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High Leverage Practices for Environment Corps (E-Corps) Courses

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Curriculum and Instruction Storrs, University of Connecticut, Mansfield, CT, USA

ABSTRACT

The Environment Corps (E-Corps) program emerged out of our goal to reciprocally serve undergraduate students and communities as they engage with faculty across E-Corps courses in collaborative environmental sustainability pursuits. Currently, the three E-Corps courses focus on brownfields, stormwater, and climate. The E-Corps program is a unique two semester sequence of coursework anchored in high leverage practices (HLPs) that we have collaboratively developed and worked to refine over the last several years. In this article, we describe the E-Corps program, our HLPs, and how these HLPs are used across the three courses.

KEYWORDS

High-leverage practices; environmental sustainability; service-learning; outreach

Environment Corps (E-Corps) courses at the University of Connecticut are a suite of courses (i.e., Brownfields Corp, Stormwater Corp, Climate Corp) that combine familiar elements of classroom instruction, service-learning, and extension outreach to create a method of engagement that aims to benefit students, faculty, surrounding communities, and the university community itself. Typical of service learning, the E-Corp model uses course-based/credit-bearing experiences as it engages students in taking action to meet a community need (Bringle & Hatcher, 1995). Benefits of service learning include the enhancement of students' facility in applying knowledge (Meyer et al., 2016), deepening their understanding of course content (Dienhart et al., 2016); and reciprocal benefits for campuses and communities (Olberding & Hacker, 2016). More specifically, the courses that make up the E-Corp program are each structured as a three-credit course with each committed to situated and practice-oriented instruction. Each course is followed by a subsequent semester with a three-credit independent study/practicum course that partners teams of students supported by instructors with town officials on a projects related to the topical theme of one of the E-Corp courses. What makes the E-Corps model unique is the combination of innovative classroom instruction, service-learning, and community engagement. In relation to benefitting communities, E-Corps courses represent a commitment to partnering with local communities and municipalities, many of which lack

resources and expertise to address current and future environmental and ecological concerns (Hyde & Barrett, 2017). E-Corps is a novel program in which a range of faculty from across varied disciplines joined together to offer courses and shared programming on training the next generation of scientists, engineers, and other practitioners (e.g., environmental consultant, environmental planner, environmental analyst) to best address environmental concerns. As detailed further in Arnold et al. (2021) and Campbell-Montalvo et al. (2021), E-Corps began in 2016 and developed an epistemic community in a resource-rich environment where E-Corps faculty held a shared orientation to robust university-community partnerships with aligned pedagogical practices.

E-Corps learning is situated in real-world problems and supported by High Leverage Practices (HLPs), understood as planning and instructional practices connected to important learning goals and literature about how people learn (Windschitl, Thompson, and Braaten 2009). While HLPs, like those included in the Ambitious Science Teaching (Windschitl et al. 2012) are widely used in the field of science teacher education, at the time our collaboration and project began, no HLPs could be found suitable for use by fields like applied environmental education, where problem solutions instead of scientific explanations are sought after outcomes (Park et al. 2022). Consequently, aligned with researchers' recognition of how HLPs can serve as footholds around which

collaborative work by communities of educators can contribute to the development and refinement of shared knowledge about teaching and learning (Campbell-Montalvo et al. 2021; Capobianco, DeLisi, and Radloff 2018), we collaborated to propose, distill, and refine fundamentally important instructional practices (i.e., our HLPs). Ultimately, in the development of these HLPs, our aim was to draw on and align E-Corp instructor experience and expertise with evidence-based practices from educational research. Once developed, the HLPs were used by the E-Corps course instructors to support students in identifying/developing and refining approaches to solving environmental problems (Figure 1). The HLPs support students to draw on and connect previous knowledge (e.g., knowledge of the community, ways of solving problems) to introduced knowledge and environmental education and sustainability practices as they are applied to solve consequential community problems. E-Corps learning supports students to collaboratively think about and propose solutions to environmental issues in classroom settings in preparation for field-based experiences where they are partnered with local communities and municipalities to engage in needed environmental projects. These projects range from the development of Environmental Protection Agency (EPA) brownfield cleanup grant proposals for local municipalities, to proposed stormwater management plans for vulnerable urban communities, to planning for managed retreat connected to sea level rise in coastal communities.

