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Bridging Borders in Engineering Education: An Analysis of Collaborative Online International Learning for Sustainable Development

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Abstract

Global challenges, such as climate change and scarcity of resources, require engineers who can innovate, think critically, and collaborate across societies. This study investigates the role of Collaborative Online International Learning (COIL) in bridging borders in engineering education to address sustainable development challenges.
This study evaluates a COIL project about developing sustainable building materials from waste products involving 6 universities from the United Kingdom, India and Nigeria. Our study explores how COIL fosters cross-cultural collaboration, improves students' global competencies, and promotes problem solving and innovative skills in engineering education. Initial findings reveal that COIL not only encourages exchange of diverse views on problem solving but also deepens understanding of sustainable systems tailored to local communities. The research emphasizes the potential of COIL in integrating theoretical learning with real-world challenges whilst also preparing future engineers to contribute to the United Nations Sustainable Development Goals.
Additionally, our study identifies important factors, such as effective digital tools, structured facilitation, and support systems, which are central to boosting the impact of COIL initiatives.
This study highlights the importance of integrating collaborative, globalized approaches into engineering education to prepare students for the challenges of the 21st century. By bridging borders and fostering inclusive innovation, COIL emerges as a promising and powerful pedagogical tool for education, sustainable development and global impact.

Keywords: Cross-cultural collaboration; Engineering education; Inclusive innovation; Pedagogy; Sustainable development goals