



QAA



Education for sustainable development:

Guidance for UK higher education providers

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Chair's foreword

This guidance is intended to assist staff in UK higher education institutions seeking to incorporate education for sustainable development within the curricula. It has been produced by an expert group drawn from across the sector with the aim of supporting students from any discipline to acquire knowledge, understanding and skills relevant to sustainable development.

I am grateful to the many individuals, higher education institutions, professional bodies and learned societies who responded to the consultation draft. This feedback has been carefully considered by the group and the final version of the guidance is stronger for these contributions. The guidance provides an outcomes-based framework for use in curriculum design and general guidance on approaches to teaching, learning and assessment. I hope that the sector will embrace the guidance and thereby assist students in preparing for the challenges that they will face in their professional lives and as members of society.

I would like to take this opportunity to thank the members of the group for their wise counsel and valuable contributions to the guidance, and to the Quality Assurance Agency for Higher Education and the Higher Education Academy for their initiative in identifying the need for this guidance. In particular I would like to thank Dr Laura Bellingham and Simon Kemp, the joint convenors of the group, for their support and guidance in overseeing the publication of this document.

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Chair, QAA/HEA Education for sustainable development group

QAA preface

This guidance has been prepared by representatives of the higher education community with expertise in education and sustainable development. It has been produced via collaboration between the Quality Assurance Agency for Higher Education (QAA) and the Higher Education Academy (HEA). A draft version of the guidance was subject to sector-wide consultation over the period of November 2013 to January 2014; a great number of insightful comments were received that helped to shape the final version.

The guidance is intended to be of practical help to higher education providers working with students to foster their knowledge, understanding and skills in the area of sustainable development. The guidance recognises that there are many ways in which this may be achieved and is not prescriptive about delivery. Instead it offers an outcomes-based framework for use in curriculum design, and general guidance on approaches to teaching, learning and assessment. The guidance is intended to be relevant to educators in all disciplines wishing to embed or include learning about sustainable development within their curricula.

This guidance is intended to complement *Chapter B3* of the UK Quality Code for Higher Education (Quality Code) dedicated to learning and teaching, but it does not form an explicit part of it. The Quality Code sets out the expectations that all providers of UK higher education are required to meet and is used in QAA review processes.

QAA is grateful to its partner on this project, the HEA, and to all members of the external advisory group which helped to develop this new guidance. Membership of the group is given in **Appendix 1**.

The guidance is intended to apply to all parts of the UK.

HEA preface

The Higher Education Academy champions excellent learning and teaching in higher education. We are a national and independent organisation, funded by the four UK higher education funding bodies and by subscriptions and grants. Our mission is to use our expertise and resources to support the higher education community in order to enhance the quality and impact of learning and teaching. We do this by recognising and rewarding excellent teaching, bringing together people and resources to research and share best practice, and by helping to influence, shape and implement policy.

We are pleased to have co-convened the development of this important guidance document in partnership with the Quality Assurance Agency for Higher Education (QAA). We have a rich heritage in education for sustainable development having supported and produced influential documents and research reports that have helped shape education for sustainable development in the higher education sector. Our joint leadership of this guidance document demonstrates our continued commitment to this vital area of learning and teaching. Our work aims to help higher education institutions in the development of sustainability literate graduates who have the skills, knowledge and experience to contribute to an environmentally and ethically responsible society. This document will help us achieve our aim.

We thank our partner agency, the QAA, and all the members of the external advisory group for their hard work and expertise in the development of this guidance document. In particular we would like to thank the Chair, Professor James Longhurst for his expert leadership in steering a challenging and rewarding development process. We would also like to thank all the contributors to the consultation process for their important inputs.

We hope you find this guidance document to be of value to your learning and teaching.

Introduction

Who is this guidance for?

This guidance is intended for educators working with students to foster their knowledge, understanding and skill in the area of sustainable development. The primary audience is likely to be academics, educational developers and programme leaders. However, the guidance is also likely to be of interest to those with responsibility for quality assurance and enhancement, and the management of teaching and learning.

