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Engineering Tools for Comprehensive Learning About Ecosystem-Based Disaster Risk Reduction

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Abstract

Powerful wave events are common worldwide. Rising sea levels caused by global warming will only worsen the risks to exposed coastlines. Countries bordering the North Indian Ocean, including the UAE, therefore need to understand and prepare for such risks, especially when a large population and associated development occupy low-lying coasts. Minimizing the impact of climate change is one of the key pillars of the national Environment Vision UAE 2030 thus expecting a greater contribution from the higher education sectors of the country. New curricular and laboratory facilities are required for the successful learning about topics on climate change's impact on society and its mitigation. Ecosystem-based disaster risk reduction strategy needs a multi-disciplinary learning focus where support from innovative engineering tools is pertinent. We developed a new research facility that can demonstrate the application of Ecosystem-based disaster reduction (Eco-DRR). Two groups of undergraduate students were assigned to a project (potential of coral reefs to mitigate marine floods) on Eco-DRR. The first group worked on the project using formulas and the second group worked on the project using the research facility. Both the groups were able to achieve the aims of the project whereas the group with the research facility showed a higher interest in their work, demonstrated an in-depth understanding of the physical phenomena of the project, and a greater confidence in explaining their results in a conference.

Keywords: New Curriculum, disaster risk reduction, ecosystem, cross-disciplinary learning, demonstration