



The Centre for
Engineering and Design Education

Teaching and learning resources

to complement the guide
*'An Introduction to Sustainable
Development in the Engineering
Curriculum'* by **Roger Penlington**
and **Simon Steiner**

Sustainable Development in the Engineering Curriculum: Further reading

This repository of teaching and learning resources is a companion to *An Introduction to Sustainable Development in the Engineering Curriculum*, by Roger Penlington and Simon Steiner, originally created by The Higher Education Academy Engineering Subject Centre, Loughborough University, and reproduced as an online resource in 2014

<http://eden-share.lboro.ac.uk/id/item/99/>

The purpose of this list of teaching and learning resources is to provide access, with a brief resumé, to materials in curricula reform, recognition awards and university movements that the associated guide recommends to readers.

It is organised into sections giving information on organisations and publishers in the field of SD/ESD, and journals, books, papers and reports. The entries include references and urls (where appropriate) as a basis for further reading.

Organisations and publishers

Clean (Climate Literacy and Energy Awareness Network)

<http://cleanet.org/index.html>

CLEAN provides access to teaching resources for climate change and energy topics, including pedagogical approaches and technical background.

EAP. <http://www.engineersagainstopoverty.org/home>

Engineers Against Poverty (EAP) is a specialist NGO working in the field of engineering and international development. It has

developed a reputation for producing cutting edge action research and is rapidly establishing itself as a leading agency in its field.

EAP works with UK based HEIs, regulatory bodies and specialist research institutes to strengthen the commitment and capacity of engineering faculties and staff members to embed global issues within the learning of engineering undergraduates. It does this through a range of activities including research, advocacy, policy advice and supporting professional development. See in particular the report of its three-year study *The Global Engineer* at <http://www.engineersagainstopoverty.org/documentdownload.axd?documentresourceid=33>

EAUC. <http://www.eauc.org.uk/home>

The Environmental Association for Universities and Colleges was launched in 1996 with the aim of raising the profile of environmental management and facilitating improvement of environmental performance in member institutions. It is “the environmental and sustainability champion within Further and Higher Education in the UK, is a Member association supporting Universities and Colleges across the UK, and (with around 300 institutional members), is an influential voice within the sector”.

Their website gives access to *Rio+20 – Giving the education sector a powerful international voice*, which is available at http://www.eauc.org.uk/giving_eauc_members_a_powerful_international_voice

EWB-UK. <http://www.ewb-uk.org/>

Engineers Without Borders UK is an organisation that creates massive change from empowering thousands of new engineers to remove barriers to human development. Its approach is to put students and young professionals at the centre of its operations, providing them with resources and contact to help them become development professionals. It does this through holistic engineering, active partnerships and appropriate engineering.

The EWB Challenge (<http://www.ewb-uk.org/ewbchallenge>) is a design programme for first and second year university students delivered in the UK and Ireland by EWB-UK. It is coordinated internationally by Engineers Without Borders Australia and delivered in Australian, New Zealand, British and Irish universities. It provides students with the opportunity to learn about design, teamwork and communication through real, inspiring, sustainable and cross-cultural development projects. By participating in the EWB Challenge students are presented with a fantastic opportunity to design creative solutions to problems identified by real EWB projects.

Each year, the EWB Challenge design brief is based on a set of sustainable development projects identified by EWB with its community-based partner organisations. In past years the EWB Challenge has included developing innovative and sustainable project ideas and solutions to support communities in Vietnam, India, Cambodia and rural Australia.

Forum for the Future (F4F) <http://www.forumforthefuture.org/>

Forum for the Future is an independent non-profit organisation working globally with business, government and other organisations to solve complex sustainability challenges.

The Global Dimension for Engineering Education (GDEE) project <http://gdee.eu>

The EU-funded GDEE project aims to improve the competencies of academics with an aim of increasing the awareness, critical understanding and values of students in relation to sustainable human development and its incorporation within technical education. This aim is supported by the provision of a number of online e-learning courses for academics.

Global University Network for Innovation (GUNi).

<http://www.guninetwork.org/about-guni/about-guni>

The Global University Network for Innovation (GUNi) is an international network created in 1999 by UNESCO, the United Nations University (UNU) and the Universitat Politècnica de Catalunya - BarcelonaTech (UPC), after UNESCO's World Conference on Higher Education (WCHE) in 1998, to give continuity to and facilitate the implementation of its main decisions.

Sustainable Development Solutions Initiatives – a global initiative for the United Nations (SDSN) <http://unsdsn.org/>

The Sustainable Development Solutions Network (SDSN) seeks to harness scientific and technical expertise from academia, civil society and the private sector in support of sustainable development problem solving on local, national and global scales. Activities aim to accelerate joint learning and help to overcome the compartmentalisation of technical and policy work by promoting integrated approaches to the interconnected economic, social and environmental challenges confronting the world.

The Higher Education Academy (HEA)

<http://www.heacademy.ac.uk/>

The Higher Education Academy champions excellent learning and teaching in higher education. It is a national and independent organisation, funded by the four UK HE funding bodies and by subscriptions and grants.