Although primarily aimed at learning that occurs within the academic curriculum, this guidance may also be of interest to those working with students in the context of extracurricular activities.

Lastly, the guidance may also be of direct interest to students and others wishing to understand how a knowledge and understanding of sustainable development issues may be included in students' learning at higher education level. This may include professional, statutory and regulatory bodies, and employers or their representative groups.

What is the purpose of this guidance and how should it be used?

This guidance is intended to serve as a reference point for use in curriculum design, delivery and review. Educators are encouraged to use it as a framework, within their own disciplinary context, rather than as a prescription of a curriculum or pedagogic approach. It should be read in conjunction with the appropriate QAA subject benchmark statement.

There are two main parts to the guidance:

- the identification of **graduate outcomes** - what students will be able to know, understand and do after an appropriate period of learning
- a focus on **teaching, learning and assessment** - the ways in which educators can work with students to help them achieve and demonstrate the outcomes.

The guidance is not specific to any particular degree programme or subject specialism but is instead intended to help educators who are seeking to embed or include a knowledge, understanding and awareness of sustainable development across the curriculum. Readers may also wish to be aware of QAA guidance on enterprise and entrepreneurship education, which was published in 2012, and which serves a similar enhancement role.¹

What is the status of this guidance?

This guidance has been produced by the Quality Assurance Agency for Higher Education (QAA) and the Higher Education Academy (HEA) working together with the help of a group of experts drawn from and acting on behalf of the academic community. *Chapter B3* of the UK Quality Code for Higher Education (Quality Code),² which focuses on the basis for effective learning and teaching, identifies a number of themes which cross subject boundaries that may be considered to have a broad relevance to the purposes of higher education and its wider context in society. One of these is education for sustainable development.³ This guidance provides an authoritative point of reference which is designed to complement the Quality Code but which does not form an explicit part of it. The guidance

¹ QAA (2012) *Enterprise and entrepreneurship education: Guidance for UK higher education providers*, available at: www.qaa.ac.uk/Publications/InformationAndGuidance/Pages/enterprise-entrepreneurship-guidance.aspx.

² QAA (2013) *Chapter B3: Learning and teaching* of the UK Quality Code for Higher Education, available at: www.qaa.ac.uk/Publications/InformationAndGuidance/Pages/quality-code-B3.aspx.

³ QAA uses the terms 'education for sustainable development' and 'education for sustainability' interchangeably.

relates primarily to undergraduate provision and assessment at Level 6 but may also be helpful for those working at Level 5 (including foundation degrees) and with postgraduates.

What is meant by 'education for sustainable development'?

The term 'sustainable development' is subject to many different interpretations and definitions. It is not the purpose or the intention of this document to discuss the basis of sustainable development at length. For the purpose of this guidance, it is defined according to the definition used in the United Nations Brundtland Report (1987):⁴

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

The United Nations World Summit (2005)⁵ affirmed the concept of three 'pillars' of sustainability - the economic, social and environmental factors that need to be taken into consideration, and their cultural context. There is increasing recognition that these three factors are interconnected, overlapping and interdependent. Drawing on both the 1987 definition and its 2005 recalibration, the present guidance defines education for sustainable development as follows:

Education for sustainable development is the process of equipping students with the knowledge and understanding, skills and attributes needed to work and live in a way that safeguards environmental, social and economic wellbeing, both in the present and for future generations.

Education for sustainable development means working with students to encourage them to:

- consider what the concept of **global citizenship** means in the context of their own discipline and in their future professional and personal lives
- consider what the concept of **environmental stewardship** means in the context of their own discipline and in their future professional and personal lives
- think about issues of **social justice, ethics and wellbeing**, and how these relate to ecological and economic factors
- develop a **future-facing** outlook; learning to think about the **consequences** of actions, and how systems and societies can be adapted to ensure **sustainable futures**.

