Table of Contents

Foreword ................................................................. xxxii

Preface ........................................................................... xxxv

Acknowledgment .................................................................... xlvii

Section 1
Pedagogical Theories and Conceptual Frameworks to Address the Issues of Sustainability Education

Chapter 1
Sharing the Load: Developing Capacity for Social Sustainability in Design through Collaboration ................................. 1
  Muireann McMahon, University of Limerick, Ireland
  Tracy Bhamra, Loughborough University, UK

Chapter 2
Incorporating Place-Based Education to Cultivate Watershed Literacy: A Case Study ................................................... 27
  Nathan Hensley, Auburn University, USA

Chapter 3
Sustainability in Photography Can Change the World ............................................................ 39
  Rowena H. Scott, Edith Cowan University, Australia

Chapter 4
Integration of Education for Sustainable Development into Formal Secondary Curricula of East Timor ................................................................. 54
  Ana Capelo, University of Aveiro, Portugal

Chapter 5
Interdisciplinary Approaches to Sustainable Development in Higher Education: A Case Study from Croatia ................................................................. 67
  Dunja Andić, University of Rijeka, Croatia
  Sanja Tatalović Vorkapić, University of Rijeka, Croatia
Chapter 6
Sustainable Development in Business Education: The Role of Entrepreneurship as Pedagogy ....... 116

Fernando Lourenço, Institute for Tourism Studies, Macao, China & Manchester Metropolitan University Business School, UK
Natalie Sappleton, Manchester Metropolitan University Business School, UK
Weng Si Lei, Institute for Tourism Studies, Macao, China
Ranis Cheng, University of Sheffield, UK

Chapter 7
Integrating Sustainable Design and Systems Thinking throughout an Engineering Curriculum ...... 136

Robert L. Nagel, James Madison University, USA
Kyle G. Gipson, James Madison University, USA
Adebayo Ogundipe, James Madison University, USA

Chapter 8
Learning about the Different Dimensions of Sustainability by Applying the Product Test Method in Science Classes ............................................................................................................................... 154

Mareike Burmeister, Institute of Science Education, University of Bremen, Germany
Janine von Döhlen, Institute of Science Education, University of Bremen, Germany
Ingo Eilks, Institute of Science Education, University of Bremen, Germany

Chapter 9
Communities of Practice (CoP) as a Model for Integrating Sustainability into Higher Education.... 170

Sandra Murray, University of Tasmania, Australia
Susan Salter, University of Tasmania, Australia

Section 2
Development and Transformation of Sustainable Development Programs: Elementary and Secondary Education

Chapter 10
Using Project-Based Learning to Teach Sustainability Issues to Elementary Students ................. 190

Ingrid Weiland, University of Louisville, USA
Elisa Pokral, Monroe County Indiana Waste Management District, USA
Kristin Cook, Bellarmine University, USA

Chapter 11
Pass, Fail, or Incomplete? Analyzing Environmental Education in Nova Scotia’s Sixth Grade Curriculum .......................................................................................................................................... 210

Elizabeth Spence, Dalhousie University, Canada
Tarah Wright, Dalhousie University, Canada
Heather Castleden, Dalhousie University, Canada
Chapter 12
Learning about Sustainability in a Non-Formal Laboratory Context for Secondary Level Students: A Module on Climate Change, the Ozone Hole, and Summer Smog
Nicole Garner, Institute for Science Education, University of Bremen, Germany
Maria de Lourdes Lischke, Institute for Science Education, University of Bremen, Germany
Antje Siol, Institute for Environmental Research and Sustainable Technologies, University of Bremen, Germany
Ingo Eilks, Institute for Science Education, University of Bremen, Germany

Chapter 13
A System-Wide School-Based Program for Sustainability: Climate Clever Energy Savers
John Buchanan, Centre for Research in Learning and Change, University of Technology, Sydney, Australia
Peter Aubusson, Centre for Research in Learning and Change, University of Technology, Sydney, Australia
Sandy Schuck, Centre for Research in Learning and Change, University of Technology, Sydney, Australia

Chapter 14
Teaching Sustainability Competencies to High School Students using Small-Scale Community-Based Construction Projects
Mehmet E. Ozbek, Colorado State University, USA
Caroline M. Clevenger, Colorado State University, USA

Chapter 15
Teaching Sustainability as a Social Issue: Learning from Dialogue in a High School Social Studies Classroom
Jay M. Shuttleworth, Columbia University, USA
Anand R. Marri, Teachers College, Columbia University, USA & Federal Reserve Bank of New York, USA

Chapter 16
Systems Thinking about Severe Storms in Social Studies Education
Thomas Chandler, Columbia University, USA
Margaret Crocco, Michigan State University, USA
Anand R. Marri, Teachers College, Columbia University, USA & Federal Reserve Bank of New York, USA
Section 3
Approaches in Higher Education to Teaching and Learning Sustainability and Sustainable Development Concepts

Chapter 17
Integrating Sustainability within Higher Education .......................................................... 369
  Angus W. Stewart, Edith Cowan University, Australia

