Sustainable Infrastructure Engineering Educational Programs in the Americas

Virtual Learning Exchange for Universities Offering Sustainable Infrastructure Programming

The Need for Sustainable Infrastructure

The infrastructure built and retrofitted in the next decade will set the path of development for the next half century. To ensure that this infrastructure is sustainable, resilient, and inclusive, an urgency exists to improve familiarity among engineers with sustainable infrastructure[1] guidance, tools, and best practices. To address this need, engineering schools need to teach the upcoming generation of engineers to think holistically about incorporating sustainability, resilience and adaptation, decarbonization, circular economy, and social inclusion into infrastructure development across all phases of the project cycle and to provide them with access to resources to carry this out. An initial review reveals that engineering schools are starting to include these topics in their curricula and initiatives are forming to support these efforts, but not at the scope and scale needed.

The Sustainable Infrastructure Community of Learners (SI-CoL) is proposing to use its Virtual Learning Community model to catalyze the development of good practice guidelines and case studies for designing and enhancing sustainable infrastructure educational programs within university engineering schools.

Virtual Learning Community Model

SI-CoL has developed an interactive, case-based learning approach that is based on the widely adopted Project ECHO pedagogical model from the health sector. To test the relevance of the ECHO model to sustainable infrastructure capacity development, several SI-CoL organizations[2] hosted a pilot Virtual Learning Hub, entitled *Sustainable Infrastructure: Putting Principles into Practice,* from May 2021 through May 2022. During the pilot 641 individuals representing 71 countries attended live, and there have been over 2500 views of the webinar recordings online.

SI-CoL is now helping create a series of targeted Virtual Learning Hubs in which communities of practice share best practices in infrastructure planning and project development, access data and tools, learn from each other's experiences, and connect sustainable infrastructure practitioners with specialists.

Vision: A Virtual Learning Hub for Engineering School Program Development

Focus groups and feedback from the *Sustainable Infrastructure: Putting Principles into Practice* pilot identified a critical need to train the next generation of civil engineers so that they are familiar with the principles, foundations, and applications of sustainable infrastructure practices. A small Duke University grant has provided support to establish a Virtual Learning Hub to connect leaders from engineering schools in North America and Latin America that are currently engaged in or interested in developing programs that prepare engineering students to design and build sustainable, resilient infrastructure. This hub would connect engineering school deans for shared learning about what approaches work well and how to address challenges when creating sustainable infrastructure educational programs. The outcome will be a guidance report with case studies as well as facilitation of a network of engineering university leaders facing similar challenges.

Interested in Participating?

To advance this initiative, we are seeking engineering school leaders that would like to be engaged in a Virtual Learning Hub. If you are interested in learning more or would like to engage in the Learning Hub, please reach out to sustainable-infrastructure@duke.edu.

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[1] Sustainable infrastructure projects are defined as those that are planned, designed, procured, constructed, operated, maintained, and decommissioned to ensure economic and financial, social, environmental (including climate resilience), and institutional sustainability over the entire life cycle of the project (Inter-American Development Bank, 2018)

[2] The sponsoring organizations were Duke University, UN Environment Programme (UNEP), Conservation International, Global Green-Gray Community of Practice, International Coalition for Sustainable Infrastructure (ICSI), Ministère de la Transition Ecologique (France), and Project Echo.

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