



A GUIDE FOR APPLIED SUSTAINABILITY LEARNING PROJECTS: ADVANCING SUSTAINABILITY OUTCOMES ON CAMPUS AND IN THE COMMUNITY

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EXECUTIVE SUMMARY

This guide provides a step-by-step framework for how a new or existing applied learning for sustainability program can be systematically designed, built and scaled around two interconnected goals:

1. Providing students with exceptional learning experiences in sustainability;
2. Contributing to a workable sustainability solution pathway that—when implemented—can lead to significant and lasting sustainability outcomes on campus and/or in the community.

To accomplish this goal, the guide brings together lessons from on-the-ground management of applied learning for sustainability programs with literature related to sustainability science, sustainability pedagogy, change management, and partnership development. The synthesis of these two major bodies of work revealed: 1) four “building blocks” for developing powerful applied learning for sustainability programs; 2) activities for catalyzing and evolving those building blocks; and 3) a process for systematically growing the program over time.

The four building blocks are as follows and work in synergy to ensure the stability and long-term health of the applied learning for sustainability program:

1. **Laying the Foundation of the Program** is an approach for long-term planning for the program and fostering connections between the four building blocks.
2. **Sustainability Pedagogy** is an educational design for sustainability learning that aims to enhance the learning experience and create a positive and lasting impact on the problem being addressed.
3. **Fostering Connections** refers to the development of a programmatic framework that helps connect and enhance individual sustainability learning projects in order to extend their impact.
4. **Overcoming Bureaucracy** refers to the development of organizational structures and institutional processes for overcoming and eventually changing cultural and administrative barriers to applied learning for sustainability programs within a college or university.

Each building block has a set of “activities” attached to it, which are found either in the literature or through program management experience (or both). These activities are the actions that help develop the building blocks, and thus strengthen and grow the applied learning for sustainability program over time. The guide provides a description of the activities and also information about “what the activity is helpful for” and “how to use it.” A total of 26 activities are provided.

Finally, the guide uses a four-phase transition management framework to structure the development of the building blocks and the program over time. The framework ensures there is a long-term vision for the program and provides a process for organizing the actions so they progressively build upon each other and toward the vision. The icons below represent each of the four major phases of a program’s development: pre-development, take off, acceleration, and stabilization. The building blocks identified above cross all four phases.

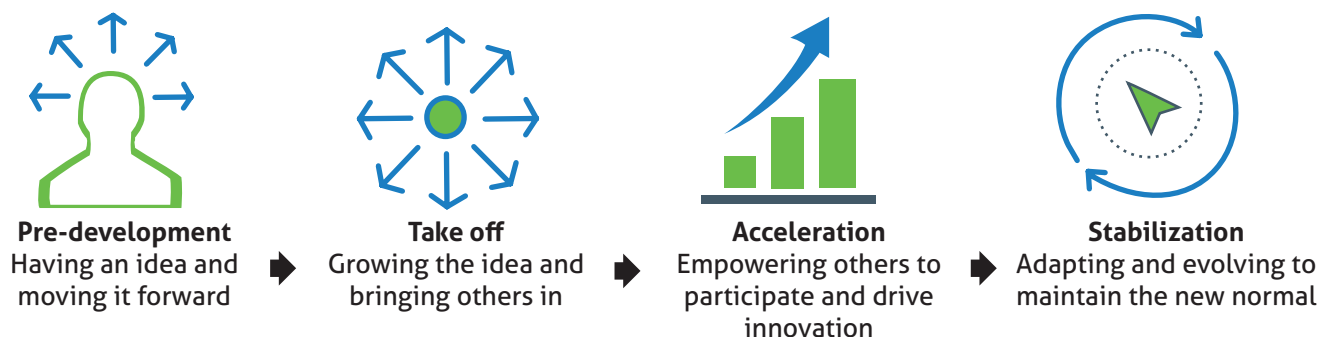


Figure 1: Overview of the four phases to systematically design, build, and scale applied learning for sustainability programs.

INTRODUCTION

The opportunity

The pursuit of a more sustainable, equitable, and resilient world is becoming increasingly imperative—with mounting environmental and social challenges such as global climate change, consumption pressures, ecosystem degradation, and more. Tackling these complex challenges will require changes across sectors and new ways of thinking and working together. Colleges and universities have a major role when it comes to leveraging their research, education, and operations to help effectively address major sustainability challenges—by contributing evidence-supported strategies, offering timely and relevant education, and using their campuses, which often resemble small cities, as living labs to test and model innovative practices.

Many colleges and universities have already made ambitious sustainability commitments and established the foundations for becoming effective contributors to sustainability problem solving (see textbox). Indeed, the long and growing trend among colleges and universities of developing community-based and applied learning programs that link student learning to on-the-ground change on the campus or in the community presents a key opportunity. These programs have significant potential to advance sustainability on their campus and in their community.

Although many of the applied learning projects and programs aim to provide real-world learning experiences, these experiences are not necessarily designed to produce lasting sustainability outcomes that can be built on over time.¹ In addition, these programs are not usually designed with a vision for the scale of impact that is possible. Most programs offer projects that are one-time, short-term interactions as opposed to longer-term partnerships between a community project partner and various students and classes at the college or university. This one-off approach limits the full potential these programs can reach and hinders their outcomes and impacts. This guide focuses on these challenges and provides a process for designing, launching, and scaling applied learning programs that can provide lasting impact on sustainability. It provides a refined framework that is applicable to a variety of contexts and stakeholders, with the ultimate goal of accelerating the deployment of these programs within colleges and universities.

Key factors enabling the growth of the applied learning for sustainability movement:

- *Association for the Advancement of Sustainability in Higher Education (AASHE)*: large network of member institutions focused on information-sharing, benchmarking, and collective action for sustainability
- *Campus as living laboratory programs*, using the campus as a medium for sustainability learning and experimentation²
- The *city as a living laboratory movement*, building city-community-university partnerships to test out new approaches to advancing the sustainability of cities³
- *Education and research programs in sustainability science* built on collaborative learning models, where students co-create (with local partners and other stakeholders) solution-based approaches to real-world sustainability challenges⁴



¹ Melnick, R. (2015). A Strategy for Scaling Sustainability Solutions: The Global Network for Sustainability Outcomes. 1-11

² Robinson, J., Berkhout, T., Cayuela, A., & Campbell, A. (2013). Next Generation Sustainability at The University of British Columbia: The University as Societal Test-Bed for Sustainability. In A. Koenig (Ed.), *Regenerative sustainable development of universities and cities: the role of living laboratories* (1st ed., pp. 27–48). Cheltenham: Edward Elgar.

³ Evans, J., Jones, R., Karvonen, A., Millard, L., & Wendler, J. (2015). Living labs and co-production: University campuses as platforms for sustainability science. *Current Opinion in Environmental Sustainability*, 16, 1–6.

⁴ Brundiers, K., & Wiek, A. (2013). Do We Teach What We Preach? An International Comparison of Problem- and Project-Based Learning Courses in Sustainability. *Sustainability*, 5(4), 1725–1746.

What this guide is about

At its core, this guide aims to provide a step-by-step framework for how a new or existing applied learning for sustainability program can be systematically designed, built and scaled around two interconnected goals:

1. Provide students with exceptional learning experiences in sustainability;
2. Contribute to a workable sustainability solution pathway that—when implemented—can lead to significant and lasting sustainability outcomes on campus and/or in the community.

When discussing the idea of applied learning for sustainability programs, we are referring to an umbrella structure that helps coordinate and connect multiple applied learning projects in sustainability. The umbrella structure is made up of four building blocks, which inform the design, strategy, and priorities for building applied learning for sustainability programs. Three of these building blocks are about the day-to-day process of developing and running a program, and the fourth building block is about integrating across the building blocks and supporting the overarching evolution of the program. The four building blocks work together synergistically and each play a critical role for the overall health of the program:

1. **Laying the Foundation of the Program** is an approach for long-term planning for the program and fostering connections between the four building blocks.
2. **Sustainability Pedagogy** is an educational design for sustainability learning that aims to enhance the learning experience and create a positive and lasting impact on the problem being addressed.
3. **Fostering Connections** refers to the development of a programmatic framework that helps connect and enhance individual sustainability learning projects in order to extend their impact.
4. **Overcoming Bureaucracy** refers to the development of organizational structures and institutional processes for overcoming and eventually changing cultural and administrative barriers to applied learning for sustainability programs within a college or university.

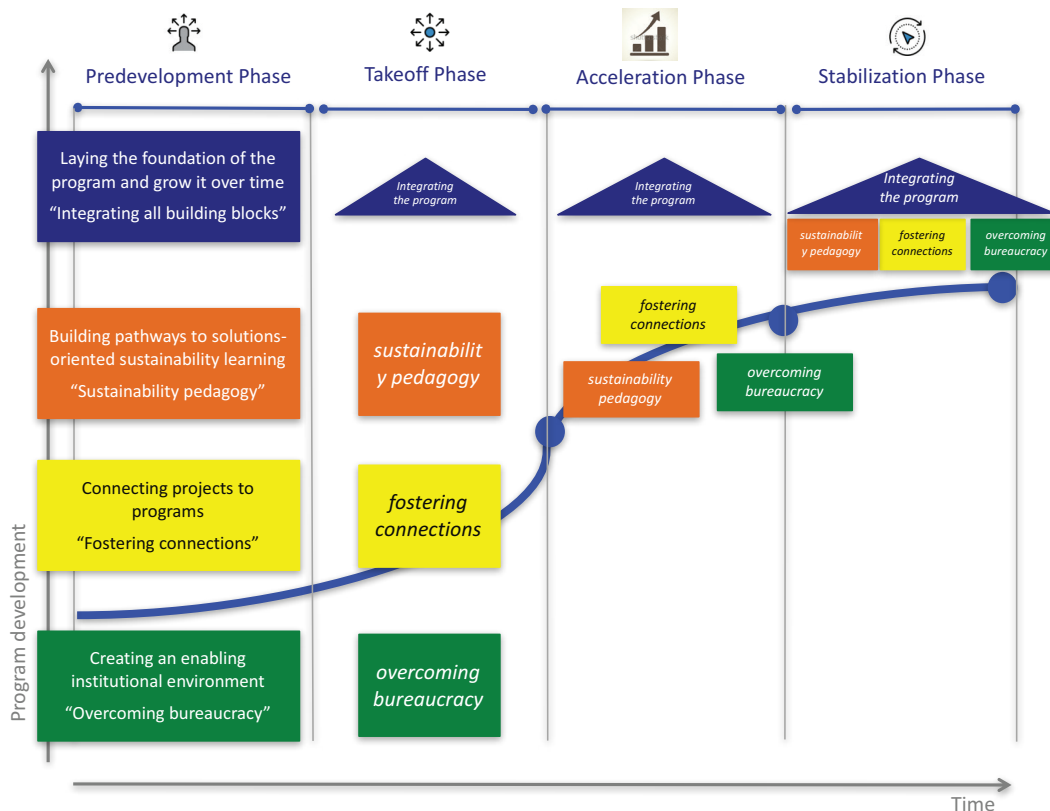


Figure 2: The four building blocks at a glance, working together over time.

Each building block has a set of activities attached to it, which help develop the building block over time. The building blocks, and their relation, are based on sustainability science literature as well as on-the-ground program development and management experience from a wide variety of colleges and universities.⁵ Figure 2 illustrates how the four building blocks evolve over time and integrate into an overarching program along the four phases.

The guide is structured in three sections. The first section presents each of the four building blocks and how they relate to each other. The second section presents the activities for catalyzing each building block. In presenting the activities we use a step-wise approach following the phases that commonly structure change processes: 1) pre-development; 2) take off; 3) acceleration; 4) stabilization.⁶ The third section is the appendix and it includes worksheets and other resources to get readers started on designing or launching their program.

How to use this guide

This document is meant to be a flexible *guide* and not a prescriptive pathway. The activities and examples are not meant to be exhaustive, but rather catalytic—each college or university has a unique context and will need to adapt the recommendations accordingly.

Readers are encouraged to read through the entire guide first and then use the worksheets provided in the appendix to execute a short analysis to identify the developmental stage of their program and where they should begin their program development quest. Once the readers have identified the section to go deeper, they are encouraged to re-read that section with their specific program in mind.

We hope that this guide will serve as a starting place (a version 1.0) for an on-going conversation about advancing applied learning for sustainability programs within the AASHE community and beyond—informing new case studies, conversations, and future iterations of this guide. Most importantly, we also hope the guide will spawn new on-the-ground examples of applied learning for sustainability programs that are operating at scale and changing universities and colleges and the communities they serve for the better.



⁵ This guide builds on the authors' experiences in developing and implementing workshops on applied learning for sustainability programs in 2013, 2014, 2015, 2016 for which we reviewed several universities and their approaches as well as our own experience developing and running applied learning for sustainability programs at Portland State University and Arizona State University.

⁶ Loorbach, D. (2010). Transition Management for Sustainable Development: A Prescriptive, Complexity-Based Governance Framework. *Governance*, 23(1), 161–183.

LAYING THE FOUNDATION OF THE PROGRAM: Integrating The Building Blocks

What is this building block?

To support the development or revision of an applied learning for sustainability program this guide uses a framework to manage transitions for sustainability. Through this transition framework, we can understand and anticipate how programs start, grow and become institutionalized over time (see figure 3). Furthermore, the transition framework has been documented and used by many institutions to develop a pathway and solid foundation for long-term social change. It helps organizations with:

- Envisioning impactful sustainability learning programs that are anchored within university and community structures and systematically planning how to realize this vision over time
- Flexibility in working toward this vision while overcoming barriers, and
- Communicating effectively with the institution's leadership and collaborating successfully with stakeholders along all phases of the development process.

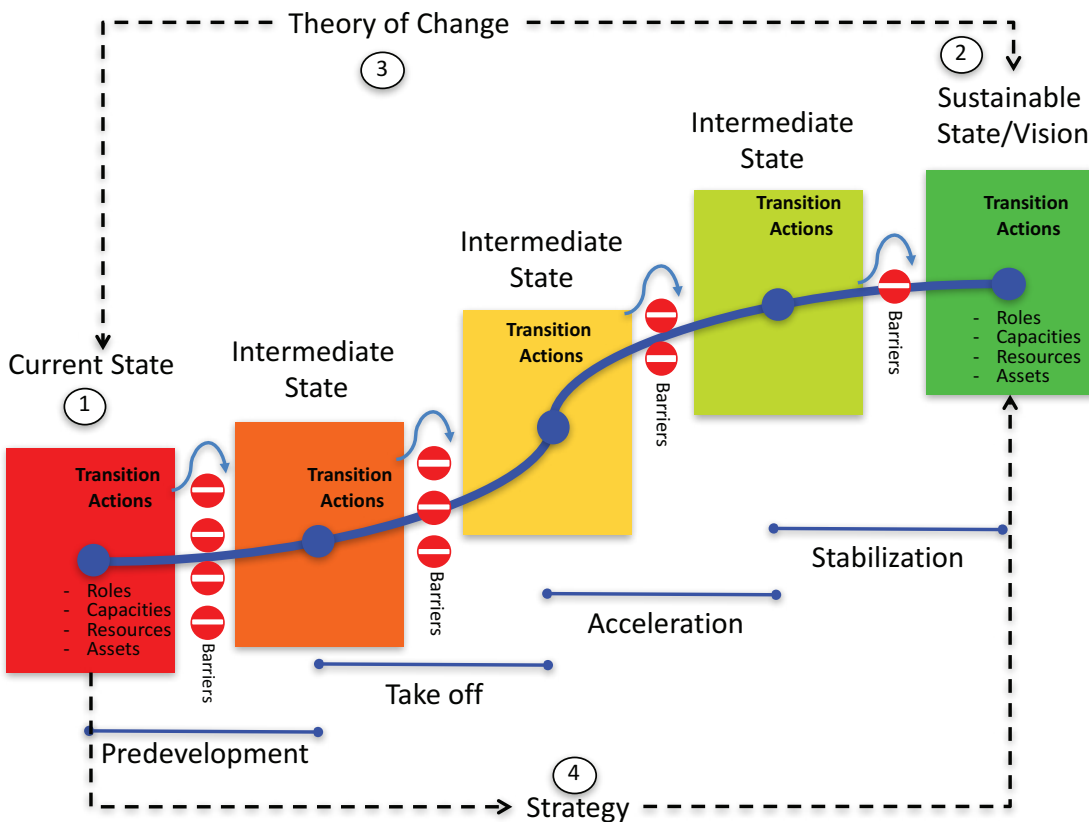


Figure 3: The framework for managing sustainability transitions over time⁷.

⁷ This figure is adapted from: Kay, B., Wiek, A., and D. Loorbach (2013). The concept of transition strategies towards sustainability. *Environmental Innovation and Societal Transition*. In review.

Why is it important?

This building block requires that users bring together three major pillars that are important in the early stages of developing or refining a program.

1. Creating a current state analysis,
2. Creating a vision of the future when the applied learning for sustainability program is fully scaled and working, and
3. Specifying the theory of change, which gives the reasoning and mechanisms that allow moving from the current state toward the vision, while overcoming anticipated and surprise obstacles.

Developing these three pillars (in relation to your program) serve as the foundation for your overarching program strategy. The strategy is a series of actions designed to move the program forward from one phase to the next. In the Appendix we provide worksheets to help develop your program's three pillars and the strategy.

A second benefit of the transition framework is that it breaks the process of developing a program into four phases: pre-development, take off, acceleration, and stabilization. This helps break down the considerable and long-term task of building a stable, high impact program, into a sequential process.

Steering change is a complex adaptive process that involves uncertainties and barriers. To address this challenge, it is helpful to use a participatory approach that includes key stakeholders in developing the three pillars as well as the subsequent actions. The key stakeholders include the institution's leadership, faculty, operations and facilities managers, students, and community groups. The participatory approach accounts for and integrates various perspectives, creates buy-in and encourages people participating in the effort to be more transparent and up-front.