The HEA supports academics, senior management, and students with the challenge of addressing Education for Sustainable Development (ESD) across Higher Education Institutions. It has a rich history of leading this field having supported and produced influential documents and research reports that have helped shape ESD in the Higher Education Sector. See

<https://www.heacademy.ac.uk/workstreams-research/themes/education-sustainable-development>

and

<https://www.heacademy.ac.uk/search/resource/sustainability>

It has also enhanced its work through the highly regarded Green Academy programme that has worked with 18 HEIs to lead institutional change for sustainable development across their institutions. Available at:

http://www.heacademy.ac.uk/resources/detail/sustainability/ESD_2014/Green_Academy

1. Recommended publications from the HEA:

Education for sustainable development and holistic curriculum change

https://www.heacademy.ac.uk/sites/default/files/ESD_Artwork_050412_1324.pdf

The future fit framework: an introductory guide to teaching and learning for sustainability

https://www.heacademy.ac.uk/sites/default/files/Future_Fit_270412_1435.pdf

Student attitudes towards and skills for sustainable development

<https://www.heacademy.ac.uk/sites/default/files/resources/Student%20attitudes%20towards%20and%20skills%20for%20sustainable%20development.pdf>

First HEA policy 'think tank' focuses on ESD

http://www-new1.heacademy.ac.uk/news/detail/2012/policy_think_tank_esd

2. HEA Workshops held in SD/ESD:

a) UWE, Bristol – November 2013

http://scotland.heacademy.ac.uk/events/detail/2014/Seminars/Themes/GEN876_UWE

Influence, implement, engage. The triple imperative for ESD in HE

b) Keele – January 2014

http://scotland.heacademy.ac.uk/events/detail/2014/Seminars/Themes/GEN881_Keele

New to ESD?: integrating education for sustainable development in teaching and the student experience

c) Bristol – May 2014

<https://wikis.bris.ac.uk/display/BristolESD/Whole+Institution+ESD+HEA+Event>

Green academies: whole institution approaches to embedding education for sustainable development in the curriculum

d) Keele – May 2014

http://wales.heacademy.ac.uk/events/detail/2014/Seminars/Themes/GEN973_keele

Sustainability culture by a thousand cuts: an integrated whole institution approach to greening your academy

e) Worcester – May 2014

http://wales.heacademy.ac.uk/events/detail/2014/Seminars/Themes/GEN971_worcester

The Worcester sustainability model now and the future: maintaining momentum from the green academy

f) Trinity St David, Wales – June 2014

https://wikis.bris.ac.uk/download/attachments/63574217/D_Sena+HEA.pptx?version=1&modificationDate=1399469050000

INSPIRE, the green academy initiative and the sustainability skills survey – 2 years on

3. HEA initiatives - The Circular Economy:

http://www-new1.heacademy.ac.uk/events/detail/2011/academyevents/23_May_Circular_economy_series_Edinburgh

A Workshop Series around the Circular Economy, held in Edinburgh and London in May 2011.

4. Resources in non-STEM disciplines

a) Biosciences:

<https://www.heacademy.ac.uk/search/resource/bioscience%2520esd>

<http://www.unesco.org/education/tlsf/>

b) Psychology:

https://www.heacademy.ac.uk/sites/default/files/Embedding_sustainability_into_psychology_teaching.pdf

5. STEM disciplines:

<http://www-new1.heacademy.ac.uk/assets/Documents/disciplines/hsc/new-to-teaching-toolkit/STEM/the-sustainable-practitioner-part-1/>

<http://www-new1.heacademy.ac.uk/assets/Documents/disciplines/hsc/new-to-teaching-toolkit/STEM/the-sustainable-practitioner-part-2/>

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International Institute for Sustainable Development (IISD).

<http://www.iisd.org/about/>.

The International Institute for Sustainable Development is a Canadian based, international public policy research institute for sustainable development.

Rocky Mountain Institute <http://www.rmi.org>

A US based organisation with an aim of transforming energy use through market based solutions. Includes information and case studies in transportation, buildings, industry and electricity.

United Nations (UN) <http://www.un.org/en/sustainablefuture/>

The website gives access to UN resources, *What is Rio+20?*, *and What is Sustainability?* and similar, as facilities of the UN in relation to living in a sustainable future.

UNESCO <http://www.unesco.org/education/tlsf/>

Teaching and Learning for a Sustainable Future (tlsf) is a UNESCO programme for the United Nations Decade of Education for Sustainable Development. It provides professional development for student teachers, teachers, curriculum developers, education policy makers, and authors of educational materials. The modules are divided into 4 themes covering curriculum rationale, sustainable development across the curriculum, contemporary issues, and teaching and learning strategies.

Journals

Engineering Education: A Journal of the Higher Education Academy (Eng. Ed.). See

<http://journals.heacademy.ac.uk/journal/ened>

Environmental Education Research (Env. Ed. Res.). See

<http://www.tandfonline.com/toc/ceer20/current#.U5cU3fldWwU>

European Journal of Engineering Education (Eur. J. Eng. Ed.).
See

<http://www.tandfonline.com/toc/ceee20/current#.U5cUovldWwU>

International Journal of Engineering Education (Intl. J. Eng. Ed.). See <http://www.ijee.ie/>

International Journal of Environmental Studies. See

<http://www.tandfonline.com/toc/genv20/current#.U5cT2PIldWwU>

International Journal of Sustainable Development. See

<http://www.inderscience.com/jhome.php?jcode=ijisd>

Journal of Cleaner Production (J. Cleaner Prodn.). See

<http://www.journals.elsevier.com/journal-of-cleaner-production/>

Journal of Manufacturing Systems (J. Manuf. Sys.). See

<http://www.journals.elsevier.com/journal-of-manufacturing-systems/>

Renewable Energy. See

<http://www.journals.elsevier.com/renewable-energy/>

International Journal of Sustainability in Higher Education. See <http://www.emeraldgrouppublishing.com/products/journals/journals.htm?id=IJSHE>

The Journal of Sustainability Education. See <http://www.jseedimensions.org/wordpress/aboutus/>

Journal of Education for Sustainable Development. See <http://jsd.sagepub.com>

The International Journal of Sustainability Education. See <http://ijsed.cgpublisher.com>

Journal of Teacher Education for Sustainability. See <http://www.ise-lv.eu/publications.php?show=39&pub=3>

Books

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