These core themes form the basis of a framework for the articulation of graduate outcomes on pages 9-12. The knowledge, understanding, skills and attributes fostered through learning for and about sustainability are also referred to elsewhere as 'sustainability literacy'.

Meeting the future needs and aspirations of graduates and wider society

As societies and economies develop, higher education providers face the challenge of ensuring that graduates are equipped to meet rapidly changing demands. As a recent European Commission report on *Modernising Higher Education* in Europe states:

higher education institutions are the focal points for imparting what is known, interrogating what is not, producing new knowledge, shaping critical thinkers,

⁴ Brundtland Report (1987) *Our Common Future: Report of the World Commission on Environment and Development*, United Nations, available at: www.un-documents.net/wced-ocf.htm.

⁵ United Nations World Summit (2005) 2005 World Summit Outcome, available at: www.un.org/en/ga/search/view_doc.asp?symbol=A/RES/60/1.

problem solvers and doers so that we have the intellectual muscle needed to tackle societal challenges at every level necessary and advance European civilisation.⁶

Through aiming to ensure that wider socioeconomic and environmental issues are part of students' learning, education for sustainable development focuses on equipping graduates for the responsibilities outlined above, wherever they decide to live and work.

The UK Sustainable Development Strategy, which aims to secure 'a sustainable, innovative and productive economy' and 'a just society that promotes social inclusion, sustainable communities and personal wellbeing', is clear on the role of education and training. It identifies 'a need to make 'sustainability literacy' a core competency for professional graduates'.⁷ All graduates will share responsibility as stewards, not only of the environment, but also of social justice - as employees, citizens and, in many cases, parents and mentors of the next generation.

Evidence suggests that students already have a high level of awareness of sustainable development issues. A three-year longitudinal study carried out by the National Union of Students (NUS) and the HEA, with support from Change Agents UK, over 2010, 2011 and 2012 has shown that over two-thirds of students surveyed believe that sustainable development should be covered in their degree courses (5,763 responses in 2010; 3,193 in 2011; and 6,756 in 2012).⁸ The final tranche of the study reported that 80 per cent of third year students (2,657 respondents) see universities as key actors in the delivery of skills for sustainable development.

Businesses and industry are also considered to be key factors. Corporate (social) responsibility may be defined as 'the responsibility of an organisation for the impacts of its decisions and activities on society and the environment through transparent and ethical behaviour above and beyond its statutory requirements'.⁹ A study carried out for the HEA in 2008 found that over half of employers surveyed (n=87) had at some time referred to social and environmental responsibility in their selection of recent graduates.¹⁰

Self-reflection, with an emphasis on the development of personal values, is increasingly seen as important for professions where ethics and moral behaviour are a hallmark of good practice.

Key features of education for sustainable development

Students may already be familiar with education for sustainable development through secondary and further education, though not necessarily having encountered it by that name. Education for sustainable development encourages different disciplines to enter into dialogue, make connections, share knowledge, and work together on emergent areas. It aims to develop students' ability to understand and evaluate connections between big

⁶ European Commission High Level Group on the Modernisation of Higher Education (June 2013) *Improving the quality of teaching and learning in Europe's higher education institutions*, report to the European Commission

⁷ HM Government (2005) *Securing the future - delivering UK sustainable development strategy*. The UK Government Sustainable Development Strategy, Crown Copyright available at: www.sd-commission.org.uk/publications.php?id=1185.

⁸ Drayson, R; Bone, E; Agombar, J; Kemp, S (2013) *Student attitudes towards and skills for sustainable development*, York: Higher Education Academy, third report in a longitudinal study of students' views, available at: www.heacademy.ac.uk/resources/detail/sustainability/2013_student_skills_final_report.

⁹ Department for Business, Innovation and Skills (June 2013) *Corporate responsibility - A call for views*, Crown Copyright, available at: www.gov.uk/government/consultations/corporate-responsibility-call-for-views.

