World Sustainability Series

Walter Leal Filho Laís Viera Trevisan Paul J. Pace Mark Mifsud *Editors*

Education for Sustainable Development: The Contribution of Universities



World Sustainability Series

Series Editor

Walter Leal Filho, European School of Sustainability Science and Research, Research and Transfer Centre "Sustainable Development and Climate Change Management", Hamburg University of Applied Sciences, Hamburg, Germany Due to its scope and nature, sustainable development is a matter which is very interdisciplinary, and draws from knowledge and inputs from the social sciences and environmental sciences on the one hand, but also from physical sciences and arts on the other. As such, there is a perceived need to foster integrative approaches, whereby the combination of inputs from various fields may contribute to a better understanding of what sustainability is, and means to people. But despite the need for and the relevance of integrative approaches towards sustainable development, there is a paucity of literature which address matters related to sustainability in an integrated way.

Notes on the quality assurance and peer review of this publication

Prior to publication, the works published in this book are initially assessed and reviewed by an in-house editor. If suitable for publication, manuscripts are sent for further review, which includes a combined effort by the editorial board and appointed subject experts, who provide independent peer-review. The feedback obtained in this way was communicated to authors, and with manuscripts checked upon return before finally accepted. The peer-reviewed nature of the books in the "World Sustainability Series" means that contributions to them have, over many years, been officially accepted for tenure and promotion purposes.

Walter Leal Filho · Laís Viera Trevisan · Paul J. Pace · Mark Mifsud Editors

Education for Sustainable Development: The Contribution of Universities



Editors
Walter Leal Filho
Faculty of Life Sciences
Hamburg University of Applied Sciences
Hamburg, Germany

Paul J. Pace University of Malta Msida, Malta Laís Viera Trevisan Federal University of Rio Grande do Sul Porto Alegre, Rio Grande do Sul, Brazil

Mark Mifsud University of Malta Msida, Malta

ISSN 2199-7373 ISSN 2199-7381 (electronic) World Sustainability Series ISBN 978-3-031-86984-6 ISBN 978-3-031-86985-3 (eBook) https://doi.org/10.1007/978-3-031-86985-3

© The Editor(s) (if applicable) and The Author(s), under exclusive license to Springer Nature Switzerland AG 2025

This work is subject to copyright. All rights are solely and exclusively licensed by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Switzerland AG The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

If disposing of this product, please recycle the paper.

Contents

for Higher Education Institutions in Latin America Juliana Restrepo Jaramillo, Ana Elena Builes-Vélez, Danny Jean Paul Mejía Holguín, Juan Diego Martínez Marín,	1
Critical Analysis of Sustainable Production Board Games Sandro Gabriel Libretti Prestes, João Victor Encide Salla, Juliana Veiga Mendes, and Diogo Aparecido Lopes Silva	19
Student-Centered Teaching for Sustainability Education in an Introductory Biology Course at Winona State University: A Case-Study Bruno Borsari	39
Can Climate Anxiety and Awareness Drive Academic Behaviour in Higher Education? Enzo Ferrari, Lorraine Whitmarsh, Nancy MacCann-Alfaro, Claudia Cáceres-González, Elvia Melara, Eva Hernadez-Gallego, and Camilo Ruiz	59
Citizen Science: Unlocking Skills and Experience for University Students in Hungary Zoltán Péter Alföldi	75
Communicating Sustainability Competencies: A Case Study of Sustainability and Learning Design	85
Conceptualising and Evaluating the Impact of Business Training Programmes Delivered to Marginalized Individuals	101