Strengthening the building block over time

Applied learning for sustainability programs progress over time through the following four phases.

1. The **Pre-development** phase entails establishing the three pillars (current state analysis, vision, theory of change). This lays the foundation for developing a strategy that describes how to move from the current state to the future vision and how to address potential challenges.
2. The **Take Off** phase entails identifying allies who want to help move the applied learning for sustainability program forward and establishing a network that is committed to supporting the vision and strategy. A pivotal step involves conceiving of and implementing a "coordinating pilot project" that works as an experiment, allowing for small-scale implementation of a key component of the vision. For instance, introducing a solutions-oriented sustainability learning project in the early stages introduces the new considerations that must be taken into account, offering time and experience for stakeholders to organize around them.
3. The **Acceleration** phase learns from the pilot project and makes adjustments and plans for future projects. Hence, this phase builds on the initial implementation successes and expands projects in order to realize more components of the vision. Additional steps in this phase include: a) monitoring and evaluation activities to understand the impact of the program and what adjustments are possible and necessary, and b) striving to secure more support and buy-in to enable expansion of the program.
4. The **Stabilization** phase completes the implementation of the vision, which is the fully fleshed out applied learning for sustainability program, including the positive sustainability outcomes for the university and surrounding communities. Now the challenge is to "normalize" this new situation.

For each phase we propose a few activities in order to activate each of the four building blocks. These are described in the Overview of Activities section.

Please note that moving through the phases of the framework as illustrated in figure 3 is not always linear; there will be detours as well as openings for shortcuts and leap-frogging; there will be positive surprises and disappointments. Moreover, institutions enter the framework at different phases and will develop the activities in a way that is unique to their situation.

SUSTAINABILITY PEDAGOGY: Pathways to Solutions-Oriented Sustainability Learning

What is this building block?

Most universities offer a set of applied learning experiences. Some of the major formats include service learning, internships, workshop classes, and independent student projects such as theses and dissertations. In addition to these formal learning formats, there are also informal or co-curricular learning formats, such as volunteering, paid work, or student leadership activities (e.g., student clubs, associations, projects with friends). This guide focuses primarily on formal learning formats.

The commonality across these diverse formats is that applied learning engages students with their heads, hands, and hearts; it combines cognitive, tactile and emotional learning. In addition to their experiential dimension, applied learning experiences allow students to engage in self-directed, place-based, and user-oriented projects (users can be community members, businesses, or other stakeholder groups). When these core elements are combined together, they are expected to lead to transformative impacts for the *individual* learner.⁸

Some universities see applied learning experiences also as a mechanism to mainstream sustainability education across the university, a leading example is the University of British Columbia in Vancouver, Canada.⁹ Applied learning experiences play an essential role in sustainability education, because sustainability issues, while often being of a global nature, are also place-based. Furthermore, addressing sustainability problems requires participation of various stakeholders in the process of creating a shared understanding of the problem and developing pathways to sustainable outcomes. Therefore, enabling students to co-create knowledge with communities and collaborate to implement this knowledge is an important learning outcome in sustainability education.



⁸ There are a variety of learning approaches attached to applied learning, each approach focuses on specific aspects. Sherman, J.D.B. & Burns, H.L. (2015). 'Radically different learning': implementing sustainability pedagogy in a university peer mentor program. *Teaching in Higher Education*, 20(3), 231-243. Dewey, J. (1938/1997). *Experience and education*. New York: Macmillan; Kolb, D., Boyatzis, R., Charalampos, M. (1999). *Experiential learning theory: Previous research and new directions*. In R.J. Sternberg and L.F. Zhang (Eds.) *Perspectives on cognitive, learning, and thinking styles*. NJ: Lawrence Erlbaum, 2000.

⁹ Marcus, J., Coops, N. C., Ellis, S., & Robinson, J. (2015). Embedding sustainability learning pathways across the university. *Current Opinion in Environmental Sustainability*, 16, 7–13.

Solutions-oriented sustainability learning projects are part of the family of applied and collaborative learning approaches, yet, they ambitiously aim for students to learn while also contributing to transformative change in the real-world. Examples of this type of learning within universities can be found at the School of Sustainability at Arizona State University as well as the University of Leuphana in Luneburg, Germany. These projects include five elements¹⁰:

1. They familiarize students with real-world sustainability problems and solutions. In their projects, students include both an analysis and framing of the problem as well as research on solution pathways able to address this problem.
2. Students work collaboratively with project partners and stakeholders to develop pathways to sustainability outcomes. They jointly frame the sustainability problem and collaborate on identifying solutions to it. They co-lead the project equally, accounting for students' educational needs and practitioners' need for changing processes, products, and their outcomes.
3. Students learn to apply evidence-supported sustainability problem-solving approaches as well as professional and interpersonal skills.
4. Faculty advisors, as guides on the sides, mentor students in their efforts of co-creating evidence-supported pathways to sustainability outcomes with project partners.
5. The project team incorporates reflection as an ongoing practice to enhance their learning, their collaboration, and the quality of their outputs.

In sum, the project helps stimulate individual transformation and tangible progress toward addressing the problem. Moreover, while a project might result in individual and possibly real-world changes, generating lasting and measurable impact requires connecting projects to programmatic efforts to create synergies with other projects and allow the individual project to continue over time.

Why is it important?

Solutions-oriented sustainability projects provide the dual benefit of enhancing the student's individual learning experiences and creating sustainability outcomes on campus or in the community. However, they are hard to do, because of the need to actively integrate a community partner and also to change the learning environment to allow faculty to be supporters of a process as opposed to the ones with all of the solutions. There are ways to reduce the hurdles by building better pathways within the curriculum and by creating a support system for students and faculty to engage in this type of high impact learning. One model that allows students and faculty members to build their capacity for the elements (1-5) outlined above is a sequence of applied and real-world learning experiences that progressively build upon each other (see figure 4).¹¹

The staircase model of applied learning experiences has four levels:

1. *Bringing the world in*: allowing students to engage with real-world sustainability issues and professionals (e.g., as guest speakers) in the safe environment of the classroom.
2. *Visiting the world*: engages students in field trips and site visits, using the experiential, place-based, and dialogic components to reinforce learning.
3. *Simulating the world*: engages students with in-person role-playing sessions and computer-based decision-making games in order to resolve trade-offs, which are characteristic of sustainability issues. Role-playing includes: decision-making or negotiation processes, scenario development, or modeling.
4. *Engaging with the world*: offers students opportunities to develop the skills and experiences to engage in collaborative ways with project partners and stakeholders. This final tier is what we refer to as a solutions-oriented sustainability learning project.

¹⁰ Wiek, A., & Kay, B. (2015). Learning while transforming : Solutions-oriented learning for urban sustainability in Phoenix, Arizona. *Current Opinion in Environmental Sustainability*, 16, 29–36.

¹¹ Wiek, A., Xiong, A., Brundiers, K., & Leeuw, S. Van Der. (2014). Integrating problem- and project-based learning into sustainability programs: A case study on the School of Sustainability. *International Journal of Sustainability in Higher Education*, 15(4), 431–449.

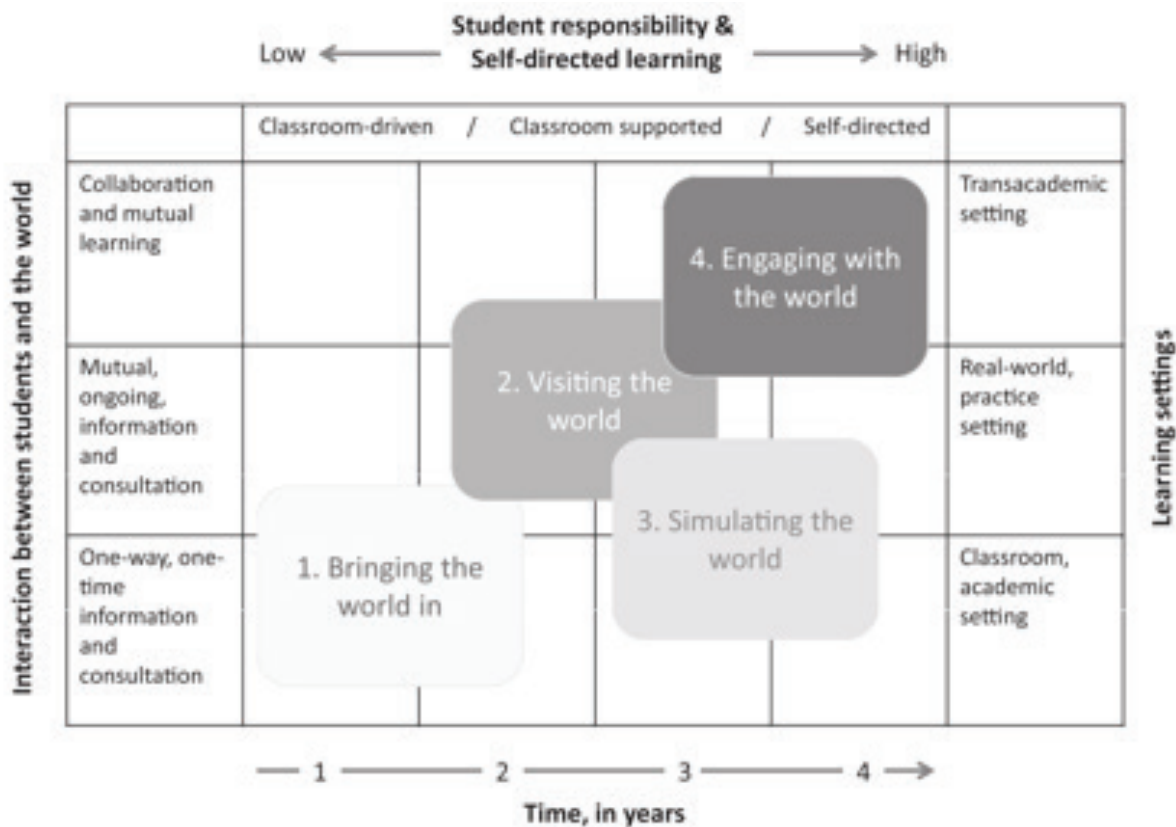


Figure 4: The staircase model of applied learning experiences.¹²

Strengthening the building block over time

The trajectory for this building block is to move from a non-existent or small number of solutions-oriented learning projects to a large number of high quality solutions-oriented projects. To get there, we follow the staircase model (figure 5). The staircase model helps with two things; first, it allows faculty and students to build up their capacity so that they can effectively participate in a solutions-oriented project. Secondly, the experiences earlier in the staircase (levels 1-3) offer opportunities to execute on fundamental projects (such as background analysis or literature reviews) that will be critical to successfully implementing a full-fledged solutions-oriented project.

If these learning opportunities are built into courses all along the curriculum, students can align their applied learning experiences as their own pathway in the early years of college. These experiences early in their careers give them key competencies that can allow them to effectively engage in solutions-oriented sustainability projects during their final years at a college or university.¹²

To build solutions-oriented sustainability learning projects, existing applied learning experiences that are offered at the institution can be reframed using the solutions-oriented learning perspective (see elements 1-5). Additionally, new applied learning experiences can be created as fully fleshed out solutions-oriented learning projects using the same five elements. Figure 5 schematically indicates how schools can build these pathways and solutions-oriented sustainability projects over time, and embed them within the school's curricula and the campus culture.

¹² Allen, J. H., Beaudoin, F., Lloyd-Pool, E., Sherman, J., & Ed, M. S. (2014). Pathways to Sustainability Careers: Building Capacity to Solve Complex Problems. *Sustainability*, 7(1), 47–53.

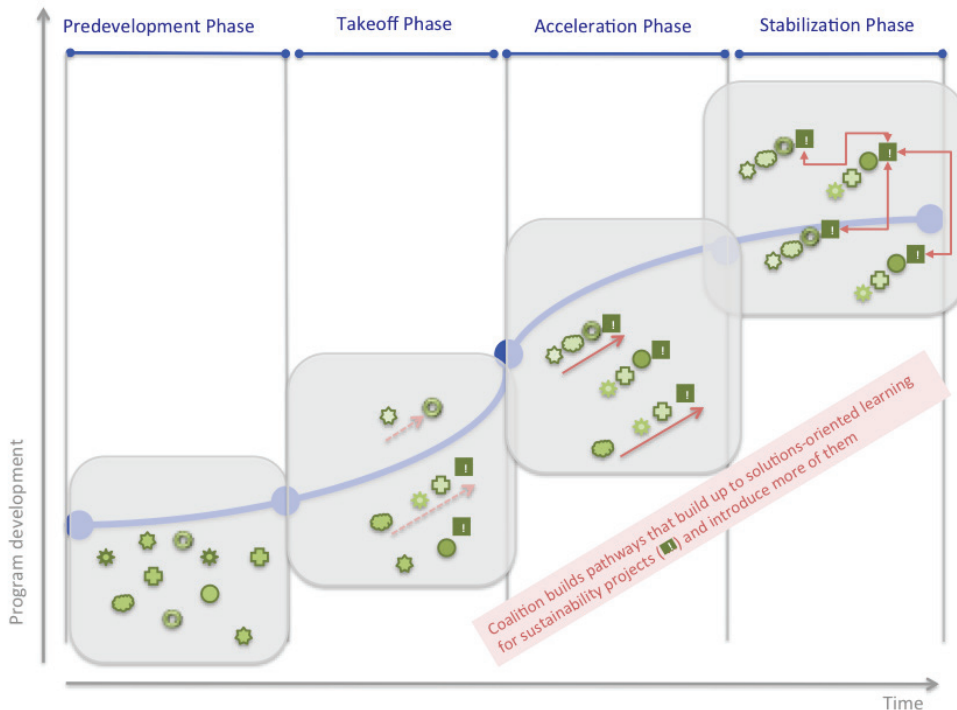


Figure 5: Schematic illustration how existing applied learning formats can be connected with each other to create a pathway to solutions-oriented learning. The different shapes symbolize the diversity of applied learning formats that exist at most colleges and universities, including e.g., service learning, internships, independent applied research, in-class applied research team projects (class assignments). The green quadrant filled with an exclamation mark indicates the solutions-oriented learning for sustainability projects.

For the coalition that tries to set up the program, the pathway idea means to introduce solutions-oriented learning for sustainability projects over time and to try and combine diverse applied learning projects consecutively with each other in ways that allow them to develop the necessary knowledge base needed for working on the culminating solutions-oriented learning project. In the Stabilization phase, the coalition also tries to connect the solutions-oriented learning for sustainability projects with each other to further leverage their impact.

FOSTERING CONNECTIONS: Connecting Projects to Programs

What is this building block?

At the beginning of developing or revising an applied learning for sustainability program it is important to establish a connection between individual engagements (projects) and the broader system of activity that runs across those engagements (the program).

This building block “Connecting projects to programs” builds off of the “collective impact” literature, which criticizes the tendency for socially-oriented organizations to focus the bulk of their time on building infrastructure to support organization-specific goals and less time on building synergies with other initiatives or organizations with similar goals.¹³ This literature recommends that organizations spend more energy integrating and setting common agendas across organizations and initiatives as a means to address complex and urgent challenges.

The collective impact concept is applicable to colleges and universities in general and to applied learning for sustainability programs in particular. Too often, the bulk of the staff and faculty time is spent on the development of a project – with little or no time spent on an overarching program. An overarching program builds systems that reduce project set-up time and supports connections to other projects with similar goals – two factors

¹³ Kania, J. & M. Kramer (2011) Collective Impact, Stanford Social Innovation review (<http://ssir.org>)

that can increase the eventual impact of the individual projects. Taking time to build shared processes, communications channels, common agendas and joint activities across projects requires a change in behavior and an upfront investment of time. This investment can create “systematic” pathways for student and faculty engagement, thereby reducing the overall time and energy necessary to develop effective projects, while increasing overall impact of individual projects.¹⁴

Why is it important?

Developing an applied learning for sustainability program is a complex endeavor that aims for transformational change within a college or university. Building a programmatic framework under which many projects can exist is helpful for clustering activities, creating synergies, and deploying resources more efficiently. This overarching framework serves as an umbrella that maps out the system of activity and fosters the development of collective planning across projects. It creates visibility, which is important for attracting resources and partnerships. Clustering the projects together in common themes can help produce larger, more dynamic stories than what can be achieved by individual projects.¹⁵

The project-to-program linkage also helps with focusing efforts over time. Initially, the program theme(s) will emerge from the existing set of projects, but over time those themes will inform and direct the development of future projects and also become a lens for denying other projects that do not fit the focus. Maintaining a strong focus also helps direct the bulk of the resources and staff time toward the areas where there are clear opportunities for growth and reputation, and away from areas that could be a distraction or are more exploratory.

This building block also looks to inform a future “new normal” for how projects interact with each other. Fostering greater project-to-project exchange unlocks significant efficiencies, such as sharing and refining project development processes, connecting project outputs together, and deepening relationships and streamlining communications with common partners. Strengthening the project-to-project connections can accelerate individual project performance and also demonstrate coordination across the system of activity – a helpful characteristic for growing programmatic resources, project impact, partnerships and visibility.

Strengthening the building block over time

The vision for the connecting projects-to-programs building block is to move from highly individualized and scattered projects into a system of projects that are synergistic, coordinated and driving toward common goals.

To get there, we begin by envisioning a programmatic framework and make initial connections across projects and into the program. A first step would be to identify a common theme that ties together existing projects across campus and/or into the community – for example, food justice. By simply organizing the existing food justice projects and partners that your college or university is engaged in, you have begun to lay the foundation for fostering project-to-program connections.

From there, you begin to explore synergies across projects and also identify the actions a program can play in support of the projects. To continue on the food systems theme, a next step could be to convene the full list of project leads and partners working on food systems for information sharing, networking and also communications about the effort to build an applied learning program on food systems. This helps faculty, partners and students see themselves as a part of a larger system of activity and also to gather information about more projects to integrate. A point person (or point people) for building the project-to-program connection emerges and also supports individual projects, providing services such as facilitation and project management support.