Beyond being situated in real-world problems and supported by HLPs, E-Corps learning is an innovative service learning model characterized by both innovative structural design components within courses and across a course sequence that consists of an initial semester on campus in the classroom. During the

initial semester, student learning is scaffolded using the HLPs. As part of the on-campus course, students work to resolve 'real-world' cases or scenarios that embody the local impacts and issues of the service learning course in which they will be enrolled in the following semester. In the classroom semester, students are supported to resolve the real-world cases/scenarios as they work in small groups, read relevant articles, engage with guest lecturers from both private and public sector practitioners, and are supported by instructors with relevant expertise. Further, the practical, social, and economic aspects of the real-world cases/scenarios are foregrounded so that usable solutions to community problems emerge (Campbell-Montalvo et al. 2021). As part of the course sequence, students' facility with solving complex community challenges developed in connection with the instructors' use of HLPs in the first semester are leveraged in a second semester internship. In the internship, students are partnered with municipalities or community organizations to design solutions to community opportunities or challenges, to provide both real-world participatory learning experiences for students and community benefits.

The purpose of this article is to introduce the HLPs we have developed (Campbell-Montalvo et al. 2021), while also exemplifying how these HLPs are used across the three E-Corps courses (i.e., brownfield, climate, stormwater corps). Our efforts are ongoing as we engage in research aimed at both refining and expanding our E-Corps model. We share about our HLPs and our E-Corps model here as a potential resource for others to adopt or adapt to meet their own needs in supporting students in college settings to productively engage in complex societal issues in collaboration with surrounding communities. This is accomplished first with a brief introduction to HLPs, before examples of how the HLPs support student experiences across the E-Corps courses are shared.

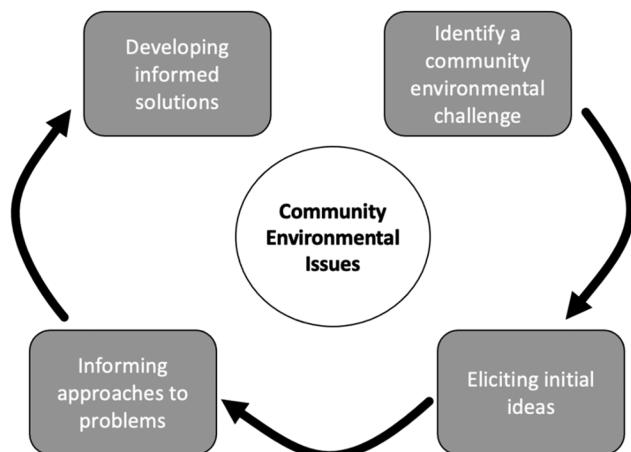


Figure 1. E-corps high leverage practices.

High leverage practices (HLPs)

HLPs or core practices (Grossman et al. 2009) emerged from the field of teacher education in connection to a belief that improvements in student learning depend on how teachers are prepared for and supported in their work (Ball & Forzani, 2009). HLPs are conceived of as a set of fundamental planning and instructional strategies, routines, and moves that are grounded in important learning goals, literature about how people learn, and evidence. They can be understood more generally as the instructional practices that seek (a) to stimulate significant

advancements in student thinking across groups, (b) support students' participation in disciplinary pursuits, and (c) be applied frequently across disciplinary topics and subject matter (Windschitl, Thompson, and Braaten 2009). While the majority of HLP research completed to date has focused on supporting pre-service teachers in teacher education, researchers have recently begun to recognize how collaborative work with HLPs can be central to establishments of communities of educators and stakeholders capable of developing and refining shared knowledge about teaching and learning (Campbell et al. 2019; Capobianco, DeLisi, and Radloff 2018).

Specific to our work, HLPs for E-Corps courses represent a conceptual stance embodied in a set of four instructional design principles about how learning and participation can be effectively fostered over time in community-level environmental problem solving contexts. The HLPs are cyclic in nature (see Figure 1) in that they start with an instructional planning high leverage practice of *identifying a community environmental challenge*, which then serves as the instructional anchor or problem space for the instructional high leverage practices. The importance of using real-world problems as the problem space within which students work as they engage in instruction has been highlighted by other researchers (e.g., Windschitl and Calabrese-Barton 2016; Krajcik and Sutherland 2010) as centrally important for redistributing epistemic agency (Ko and Krist 2019) to, among other benefits, positions learners to grasp disciplinary practice (Ford 2015; Ford & Forman and Ford 2014) (e.g., in science this means engaging in practices like experimentation and argumentation to use core disciplinary knowledge to make progress on problems) through the negotiation of uncertainty (Manz and Suárez 2018). The instructional HLPs begin with *eliciting initial ideas from students* where students' initial ideas and experiences are seen and leveraged as assets and serve as the foundation for addressing the community environmental challenge (Campbell, Schwarz, and Windschitl 2016). In addition to supporting an orientation to students' ideas as assets and resources, the elicitation of student ideas is also meant to serve as a source of information to help instructors design instruction that is responsive to student needs that are made more apparent as student ideas are shared early with peers in classrooms (Larkin 2017; Windschitl and Calabrese-Barton 2016; Windschitl et al. 2012). *Informing approaches to problems* is the instructional practice whereby the instructors introduce important science and engineering principles, frameworks, and practices for students to consider and work to apply

