

Table of Contents

Foreword	xxxii
Preface	xxxv
Acknowledgment	xlvi

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
<i>Muireann McMahon, University of Limerick, Ireland</i>	
<i>Tracy Bhamra, Loughborough University, UK</i>	

Chapter 2

Incorporating Place-Based Education to Cultivate Watershed Literacy: A Case Study	27
<i>Nathan Hensley, Auburn University, USA</i>	

Chapter 3

Sustainability in Photography Can Change the World.....	39
<i>Rowena H. Scott, Edith Cowan University, Australia</i>	

Chapter 4

Integration of Education for Sustainable Development into Formal Secondary Curricula of East Timor.....	54
<i>Ana Capelo, University of Aveiro, Portugal</i>	

Chapter 5

Interdisciplinary Approaches to Sustainable Development in Higher Education: A Case Study from Croatia	67
<i>Dunja Andić, University of Rijeka, Croatia</i>	
<i>Sanja Tatalović Vorkapić, University of Rijeka, Croatia</i>	

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..... 229
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..... 245
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..... 270
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..... 328
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..... 348
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
<i>Angus W. Stewart, Edith Cowan University, Australia</i>	

Chapter 18

Teaching about Sustainability: Raising Consciousness and Taking Action	383
<i>Richard Penaskovic, Auburn University, USA</i>	
<i>Dennis R. DeVries, Auburn University, USA</i>	
<i>Nanette E. Chadwick, Auburn University, USA</i>	

Chapter 19

Teaching of Sustainability: Higher Education (HE) Case Studies.....	398
<i>Sue Haile, Newcastle University, UK</i>	
<i>Jarka Glassey, Newcastle University, UK</i>	

Chapter 20

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

Chapter 21

Sustainability, Ethics and Education: What's Accounting Got to Do with It?	424
<i>Tehmina Khan, RMIT University, Australia</i>	

Chapter 22

Physics of Energy: A Sustainability-Themed University Travel Course	441
<i>Katrina Hay, Pacific Lutheran University, USA</i>	

Chapter 23

Green Chemistry: Classroom Implementation of an Educational Board Game Illustrating Environmental Sustainable Development in Chemical Manufacturing	453
<i>Mike Coffey, Nottingham Trent University, UK</i>	

Chapter 24

Designing Sustainability Curricula: A Case Following Chemical Engineering Curriculum Redesign.....	474
<i>Madoc Sheehan, James Cook University, Australia</i>	

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