Chapter 18
Teaching about Sustainability: Raising Consciousness and Taking Action ............................. 383
  Richard Penaskovic, Auburn University, USA
  Dennis R. DeVries, Auburn University, USA
  Nanette E. Chadwick, Auburn University, USA

Chapter 19
Teaching of Sustainability: Higher Education (HE) Case Studies........................................ 398
  Sue Haile, Newcastle University, UK
  Jarka Glassey, Newcastle University, UK

Chapter 20
The Reinvention of an Unremarkable Building through Adaptive Reuse: A Case Study .......... 410
  Deborah Schneiderman, Pratt Institute, USA
  Anne L. Carr, HKS Architects, Inc., USA

Chapter 21
Sustainability, Ethics and Education: What’s Accounting Got to Do with It? ......................... 424
  Tehmina Khan, RMIT University, Australia

Chapter 22
Physics of Energy: A Sustainability-Themed University Travel Course ................................ 441
  Katrina Hay, Pacific Lutheran University, USA

Chapter 23
Green Chemistry: Classroom Implementation of an Educational Board Game Illustrating Environmental Sustainable Development in Chemical Manufacturing ............................ 453
  Mike Coffey, Nottingham Trent University, UK

Chapter 24
Designing Sustainability Curricula: A Case Following Chemical Engineering Curriculum Redesign .......................................................... 474
  Madoc Sheehan, James Cook University, Australia
Chapter 25
Using Accreditation to Foster Education for Sustainability in Higher Education: The Implementation of the Peace with Creation Project at Eastern Mennonite University .......................... 494
  James Yoder, Eastern Mennonite University, USA
  BJ Miller, Eastern Mennonite University, USA

Chapter 26
Implementing an Interfaculty Elective “Sustainable Development”: An Intervention into a University’s Culture between Organized Scientific Rationality and Normative Claim ..................... 510
  Renate Hübner, Institute of Intervention Research and Cultural Sustainability, Alpen-Adria University, Austria
  Franz Rauch, Institute of Instructional and School Development, Alpen-Adria University, Austria
  Mira Dulle, Institute of Instructional and School Development, Alpen-Adria University, Austria

Section 4
Contemporary Approaches to Adult Education for Sustainable Development

Chapter 27
Analyzing Farmers’ Learning Process in Sustainable Development: The Case of Organic Paddy Farmers in North Sumatra, Indonesia ................................................................. 524
  Diana Chalil, University of Sumatera Utara, Indonesia

Chapter 28
Growing PEAS at the Duke Campus Farm: An Analysis of Post-Secondary Sustainable Agriculture Education Curricula ................................................................. 543
  Damon Cory-Watson, Duke University, USA

Chapter 29
Synchronous E-Learning on Rural Sustainability: A Reflection on a Course with Six Universities across Canada, Mexico, and the United States ............................................. 565
  Denise M. Golden, Lakehead University, Canada
  Alex S. Mayer, Michigan Technological University, USA
  Brian E. McLaren, Lakehead University, Canada
  Jason E. Dampier, Lakehead University, Canada
  Patrick T. Maher, University of Northern British Columbia, Canada
  M. A. (Peggy) Smith, Lakehead University, Canada
  Mirella Stroink, Lakehead University, Canada

Chapter 30
‘Growing Oak Trees’ - Education for Sustainable Design: Building a Sustainable Design Literacy in Undergraduate and Professional Designers ............................................. 584
  Adam de Eyto, University of Limerick, Ireland
Section 5
Education for Sustainable Development: Problems, Prospects and Promise

Chapter 31
Are University Lecturers Literate in Sustainability? ................................................................. 606
   Noora Kokkarinen, Liverpool John Moores University, UK
   Alison J. Cotgrave, Liverpool John Moores University, UK

Chapter 32
Transforming University Curricula towards Sustainability: A Euro-Mediterranean Initiative .... 619
   Vassilios Makrakis, University of Crete, Greece

Chapter 33
Embedding Sustainability Learning: Robustness in Changing Circumstances - Perspectives from a United Kingdom (UK) Higher Education Institution (HEI) .................................................... 641
   Ros Taylor, Kingston University, London, UK
   Elise Barron, Kingston University, London, UK
   Katherine A.T. Eames, Kingston University, London, UK

Chapter 34
Efforts to Promote Sustainable Development through Education in Cambodia .................... 672
   Yuto Kitamura, The University of Tokyo, Japan

Chapter 35
Digital Textbook in Personal Learning Portfolios: A Case of Interdisciplinary Pedagogical Innovation for Sustainability .......................................................... 685
   Elena Railean, Academy of Sciences, Republic of Moldova

Chapter 36
Intercultural Communication and Sustainable Leadership: The Case of a Joint Master Course ..... 700
   Nelly Kostoulas-Makrakis, University of Crete, Greece

Compilation of References ............................................................................................................. 717

About the Contributors .................................................................................................................. 782

Index ........................................................................................................................................... 796