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ACTIVE LEARNING IN A SUSTAINABILITY-FOCUSED COURSE

Abstract:

The current crisis of Covid-19 pandemic combined with issues of climate change and global warming is paving the way for a transformation of tertiary education to make it relevant to the current and future generation of students. Moreover, with the advancement of technology, students are less inclined to read books, but at the same time passionate about experiential and hands-on learning that they believe will help them to solve real world problems. This presentation will share a variety of innovative strategies that are used to teach a science-based and sustainability-focused course for first year undergraduates at Singapore University of Technology and Design (SUTD). One of the learning objectives of this course is to equip future engineers and architects of SUTD with a sustainability lens.

Science concepts introduced in this sustainability course is based on four main themes associated with the United Nation's Sustainable Development Goals (SDGs):

(1) Sustainable materials (related to SDG 12 Responsible Consumption)

(2) Water treatment (related to SDG 6 Clean Water)

(3) Renewable Energy (related to SDG 7 Energy)

(4) Biodiversity (related to SDG 14 Life on Land and SDG 15 Life in Water)

Laboratory-based hands-on activities related to biodegradable materials, wastewater treatment, batteries and genetic engineering are implemented in this module to demonstrate the role of science in sustainability. Students also learn about the Life Cycle Assessment (LCA) of a product in a design project where they analyze environmental impacts associated with a product's life cycle. These active learning pedagogical strategies will help students understand the science, technology, and challenges behind sustainability issues.

Keywords:

sustainability, active learning, science-based, experiential learning

JEL Classification: C91, I23, Q01