14 Evans, J., Jones, R., Karvonen, A., Millard, L., & Wendler, J. (2015). Living labs and co-production: University campuses as platforms for sustainability science. *Current Opinion in Environmental Sustainability*, 16, 1–6.

15 Beaudoin, F., Sherman J. 2016 “Higher education as a driver for urban sustainability outcomes: The role of Portland State University Institute for Sustainable Solutions” *Sustainable Solutions Volume 1*. GreenLeaf Publishing

The last steps are to increase the engagement in the program and to institutionalize its existence. The program builds out strong connections and partnerships within the community so that new projects are tied directly to community-identified needs. The synergies across projects are strong, allowing for multi-year planning and agreements with faculty, administrators and partners.

Figure 6 provides a schematic breakdown of how the project to program link grows and strengthens over time – eventually leading to the development of focused and highly synergistic projects.

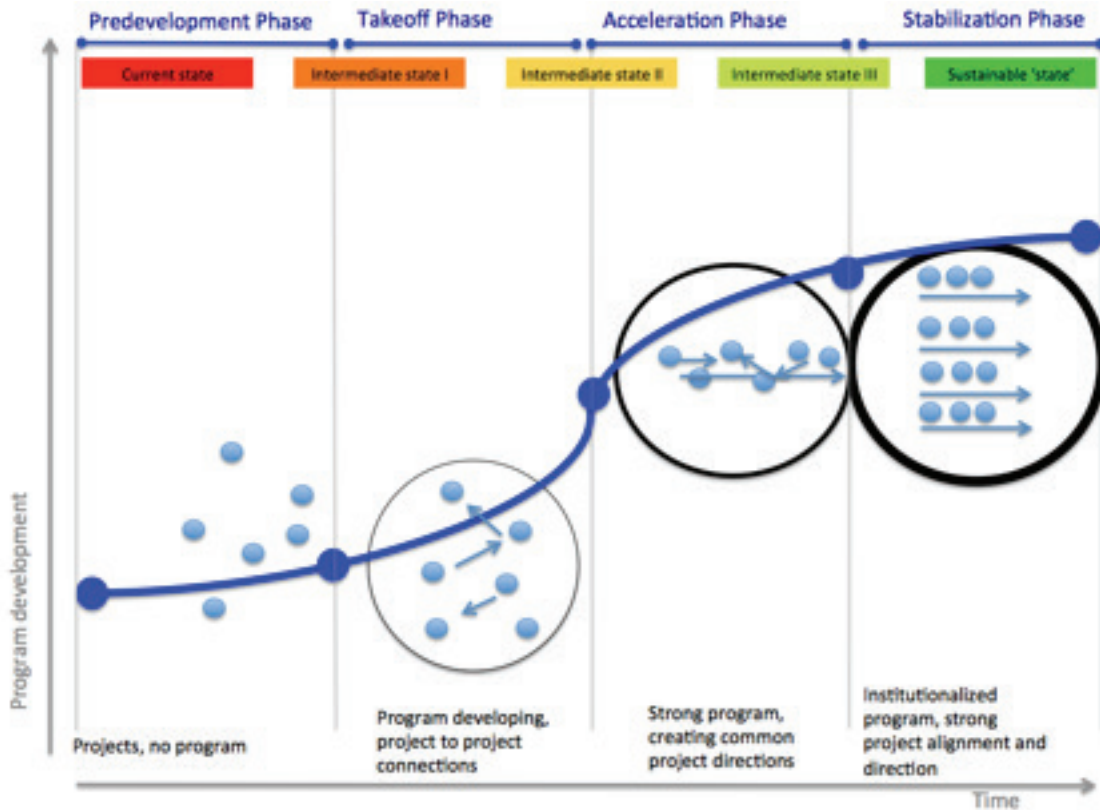


Figure 6: Illustration of how individual projects connect with each other and to programmatic efforts.

OVERCOMING BUREAUCRACY: Creating an Enabling Institutional Environment

What is this building block?

Creating an enabling institutional environment for applied learning for sustainability programs involves both connecting the program to the institutional culture while influencing and changing that culture. The institutional culture is a complex mix of the culture promoted by the leadership of the institution, its faculty and administrators, facilities and operations managers and staff, and of course the students and their communities. Hence, connecting the applied learning for sustainability program to the institutional culture means to connect to the cultures of these groups and to the culture of the college or university as a whole.

The “creating an enabling institutional environment” building block is based on the assumption that the college or university is not already providing an enabling institutional environment for an applied learning for sustainability program. Indeed, many colleges or universities often unintentionally discourage participation in an applied learning for sustainability program. For example, executing projects connected to the applied learning for sustainability program could require additional time from a faculty member to coordinate and communicate with the community partner (to facilitate project outcomes, site visits, and more). The faculty member is often not compensated or otherwise recognized for this additional time. Furthermore, the applied nature of the

course, although a major investment on behalf of faculty, will not be a major factor in the faculty's promotion and tenure review. An enabling institutional environment can strengthen applied sustainability programming by supporting faculty and staff's participation in it; e.g., through creating new types of positions to support the program's activities or offering a reduced teaching load to faculty administering projects. In addition, partnerships with existing applied learning programs (such as workshops and capstones) can be an important starting place for building buy-in and momentum for an applied learning for sustainability program.

Why is it important?

A major barrier facing an applied learning for sustainability program is that it can be viewed as a peripheral activity instead of something that is central to the institution's core values. Creating an enabling institutional environment ensures that the activities associated with an applied learning for sustainability program are supported by the college or university's structures, policies, and reward systems. Influencing the institutional environment also allows the program to build broad support across all levels within the college or university, from the president to staff to students.

Influencing multiple levels of a college or university is a complex endeavor, and therefore structures must be in place that can reinforce the vision and direction. Examples of these structures include:

- Flexible pathways for students and faculty to engage in sustainability learning;
- The development of a university-wide framework for sustainability education;
- A fellows program for supporting connections and building capacity between sustainability faculty across colleges.¹⁶

These structures are representative of an enabling institutional environment and work together to influence different parts of the college or university—systematically nudging the system to more effectively support and invest in the new normal.

Creating an enabling institutional environment will also assist with growing awareness and visibility. Growing awareness and accolades for an applied learning for sustainability program helps drive more people to participate and engage within the college or university and the community. It also raises the acceptance of the program at the highest levels of the college or university.¹⁷

Further, creating an enabling institutional environment also means that the activities to advance the program are supported reflexively and are not "dependent on external conditions or leadership activities."¹⁸ When this vision is achieved, the program becomes an enduring institutional priority, driving hiring decisions, being prioritized in budget cycles and being lauded in the college or university's fundraising campaigns and media outreach.

Strengthening the building block over time

This building block aims to shift the value system within colleges and universities from a culture that places a low value on the community impact resulting from student and faculty engagements to a culture that supports and rewards extraordinary student experiences that have a positive and lasting impact on the partner communities.

¹⁶ Marcus, J., Coops, N. C., Ellis, S., & Robinson, J. (2015). Embedding sustainability learning pathways across the university. *Current Opinion in Environmental Sustainability*, 16, 7–13.

¹⁷ Evans, J., Jones, R., Karvonen, A., Millard, L., & Wendler, J. (2015). Living labs and co-production: University campuses as platforms for sustainability science. *Current Opinion in Environmental Sustainability*, 16, 1–6.

¹⁸ Robinson, J., Berkhout, T., Cayuela, A., & Campbell, A. (2013). Next generation sustainability at the University of British Columbia: The university as societal test-bed for sustainability. In *Regenerative Sustainable Development of Universities and Cities: The Role of Living Laboratories* (pp. 27-48). Edward Elgar Cheltenham.

Creating such an enabling institutional environment is a process that occurs over a long period of time. At the start, an applied learning for sustainability program often must overcome significant barriers, such as the dominance of the current paradigm and competition for resources across units. However, small shifts within the college or university can add up into a solid foothold for the program within the college or university’s culture. This foothold can be leveraged over time to create a positive feedback loop that turns the college or university into a driver for the proliferation and stability of the applied learning for sustainability program.

A first step is to clearly articulate the benefits of the program and resources, roles, and responsibilities necessary to produce those benefits. Through this process, tangible results are created that can be used as evidence of the program’s impact; stakeholder groups are built (within the college and university and beyond) and a deeper understanding of the constraints and opportunities associated with an applied learning for sustainability program are developed.

Additional steps include developing examples of the positive benefits provided by the program. The base of stakeholders described above will produce salient examples of the benefit provided by the program and also become a core advocacy group for changes necessary to ensure the work can be successful within the college or university. Another step entails cultivating major investments and structures that can allow the program to exist as a central activity that runs throughout the institution. At this point the college or university has put the applied learning for sustainability program into its major strategic and operational plans, and systems for promotion and ranking (amongst faculty and staff) are adjusted to reinforce participation in the program.

Figure 7 visually depicts the strengthening of a college or university’s institutional environment over time – with particular focus on the program’s role in fostering increasing connectivity between the goals, timelines and aspirations of the community and those of the college or university.

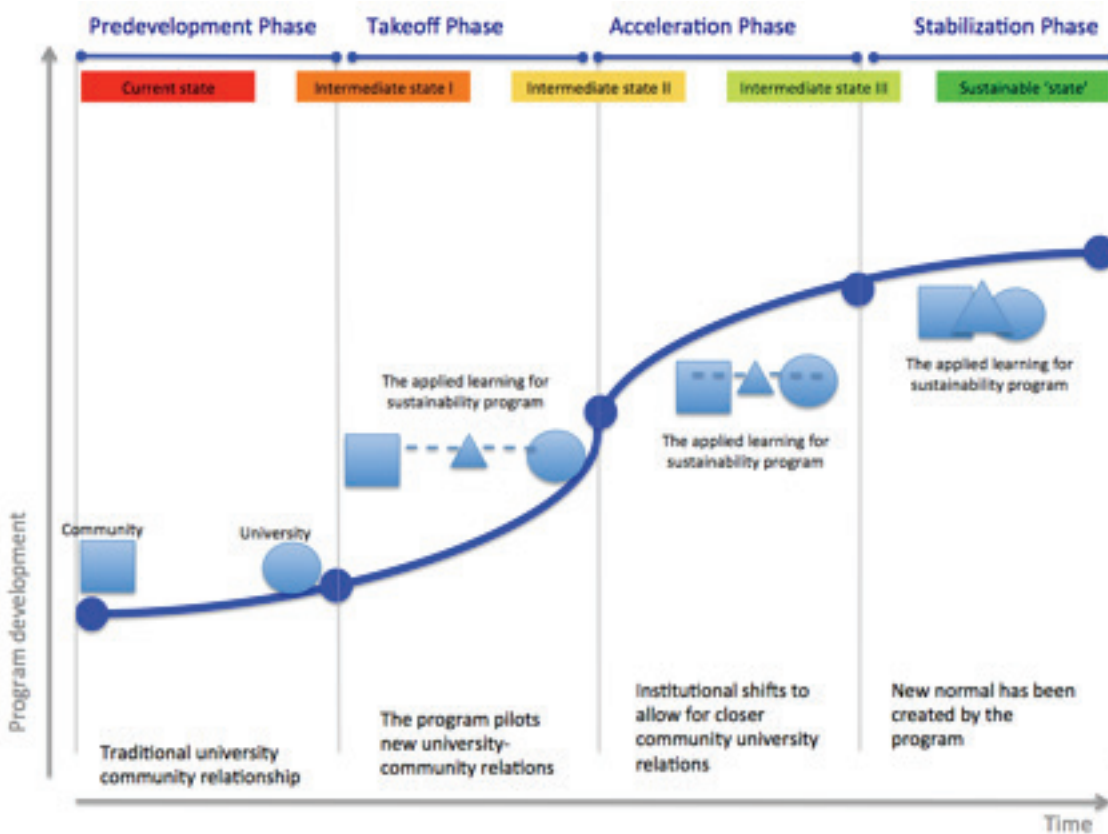


Figure 7: Strengthening the institutional environment over time.

OVERVIEW OF ACTIVITIES TO ACTIVATE EACH BUILDING BLOCK

This second section of the guide moves now through the four phases and explains the set of activities available in each phase, drawing from all four building blocks. Figure 8 provides an overview of the activities in each phase.

BUILDING BLOCK	PHASE 1: PRE-DEVELOPMENT	PHASE 2: TAKE OFF	PHASE 3: ACCELERATION	PHASE 4: STABILIZATION
Laying the Foundation of the Program: Integrating The Building Blocks	1. Build the framework: define the three pillars	8. Implement pilot project to coordinate all building blocks 9. Set up monitoring and evaluation	15. Create a high-level advisory board 16. Develop your impact evaluation	23. Nurturing the new normal
Sustainability Pedagogy: Pathways to Solutions-Oriented Sustainability Learning	2. Learning about solutions-oriented sustainability learning 3. Building a case study of solutions-oriented learning	10. Develop good project guidelines 11. Develop engagement workshops for faculty and staff about solutions-oriented sustainability learning	17. Map pathways for students to engage in solutions-oriented sustainability learning 18. Training in professional skills and sustainability competencies	24. Creating pathways of solutions-oriented sustainability learning projects
Fostering Connections: Connecting Projects to Programs	4. Inventory of applied learning projects 5. Cluster applied learning projects for sustainability	12. Project-tracking database	10. Multi-year partnership framework for legacy partners 20. Program scaling model	25. Hire a community partner advisor
Overcoming Bureaucracy: Creating an Enabling Institutional Environment	6. Enable a sustainability broker 7. Build a coalition of people interested in developing the program	13. Revise the position of the sustainability broker to have a key role in the program 14. Deploy an engagement strategy for the program	21. Develop an organizational model for the program 22. Develop a web portal for the program	26. Adjusting standards for faculty and staff to support the program

Figure 8: Overview of activities across all building blocks for each phase

PRE-DEVELOPMENT PHASE

What is happening in this phase?

A vision emerges to develop or refine an applied learning for sustainability program. A small group of people comes together around this goal and they form an informal working group to study best practices on this subject¹⁹ and adapt those practices as appropriate to their college or university's context. This group could include roles such as campus sustainability managers, partnership coordinators and managers, community-based learning specialists and more.

A core champion for the development of a program is emerging, but this individual may be working without direct support from her or his supervisor. Since the initiative is informal, there are limited resources going into the development of the program. A formal program does not exist, but the members of the group share a desire to better coordinate and connect the disparate set of sustainability projects taking place at the college or university. The existing applied learning for sustainability projects at the college or university range greatly in terms of quality for the students and the partners.

LAYING THE FOUNDATION OF THE PROGRAM: INTEGRATING ALL BUILDING BLOCKS

ACTIVITY 1: BUILDING THE FRAMEWORK: DEFINE THE THREE PILLARS

What it helps with:

Starting a complex endeavor that holds a variety of unknowns always entails some degree of testing new things on uncharted ground and improvising. A strong foundation for an applied learning for sustainability program is made up of three pillars:

1. Current state analysis and assessment,
2. Sustainable vision, and
3. A theory of change.



Strategy

These three pillars later inform your strategy for moving forward (see activity 2). Together, they establish the backbone for the first building block. Furthermore, they will serve as a reference point that guides and integrates the other three building blocks: connecting projects to programs; pathways to solutions-oriented learning; and creating an enabling institutional environment. In the Appendix we provide a worksheet to develop each pillar as well as the overarching program strategy.

What you need to make it work:

Developing the three pillars will require time to collect and analyze information. It might be easiest to work one pillar at a time, starting with the current state analysis, followed by the vision and the theory of change.

Start with preparing an outline for each pillar. Use that outline as input for a collective brainstorming that involves the other interested individuals. Next, the group can solidify the ideas through a structured work session where a cohesive plan is drafted and prepared for review by a boarder set of university stakeholders. In order to make the overarching program strategy work it needs to be complete, but not set in stone. The overarching program strategy can be an engagement tool for talking with key people at the college or university about how the applied learning for sustainability program can tie to the core mission of the institution.

The three pillars and the resulting overarching program strategy are living documents that should be updated regularly based on the lessons learned, insights from participating stakeholders, and in response to a changing context.

¹⁹ Koenig, A. (Ed.) (2013) Regenerative Sustainable Development of Universities and Cities: The Role of Living Laboratories. Cheltenham: Edward Elgar.



Suggestion for an applied learning for sustainability project:

Engage students in supporting you and the coalition in developing the strategy and the three pillars. Students from public policy, urban studies, environmental sciences and management as well as business programs learn how to develop strategies in theory and might appreciate the opportunity to apply their learning to a concrete endeavor.

SUSTAINABILITY PEDAGOGY: PATHWAYS TO SOLUTIONS-ORIENTED SUSTAINABILITY LEARNING

ACTIVITY 2: LEARNING ABOUT SOLUTIONS-ORIENTED SUSTAINABILITY LEARNING

What it helps with:

Solutions-oriented sustainability learning is an emerging pedagogical approach.²⁰

Key features of solutions-oriented sustainability learning are:

1. They familiarize students with *real-world sustainability problems and solutions*.
2. *Students work collaboratively with project partners and stakeholders* to develop pathways to sustainability outcomes.
3. *Students learn to apply* evidence-supported sustainability problem-solving approaches as well as professional and interpersonal skills.
4. *Faculty advisors, as guides on the sides, mentor students* in their efforts to self-direct their learning and the project.
5. The project team incorporates *reflection* as an ongoing practice.

In sum, the project stimulates *individual transformation and transformation of the problem addressed*.

What you need to make it work:

Learning about solutions-oriented sustainability learning can start with reading a handful of articles and discussing the insights with the other individuals committed to building the program. The goal of these discussions is to explore how solutions-oriented sustainability learning can be developed at one's own college or university and how existing projects can be linked with each other to build a pathway that culminates in a solutions-oriented sustainability learning experience. The bibliography at the end of this guide provides a list of some introductory articles illustrating how diverse colleges and universities incorporate solutions-oriented sustainability learning (e.g., Arizona State University, USA, Portland State University, USA, University of British Vancouver, CAN, University of Manchester, UK).