in addressing the focal community environmental challenge. As part of informing approaches to problems, researchers (e.g., Lineback 2015; Campbell et al. 2020) have demonstrated the effectiveness of teachers redirecting or foregrounding particular ideas in the space of classrooms to help students and classroom communities make progress in their sensemaking pursuits. This HLP is similar to Windschitl et al.'s (2012) HLP named *supporting on-going changes in thinking* and differs only in that their HLP focused exclusively on the introduction of science ideas and practices, whereas our HLP considers a wider diversity of disciplinary frameworks and resources necessitated across disciplines to address E-Corp applied environmental education challenges. Finally, *developing informed solutions* supports students to connect their initial ideas to what they learned from instructors as a foundation to revisit, build on, and finalize an informed responses to the community environmental challenge (see Figure 2 for more details about these HLPs). This instructional HLP is an amalgamation of Windschitl et al.'s (2012) HLP *developing evidence-based explanations* and principles of community conservation work from various literatures aimed at protecting, conserving, or improving local environments (e.g., Horwich and Lyon 2007; Ohmer et al. 2009). As part of developing evidence-based explanations in Winschitl and colleagues work, students are supported to build on their initial ideas by making connections to what they learn as they are introduced to science ideas and collected evidence from experimentation, texts, and other resources to develop explanations. What differentiates our HLP is our orientation to developing solutions instead of explanations. More specifically, our HLP (i.e., *developing informed solutions*) is an instructional HLP for helping students pull together what they learned with the aim of proposing a solution to support the navigation of community environmental challenges. Further, in alignment with community conservation literature, the following are examples of types of commitments used to shape students informed solutions developed during this HLP: reliance on community-level implementation by community actors (Horwich and Lyon 2007) and the promotion of sustainable forms of development in communities (Ohmer et al. 2009).

Next we provide examples of HLPs in the three E-Corps courses. Specifically, we offer an in-depth look at the HLPs in the brownfields course, with shorter examples from the remaining two courses. More expansive descriptions of the HLPs and how they are used in of the E-Corps courses are found in On the Web at the end of this article.

Planning the E-Corps Experience	Identify a community environmental challenge (stormwater, climate, or brownfield related) that sets the goal or establishes the focal problem (the “Big Idea”) for learning and meeting our professional responsibility to the communities that we serve long-term. This focus is identified by faculty in partnership with communities during course development. It provides a real-world context to elicit ideas in the Initial Phase: Eliciting initial ideas , a guide for identifying the topics and instructional techniques used in the Middle Phase: Informing approaches to problems , and the focus of the development of informed solutions in Final Phase: Developing informed solutions .
Initiating the E-Corps Experience	Orient students and the community to the pursuit of E-Corps focused work (e.g., community assessments, grant proposals) at the outset and throughout the course. This orientation entails acknowledging that resolutions will be developed within contexts of uncertainty—important for students entering professions that address environmental community concerns. Help students and communities understand what they will be doing and begin to see HLPs as essential for achieving their identified pursuit. Make it explicit that the pursuit (the community environmental challenge) is their important focus that sets the stage for how solutions are proposed (Eliciting initial ideas), informed (Informing approaches to problems), finalized (Developing informed solutions), and continually negotiated with community (Involvement and iterative negotiation of solutions with community members).
Throughout the E-Corps Experience	Involve and negotiate solutions with community members iteratively. This process begins early, as instructors work with local stakeholders to identify the community challenge of consequence (in the initial semester this may happen behind the scenes). This continues through instruction as more information about the local community is shared, such as through in-class guest lectures by community members. Finally, community members are invited to help conceptualize and negotiate developing solutions, particularly as part of the practicum semester. This process becomes iterative as each year’s group of student-community collaborative projects adds to the Corps collective experience, shedding more light on the types of outcomes that can be achieved.
Engaging: High Leverage Practices in the E-Corps Experience	<p>1. Initial Phase: Eliciting initial ideas for addressing the community environmental challenge. Ideally, these initial ideas would be captured so that they could be revisited and improved overtime. This will also help students see how their ideas have evolved as connections between their ideas and newly introduced ideas are made as they engage with peers and the instructor(s) around the challenge.</p> <p>→</p> <p>2. Middle Phase: Informing approaches to problems. Here, instructors help introduce important science and engineering principles, practices, frameworks, and approaches informed by community needs. These will build upon students’ initial ideas for addressing the environmental challenge in context. These are the things that students learn in the course that they may not have considered otherwise.</p> <p>→</p> <p>3. Final Phase: Developing informed solutions for addressing the community environmental challenge. Building upon initial ideas, this is where students revisit their initial proposals and strengthen them with what they learned about engaging in the previous ‘informing solutions to problems’ mid-instruction experiences with peers and instructors.</p>

