

# HIGHER EDUCATION AND SUSTAINABLE DEVELOPMENT

A model for curriculum renewal

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This text is an extract from 'Higher Education and Sustainable Development: A Model for Curriculum Renewal' (Earthscan/Routledge 2014). To purchase the entire book please visit [www.routledge.com](http://www.routledge.com).

First edition published 2014  
by Routledge  
2 Park Square, Milton Park, Abingdon, Oxon, OX14 4RN

and by Routledge  
711 Third Avenue, New York, NY 10017

*Routledge is an imprint of the Taylor & Francis Group, an informa business*

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*British Library Cataloguing in Publication Data*

A catalogue record for this book is available from the British Library

*Library of Congress Cataloging-in-Publication Data*

Desha, Cheryl.

Higher education and sustainable development : a model for curriculum renewal / Cheryl Desha and Karlson Charlie Hargroves. – First edition.

pages cm

Includes bibliographical references and index.

1. Education, Higher. 2. Sustainable development. 3. Curriculum planning. 4. Curriculum change.

I. Hargroves, Karlson, 1974– II. Title.

LB2325.D435 2014

378–dc23

2013015806

ISBN13: 978–1–84407–859–2 (hbk)

ISBN13: 978–1–84407–860–8 (pbk)

ISBN13: 978–1–315–88395–3 (ebk)

Typeset in Bembo by  
Keystroke, Station Road, Codsall, Wolverhampton

## FOREWORD

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Former President, World Federation of Engineering Organisations (WFEO)

2007–2009★

In times of change learners inherit the earth; while the learned find themselves beautifully equipped to deal with a world that no longer exists.

*Eric Hoffer, Philosopher*

I have had the pleasure of mentoring the team from The Natural Edge Project since their beginnings as a special interest project with the Institution of Engineers Australia in 2002. Watching their emergence as an internationally regarded sustainability think-tank that produces rigorous content for capacity building within the engineering profession gives me great hope for the future. In this their latest work I congratulate the team for succinctly presenting the rationale for issues related to sustainable development to be given the highest priority by engineering educators over the coming decade, as we seek to rapidly improve the sustainability attributes of our engineering graduates. Engineering departments must expect that program accreditation requirements related to sustainability will increase and the set of graduate attributes to meet such challenges will quickly become increasingly demanding over the next decade as the profession clarifies its responsibilities.

I have had a long interest in improving the quality of engineering education and training in all member nations, as well as improving the procedures for accrediting engineering courses that provide assurance of the quality of engineering education to meet international standards. I have been involved in many exciting conversations over recent years about how the engineering profession can address sustainability challenges facing humanity this century. In the same period I have also witnessed the reluctance of many heads of engineering departments from around the world to integrate sustainability knowledge and skills within all engineering programs. Despite this inertia to stay the same, I believe 2008–2009 will be historically referred to as a tipping point for action in our profession, where increasing pressures from government, industry and the profession itself, resulted in the commencement of a transition to engineering education for sustainable development (EESD) in many countries. I am particularly pleased with the authors' summary of the key drivers for engineering education to embrace sustainable development, which will assist any departments where such debate has previously stalled action.

The authors have also provided an enlightening discussion of the serious time lag dilemma facing engineering departments to equip the profession with knowledge and skills to meet society's needs this

century. Simply put, engineering departments must have a clear understanding of this current context and the risk implications of their decisions today. Globally, the public is becoming increasingly aware that development need not come at the price of a compromised environment. Among the ever-increasing global population that continues to shift to urban areas, engineers are being challenged to meet demands for energy, drinking water, clean air, safe waste disposal, transportation, and infrastructure that does not further diminish our natural systems. We are also being challenged to address built environment complications arising from sea level rise; the increasing regularity and severity of threats such as drought, flooding, heat-waves and hurricanes resulting from climate change phenomena; and perhaps other indirect political threats arising from issues such as oil, food and water scarcity. These issues require truly intra-disciplinary, cross-disciplinary and multi-disciplinary collaborations, where engineering contributions must be well grounded in sustainability principles and practices.

I commend this guide to the engineering education community as a milestone in moving towards sustainable engineering. As the authors make clear, the critical issue for our profession is now *how fast* we can undertake this process of curriculum renewal, in such urgent and challenging times. In the absence of a 'how to' manual, the authors have consulted with an extraordinary international network of accomplished practitioners and academics, to present a strategic yet ultimately pragmatic approach for undertaking rapid curriculum renewal for EESD. The elements of rapid curriculum renewal highlight many opportunities for departments to meet multiple objectives in addressing EESD, including accreditation requirements and recruitment, while also reducing their risk exposure to rapidly shifting market, regulatory and accreditation requirements.

I also highlight this book for the attention of all accrediting institutions internationally. The authors make it clear that professional engineering institutions that are responsible for accrediting university programs are a crucial component in driving accelerated curriculum renewal within the higher education sector. Engineering educators are calling for benchmarks for action with clear time horizons. By incorporating and prioritising explicit sustainability-related attributes for engineering programs in accreditation requirements, accreditation can play a key role in driving rapid and systemic curriculum renewal to EESD.

\* The World Federation of Engineering Organisations (WFEO) has a core objective to use the skills and knowledge of the engineering profession for the wider benefit of humanity. With membership comprising national organisations, it represents in the order of 15 million engineers worldwide.