Suggestion for an applied learning for sustainability project:

The results of this student project could support you and the other members of the group in learning about solutions-oriented sustainability learning. To this end, one or more students from various programs, but in particular educational or sustainability programs, could be offered an internship, a honors project, or another form of academic assignment. The task of the assignment would be to conduct a literature review, compile their findings in a report, and present them to the group for discussion.

²⁰ Wiek, A., & Kay, B. (2015). Learning while transforming: Solution-oriented learning for urban sustainability in Phoenix, Arizona. *Current Opinion in Environmental Sustainability*, 16, 29–36.

ACTIVITY 3: BUILDING A CASE STUDY OF SOLUTIONS-ORIENTED SUSTAINABILITY LEARNING

What it helps with:

Building a case study of a solutions-oriented sustainability learning project helps with communicating the impact of such a project and the core elements that must be in place to deliver that impact. If the case study comes from your college or university, it also helps celebrate the good work of your college or university's faculty, students, staff, and community partners involved in the project. This case study can be a source for talking points and specific examples when engaging external partners, faculty and staff in the early stages of developing an applied learning for sustainability program.

What you need to make it work:

Ideally, the case study should build on a compelling example within your college or university, and speak to the unique context, constraints, and opportunities facing your institution. However, if a strong case is not yet present at your college or university, choose a strong example from another institution to highlight (ideally from an institution that has similar characteristics – such as size, student population, or type of institution). It is important that the case study contain the core elements of a solutions-oriented sustainability learning project even if they are still in rudimentary form (see p. 22 for core elements). Execute an interview with the head of the project you are highlighting. Your interview partner might even serve as a helpful ally and mentor in future stages of your program's development.

FOSTERING CONNECTIONS: CONNECTING PROJECTS TO PROGRAMS

ACTIVITY 4: INVENTORY APPLIED LEARNING PROJECTS FOR SUSTAINABILITY

What it helps with:

The inventory of applied learning projects in sustainability provides an initial baseline of activity and serves as an umbrella for capturing a myriad of projects. The information gathered in the inventory will be important for understanding the relevant future project stakeholders, collecting stories of past projects that help to build momentum for the program, and for building a comprehensive set of data that will inform how to develop a program to connect a subsection of these projects. In addition, it will begin to uncover common pathways for students and project connections that can enrich the overall learning and impact.

The inventory will describe each project following the same structure:

- Goals of the project
- History and length of existence
- College or university and partner leads
- Project theme (such as climate action)
- Level of engagement for students with the real-world (bringing the world in; visiting the world; simulating the world; engaging with the world)
- Explore if there is a solutions-orientation (describe the project's transformative aspirations)

What you need to make it work:

Before beginning with creating a new inventory, look for existing inventories or synergistic efforts that can save time and increase buy-in for the inventory. The inventory will eventually need to be managed by the individuals involved in developing the applied learning for sustainability program.

→ ***Suggestion for an applied learning for sustainability project:***

Creating this inventory is an ideal process for a student to execute as an applied learning for sustainability project. However, staff time is needed to develop the work scope, supervise the student, and help the student identify the key stakeholders across the college or university that need to be contacted in order to build out this inventory. Example stakeholders include university partnerships coordinators, sustainability coordinators, and heads of sustainability-related departments and community-based learning managers.

ACTIVITY 5: CLUSTER APPLIED LEARNING PROJECTS FOR SUSTAINABILITY

What it helps with:

Based on the inventory, projects can be organized into clusters. Clustering involves analyzing the project data to understand patterns that could inform how projects connect with each other to eventually form a program. Projects might be grouped around common themes and/or common partners, which can serve as the foundation for fostering better coordination across projects and also for the eventual development of an applied learning for sustainability program. For example, Portland State University identified a cluster of projects and partners around sustainable neighborhoods and used that information as the foundation for building a small cohort of interested faculty and then, eventually, launching the Sustainable Neighborhoods Initiative (see the case study description below). These clusters can also serve as an engagement tool for reaching out to project partners and stakeholders within your college or university, sharing the information with them as a means for growing their participation and also uncovering more data points. The program can evolve over time to integrate multiple themes.

What you need to make it work:

The clustering tool is highly contingent on a well-executed inventory. A strong inventory will ensure that the clusters represent real patterns and that it can stand up to scrutiny by project partners or stakeholders within your college or university who have high levels of knowledge related to a given project. The individuals engaged in developing the program need to be committed to integrating more data into the inventory; however, at some point they must shift from inventorying and clustering projects to actually activating a few of the clusters. The group of individuals engaged in developing the program should consider setting a milestone (such as a half day work session) where the clusters will be reviewed and decisions will be made to activate a few of those clusters.

Case Study: Sustainable Neighborhoods Initiative – Portland State University

The Sustainable Neighborhoods Initiative (SNI) is a program at Portland State University that connects students and faculty with community organizations in long-term partnerships that advance sustainability at the neighborhood scale. The SNI is managed by the Institut for Sustainable Solutions (pdx.edu/sustainability/iss), which helps cultivate and support the implementation of community-university sustainability projects. The SNI is inspired by PSU's long history of community-based learning and is designed for cumulative impact, with groups of students from various classes working over multiple terms on projects and issues identified by community partners. The SNI provides rich learning and research opportunities that engage students in addressing real-world sustainability issues, while adding capacity to help local organizations advance their projects and initiatives.

An example stems from the partnership with the South of Market EcoDistrict (SoMa) and their place-making efforts in the district. Over a period of 18 months, PSU architecture students designed and built Downtown Portland's first public parklet. Students worked closely with SoMa and ISS staff to design the parklet, seek approval from the city, solicit support from local businesses, engage key stakeholders, and launch a crowd-funding campaign that raised more than \$15,000 for building materials.

For more information: pdx.edu/sustainability/sustainable-neighborhoods

OVERCOMING BUREAUCRACY: CREATING AN ENABLING INSTITUTIONAL ENVIRONMENT

ACTIVITY 6: ENABLE A SUSTAINABILITY BROKER

What it helps with:

Enabling a sustainability broker is a core strategy for building a center of gravity around the development of an applied learning for sustainability program. The sustainability broker is a person who connects students and faculty with project partners on campus and in the community and helps design applied learning for sustainability projects. The sustainability broker is also called a TIM for Transacademic Interface Manager.²¹

This position builds momentum and awareness for the projects within the program by effectively managing partner relationships and facilitating the creation of projects, generating stories about program's projects and building cohesion within the core team.

What you need to make it work:

It is important to note that an individual or individuals may already be playing this role, but just informally. Formalizing such brokerage activities across the university will require commitment from the newly minted sustainability broker to work on the project outside of the scope of their existing position (e.g. a campus sustainability manager adding the sustainability broker role to her/his responsibilities). For instance, it might not be part of their position description to convene a cross-campus group interested in developing an applied learning for sustainability program, but this is a fundamental element to building a program. If there is no flexibility for the sustainability broker to work outside of their position description, then a strong case must be made to the sustainability broker's supervisor to revise the position description to allow for such activities.

ACTIVITY 7: BUILD A COALITION OF PEOPLE INTERESTED IN DEVELOPING THE PROGRAM

What it helps with:

This coalition, paired with the sustainability broker, will serve as the foundation for advancing the applied learning for sustainability program. The coalition will build out the initial value proposition for the sustainability broker, advise on framing the program and enhance the overarching program strategy. This coalition can also help access financial, political and human resources needed to officially launch the program.

What you need to make it work:

The coalition can form in many ways. It might be a natural outgrowth from an existing committee (such as a cross-university sustainability committee) or planning process (such as developing a climate action plan) or the sustainability broker may play an active role by meeting with individuals and stitching together a collective agenda. The coalition does not need to be large, but needs to be made of people who are persistent, have a strong understanding of the college or university context and structure, and who are committed to spending time and energy on the development of the program. The coalition can also form from a top down process, a bottom-up process or a hybrid or both. Eventually, however, the program will need to garner the attention and support from high-level administrators in the university in order to influence the desired change.

California State University offers a good example for how to build a diverse collection of stakeholders that are engaged and invested in developing an applied learning for sustainability program.



²¹ Brundiers, K., Wiek, A., & Kay, B. (2013). The Role of Transacademic Interface Managers in Transformational Sustainability Research and Education. *Sustainability*, 5(11), 4614–4636.

Case Study: Campus as a Living Lab – The California State University

The Campus as a Living Lab (CALL) program in the California State University system provides a unique opportunity for faculty and facilities management staff to partner by using the campus as a forum for exploring sustainability concepts and theories. CALL offers funds for the redesign of courses that use the campus physical plant as an opportunity for learning about sustainability, and it aligns CSU's long-standing commitment to sustainability with the fundamental goal of preparing students for the workforce. The Campus as a Living Lab program is a partnership between the Divisions of Business and Finance, Academic Affairs, and System-wide Academic Senate, and is managed by staff in the Capital Planning, Design and Construction Division.

A recent example project from Sacramento State University involved the redesign of Urban Agriculture, a course in the Department of Environmental Studies, and it helped to defray the cost of bringing electrical power and running water to a parking lot on campus, which had been partly converted to a composting yard. At this site, students and faculty are using earthworms to turn organic waste into high-quality compost, resulting in reductions in the waste stream and the creation of compost that could be used on campus.

The CALL illustrates the activity 7 "build a coalition of people interested in developing the program" in that it has pulled together a diverse set of stakeholders from different parts of California State who have provided financing and influenced the design of the program.

For more information: calstate.edu/cpdc/sustainability/liv-lab-grant

TAKE OFF PHASE

What is happening in this phase?

In the take off phase, the coalition focuses on implementing one fully fleshed out solutions-oriented sustainability learning project as a pilot that serves as a central activity for developing the building blocks. Moreover, the coalition works with interested faculty members on reframing existing applied learning projects; helping to frame projects so that they also work toward a sustainability solution approach and to extend one-off projects into ongoing projects or link them to a program. To support these efforts in the future, the coalition develops guidelines for good projects. The coalition also sets up a monitoring and evaluation system to be able to learn how the projects and overall program are progressing. The coalition is able to attract minimal resources to expand the awareness and engagement in the program and is successful in firming up the position of a sustainability broker.

LAYING THE FOUNDATION OF THE PROGRAM: INTEGRATING ALL BUILDING BLOCKS

ACTIVITY 8: IMPLEMENT A PILOT PROJECT TO COORDINATE ACROSS BUILDING BLOCKS

What it helps with:

The pilot project can build on an existing project or be created from scratch. The goal of the pilot project is to implement a fully fleshed out applied learning for sustainability project that aims to work toward the goals of all building blocks. Because the pilot is meant to represent the aspirations for the entire applied learning for sustainability program it is called a "coordinating" pilot.

The pilot project serves to test ideas about the program in real time and in a systematic way. This learning on the job allows drawing lessons about what works and what does not, as well as identifying and implementing ways for improvement while the pilot is running. A successfully realized pilot demonstrates the value of ensuring the project is built with the building blocks in mind. Lastly, the pilot project also helps the coalition engaged with building the program gain experience in designing and implementing an applied learning for sustainability project.



What you need to make it work:

Creating a pilot project starts with finding a project partner—from campus or the surrounding community—who has a project and is willing to engage in this pilot as a learning endeavor. Furthermore, for the pilot to be successful, the project partner needs to be interested in continuing to work with a future project that will build on the results of this pilot. Ideally, the project would be low-risk for the project partner involved (e.g., working on an issue that the project partner always wanted to get to but never had the time or opportunity). Next, find one or more faculty member(s) willing to participate in the project and turn the project into a full workshop class, using either an existing course or a new course number.

Once a committed team of champions is composed, you will facilitate the collaboration among project partner(s) and faculty member(s) to define a project that takes into account the:

- learning outcomes for students,
- desired deliverables for project partners, and
- desired real-world sustainability contributions or changes.

After agreement and mutual benefits have been identified, the project will be advertised as a curricular project to recruit students. As the project is running, you continue facilitating the interactions among all parties involved to adaptively manage the effort and to facilitate strong communications channels. As it is a “coordinating pilot,” monitoring and evaluating the pilot is essential. Closing the pilot involves a final feedback round, reflecting on lessons learned, identifying opportunities for improvements, collecting project reports and deliverables, and writing a short story (with visuals) about this project. Preparing a pilot project is a time intensive endeavor, so it may be helpful to start planning at least one semester before the pilot will be launched.

ACTIVITY 9: SET UP YOUR MONITORING & EVALUATION SYSTEM

What it helps with:

The monitoring and evaluation system helps you to understand how well the applied learning for sustainability program has set up its structure to integrate the four building blocks and how well each building block works. Furthermore, it helps to provide data that can be used for communicating the impact of the program and projects.

The monitoring and evaluation system helps to determine a few crucial questions:

1. who to evaluate for,
2. what to evaluate, and
3. what information is needed for this evaluation.

The monitoring and evaluation system allows you to get an overview of what's happening in the program. In other words, it helps you understand how the daily operations connect with the framework and its pillars which were developed in phase 1 Pre-development, including vision, current state, theory of change, and overarching program strategy. Thus, the monitoring and evaluation system helps balance efforts directed at achieving the daily business while maintaining focus on the big picture vision.

What you need to make it work:

Developing the monitoring and evaluation system should start early in the process. It helps to collect the evidence on the progress of the program and helps identify opportunities for improvement and for leveraging existing assets. The coalition that supports the program can use the results of the monitoring and evaluation system to contribute data to the units that monitor and evaluate the institution's programs in general and report success directly to the leadership.

When developing the monitoring and evaluation system, it is important to start small and be patient, realizing that the system will get more complex over time and that part of developing the "right" questions about what to monitor and what to evaluate means testing the monitoring and evaluation system in real time. Developing the system will most likely be an iterative process of reviewing and updating the tool in order to increase its effectiveness.

In the Appendix we provide a worksheet to stimulate thinking around the monitoring and evaluation system.

→ ***Suggestion for an applied learning for sustainability project:***

Engage a class or professor to work with the coalition to develop a monitoring and evaluation system. This task could be given to a professor who teaches a class on social science methods. Students in this class could be tasked to identify and combine the appropriate methods in order to monitor and evaluate the program. A subsequent class in the next semester could be tasked with applying the monitoring and evaluation system and thereby testing its applicability, while collecting data. Alternatively, the coalition could offer an internship to a student with a background in social science and task this person to help the coalition in developing the monitoring and evaluation system.



SUSTAINABILITY PEDAGOGY: PATHWAYS TO SOLUTIONS-ORIENTED SUSTAINABILITY LEARNING

ACTIVITY 10: DEVELOP GOOD PROJECT GUIDELINES

What it helps with:

Applied learning for sustainability projects typically demand more effort and risk from all parties involved. To increase the chances for a rewarding and low-risk experience, it helps to plan projects carefully. Planning is required for those projects that extend over several semesters, but planning also improves shorter-term experiences. Planning can be made easier and faster, when people can draw from guidelines. Therefore, developing guidelines for good projects will be helpful for project leads as the guidelines offer a series of questions on which to reflect:

- What learning outcomes do we want to achieve through this project?
- What sustainability outcomes do we want to achieve?
- How can we link the educational learning outcomes (for the students) with the desired deliverables for partners as well as sustainability outcomes in the real-world?
- What is the appropriate pedagogy that supports students in achieving these learning outcomes?
- How do we design the project process and the overall collaboration so that the process supports both, achieving the educational learning outcomes and the desired deliverables and sustainability outcomes?
- When do we need to submit the project or course to the college or university so that it can be built into the institution's course catalogue?

The guidelines should also entail questions that help project leads to think about how their project connects with other projects and with the overall program. The guidelines for linking projects to programs need to be developed based on the unique conditions and resources available at the college or university. For example, some institutions may have access to fundraising resources at the program level. In this situation, a guideline could be for faculty to send a short description of the project (at the end of the semester or quarter) to the appropriate fundraising lead within the program or in the fundraising office at the university who could assess external funding opportunities. Questions that help raise this awareness and support building connections include:

- Does your project link to other projects in the program or clusters around a theme or common project partner (check the clusters defined in the inventory)?
- How can your project benefit from the overarching program and its resources, e.g., from project development processes, funding support, assessment support, and storytelling capacity, as well as help in accessing those resources?

What you need to make it work:

The sustainability broker might be best suited to draft these *good project guidelines*, drawing on her/his experiences as well as on guidelines available through the literature on sustainability in higher education. The coalition is well suited to review and revise the guidelines to ensure they are specific, clear, and practical as well as enabling and not constraining. Keeping the guidelines for creating good applied learning projects for sustainability flexible and adaptable will help to ensure that a wide range of instructors consider them as a useful tool in their area and for their purposes. Ideally, each set of guidelines should fit onto one page to allow users to capture information at a glance. The guidelines should be made easily accessible, such as through the program's website and shared with the schools (e.g., with the dean's office, instructional designers, and student advisors). In the Appendix we provide checklists to develop guidelines for good projects.

ACTIVITY 11: DEVELOP ENGAGEMENT WORKSHOPS FOR FACULTY AND STAFF ABOUT SOLUTIONS-ORIENTED SUSTAINABILITY LEARNING

What it helps with:

A solutions-oriented sustainability learning workshop to engage faculty and staff helps with a variety of objectives. It helps grow awareness of solutions-oriented sustainability learning among faculty and staff within your college or university. It creates interest in getting engaged with solutions-oriented sustainability learning and offers faculty and staff an educational opportunity to learn how they could design such projects. They learn from you as the workshop provider as well as from and with each other. Executing solutions-oriented sustainability learning projects requires that faculty, staff, students and community partners collaborate differently within a course. Therefore, the workshop provides examples of what that new form of collaboration looks like, and the impact on learning and sustainability that it creates. The workshop is also a venue for sharing experiences in teaching and coaching students through such projects, sharing project opportunities and beginning to discuss those ideas within the context of existing course structures. In some, the workshops help to create a culture that values investments by faculty and staff in pedagogical developments.