Figure 2. More details about the E-corps high leverage practices.

Brownfields corps

The Brownfield Corps is associated with the Connecticut Brownfields Initiative (CBI), a program supported by the University of Connecticut, the State of Connecticut and philanthropic contributions from private sector partners who are actively engaged in brownfield redevelopment across the state. Brownfields are abandoned or underutilized sites where the reuse of the property has not occurred due to the presence or potential presence of contamination. In addition to advancement of environmental quality and public health, the revitalization of brownfields also stimulates local economies and provides significant economic development benefits. The Brownfield Corps course benefits from the sustained engagement of CBI with surrounding communities, where trust has been established through long-term relationships as CBI provides technical assistance to CT communities with engagement beyond the service learning program. In the Brownfields Corps, the students work together with municipalities on hands-on brownfields projects under faculty supervision. Additionally, CBI’s close ties with state and local industry augment the pedagogical capacity of the Brownfield Corps.

Planning the E-corps experience: identify a community environmental challenge

The community environmental challenge identified in the planning stage serves as the anchor or problem

space for the instructional HLPs that follow. In the example highlighted here, the community environmental challenge involves the management, clean up and redevelopment of brownfields sites more broadly, as well as securing grant funding from the EPA to promote characterization and remediation of specific sites. This environmental community challenge was selected because it positions students to:

- Learn about brownfield redevelopment practices
- Develop an understanding of the phases of brownfield redevelopment (e.g., assessment, clean up, revitalization planning)
- Orient to environmental justice in addressing unequal burdens connected to the location of brownfield target sites, especially the disproportionate impact on racial and ethnic minority populations
- Understand relevant laws and regulations that govern the management of brownfield sites
- Learn about public (federal, state, municipal) and private partner involvement
- Describe the community’s need as manifested by socioeconomic markers
- Develop community engagement plans for the redevelopment process

This community environmental challenge engages student teams in the semester-long task of iteratively developing an EPA brownfield grant proposal which

is submitted in collaboration with partner communities. EPA publishes an annual Request for Proposals that communities can apply to, and the deadline is typically aligned with the end of the fall semester. The EPA funds provide an essential step in the environmental due diligence process which includes assessment and remediation of the contaminated site, and preparation for its future reuse.

Instructional HLP 1: eliciting initial ideas

Because students' initial ideas and experiences inform their approach to addressing the community environmental challenge that will be critiqued, added to, and refined over time, this instructional HLP serves as the beginning or foundation upon which the final informed solution student groups propose will be built. To elicit students' initial ideas for this purpose, early in the semester students are engaged in an exercise in class where they are asked to articulate what they think should go into a viable brownfield redevelopment grant proposal that would be selected for funding. As part of this exercise, students participate in an in-class active learning activity where they are asked to identify key components to leverage federal funding for a brownfield site in a think-pair-share exercise. Specifically, the students form groups of two and discuss what arguments they would use to persuade an EPA official to provide funding for brownfield work in their community, before sharing with the whole-class. As a result of this exercise, the instructor forms a diagram on the board with all student input which outlines the major components of the grant including community need and engagement, site information and redevelopment goals, and a plan for allocating the requested funds.