¹⁰ Cade, A. (2008) *Employable graduates for responsible employers - Research on the links between sustainability and employability in the graduate job market in relation to higher education teaching and learning* - report to the Higher Education Academy, StudentForce for Sustainability, available at: www.heacademy.ac.uk/projects/detail/esd/esd_employable_graduates.

issues, such as inequality, public health, global consumption, biodiversity loss and the limits of natural systems. Learning for and about sustainable development aims to prepare graduates to be able to contribute to, stimulate and lead the debate on complex issues such as what constitutes global citizenship and good governance, sustainable resource use, and the determination of ecological limits.

Education for sustainable development is 'future-facing' in the sense that students are encouraged to think about current and emergent and future situations, relevant to their studies, and in so doing gain a wider socioeconomic and environmental perspective on the relevance of their work. Being open to a range of other areas of expertise and banks of knowledge, outside their immediate discipline, through both formal and informal learning environments, is a fundamental feature of education for sustainable development.

When students in the NUS/HEA study were asked how skills in sustainable development might best be developed, they expressed a preference for skills development to be embedded into the existing content of the programme, but were open to other means, including adding additional content to the course, attending a specific module, having the facility to specialise within the academic department, and taking part in extracurricular activities.

Education for sustainable development is already present in higher education in numerous programmes and settings,^{11, 12, 13} and research across a wide range of disciplines has shown that educators who want to foster students' learning in this context usually find engaging and effective ways of doing so.¹⁴ Learning for and about sustainable development may not necessarily involve additional content over and above that defined by a discipline; it may in some cases involve minor adaptation, or different ways of approaching issues.

The present guidance is not prescriptive about how education for sustainable development should be delivered, because it recognises that educators will have their own ideas, will be working within distinct local and national contexts, and will be influenced in most cases by broader institutional strategies.

While the guidance is focused on curricular activities, it recognises that students may also learn through extracurricular activities, both on and off campus, such as volunteering or participation in community-based projects.

Education for sustainable development encourages students to develop critical thinking and to take a wide-ranging, systemic and self-reflective approach, adapting to novel situations that can arise from complexity. An ability to anticipate and prepare for predictable outcomes and be ready to adapt to unexpected ones is an important goal.

¹¹ Higher Education Academy Green Academy Programme, available at:

www.heacademy.ac.uk/resources/detail/change/GA_ESD_12_13/GA_ESD_info.

¹² Higher Education Funding Council for England (2008) Strategic Review of Sustainable Development within Higher Education in England.

¹³ Higher Education Academy (2006) Sustainable development in higher education - current practice future developments - a progress report for senior manager in higher education, available at:

www.heacademy.ac.uk/assets/documents/resources/database/id587_sustainable_development_managers_report.pdf.

¹⁴ Cotton, D; Sterling, S; Neal, V; and Winter, J (2012) *SEDA Special no 31: Putting the 'S' into ED - Education for Sustainable Development in Educational Development* London: Staff and Educational Development Association (SEDA), available at: www.seda.ac.uk/publications.html?p=5_2.

Education for sustainable development and the devolved administrations for higher education in the UK

This guidance is for higher education providers across all parts of the UK; however, it recognises that higher education is a devolved matter and as such, the policy context may differ between the different countries.

In England, the Higher Education Funding for England (HEFCE) is preparing to publish a revised framework setting out its commitment to supporting sustainable development in higher education.¹⁵ The framework recognises the role played by education for sustainable development in realising overall goals and ambitions.

In Wales, the Higher Education Funding Council for Wales (HEFCW) maintains a network of contacts from each higher education institution who work together in pursuit of projects aimed at supporting education for sustainable development and global citizenship (ESDGC). The curriculum, links between universities and society, and institutions' management of their estates combine in an integrated way that is consistent with the aspirations of the Welsh Assembly Government's sustainable development scheme 'One Wales: One Planet'.¹⁶

Priorities for higher education institutions in Scotland are set out in the Scottish Government's action plan, *Learning for change*, for the period relating to the second half of the United Nations decade of education for sustainable development.¹⁷ Published in 2010, the plan sets out the country's vision for the proceeding five years and beyond, with actions for all levels of education, including higher education.