What you need to make it work:

Form a team to help with developing and implementing the workshop as well as following up with workshop participants. Consider drawing on individuals in the coalition who have experience with similar projects, either as a student, faculty member, or project partner. They will be able to inform the design of the workshop as well as share their experience with participants.

Design the capacity building activities around one or two case studies on solutions-oriented sustainability learning to illustrate what a solutions-oriented sustainability learning project is, what challenges might occur and how to overcome them. Use 1-2 project ideas from partners to develop, together with workshop participants, how these ideas can be translated into a solutions-oriented sustainability learning project in their area of work. Furthermore, support matchmaking between faculty and staff by inviting faculty to use the white board to write the classes they teach and that they would like to connect to a solutions-oriented sustainability learning project. In response, invite operations and facilities staff members to share their projects that could benefit from faculty and students participation. Finally, it is important to have a short survey (executed within the workshop!) to identify other opportunities to engage (that may have been missed) and also to get comments about how to improve in the future.



FOSTERING CONNECTIONS: CONNECTING PROJECTS TO PROGRAMS

ACTIVITY 12: PROJECT-TRACKING DATABASE

What it helps with:

The project-tracking database is an active record of projects. The database outlines the project's details and major milestones. The project-tracking database is a project management tool for the sustainability broker, allowing them to track progress across the projects, identify project synergies, and effectively plan for project interventions. The sustainability broker can also use this database to execute a longitudinal assessment of the growth and impact of the program through its projects. The project-tracking database could just be a subsection within the broader applied learning projects inventory discussed above (see activity 4: inventory applied learning projects for sustainability).

What you need to make it work:

A project-tracking database for an applied learning for sustainability program requires that the sustainability broker and the coalition have decided on a cluster for the program and also identified the list of projects that fit within the cluster (see activity 5: clustering of applied learning for sustainability projects). For on-going use of the database, it's important that guidelines are established that explain what types of projects fit within the chosen cluster (see activity 12: project development guidelines). This will ensure that the database represents a targeted list of projects that fit together and can benefit from clustering (such as having similar community partners and synergistic outputs).

 **Suggestion for an applied learning for sustainability project:**

Students could create the structure for the database (and populate it with the current project) and also develop the processes for gathering data and updating it over time. This project would be a good fit for a two-term internship for a student working closely with the sustainability broker. They should have good organizational skills and also a comfort with executing interviews.

OVERCOMING BUREAUCRACY: CREATING AN ENABLING INSTITUTIONAL ENVIRONMENT

ACTIVITY 13: REVISE THE SUSTAINABILITY BROKER'S POSITION DESCRIPTION (OR CREATE A NEW ONE) TO HAVE A KEY ROLE IN THE PROGRAM

What it helps with:

Revising the sustainability broker's position description to have a major role in the applied learning for sustainability program will feed two birds with one stone. It helps institutionalize the role that the sustainability broker is playing, acknowledging that the brokerage activities are central to the existing position and it helps further institutionalize the program. Expanding this role will also increase the sustainability broker's capacity to execute on outreach and awareness activities for the program (such as faculty workshops and meetings with external project partners). Lastly, position revision (or creating on a new position) can help increase engagement from the coalition by providing a clear signal that the program is an institutional priority.

What you need to make it work:

If the sustainability broker is not an existing position, additional budget might be needed to create a new part time role. If the sustainability broker is an existing position, additional budget might be needed to support the tasks this person can no longer take on. Alternatively, the sustainability broker will need to make a strong case for how the additional brokerage tasks add value to the college or university as well as to core goals within his or her unit (and how they contribute to or even outweigh other tasks). Since this type of role is not typical there will be considerable communication efforts and dialogue needed to reinforce the value and opportunity.

ACTIVITY 14: DEPLOY AN AWARENESS AND ENGAGEMENT STRATEGY

What it helps with:

Deploying an awareness and engagement strategy will be a core approach for building buy-in and interest in the applied learning for sustainability program within the core audiences, in particular faculty, students, and partners. This campaign should have a "launch" date, but will continue on for the life of the program as the needs evolve. The initial purpose of the campaign is to catch the attention of key stakeholders and give them a clear understanding of what the program is, why it's important, and how to engage.

What you need to make it work:

The core of the awareness and engagement campaign entails a set of stories about completed or ongoing projects that illustrate how faculty, students, staff and partners can engage in the program. The campaign also brings faculty, students, and community partners together through meet & greet events, workshops to jointly

explore project opportunities, and through project fairs where project results are shared with the broader community. Since resources are limited at this stage in the program, it will be important to prioritize audiences and choose the activities that serve multiple purposes. Therefore activities that allow college or university stakeholders to learn and directly engage at the same time (such as a faculty workshop) should be prioritized.

→ ***Suggestion for an applied learning for sustainability project:***

Students could work on and support the coalition's efforts in building the awareness and engagement campaign for the program. This would be a good fit for a graphic design or community engagement course (or perhaps a collaboration across courses). The added benefit of engaging a class with this project would be to gather first hand the experience and perspective from faculty and staff participating in the program.

ACCELERATION PHASE

What is happening in this phase?

Arriving at the Acceleration phase, the coalition has grown strong and is poised to build on the previous implementation successes by realizing more components of the vision to foster the program. It uses reflection as well as monitoring and evaluation to further their learning and increase the quality of the program.

There are now already a handful of fully fleshed out solutions-oriented sustainability learning projects and these projects have connections among each other. Significant opportunities exist for students and faculty to build capacity to execute solutions-oriented learning projects.

There is now also clarity about how to make good projects work and how to realize the desired interactions between individual projects and the overarching program (e.g., through assessment protocols, communications requirements, and funding needs). Indicators are established regarding the characteristics of good partners vs. average or poor partners. The sustainability broker has built robust connections across projects and is constantly fostering synergies that naturally cultivate new project ideas.

The program has become an acknowledged entity of the college or university. The entity can be stand-alone or be integrated into another unit. At a minimum, it has a full-time sustainability broker, a small budget for incentives, and a web-presence. There are mechanisms for building awareness about the program at all levels of the college or university and the coalition makes a strong case for how the program connects with core goals and metrics of the college or university. The external awareness of the program is growing and there are increasing inquiries from new partners wanting to engage.



LAYING THE FOUNDATION OF THE PROGRAM: INTEGRATING ALL BUILDING BLOCKS

ACTIVITY 15: CREATE A HIGH-LEVEL ADVISORY BOARD

What it helps with:

Creating a high-level advisory board helps support the growth and success of the applied learning for sustainability program through communications, fundraising, expert assessment and political lobbying. It also can be a mechanism for growing engagement and awareness from key individuals within the college or university and the community.

What you need to make it work:

Start with a conversation among the members of the coalition about establishing an advisory board. Major topics to discuss include: ideas about the qualifications of board members; tasks for board members; and logistics for coordinating meetings. Based on the outcomes from this conversation, the coalition can identify a list of candidates and start inviting them to join the board. Conversations with prospective board members can also shape the role of the advisory board because candidates will ask questions about the program's future, projects in the pipeline, and the expectations for the board. Once the advisory board is established, meetings should be held sparingly. They should be organized effectively, designating time to briefly update board members on current and upcoming projects and programs, and provide them with specific questions and situations on which they can advise. An advisory board should help shape and improve existing ideas, and help communicate and support the program through individual activities in their realm of influence and in their communities.

ACTIVITY 16: IMPACT EVALUATION

What it helps with:

The monitoring and evaluation system helped understand how the program and projects within the program were operating. The impact evaluation builds on this system, but expands the task to also investigate the *impacts* of projects on *sustainability on the ground* (e.g., in communities and ecosystems), on *student learning*, and on the *community partners*. As these impacts emerge only over the long-term, the impact evaluation is a longitudinal tool to assess and communicate the *impacts* of the program.

What you need to make it work:

The impact evaluation should build upon the monitoring and evaluation system. The key is to identify a few sustainability criteria to which the applied learning for sustainability program wants to contribute and how these are currently measured (e.g., maybe through the institution's sustainability plan) or could be measured. For instance, did the program contribute to reducing CO2 emissions on campus or in the community? Did the program enhance inter-generational equity in the project's area? Did the program improve the local economy? The relevant criteria can be identified based on the program vision and/or in connection to other sustainability goals, such as those pursued by the institution or city or the UN Sustainable Development Goals.

SUSTAINABILITY PEDAGOGY: PATHWAYS TO SOLUTIONS-ORIENTED SUSTAINABILITY LEARNING

ACTIVITY 17: MAP PATHWAYS FOR STUDENTS TO ENGAGE IN SOLUTIONS-ORIENTED SUSTAINABILITY LEARNING

What it helps with:

So far, the coalition involved in the applied learning for sustainability program drove the efforts to connect existing applied learning projects for sustainability with each other to build a pathway for students. This activity helps to turn some of this effort over to students. It supports students in actively seeking out and planning their applied learning experience for each semester as well as for the course of their entire degree program (see figure 10, below). Planning their applied learning for sustainability experiences helps students think about the competencies that are relevant for their sustainability careers and seek out those sustainability projects

that help them develop these competencies. Furthermore, it allows students to become aware of eligibility requirements for participating in projects that are coordinated through the program. For instance, Manchester University requires students to formally apply for applied learning for sustainability projects by submitting a proposal describing their motivations for participating. Planning their roadmap of applied learning projects in sustainability also sets students up for delivering strong outcomes for the project partners.

What you need to make it work:

To suggest possible pathways that students across the college or university can elect to pursue it may be helpful to draw on past projects and pathways of alumni as well as on existing projects available within the program. A website can feature the possible pathways, the stories of actual pathways of current students and graduates, as well as information on how to build a roadmap. The coalition can also share this information directly with student advisors and other pertinent academic staff. Additionally, the program team may choose to present these resources to students (e.g., at student orientation, or in the students’ welcome package) and to faculty (e.g., at a faculty meeting).

Typically, some of the sustainability projects will be offered as courses while others are offered as individual student projects. In the latter case, the onus is on the student to negotiate with his/her department whether s/ he can take this experience for academic credit. Projects presented in these pathways require that the applied learning for sustainability program-team speak with the department and faculty involved in these projects prior to including the project in the pathway in order to ensure that the project can be advertised to students and to clarify the eligibility requirements for students.

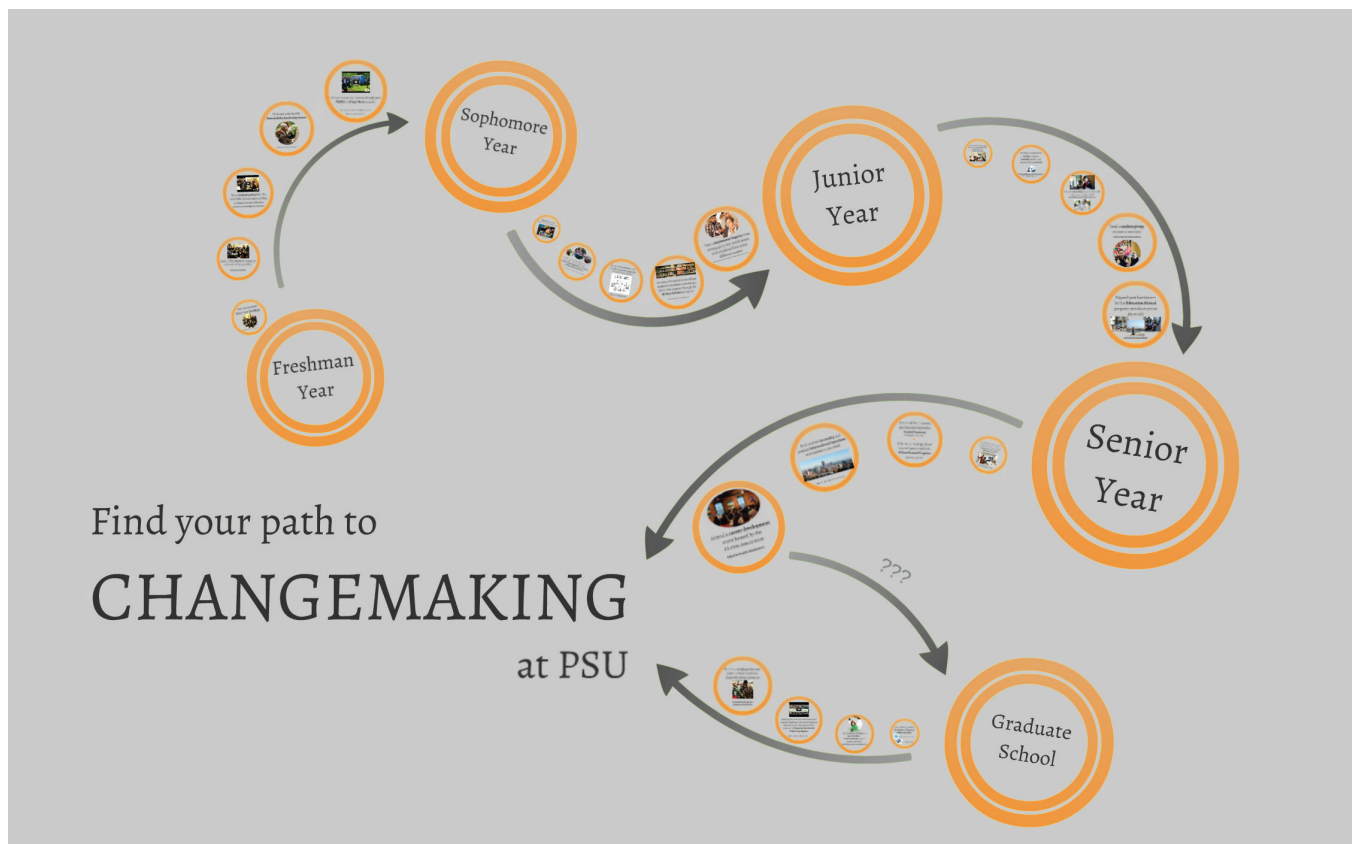


Figure 10: Visual illustration of a pathway for a student at Portland State University. See full version at pdx.edu/sustainability/pathways-to-sustainability-careers



ACTIVITY 18: TRAINING IN PROFESSIONAL SKILLS AND SUSTAINABILITY COMPETENCIES

What it helps with:

Students bring a variety of assets to a project, potentially including technical expertise as well as an upbeat and open-minded attitude. On the flipside, students often lack the competencies required for sustainability problem solving as well as the professional skills necessary for good team-based and real-world project collaboration with stakeholders. Training in sustainability competencies can help address this issue. Wiek and colleagues summarized sustainability competencies as comprising of systems-, future-, values-, and strategic-thinking, as well as interpersonal skills (e.g., professional skills). Drawing and integrating these competencies to facilitate an entire collaborative process for sustainability problem-solving is another competence (problem-solving competence). Figure 11 below illustrates the six competencies and how they relate to each other.²²

The training could start with providing students with a brief overview of the sustainability competencies and how they come together in efforts of sustainability problem solving. This overview enables students to seek out courses that offer training in students' desired competencies and/or to start studying them in a self-directed manner. The main focus of the training, however, would be on the interpersonal skills as they are relevant for any project and for students of any degree program participating in projects offered through the applied learning for sustainability program. Interpersonal skills include activities and good practices related to effective and compassionate communication; collaborative teamwork; responsive project management; impactful stakeholder engagement; caring self-management; and continuous learning.

What you need to make it work:

There are various ways to provide this kind of training. For example, you could hire an adjunct faculty or appoint one of the applied learning for sustainability program-team members to develop and run the training every semester. Independent of who facilitates the training, consulting with faculty and project partners who have expertise in one of the sustainability competencies will help with developing specific activities for students to practice the skills.

²² A short summary of the competencies is here: Wiek, A., Withycombe, L., Redman, C., & Mills, S. (2011). Moving Forward on Competence in Sustainability Research and Problem Solving. *Environment: Science and Policy for Sustainable Development*, 53(2), 3–13. A more detailed description of each competency is here: Wiek, A., Withycombe, L., & Redman, C. L. (2011). Key competencies in sustainability: a reference framework for academic program development. *Sustainability Science*, 6(2), 203–218.

The course could be offered as an extracurricular activity for students. It could be an eligibility requirement in order to participate in projects offered through the applied learning for sustainability program. Students could receive a certificate of completion. This skills-training course could be a core element around which to build the “community of practice” of young sustainability professionals and scholars. For later years, it may be valuable for the program to find ways to offer the training in professional skills and sustainability competencies for academic credit. Such a course is relevant for almost all students, because these skills are highly sought after by future employers and hence students could receive career benefits beyond their participation in projects of the applied learning for sustainability program.