Instructional HLP 2: informing approaches to problems

Here, science and engineering principles, frameworks, and practices are introduced for students to consider and apply in addressing the focal community environmental challenge. Example topics include presence of pollution in the environment, environmental assessment and remediation, environmental justice and community engagement. Students' initial ideas about what they think should go into a brownfield redevelopment project are further developed as they apply the principles taught in the course toward the development of the EPA brownfield grants. The students are engaged in a series of lectures and discussions

that introduce the following important ideas as they develop and write their proposals:

- Strategies for effectively providing background and descriptions of priority target sites, mechanisms for identifying reuse strategies aligned with revitalization plans connected to outcomes and benefits, and strategies for leveraging resources (e.g., resources needed for site reuse, use of existing infrastructure).
- Ways to identify and highlight community need (i.e., need for funding and the extent to which this need is connected to threats to sensitive populations). For example, the EPA's EJSCREEN: Environmental Justice Screening and Mapping Tool (<https://www.epa.gov/ejscreen>) is introduced to students for use in elevating environmental justice among project commitments.
- How the community will be engaged (i.e., project involvement, project role, and incorporating community input). Examples include community participation on a project advisory committee, involvement in the cleanup/reuse planning process, or engagement in design charrettes.
- Strategies for describing task activities and outputs, developing cost estimates, and measuring environmental results.

Instructional HLP 3: developing informed solutions

This final instructional practice supports students to connect their initial elicited ideas (i.e., Instructional HLP 1) to what they learned as the instructors introduced engineering and ecological principles, frameworks, and practices (i.e., Instructional HLP 2), in order to revisit, build on, and finalize an informed solution to the community environmental challenge (i.e., Instructional HLP 3). In the case of the EPA brownfield redevelopment grant proposal project, student groups revisit their initial ideas about what they think should go into a brownfield redevelopment project proposal, and connect those to important ideas they were introduced to during the progression of the class. They then use this new understanding to produce finalized EPA proposals that are submitted in collaboration with partner communities at the end of the semester. The following are a few brief descriptions of a sample of the projects that have been funded (\$1.4 million, total, to date):

- EPA Brownfield Community-Wide Assessment Grant for the Town of Stafford, CT. The students identified five blighted sites in the center of the town that needed environmental assessment and successfully secured \$300,000 in EPA funds. The student effort and EPA funds awarded acted as a catalyst for the Town's brownfield program: <https://www.explorestdt.com/brownfields>
- EPA Brownfield Community-Wide Assessment Grant for the City of Middletown, CT. The students suggested assessment and cleanup and reuse planning activities for several brownfield sites in the Connecticut River waterfront. During the semester, the student team visited the sites and worked with the City's Planning, Conservation, and Development Division to develop the grant proposal which resulted in \$300,000 in EPA funds for the City.
- EPA Brownfield Community-Wide Assessment Grant for the City of New Haven, CT. Several brownfield sites in one of the City's oldest industrial corridors were targeted for environmental assessment and reuse planning activities. The students worked on the grant proposal together with the City's Economic Development Department to secure \$200,000 on EPA funds.

Climate corps

The Climate Corps is focused on students developing the ability to assess and analyze how large-scale environmental problems translate to the local level, particularly the world of local land use planning, and for Connecticut towns to gain much-needed assistance in adapting to a changing climate. To this end, attention is paid to the following learning outcomes for the course:

- analyze and assess climate change impacts at a regional, state, and local scale;
- understand climate policy and programs at the federal, state, and municipal levels;
- analyze and assess the relationship of land use to environmental health;
- gain the ability to conduct a vulnerability assessment through the use of maps, imagery, and land use information;
- analyze climate-related problems at the local level from interdisciplinary perspectives;
- gain an understanding of how local government functions, and the many factors that come into

play during the land-use decision-making process, both historic and current environmental and climate justice factors.

High-leverage practices in the climate corps

An example of how HLPs are used in the Climate Corps course can be found as students are engaged in a semester-long Climate Vulnerability Assessment (CVA) and Climate Adaptation and Resilience Plan (CARP) team project. [Figure 3](#) presents the CVA and CARP team project focus, with students exploring and proposing actions for dealing with four climate change impacts (sea level rise/storm surge, increased precipitation, heat stress and vector borne diseases) in the coastal town of East Lowland, while [Figure 4](#)