In Northern Ireland, the Department for Employment and Learning (DELNI) considers its role in addressing education and skills in relation to the needs of the Northern Ireland (NI) economy to be critical in relation to realising the aims of the NI Executive Sustainable Development Strategy, *Everyone's involved*.¹⁸

¹⁵ HEFCE (2013) Sustainable development in higher education: Consultation on a framework, available at: www.hefce.ac.uk/pubs/year/2013/201331/name.83723.en.html.

¹⁶ Welsh Assembly Government (2009) *One Wales: One Planet, a new Sustainable Development Scheme for Wales*, available at: wales.gov.uk/topics/sustainabledevelopment/publications/onewalesoneplanet/?lang=en.

¹⁷ The Scottish Government (2010) *Learning for Change: Scotland's Action Plan for the Second Half of the UN Decade of Education for Sustainable Development*, available at: www.scotland.gov.uk/Publications/2010/05/20152453/0.

¹⁸ Northern Ireland Executive (2010) *Everyone's Involved: Sustainable Development Strategy*, available at: www.ofmdfmi.gov.uk/sustainable-development.

Graduate outcomes

The aim of this section is to provide indicative guidance to assist in developing curricula, such as for a new module or programme, or modification to an existing module or programme, to incorporate sustainability. It identifies a set of graduate learning outcomes which reflect what graduates might be expected to know, understand and be able to do after a period of learning covered by this guidance. The outcomes are not prescriptive, and educators are invited to select the most appropriate and to modify or adapt them as appropriate to the discipline or interdisciplinary context (as well as to the level, year of study or credit-rating of the module).

It is widely understood that although education for sustainable development is applicable across disciplines, it is likely that some of the outcomes may be more easily addressed by some disciplines than others. The outcomes should not therefore be used as a rigid checklist, but rather as a helpful guide to assist in module or programme design or enhancement. Practitioners might use the framework in one or more of the following ways.

- Discussing the outcomes as a staff development exercise to enhance understanding of sustainability and how it might align with existing learning outcomes in a module or programme.
- Selecting outcomes from the framework which align with the requirements of the curriculum in a specific discipline, and embedding them in module or programme specifications as relevant.
- Using the whole set of outcomes as a guide for developing a new interdisciplinary programme focusing on sustainability - with appropriate adjustments to suit the institutional context and course team expertise.

There are likely to be additional points of reference in use in the context of programme design, such as the relevant subject benchmark statement and requirements of any professional, statutory or regulatory body. It is anticipated that practitioners will use this guidance as a framework to inform the design, delivery and assessment of students' learning, and to enhance engagement with this area in different curriculum contexts.

The graduate outcomes are set out in terms of:

- knowledge and understanding
- skills
- attributes.

The outcomes are cross-referred to the four core themes outlined in the introduction: global citizenship; environmental stewardship; social justice, ethics and wellbeing; and future-thinking.

Knowledge and understanding

Graduate outcome	Global citizenship	Environmental stewardship	Social justice, ethics and wellbeing	Future-thinking
describe the relationships between environmental, social and economic systems, from local to global level	X	X	X	X
identify the risk that system complexity can lead to unexpected and novel outcomes	X	X	X	X
identify the root causes of unsustainable development, including environmental, social and economic actions, and the links to cultural considerations	X	X	X	X
evaluate the impacts and interconnections between the activities of different generations, demographic groups and cultures, recognising that there may be tensions and competing factors between them	X		X	X
demonstrate that both unsustainable and sustainable practices take place in an evolving context, necessitating adaptability in policy and planning responses	X	X	X	X
identify the causes and possible solutions to inequity at intra- and inter-generational global levels	X		X	X
identify the importance of drawing upon scientific evidence and scholarly research in seeking to understand the environment and the impact of human activity upon it		X		X
identify that natural systems have non-negotiable limits and may become unstable or collapse if subjected to excessive pressures or changes		X		X
demonstrate that the collective effect of actions is not necessarily just a simple sum of their individual effects but is likely to be more complex	X		X	
identify the rationale for encouraging behavioural change where existing practices are shown to have a negative impact on the human and natural environment	X			
identify that positive or negative environmental change may arise from economic growth	X	X	X	X
identify risks and uncertainties associated with the transformation of the natural environment		X		
identify the need for decisions about natural resources to involve judgements not just about economic viability but about risks to future ecological, social or cultural wellbeing		X		X
describe how aspects of their own discipline or area of study contribute to sustainable development	X		X	X