Key Competencies in Sustainability

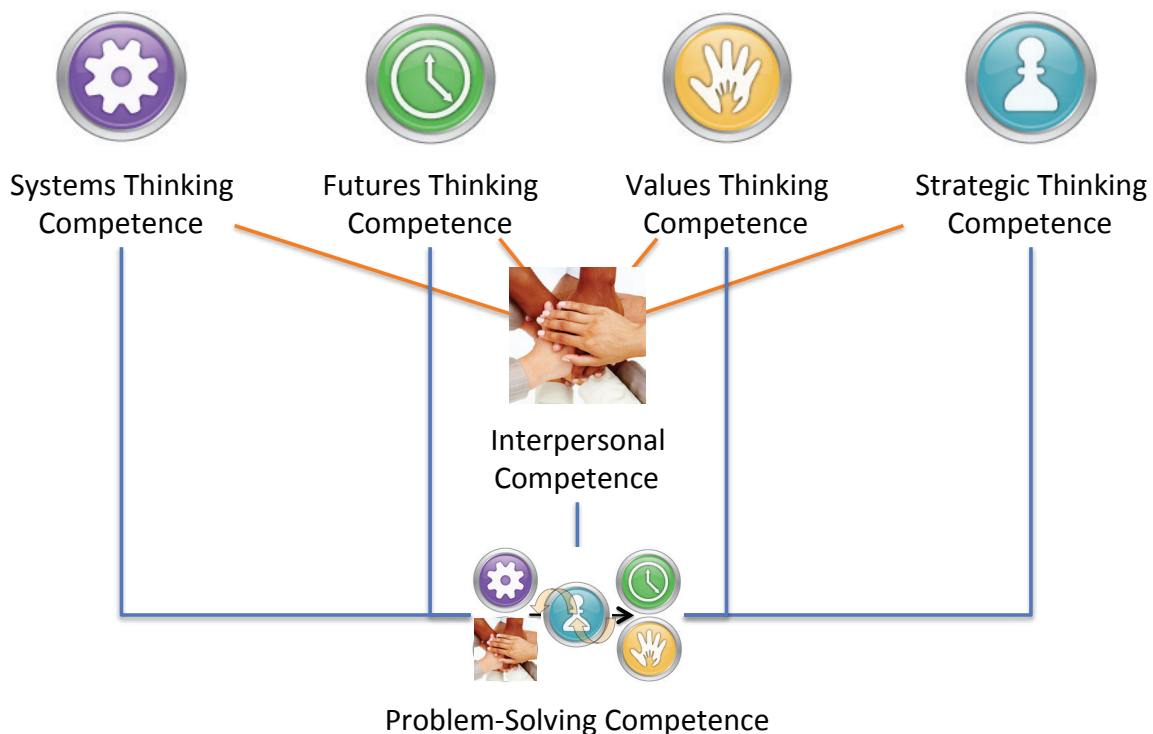


Figure 11: Overview of the set of sustainability competencies. Picture credit: Wiek, A. (2015) Solving Sustainability Problems. Tools for a New Generation of Professionals. School of Sustainability, Arizona State University, Tempe, AZ. Icon credit: SSFT — Sustainability Science for Teachers, Arizona State University.

FOSTERING CONNECTIONS: CONNECTING PROJECTS TO PROGRAMS

ACTIVITY 19: MULTI-YEAR PARTNERSHIP FRAMEWORK FOR LEGACY PARTNERS

What it helps with:

Many applied learning for sustainability program partnerships will exist on a term-by-term basis or for the duration of the academic year. Introducing a multi-year framework brings in an added level of complexity, but provides a variety of benefits. It ultimately aims to create a pathway for accelerating the acquisition of strong, stable partners that can enter into mutually beneficial partnerships with the college or university and produce a legacy. Hence the term “long-term partners.” Developing such multi-year partnerships offers a venue for (1) thinking and planning across longer time horizons; (2) sequencing project activities across time, which allows for the partnership to take on larger challenges by breaking the problem into different scopes of work; and (3) consistent engagement between community members and the university to deepen the relationship.

Developing a framework for the multi-year partnership helps to clarify new partnership goals related to sustainability impact, the projects and programs that help achieve these impacts, and the roles, responsibilities and resources for effectively reaching those goals. Such a framework will be helpful as the program grows and faces an increased need for solutions-oriented sustainability learning projects, which can be easier addressed through established partnerships as opposed to one-time, one-off project collaborations. In the Appendix we provide an example of a Memorandum of Understanding (MoU).

What you need to make it work:

A multi-year partnership framework requires past experience between the institution's sustainability program and the partner(s). The program leads and the project partner also need to have a mutual desire to evolve and grow the relationship together and have shared ideas about the themes around which the partnership should develop.

The process for building the multi-year framework can be facilitated in different ways. It can be an open and exploratory process involving a set of collaborative dialogues between the program's leadership and existing partners. This process may be most applicable when there is a significant working relationship with existing partners. It can also be a request for proposal (RFP) process, which occurs periodically and invites select and established legacy partners to submit ideas. This process may be applicable when the college or university does not have a significant amount of history with community partners. It can also be a blend of both, especially when new trying to recruit new partners to come on board (open process) while keeping the good collaboration with existing partners going (RFP).

ACTIVITY 20: PROGRAM SCALING MODEL

What it helps with:

A program scaling model outlines the key strategies that must be pursued in order to expand the number of projects in the applied learning for sustainability program while maintaining project quality. This program scaling model outlines the goals for a minimum number of projects needed to meet anticipated student and faculty demand, to achieve learning outcomes for students as well as community outcomes, and the resources needed to get there. Building the program scaling model serves as a valuable process for clarifying reasonable metrics for the program's growth and structure based on the unique constraints facing your college or university (such as location, history with integrating sustainability into the institution and institutional policies in place). This process also requires that the sustainability broker reach out to new stakeholders across the institution and in the community who have not been deeply engaged in the program. This outreach can be helpful for identifying additional partners and key barriers.

What you need to make it work:

The program scaling model should be developed by the sustainability broker in collaboration with the coalition involved in developing the program. The program scaling model will need to be based on real commitments from the coalition and from stakeholders such as deans and the provost. These stakeholders might be less familiar with applied learning for sustainability programs, but they are important for scaling the program in the future. The level of interest within the college or university in scaling the program must be high enough so that major structural changes within the institution can be considered, namely changing faculty teaching loads, creating new roles like the sustainability broker, and increasing the program's effectiveness by investing in a support structure. Furthermore, engagement and buy-in from community partners that have been involved with the program and those who have the potential to be involved in the program is important because as projects grow so does the need to identify good project partners. Partners need to be aware of the resources it would take on their end to scale the activities within the partnership so they can adequately assess funding possibilities, staffing capacities and compare them with the projected outcomes.

To make the case for the program scaling model, it helps to compile the data from the project-tracking database (see activity 12: project development guidelines) in order to corroborate the arguments for scaling the program with facts and figures that demonstrate its achievements.

OVERCOMING BUREAUCRACY: CREATING AN ENABLING INSTITUTIONAL ENVIRONMENT

ACTIVITY 21: DEVELOP AN ORGANIZATIONAL MODEL FOR THE PROGRAM

What it helps with:

An organizational model for the program represents the ecosystem of people connected with it and the set of activities they represent. Creating an organizational chart is a way to visualize this ecosystem. It also helps with internal coordination, information exchange, and the successful maintenance of the program's activities. Activities here include regular meetings, email groups, and shared project management systems. Periodic review of the organizational model can help identify where additional investments could help to further increase the health and success of the program. Some elements to consider include creating a full-time position for the sustainability broker, extra-curricular fellowships for faculty to support them in making connections across courses, incentives for faculty engagement, and an annual budget for events as well as annual awards e.g., for best projects to grow engagement.

Lastly, creating and updating the organizational model also helps to institutionalize it, e.g., to make its staff position and activities part of the institution's fabric. It codifies funding stability and changes in the curriculum and the way that the university plans courses and builds partnerships. Institutionalization provides a stable foundation for building future community partnerships and represents a significant institutional investment, which can help attract additional outside philanthropy and grants.

What you need to make it work:

Creating an organizational chart requires you to have a full overview of the people involved, including their roles, activities, and responsibilities. And it requires some visual creativity to make it an engaging and fun chart. In order to leverage the organizational model as a funding tool or as a tool to support the program's claims for further recognition and embedding it in the college or university's processes, it helps to show which roles and activities have led to specific outcomes. Relating outputs and outcomes to the roles and activities of the program can be done by using the results from the monitoring and evaluation activities as well as from the website and database (see activity 22, below).

ACTIVITY 22: DEVELOP A WEB PORTAL FOR THE PROGRAM

What it helps with:

A web portal for the program serves as a project exchange and public portal to the program. The portal accomplishes three major goals: (1) provide one central place across the college or university where project partners can submit project ideas for applied learning projects *in sustainability*; (2) advertise project opportunities to students; (3) feature and compile past projects. This web portal is a highly visible and interactive mechanism that can also be used to greatly expand the engagement in the program, especially when combined with a social media campaign that shares project stories, celebrates success, and provides updates of projects or related events. The portal also provides institutional memory (a database) about all projects that can be helpful for developing yearly reports or generating stories for different audiences (e.g., funders, the media, faculty, administrators), see figure 12.

What you need to make it work:

A web portal requires a program developer to develop the portal in collaboration with the coalition to address the needs and visions of the program. Once the portal is set up, it requires a staff person (at least part-time) who will collect, distribute, and advertise projects, share project stories, and ensure the website is up to date and operating effectively. Depending on the approach, the portal may require project leaders to submit updates or information to the site periodically.

The University of British Columbia in Vancouver, Canada has developed its Social Ecological Economic Development Studies (SEEDS) web portal over the past 10 years. The web portal includes the inventory (activity 4: inventory applied learning projects for sustainability) as well as the project-tracking database (activity 12: project development guidelines). The SEEDS portal offers a great example what such a portal could look like.

Case Study: Social Ecological Economic Development Studies – University of British Columbia

The Social Ecological Economic Development Studies (SEEDS) sustainability program at the University of British Columbia (UBC) advances campus sustainability by creating partnerships between students, operational staff, and faculty on innovative and impactful research projects. SEEDS is managed by Campus + Community Planning, and the program directly supports UBC’s efforts to advance university and unit-level goals in environmental and social sustainability, develop strategies for achieving the university’s environmental and social sustainability goals, and integrate operational and academic efforts through projects and partnerships that enrich the student experience. SEEDS supports more than a hundred projects a year, making it the largest solutions-oriented learning for sustainability program in North America.

Recent example projects involve partnerships with the Creative Writing Program. These projects resulted in a series of six interactive place-based projects sited around UBC that contribute to campus vibrancy and social sustainability. Examples include an installation that explores concepts of identity, refuge, and home; a series of eight simple text installations that invite by-passers to manipulate and change the meaning of traditional lines of advice; a series of five chair hammocks, each bearing a stanza of a new poem; five large granite stones placed at the clock tower plaza, each inscribed with a student-curated Ghazal poem; an installation that invites visitors to explore the North-South spine of campus while navigating a mysterious narrative; and, a series of 120 playful plant-identification signs distributed at gardens throughout the campus.

For more information: sustain.ubc.ca/courses-teaching/seeds

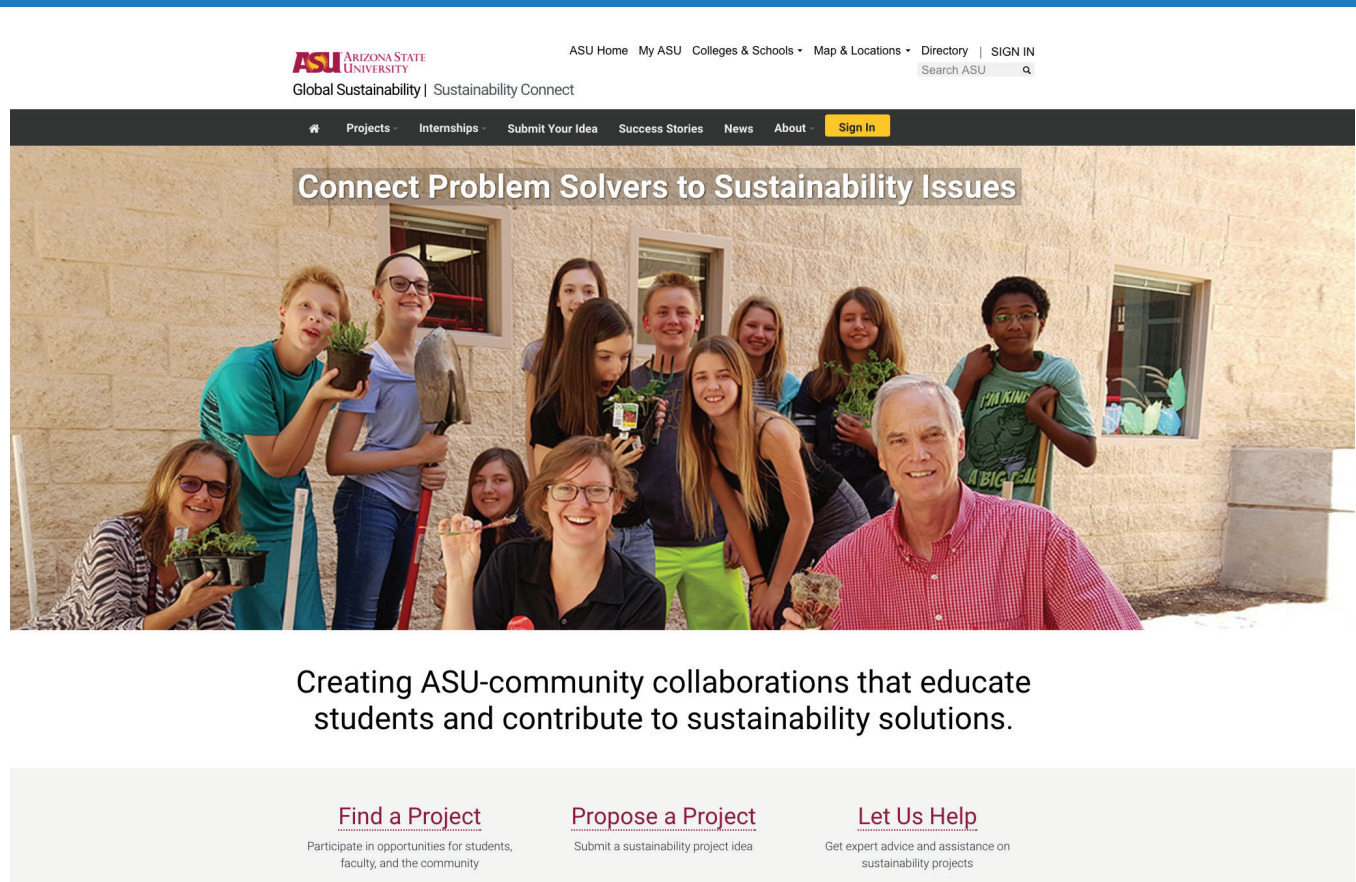


Figure 12: Sustainability Connect is a project exchange platform, which the School of Sustainability at Arizona State University has implemented to provide one portal for community members offering projects and students looking for applied projects in sustainability. The web portal is managed through a staff member of the school.

STABILIZATION PHASE

What is happening in this phase?

The vision of the applied learning for sustainability program is completely realized, it is institutionally anchored and its impacts on sustainability outcomes and student learning are transparently measured. The program is known for its well-designed projects and for its commitment to continuous learning in order to improve the leadership of the program.

Degree programs around the college or university start to formally commit to participating in the pathways program leading up to solutions-oriented learning for sustainability projects. This means a certain number of faculty members commit to collaborate with the program and strive to regularly offer solutions-oriented learning for sustainability projects. Students participating in the program take the training in professional skills and sustainability competencies while receiving academic credit for it.

The program is now strongly connected to institutional structures, such as the provost's office, the head of university partnerships and to leaders in development and communications. These connections result in course pathways throughout the curricula as well as certificates, minors, and majors that drive students to the program. There is growing investment in the program within the institution and also from external partners and funders. This investment allows staffing a small team of sustainability brokers that have strong connections across the university and into the community, support participating faculty members in offering solutions-oriented learning for sustainability projects, actively advance core metrics for schools, colleges, and universities and draw budget from multiple sources across the university in order to provide these services.²³ Despite this success, the coalition cannot rest. The challenge now is to "normalize" this new situation.

LAYING THE FOUNDATION OF THE PROGRAM: INTEGRATING ALL BUILDING BLOCKS

ACTIVITY 23: NURTURING THE NEW NORMAL

What it helps with:

A new normal is established. This raises the question how to ensure it remains the new normal? Newly instituted changes are fragile for various reasons. For instance, if they depend on the leadership and charisma of one person and this individual leaves, the initiative may falter. Or, the program successfully created buy-in but failed to keep that buy-in alive over the years especially as new faculty members and staff came on board. Therefore, nurturing the new normal means finding ways the program can be embedded and stabilized within the (changing) power structure of the institution. Furthermore, it means being mindful of ongoing changes and anticipating possible future changes in order to creatively adapt the strategy and be responsive to a dynamic environment.

What you need to make it work:

At this point, the notion of nurturing the new normal refers mostly to a mindset of celebrating successes, but not resting on them and trusting things will continue on their own. Nurturing the new normal means continuing to manage all activities along the four building blocks. It also means remaining open to innovation and change. For instance, the nature of sustainability challenges and their urgency may change, requiring solutions-oriented sustainability learning projects to co-create options for faster and more radical change.

²³ Metrics include: strong connection between students engaged in the applied learning for sustainability program and retention and post-graduation success; external resources attracted; and high levels of faculty participation from across the campus.

SUSTAINABILITY PEDAGOGY: PATHWAYS TO SOLUTIONS-ORIENTED SUSTAINABILITY LEARNING

ACTIVITY 24: CREATING PATHWAYS TO SOLUTIONS-ORIENTED SUSTAINABILITY LEARNING

What it helps with:

A key problem with many applied projects at the “engaging with the world” level, is that they often overwhelm students and course instructors and subsequently lead to a suboptimal experience for project partners, but also students and faculty. Building a pathway to a solutions-oriented learning project allows students to build up the skills and experiences gradually over time. This allows faculty members to work more effectively with students. Offering the solutions-oriented sustainability learning as a culminating experience also allows for developing content, data, and relationships in prior projects. Please note that activity 17 maps pathways for students. This activity is the complementary component to activity 17, but instead of providing pathways through existing offerings to students it aims to change offerings within the school or degree programs so students have easier access to solutions-oriented sustainability learning (see figure 13, below).