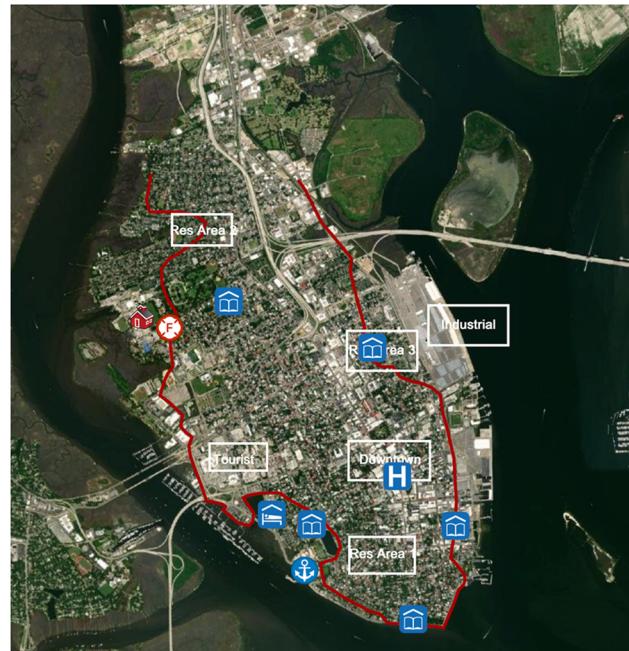


Figure 3. Climate corps CVA and CARP project.

Your consulting firm has been asked by Climate Czar, John Kerry, and the EPA to prepare a Climate Vulnerability Assessment (CVA) for the Town of East Lowland. EPA is also looking for a Climate Adaptation and Resilience Plan (CARP) to address impacts on residences, businesses, critical facilities and other uses that will be affected by sea level rise/storm surge, increased rainfall, heat stress and vector borne diseases. The scope of work calls for the CVA to **qualitatively** look at vulnerability up to the year 2050. For the CARP, EPA wants to see suggestions for how to address the vulnerabilities identified in the CVA through a range of adaptation solutions. These include infrastructure improvements and retreat/relocation. There will be secondary impacts from the implementation of adaptive solutions. EPA has asked for an analysis of these secondary impacts. They have asked you to allocate \$ 1 Billion (\$1,000,000,000) in a way that provides the most benefit to the Citizens of East Lowland, the environment and the economy. Sources of funds include, municipal bonding (possible), user fees and state and federal grants. There will not be enough money to address all the identified vulnerable assets, the Scope of Work calls for you to analyze what will happen to those assets if no action is taken (e.g. What are the tradeoffs due to your decisions?).

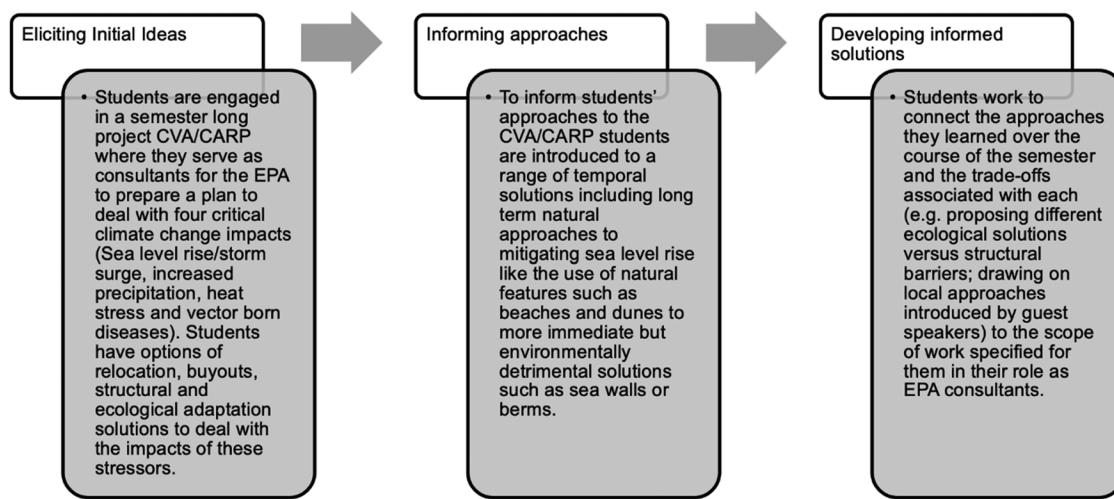


Figure 4. HLPs in the climate corp.

shows how this unfolds in connection to the E-Corps HLPs.

