Actas de las Jenui, vol. 7. 2022.
Páginas: 401-401

Tools for Embedding and Assessing Sustainable Development Goals in Engineering Education

Fermín Sánchez-Carracedo[1], Jordi Segalas[1], Pere Busquets[2], Joan Climent[1], Victor G. Galofré[1], Boris Lazzarini[1], David Lopez[3], Carme Martín[1], Bárbara Sureda[1], Gemma Tejedor[1] and Eva Vidal[1]
[1] University Research Institute for Sustainability Science and Technology, [2] Department of Mining, Industrial and ICT Engineering, [3] Department of Computer Architecture
Universitat Politècnica de Catalunya—UPC-BarcelonaTech
08034 Barcelona
fermin.sanchez@upc.edu, jordi.segalas@upc.edu, pere.busquets@upc.edu, juan.climent@upc.edu, victor.garcia.galofre@upc.edu, boris.lazzarini@upc.edu, david.lopez@upc.edu, carme.martin@upc.edu, barbara.sureda@upc.edu, gemma.tejedor@upc.edu, eva.vidal@upc.edu

Gorka Bueno, Estíbaliz Sáez de Cámara
Facultad de Ingeniería de Bilbao
Universidad del País Vasco (UPV/EHU)
48013 Bilbao
gorka.bueno@ehu.eus, estibaliz.saezdecamara@ehu.eus

Rafael Miñano
Innovation and Technology for Development Center
Universidad Politécnica de Madrid-UPM
28040 Madrid
rafael.minano@upm.es

Palabras clave: Education for Sustainable Development, Education for Sustainable Development Goals, Education for Sustainability, Engineering Sustainability Map, Sustainability presence map, Sustainability assessment.
Lugar de publicación: Sustainability 2021, 13(21), 12154
Índice de impacto: 3,251, JCR Q2, CITESCORE 3,9 SCOPUS
DOI: https://doi.org/10.3390/su132112154

Abstract

This paper presents three tools developed within the framework of the project EDINSOST2-SDG, aimed at embedding and assessing the Education for Sustainable Development (ESD) in Engineering curricula. ESD is promoted through the introduction into engineering curricula of learning outcomes related to sustainability and, specifically, to the Sustainable Development Goals (SDG). The first tool, the 'Engineering Sustainability Map', contains ESD-related learning outcomes that any engineering student should have acquired upon completion of their studies. These learning outcomes are described according to four sustainability competencies: (1) Critical contextualization of knowledge, (2) Sustainable use of resources, (3) Participation in community processes, and (4) Application of ethical principles. The second tool, the 'Sustainability Presence Map' of a degree, shows the percentage of the presence in the curriculum of each sustainability competency. The calculation of the presence of each competency is based upon the effective integration of the related learning outcomes in a specific curriculum. Respective data are provided by teachers responsible for the coordination of the different subjects of the degree, collected through a questionnaire. The third tool presented is a questionnaire aimed at measuring the level of ESD that students perceive they have acquired through each competency. The comparison of data resulting from the Sustainability Presence Map with the data from the student questionnaire allows to determine the effectiveness of embedding ESD in a degree. The three tools presented in this work have undergone a validation process and are currently being used in a set of engineering degrees related to the EDINSOST2-SDG project. The results of the application of these tools is part of the future research work of the authors.