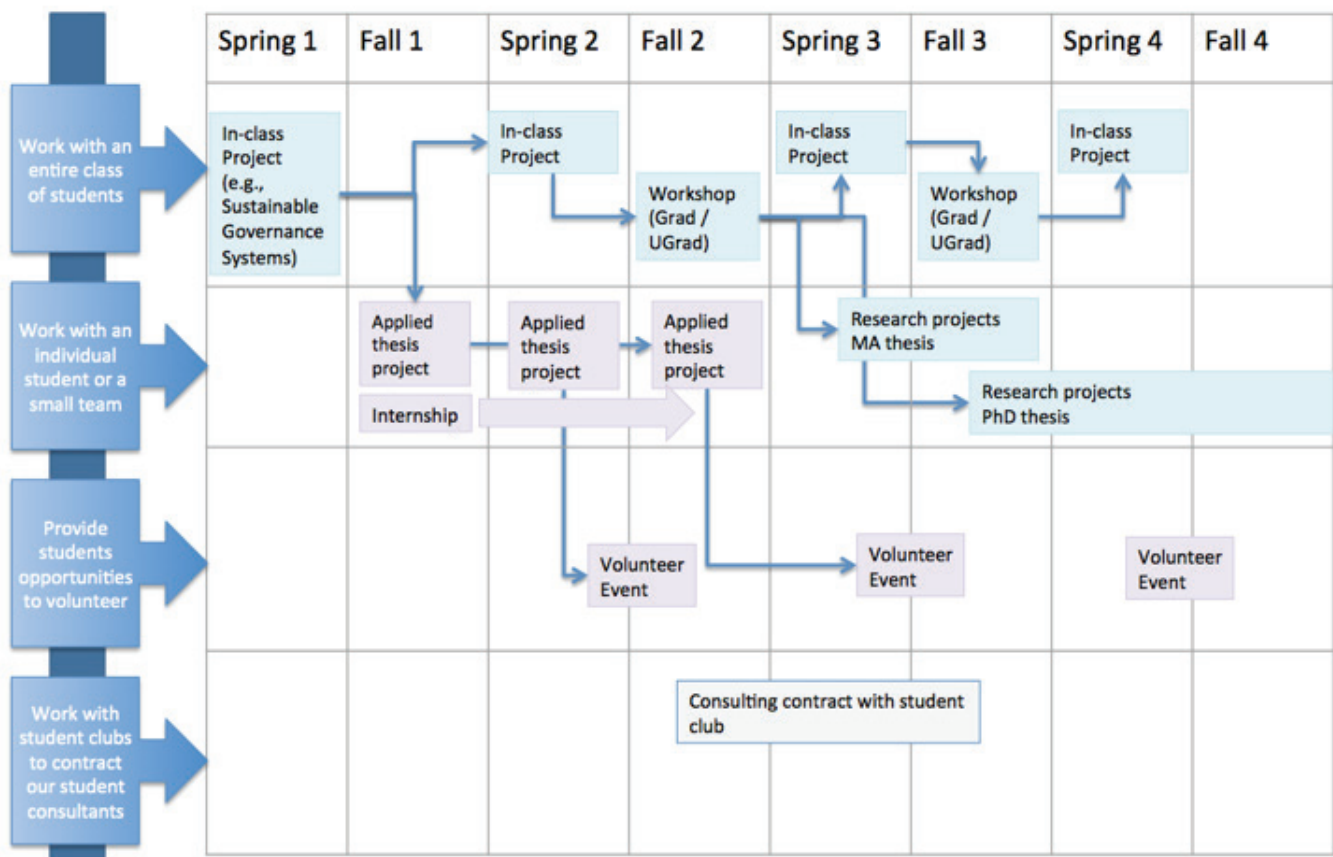


Figure 13: This visual depicts how a pathway of applied learning for sustainability can be planned through the sustainability broker. The boxes at the left suggest some options for project partners how they can work with students and how these options can be combined over the course of several semesters in order to create a substantive output.

What you need to make it work:

A pathway starts with “bringing the world in” and ends with a solutions-oriented sustainability learning experience that “engages the world.” In between, students engage in “visiting the world” and “simulating the world.” Aside from the solutions-oriented experience, all three activities can be incorporated into existing courses as group-activities and assignments (see Figure 14). The applied learning for sustainability program also creates a tangible description of each activity, using one of its projects. Faculty can use this activity and adapt it for their course, thereby helping students to develop the necessary skills for truly collaborating with project partners in

sustainability problem-solving endeavors. Figure 14 presents on the left side the types of real-world learning experiences that progressively build upon each other. The right side of Figure 14 shows how these real-world learning experiences could be incorporated into existing offerings over the course of a degree program and even across programs.

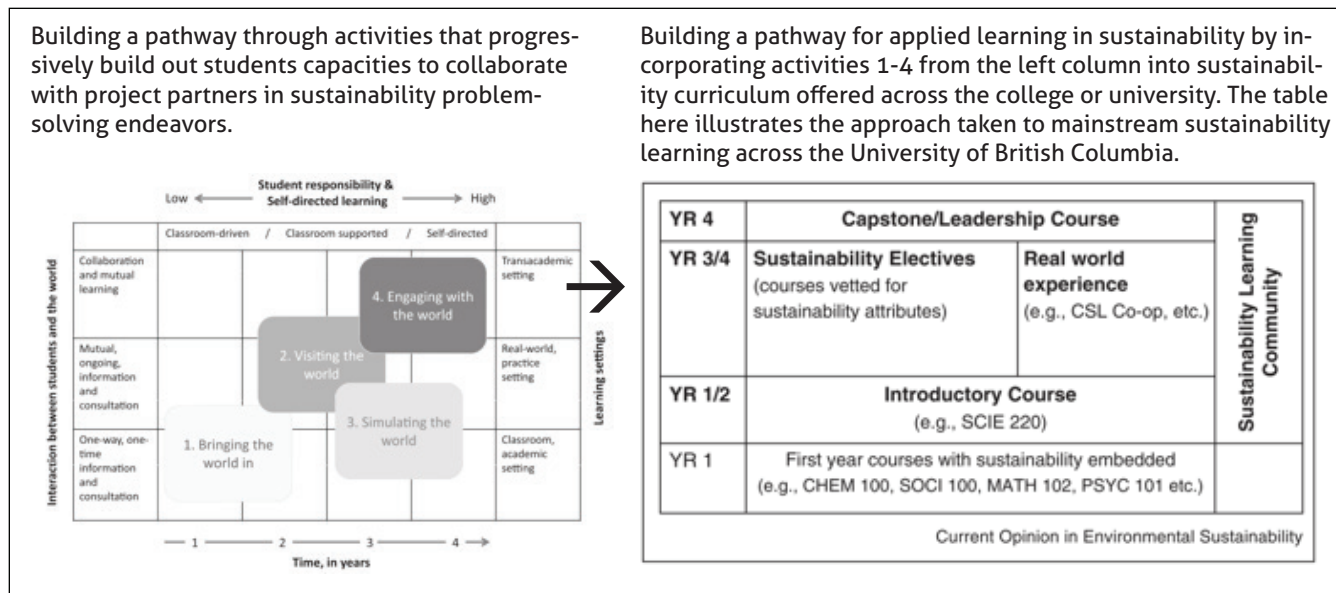


Figure 14: Integrating applied learning experiences into an entire curriculum. Both figures are reproduced with the permission of the authors (left figure: Wiek et al., 2014 and right figure: Marcus et al., 2015).

The guidelines for creating pathways should be specific and clear as well as flexible and adaptable so that project leads across the college or university consider them as a useful tool in their area and for their purposes.

Below is a short description of a program at Arizona State University that is implementing this pathways approach.

Case Study: ProMod – Arizona State University

ProMod stands for project-based, modular learning. Funded by a Department of Education “First in the World” grant, Arizona State University’s ProMod program provides a novel pathway for incoming students to engage in real-world projects from Day One of their college experience. Under the structure of ProMod, a community project serves as a large umbrella to connect all courses with each other. While the courses from the School’s curriculum retain their course objectives, for the ProMod students, the course projects and assignments are designed to fit together over each semester and culminating in a final collaborative project deliverable. Hence, while students work on the community project, they are also earning general studies and degree requirements from freshman to senior year; they build their professional portfolios of real-world experience as well as a “professional skills toolbelt” to use in their team work with their peers and the community.

For the first semester of the 2015-2016 academic year, student teams worked closely with a variety of schools in Maricopa County to develop preliminary Farm to School strategic plans in one of three primary areas: local and healthy food procurement, healthy food education, or school gardens. In the second semester of the 2015-2016 academic year, students worked primarily with one of these schools to design and run a visioning workshop with students, staff, and teachers at a local elementary school to envision the future of their school garden and create a preliminary design.

For more information: schoolofsustainability.asu.edu/student-experience/promod

FOSTERING CONNECTIONS: CONNECTING PROJECTS TO PROGRAMS

ACTIVITY 25: HIRE A COMMUNITY PARTNER ADVISOR

What it helps with:

Hiring a community partner advisor aims to fully bring in the perspective of community partners to inform the evolution of the applied learning for sustainability program. This position is different from the sustainability broker because it is aimed at integrating the community partners' perspective at large, of which the sustainability broker only has a partial perspective. The sustainability broker sits in the middle between the academic and community world and is familiar with both, but as s/he is hired through the college or university, s/he is not deeply embedded in the community. In contrast, the community partner advisor is embedded in the community and hence can apply this perspective to provide feedback about the project scoping process, fundraising, current community conversations, and evaluation – ensuring that the community partner perspective is fully integrated into the design. Furthermore, the community partner advisor would ideally be co-funded through the college or university and the city. Such a position will help evolve the program's effectiveness at delivering sustainability outcomes and also in building long-term community partnerships. This experience will also provide the community partner advisor with an in-depth understanding of the program (e.g., constraints, opportunities) that will deepen their connection to the program and support effective collaborations in the future.

What you need to make it work:

Hiring a community advisor will require identifying new financial resources, developing a hiring process, and building a clear position description and set of duties. The case for hiring a community partner advisor can be made internally within the college or university or formed as an external pitch to a foundation, or a co-funding through university and city/community institutions. Note that this is not a full time role, but can be supported in a part-time position or as a stipend for the partner to execute tasks outside of their normal work duties. There needs to be a strong emphasis on the impact of the role and how it will empower the applied learning for sustainability program to create more opportunities for student learning and increase the value of the outputs produced in the community. Consider forming a small team within the program to build out the case for this role and the mechanics of how it will operate.

OVERCOMING BUREAUCRACY: CREATING AN ENABLING INSTITUTIONAL ENVIRONMENT

ACTIVITY 26: ADJUSTING STANDARDS FOR FACULTY AND STAFF TO SUPPORT THE PROGRAMS

What it helps with:

Adjusting standards for faculty and staff to support the applied learning for sustainability program will provide added incentives for faculty to engage in the program. For example, in many promotion and tenure standards, faculty are given greater rewards for single author publications. This institutional standard conflicts with the nature of applied sustainability publications, which are likely to involve community partners and be interdisciplinary. Applied learning for sustainability programs also require significantly more time related to teaching activities because faculty members must regularly engage with community partners. That type of work is usually placed at a lower value in promotion and tenure reviews than other activities. Providing formal recognition of faculty's participation in the program, e.g., through official thank you letters sent to the faculty member and her/his dean, and adjusting evaluation standards so that applied learning for sustainability program activities fit squarely within them will help increase faculty and staff participation.

WHAT YOU NEED TO MAKE IT WORK:

Adjusting these standards will require significant cultural change within the college or university and support from all levels of the university hierarchy. Faculty and staff participating in the applied learning for sustainability program will need to be activated as strong advocates for the changes in review standards. In addition, the coalition administering the program will need to make the case for shifting the review standards to support

applied learning for sustainability activities. This case will need to be made throughout the development of the program but the efforts will need to intensify during the stabilization phase. It starts with keeping a track record of faculty members involved, documenting and honoring their commitments and investments through e.g., official thank-you notes (copied to the Dean) and awards, and also includes documenting the reactions and impacts in the community.

Deploying this activity will require patience, time and a strong track record of success that also demonstrates how faculty's engagement in applied learning for sustainability translated into tangible sustainability outcomes. However, if successful, the program will move beyond optimizing the institution and into fostering a complete paradigm shift, or transformation of the college or university.²⁴

An example of a well-established program, which now serves as a model for other universities is the Sustainable City Year Program at the University of Oregon.



Case Study: The Sustainable City Year Program – University of Oregon

The Sustainable City Year Program (SCYP) links the students of the University of Oregon with an Oregon city, county, special district, or partnership of governments for an entire academic year. Every year, SCYP helps cities reach their sustainability goals in an affordable manner while transforming higher education into an arena where students can learn through real-life problem solving. This program has focused on projects related to sustainable architectural design, urban design, planning, cost-benefit analysis, economic development, legal and policy analysis, and community engagement, among others. SCYP is managed by the Sustainable Cities Initiative (SCI), which is a cross-disciplinary organization at the University of Oregon that promotes education, service, public outreach, and research on the design and development of sustainable cities.

A recent example project involved a partnership with the City of Medford, Oregon where students conducted research and developed strategies to engage diverse communities in this small town. Students conducted outreach and interviewed community stakeholders, preparing a toolkit of best practices that the city could use for future engagement efforts.

The SCYP has been in operation since 2009 and successfully created an enabling environment (which is one of the building blocks mentioned in this guide). The SCYP also illustrates activity # 21 “Develop an organizational model for the program”, which is essential for the scaling. The SCYP has a set RFP system for accepting new cities each year and has set up a co-funding system, where cities pay for some of the administrative services involved with working with classes and students.

For more information: sci.uoregon.edu/content/scyp

²⁴ Lotz-Sisitka, H., Wals, A. E. J., Kronlid, D., & McGarry, D. (2015). Transformative, transgressive social learning: Rethinking higher education pedagogy in times of systemic global dysfunction. *Current Opinion in Environmental Sustainability*, 16, 73–80. P. 73.

CONCLUSION

Universities and colleges across the world are increasingly taking up the charge to advance sustainability at local and global levels. Applied learning is a major category of activity that has taken place at higher education institutions for decades and is more recently being connected to sustainability agendas. This guide is meant to serve as a central resource for colleges and universities about how to design, launch and scale applied learning programs aimed at advancing sustainability on their campus and in their communities. It provides strategies for advancing applied learning for sustainability programs, and grounds these activities in sustainability literature and good practices from the field. The activities put forth in the guide have been chosen specifically with the goal of jointly advancing sustainability learning as well as tangible sustainability outcomes in the community.

Ideally, readers would take the time to work through the entire guide before they begin applying the ideas and concepts; however, due to the significant amount of information that the guide brings together, the authors also envisioned that it could be read and applied in pieces as users test concepts and grow their programs. It might be helpful to look at figure 8 to get an overview of the activities and at what development stage the activities would be most helpful.

The authors envision that this guide will help grow the conversation about applied learning for sustainability programs across the AASHE network and beyond. This guide is Version 1.0, and beginning at AASHE 2016 we will be collecting feedback from users about how the guide could be improved. We plan to incorporate that feedback and produce a version 2.0 by January 2017.

If you have direct questions or comments about the guide, please do not hesitate to contact the authors, Fletcher Beaudoin (beaudoin@pdx.edu) and Katja Brundiers (katja.brundiers@asu.edu).


We hope the information included here was useful and wish you the very best in your pursuit to build powerful learning experiences that also produce positive and sustained change in the world.

APPENDIX

Pre-development Phase: Worksheet for developing the three pillars and the strategy

This worksheet helps with accomplishing Activity 1: "Building the framework: define the three pillars."

The three pillars identified below come together to form the strategy:

1. Current state analysis and assessment
 2. Sustainable vision
 3. Theory of change
- 
- Strategy

PILLAR 1: CURRENT STATE ANALYSIS

Conduct a current state analysis of your applied learning for sustainability program.

1. What phase is the program in (pre-development, take off, acceleration, stabilization)? Why?
 - Phase:
 - Why it is in this phase:
2. What activities are taking place (or have taken place) at your institution related to applied learning for sustainability? (provide both the history and current situation).
 - Activities conducted in the past:
 - Activities currently carried forward:
3. Where are the top three opportunities for growing an applied learning for sustainability program or connecting with other applied programs or with institutional plans that currently do not have a sustainability focus? (for example, existing policies, investments).
 - 1st opportunity:
 - 2nd opportunity:
 - 3rd opportunity:
4. Who are the key players that are currently involved in the applied learning for sustainability program (this could just be people that are helping conceptualize it)? And who else will be important to involve moving forward?
5. What are the current or potential weaknesses and risks associated with the program?

PILLAR 2: VISION

Where would you like to be in 10 years with the applied learning for sustainability program?

1. How are people engaging with the program (students, faculty, administration, community partners)?
2. What projects are people working on?
3. How are projects connected to each other?
4. What outputs and real-world sustainability impacts are these projects creating?

5. What resources (human, financial, political) do people use in their projects and program?
6. Take step back and assess the vision whether it is a sustainability vision. For instance you may ask:
 - Do the different components of your vision identified above advance sustainability (e.g., significantly contribute to social justice, foster socio-ecological integrity, and students' proposed solutions are economically viable)?
 - If not, explore how the vision could be more sustainable.

PILLAR 3: THEORY OF CHANGE

Developing the theory of change helps to identify the mechanisms that support transitioning from the current state today to the future vision of the applied learning for sustainability program.

A simple way to develop a theory of change is to start with creating a logic model. The logic model basically translates your vision into measurable outcomes, which themselves are represented through outputs (concrete things that make the outcomes tangible). Furthermore, the logic model identifies the activities that create the outputs and outcomes as well as the inputs needed to run the activities (e.g., resources, material, people).

A basic template to begin with is below:

Inputs	Activities	Outputs	Outcomes	
			Initial/intermediate	Long-term
1.				
2.				
3.				
...				

Once a draft logic model is developed, the next step is to explore what assumptions are hidden in your logic model and write them out to further explore these assumptions. Also, explore whether you have assumptions about key drivers or factors that influence resources, activities, outputs and outcomes.

Finally, assess your theory of change and identify any opportunities and challenges related to successfully implementing the theory of change.

STRATEGY

Based on your current state analysis, your vision, and your theory of change, identify a strategy for advancing the applied learning for sustainability program. The strategy help you to weave actions related to each building block together to a coherent whole.