As can be seen in [Figure 4](#), the instructional HLPs for Climate Corps are anchored around the environmental challenge of climate CVA and CARP for the coastal town of East Lowland. Student ideas are elicited [Instructional HLP 1] as they are asked to think about and share their early ideas about how to address climate change impacts (e.g., sea level rise; storm surge). Students' initial ideas are further informed [Instructional HLP 2] as they are introduced, in subsequent class sessions, to both natural approaches for mitigating climate impacts (e.g., dunes) to more immediate, but environmentally detrimental approaches like sea walls or sea barriers. Finally, drawing on their initial ideas elicited as part of Instructional HLP 1, and approaches they learned as part of Instructional HLP 2, students developed and shared their informed solutions (e.g., proposed ecological barriers to mitigate sea level rise or storm surges) [Instructional HLP 3].

Stormwater corps

In the Stormwater Corps course, students learn about stormwater runoff and recommend innovative management practices, such as low-impact development (LID), for urbanized areas most vulnerable to stormwater impacts. Students' classroom experiences are centered around class exercises, field trips, and guest practitioner speakers who share information and approaches about local aspects of stormwater management. The class takes advantage of the many stormwater-focused projects and tools developed by the instructors in the course of their extension work

that include green stormwater practices found across campus (Dietz et al. 2015). Students in the course are also introduced to smartphone applications like "Rain Garden" (Dietz and Dickson 2013) and an online interactive "Story Map" detailing the progress of green stormwater implementation throughout Connecticut's towns (Dickson et al. 2018).

High-leverage practices in the stormwater corps

In the case of the example highlighted here, the community environmental challenge involves students in stormwater decision-making as they are presented with a scenario a local municipality is likely to face ([Figure 5](#)). More specifically, students engage in HLPs as they learn about stormwater induced flooding and pollution, and develop stormwater management plans for urban areas most vulnerable to these problems. [Figure 6](#) shows how HLPs are used in Stormwater Corps.

In [Figure 6](#), the community environmental challenge around which the Instructional HLPs are anchored is the impaired Dietz Creek Watershed. As part of Instructional HLP 1, students are introduced to the impaired watershed before their ideas are elicited concerning storm runoff related experiences they have witnessed in their communities or mitigation practices they have seen communities employ to deal with stormwater issues. As part of Instructional HLP 2, students are introduced to stormwater runoff mitigation strategies like bioretention, permeable pavements, and green roofs. Finally, as part of Instructional HLP 3, students are asked to build from their early ideas [Instructional HLP 1] and what they learned about stormwater runoff mitigation strategies [Instructional HLP 2] to propose a green stormwater

Dietz Creek Watershed

Dietz Creek, a tributary of Chester Cove, runs through the center of Dicksonville, a coastal community in Southeastern CT. The Creek and the Cove have been deemed impaired by CT DEEP for stormwater runoff-related impairments. A developer from New York City wishes to build a new 35-unit housing complex within the watershed. Objections have been raised by the Dietz Creek Defenders, a local watershed group, and some members of the planning and zoning board about the impact of the proposal on water quality and community character. You have been hired by the developer to come up with a plan for addressing those concerns.

Some background on the town and watershed:

- The Dietz Creek Watershed is fairly heavily developed with about 20% impervious cover as of 2012.
- In some areas of Dicksonville stormwater drains into a separate storm sewer system, while in other portions it drains into a combined sewer system.
- In bigger rainstorms (typically more than 1.5"), the combined sewer system in the older part of town overflows and empties untreated sewage into the creek.
- The area downstream of a new shopping district, served by the separate stormwater system, has experienced an increase in flooding problems in recent years.
- Dicksonville's Plan of Conservation and Development expired in 2020, but due to the pandemic has not yet been updated.
- The Town's subdivision requirements have not been updated in 20 years and currently require the use of traditional stormwater management practices, including curb and gutter, a minimum of 2 parking spaces per dwelling unit, and connection to the municipal stormwater system. Deviations from those requirements require a variance.
- Dicksonville is a CT Municipal Separate Storm Sewer System (MS4) community and all that that entails.

Figure 5. Scenario students are asked to develop a plan to address early in the semester in the stormwater corp course.