vi Contents

Education for Sustainable Urban Development in a Global Context—Study of the Academia's Contribution	
and Cross-Sectoral Cooperation in the UN HABITAT 11th World Urban Forum in Katowice	115
Greening the Audit: How Universities Can Shape Tomorrow's Sustainability Assurance Professionals Sakshi Girdhar and Kristina Linke	133
How to Be a Change Agent at Schools? Development and Implementation of a Virtual Course for Pre-service Teachers' Sustainability Education Nataliia Demeshkant, Tobias Hoppe, Armin Lude, Verena Raissa Bodenbender, Katarzyna Potyrała, and Kees-Jan Van Oorsouw	147
Implementation of Vocational Education and Training for Sustainable Development Through Cooperation Between Research and Practice Robert Hantsch and Harald Hantke	161
Integration of Sustainability Competencies in Creative Disciplines Training. Colombian Case Lina María Suárez-Vásquez, Ana Elena Builes-Vélez, Juliana Restrepo Jaramillo, and Natalia Pérez-Orrego	177
Nourishing Change Agents by Undergraduate Program for Sustainable Futures at a Japanese University Hideki Maruyama	193
Preferences and Effectiveness of Sustainability Communication: A Study Amongst Maltese Generation X and Y Clinton Cassar	209
Shaping University Teaching Programs on Sustainability: Solidifying the Fluid Concept of Sustainability Martijn Pieter van der Steen, Kristina Linke, Paula Dirks, and Nazim Hussain	229
Sowing Seeds of Change: Cultivating Sustainability Literacy in TU Dublin's Language Studies Curriculum Odette Gabaudan, Pilar Molina Taracena, and Alexandra Severino	245
Sustainable Competencies of the Soon-to-be Leaders and Experts: Evidences from Higher Education System Lazar Pavić, Mateja Čuček, and Matevž Obrecht	265

The Social Capital of a Higher Education Institution and the 2030 Agenda	283
Gabriela Daiana Christ, Lair Barroso Arraes Rocha, Moacir Piffer, and Jandir Pauli	203
University Teachers' Competencies for Implementing ESD in Higher Education Curriculum: A Case Study of Malaysia	301
A Digital Training Tool to Support the Industry 5.0 Transition—Case Description with Bachelor Students in a Brazilian University João Victor Encide Salla, Ana Carolina Godoy Albino, Daiane Vitória da Silva, Antônio Carlos Farrapo Jr, Yovana María Barrera Saavedra, and Diogo Aparecido Lopes Silva	321
Higher Education for Sustainable Development in South-East Asia: Problems, Values, Strategies and Practices Viktor Zinchenko, Yurii Mielkov, Vasyl Levkulych, Mykola Popovych, Iryna Storozhuk, Oksana Bulvinska, and Viktoriia Levkulych	343
Perceptions of Periti on Sustainable Construction and Development in Malta James Gabarretta and Mark Mifsud	357
Enacting Sustainability at the University—Staffs' Hope and Motivation in Relation to Their Actions Ilona Södervik, Heidi Hyytinen, Rami Ratvio, Tuija Veintie, Janne Salovaara, Janna Pietikäinen, Milja Heikkinen, and Tarja Tuononen	371
Sustainable Development in Higher Education: A Review of Effective Pedagogical Tools Katalin Ásványi and Eszter Gedeon	393
Enhancing Sustainable Development Literacy in Higher Education: Insights from Accounting and Pedagogy Courses Sara Moggi and Gabriella Calvano	411
Sustainability in University Curricula. Comparison of the Environmental Competences of Cross-Disciplinary Subjects in a University in the Metropolitan Area of Buenos Aires, Argentina Norma Gabriela Faitani	427
The TRAIN Framework for AI-Assisted Development of Novice Accounting Instructors Semen Son-Turan	447

viii Contents

A Critical Analysis of Sustainability Indicators for Education	
and Curricula in Higher Education Institutions and Their	
Adaptation to the Portuguese Context	465
Maria Constança Simões Rigueiro, Sandra Caeiro,	
Patrícia Câmara, Ana Fonseca, Teresa Godinho, Mahsa Mapar,	
Anabela Mendes Moreira, Maria Alzira Pimenta Dinis,	
Carla Sá Farinha, João Simão, and Manuela Vieira da Silva	