As a reminder, the four building blocks are:

- Laying the Foundation of the Program
- Sustainability Pedagogy
- Fostering Connections
- Overcoming Bureaucracy

When developing the strategy do not attempt to build out all of the actions necessary to get to the vision. Focus rather on the initial steps that are most important to be taken first and are either foundational or catalytic for making progress on the development of a building block.

When brainstorming your actions, you may consider the activities proposed in the guide and how to adapt them to fit your situation.

Brainstorm actions

Sort the brainstormed list into this table to get an overview of how they relate

Building Blocks	List your related actions	Who is the lead for this action?	Prioritize each action (H (high), M (medium), L (low))	When should this action take place? (in which phase)?
Laying the Foundation of the Program: Integrating The Building Blocks				
Sustainability Pedagogy: Pathways to Solutions-Oriented Sustainability Learning				
Fostering Connections: Connecting Projects to Programs				
Overcoming Bureaucracy: Creating an Enabling Institutional Environment				

Once you’ve completed the table above:

1. Identify a timeline for this strategy document and an annual timeline to revisit and update the strategy.
2. Compile all of the information (current state, vision, theory of change, strategy) in one cohesive document.

YEARLY REVIEW AND REORGANIZATION

Take time to reflect on the development of the applied learning for sustainability program over the past year.

1. What are the major changes that have taken place at your institution over the past year?
2. How has each change impacted the program?
3. What were the major successes over the year?
4. What have you learned this year that will influence the program moving forward?
5. Review your strategy action items. Which ones did you complete? Which ones were not completed? Why?
6. Fill out the strategy questionnaire once again

Take Off Phase: Worksheet for developing the monitoring and evaluation system

The following list of questions can help you with developing the monitoring and evaluation system. However, you may wish to disregard or add some questions:

- Who is the evaluation audience?

- What are the broad evaluative questions that are important to the audience? Monitoring questions are measurement questions. Evaluative questions are higher order questions; they are bigger than measurement questions. Here are some examples of evaluative questions:
 - Does the program achieve the objectives of each building block?

 - Could the program achieve its objectives in other, better, ways?

 - How well is this program building institutional support for its existence?

 - How aware are faculty members of the program?

 - What has resulted from the solutions-oriented learning for sustainability project?

- Based on the evaluative questions, what are the monitoring questions that you want to answer? Here are some examples of evaluative questions:
 - How many projects are we engaging in each year? How many of them are fully fleshed out solutions-oriented learning for sustainability projects and how many are applied learning for sustainability projects?

 - How many faculty members and students are involved?

 - How many projects are taking place?

 - Do the projects use the resources of the program?

 - How many projects are connected with each other to form a program? How many projects are stand-alone?

- What are the indicators and data sources that you need to answer your monitoring questions?

- Who measures the information, when, and how? Here are some ideas:
 - For “Sustainability Pedagogy”: incorporate three rounds of reflection, where a sustainability broker engages with project participants in a dialogue about their hopes, aspirations, needs, and commitments related to the project. At the beginning of a project, the reflection round elicits expectations; at the middle it elicits expectations and at the end the reflection round reconciles expectations.

- For “Fostering Connections”: use the end of the semester to reflect upon the past progress (related to the connections and synergies among projects, the projects’ individual and cumulative contribution to the program’s goals, new number of new partners to be included in the program). Use the beginning of the next semester to introduce the improvements in order to support the program.
- For “Overcoming Bureaucracy”: Execute interviews with stakeholders across campus that have been involved in the program. Gather feedback on how the institution is currently supporting the program well, where are there challenges, and what are some opportunities for improvement.
- For “Laying the Foundation of the Program”: incorporating monitoring and evaluation here means to ensure that monitoring and evaluation addresses everything pertaining to the entire program. Periodic review sessions, e.g., once a year, every two years will help to enhance quality of the program’s processes, its saliency to its stakeholders, and the relevance vis-à-vis education and sustainability problem solving.

When the answers to these questions are identified, it helps to pull them all together into one overview document for the monitoring and evaluation strategy. A useful illustration how to develop such an overview document can be found on the website of the Community Sustainability Engagement Evaluation Toolbox (<http://evaluationtoolbox.net.au>). Look under the menu tab “Planning your Evaluation” and for the link to the “Developing a Monitoring and Evaluation Plan.

Lastly, keep the records of the monitoring and evaluation activities. This allows you to see how things change over time and to collect important “facts and figures”, which are essential for fundraising requests and to demonstrate program impact to the college or university leadership.

Take Off Phase: Worksheet for developing good project guidelines

In addition to the suggestions provided in the guide, there are a few initial considerations that can be used for building your own guidelines.

Pedagogy

Guidelines related to defining learning outcomes in sustainability and pedagogical approaches so that the sustainability broker and faculty can design structured experiences for students, which allow students

- to conduct research on and for sustainability solution approaches
- to develop sustainability competencies,
- to gain the learning outcomes defined through students' degree program.

Project process

Guidelines relate to:

- Project brief, which describes the project
- Process checklist (see figure below)
- Schedule for students, faculty and project partners, which ensures pre-semester that meetings are penciled in through the semester (at beginning for the initial exposure to project and place, in the middle to review work in progress review, and at the end evaluate the project and close it)

Sustainability outcomes

Guidelines here ensure that each project specifies relevant sustainability goals and measurable sustainability outputs; the latter should be achievable either through the project itself or through the program, of which the project is part of.

For the project process guidelines we provide here a description for the Sustainable Neighborhood Initiative carried out through Portland State University. In addition to the description, we also include a flowchart as an alternative way to communicate important guidelines at a glance.

Project development process for Sustainable Neighborhoods Initiative – Portland State University

The development of Sustainable Neighborhoods Initiative (SNI) projects begins 2-3 months prior to the start of the upcoming academic term. ISS staff set up meetings to explore community partners' key priorities, which function as the foundation for potential projects over the academic year. Simultaneously, faculty who might be interested in working on community projects are sought out through ISS-led professional development workshops, outreach at department meetings, or one-on-one meetings with individual professors. ISS also has a Faculty Fellows program where faculty interested in sustainability can affiliate with the Institute, and the faculty who participate in this program are also sought out during outreach. As community priorities are solidified and faculty research and teaching interests are clarified, ISS staff pitch preliminary project ideas to professors to explore their interest in collaborating with a community partner. When all parties show enough interest in collaboration, ISS staff schedule a series of meetings to define the problem and refine the scope of work, narrowing it to fit within course curricula while also maintaining an ability to meet the community partner's objectives. An outcome of this process is a written scope of work that is used to clarify roles, logistics, and desired project outcomes for the students.

Once the scope of work is complete but before the academic term begins, ISS staff develop a blog post to detail all the projects for the term, raising the profile of these complex partnerships for both internal and external audiences. At the same time, a time is scheduled for ISS staff and/or the community partner to attend a class session to introduce their organization, discuss the project, articulate why it matters, and answer any questions from the students. After this point, students form teams and begin working on the project in collaboration with the community partner and under the guidance of their professor. Halfway through the term ISS staff check-in separately with the faculty member, community partner, and student team leads to determine if the project is on-track, provide advice, troubleshoot any challenges, and offer any other support, if necessary. At this time, ISS staff also reach out to faculty members to schedule final presentations, making sure to invite community partners to provide attend presentations, provide feedback, and get copies of project outcomes (presentations, written reports, etc.). Near the end of the course, ISS staff survey students, faculty, and the community partners to assess whether or not the project impacted student learning and/or provided a benefit to community partners.

As the project comes to a close, ISS staff work with the faculty to approach motivated students to write a first-person account about their project for the ISS blog, providing students with an opportunity to highlight the innovative work that they have engaged in at PSU. ISS staff also explore whether or not the community partner is interested in continuing to advance the project through another course or via a student internship. If parties decided to advance the project through a course, this process repeats itself; if a student intern is sought, ISS staff work with community partners to identify resources to support the intern, develop a scope of work, create a position description, recruit an intern, and process the necessary paperwork for payroll.

For more information about the SNI project development process and details about a community-university partnership, see: Holiday, M., DeFalco, T., & Sherman, J.D.B. (2016). Putting impact first: Community-university partnerships to advance authentic neighborhood sustainability. *Metropolitan Universities*, 26(3), 79-104.

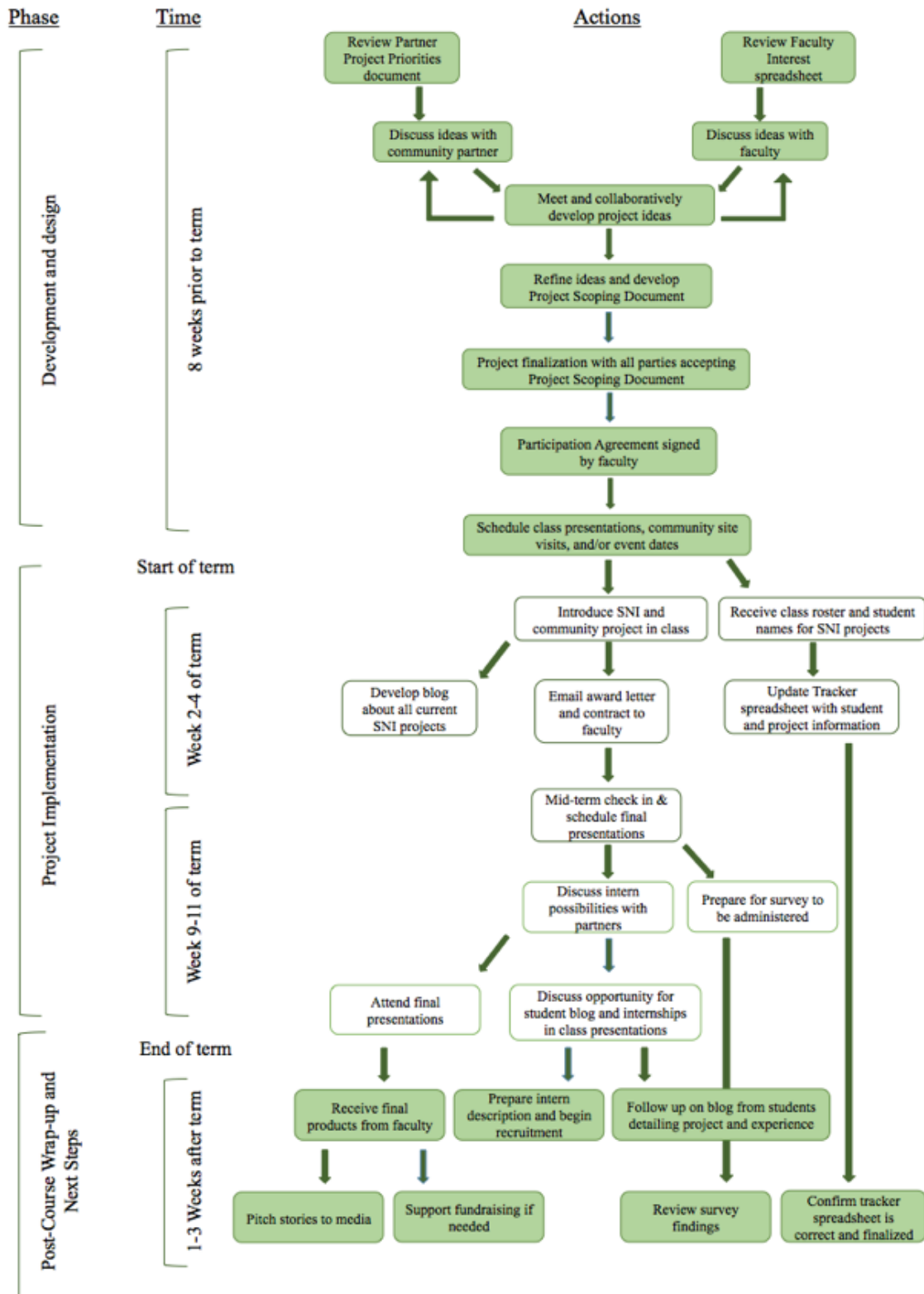


Figure 16: Flowchart illustrating the project development process for Portland State University's Sustainable Neighborhoods Initiative. Credit: Jacob Sherman, Portland State University.

Acceleration Phase: Memorandum of Understanding (MOU) or Partnership Agreements

Portland State University Institute for Sustainable Solutions (ISS)

An MOU or partnership agreement clearly states and exemplifies a shared power and benefit structure stating the distribution and allocation of resources (financial and other), roles and responsibilities. Because of this, it is important to develop structure and surface expectations at the onset of the partnership that clearly outlines the type of partnership, the roles partners will play, the level of reciprocity, and other pertinent details to mitigate misunderstanding later in the process. It can also serve as a touchstone should misunderstandings about roles, responsibilities and expectations arise. MOU's or partnership agreements are often the first sign of commitment of an organization to a partnership. This symbolic and real act can contribute to the sustaining of the partnership beyond initial or aspirational conversations.

ISS will create an MOU for all partnerships that exist beyond a 1-time event. At a minimum, the MOU will include information such as:

1. The shared mission, vision and values that the partnership or collaboration has established
2. Agreed upon outcomes, including specific measures or indicators
3. A commitment to working toward that shared vision, and what that includes, for example:
 - Fundraising development and support
 - Communication expectations
 - Meeting attendance
 - Data collection and sharing
4. An explicit tie (in each partners words) to the mission and core work of the participating organizations
5. Decision making processes (Roberts Rules, consensus, etc.)
6. Critical feedback pathways
7. Staff roles of coordinating organization, for example:
 - Meeting coordination and management
 - Communication
 - Workgroup attendance

REFERENCES

- Allen, J. H., Beaudoin, F., Lloyd-pool, E., Sherman, J., & Ed, M. S. (2014). Pathways to Sustainability Careers : Building Capacity To Solve Complex Problems. *Sustainability*, 7(1), 47–53.
- Beaudoin, F., Sherman J. 2016 "Higher education as a driver for urban sustainability outcomes: The role of Portland State University Institute for Sustainable Solutions" *Sustainable Solutions* Vol. 1. GreenLeaf Publishing
- Brundiars, K., & Wiek, A. (2011). Educating Students in Real-world Sustainability Research: Vision and Implementation. *Innovative Higher Education*, 36(2), 107–124.
- Brundiars, K., & Wiek, A. (2013). Do We Teach What We Preach? An International Comparison of Problem- and Project-Based Learning Courses in Sustainability. *Sustainability*, 5(4), 1725–1746.
- Brundiars, K., Wiek, A., & Kay, B. (2013). The Role of Transacademic Interface Managers in Transformational Sustainability Research and Education. *Sustainability*, 5(11), 4614–4636.
- Dewey, J. (1938/1997). *Experience and education*. New York: Macmillan
- Evans, J., Jones, R., Karvonen, A., Millard, L., & Wendler, J. (2015). Living labs and co-production: University campuses as platforms for sustainability science. *Current Opinion in Environmental Sustainability*, 16, 1–6.
- Kay, B., Wiek, A., and D. Loorbach (2013). The concept of transition strategies towards sustainability. *Environmental Innovation and Societal Transition*. In review.
- Kania, J. & M. Kramer (2011) Collective Impact, *Stanford Social Innovation Review* (<http://ssir.org>)
- Koenig, A. (Ed.) (2013) *Regenerative Sustainable Development of Universities and Cities: The Role of Living Laboratories*. Cheltenham: Edward Elgar.
- Kolb, D., Boyatzis, R., Charalampos, M. (1999). Experiential learning theory: Previous research and new directions. In R.J. Sternberg and L.F. Zhang (Eds.) *Perspectives on cognitive, learning, and thinking styles*. NJ: Lawrence Erlbaum, 2000.
- Loorbach, D. (2010). Transition Management for Sustainable Development: A Prescriptive, Complexity-Based Governance Framework. *Governance*, 23(1), 161–183.
- Lotz-Sisitka, H., Wals, A. E. J., Kronlid, D., & McGarry, D. (2015). Transformative, transgressive social learning: Rethinking higher education pedagogy in times of systemic global dysfunction. *Current Opinion in Environmental Sustainability*, 16, 73–80. P. 73.
- Marcus, J., Coops, N. C., Ellis, S., & Robinson, J. (2015). Embedding sustainability learning pathways across the university. *Current Opinion in Environmental Sustainability*, 16, 7–13.
- Melnick, R. (2015). A Strategy for Scaling Sustainability Solutions: The Global Network for Sustainability Outcomes. 1-11
- Robinson, J., Berkhout, T., Cayuela, A., & Campbell, A. (2013). Next Generation Sustainability at The University of British Columbia: The University as Societal Test-Bed for Sustainability. In A. Koenig (Ed.), *Regenerative sustainable development of universities and cities: the role of living laboratories* (1st ed., pp. 27–48). Cheltenham: Edward Elgar.
- Sherman, J.D.B. & Burns, H.L. (2015). Radically different learning: implementing sustainability pedagogy in a university peer mentor program. *Teaching in Higher Education*, 20(3), 231-243.
- Stephens, J. C., & Graham, A. C. (2010). Toward an empirical research agenda for sustainability in higher education: exploring the transition management framework. *Journal of Cleaner Production*, 18(7), 611–618.
- Wiek, A., Withycombe, L., Redman, C., & Mills, S. (2011). Moving Forward on Competence in Sustainability Research and Problem Solving. *Environment: Science and Policy for Sustainable Development*, 53(2), 3–13.
- Wiek, A., Withycombe, L., & Redman, C. L. (2011). Key competencies in sustainability: a reference framework for academic program development. *Sustainability Science*, 6(2), 203–218.
- Wiek, A., Xiong, A., Brundiars, K., & Leeuw, S. Van Der. (2014). Integrating problem- and project-based learning into sustainability programs A case study on the School of Sustainability. *International Journal of Sustainability in Higher Education*, 15(4), 431–449.
- Wiek, A., & Kay, B. (2015). Learning while transforming : solution-oriented learning for urban sustainability in Phoenix , Arizona. *Current Opinion in Environmental Sustainability*, 16, 29–36.