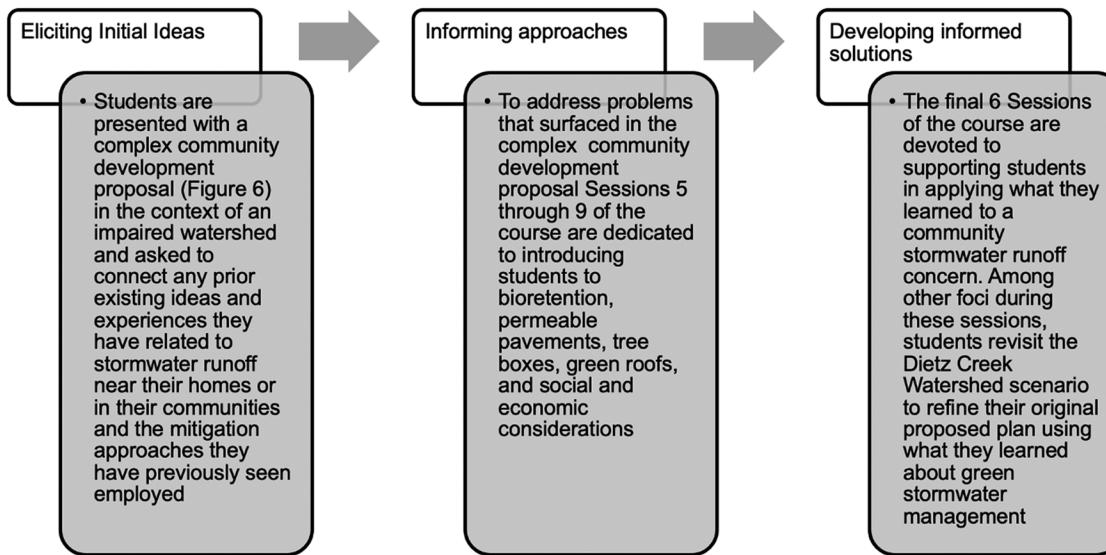


Figure 6. HLPs in stormwater corps.

management plan for the impaired Dietz Creek Watershed.

Conclusion

The Kellogg Commission on the Future of State and Land-Grant Universities (1999) report, *The Engaged*

Institution (1999), challenged universities to “become more sympathetically and productively involved with their community.” The E-Corps model, as well the HLPs we have developed, refined, and shared here represent our ongoing efforts to meet this challenge. Among other affordances, our research (Park et al., under review) has begun to illuminate, through

qualitative investigations of classroom enactments and instructor and student interviews, how these HLPs can be leveraged to support students' engagement in service-learning oriented coursework that seeks to reciprocally benefit students and communities partners. Important in our work with HLPs has been a commitment to using them as anchors for supporting collaborations by a group of educators committed to improvement. As a result of our collaborations, not only have we gathered evidence of HLPs meaningfulness as anchors for these collaborations (Park et al. 2022), these collaborations have also enriched our understanding and repertoire of strategies or tools supportive of their implementation (Park et al., under review). As an example, our research has revealed how strategies or tools connected to group discussions, guest lectures, role playing, and presentations to and from the community were emergent supports that instructors developed and shared to help one another in their implementation of the HLPs (Park et al., under review). Consequently, we suggest others seeking to take up these HLPs both in applied environmental education focused coursework and beyond, do so, as possible, in collaborations with others, so that implementation and adaptation of these HLPs for different contexts are informed and supported through collaborative interactions among groups of educators. In the end, we hope that our efforts inspire others to consider how HLPs might support their work with students in environmental science and engineering classrooms, while also inviting critique that will allow us to continue to improve both our use of HLPs across our courses and our strategies for effectively partnering with and serving local communities.

On the Web [links removed for blind review]

More detailed Descriptions of E-Corps HLPs.

HLPs: https://docs.google.com/document/d/1C9W-wcUsHE5t2TLymVTU106zrrDLqmI7CsaAWkk_dZXo/edit#

More detailed example of HLPs in the BrownfieldCorps.

Corps: <https://docs.google.com/document/d/1ZRiY2PCYOBElutZrMsBWNmeKSxQeqZI-WXo1OsCqu4o/edit>

More detailed example of HLPs in the StormwaterCorps.

Corps: https://docs.google.com/document/d/1WwO-79t-RJBEOCaLhsmOhEGRkav26is2v3a-CyyXbS_c/edit

More detailed example of HLPs in the Climate Corps.

Corps: https://docs.google.com/document/d/1YQW-wc9pzHvBRro6H7gFQnzq_dRIWM6q5UqJQQsH-TRL8/edit

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ORCID

Park Byung-Yeol  <http://orcid.org/0000-0002-7474-9693>

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