Graduate outcome	Global citizenship	Environmental stewardship	Social justice, ethics and wellbeing	Future-thinking
describe how power structures and political systems influence sustainable development	x	x	x	
identify the interactions between human communities and ecological systems, and be able to assess the potential impacts upon each other	x	x	x	
identify the wide range of human cultures in existence, and understand both the benefits and the challenges that these cultures present in terms of sustainable development	x		x	
describe the potential for their discipline to interconnect with other disciplines or areas of expertise and make creative leaps forward				x

Skills

Graduate outcome	Global citizenship	Environmental stewardship	Social justice, ethics and wellbeing	Future-thinking
use and apply established frameworks and methodologies for analysing the impact(s) of a behaviour or process, utilising the skills and expertise developed through their own area(s) of study	x			x
critically assess and analyse sustainability issues that need to be addressed, including real-life examples, within the context of their own discipline, area of study or profession	x	x	x	x
describe complex sustainability issues in clear terms and communicate about them effectively and succinctly, both orally and in writing	x	x	x	x
generate and evaluate different models of sustainable development to assess their likely impact, within the context of their own discipline or area of study	x	x	x	x
engage in interdisciplinary discussion in their professional lives to inform their thinking about sustainable futures and seek holistic, creative solutions to problems		x	x	x
think systemically, in terms of recognising connections and interactions between factors, and understand that actions often have multiple consequences	x	x	x	x
actively implement or contribute to changes that promote sustainable development within the scope of their own learning experience and study environment	x	x	x	x
effectively engage with real-life problems relevant to sustainable development	x	x	x	x

Graduate outcome	Global citizenship	Environmental stewardship	Social justice, ethics and wellbeing	Future-thinking
use historical knowledge and an understanding of the consequences of past actions to envision how futures may be shaped	x	x	x	x
identify the importance of empowering individuals and organisations to work together to create new knowledge	x	x	x	x
employ leadership for sustainable development by challenging assumptions and negotiating alternatives to unsustainable current practices, especially within their own discipline or area of study	x	x	x	x
tackle and negotiate sustainable development conflicts with an awareness of different perspectives and motivations	x	x	x	x
identify sustainable development strategies to help build consensus	x	x	x	x
facilitate and mediate progressive discussions among interested parties (stakeholders) to help resolve dilemmas and conflicts	x	x	x	x
identify the opportunities to support and develop a progressive and resilient culture that encourages citizens, professions and institutions to put learning into practice	x			x

Attributes

Graduate outcome	Global citizenship	Environmental stewardship	Social justice, ethics and wellbeing	Future-thinking
the capacity for independent, evidence-based integrated thinking as the foundation for developing their personal ethical code	x	x	x	x
the ability to clarify their own views on ways that sustainability can be achieved in different local and global communities and circumstances	x	x	x	x
the ability to evaluate the consequences of their own actions and of collective actions	x	x	x	x
the capacity to be flexible and resourceful and adapt their problem-solving mindset to fit changing or unforeseen circumstances	x			x
a commitment to lifelong learning in their education for sustainable development				x

Teaching, learning and assessment

This section provides guidance on the types of teaching, learning and assessment that can help students to achieve the graduate outcomes identified in the previous section, and demonstrate their achievement. The approaches outlined here are intended to be applicable to a wide range of disciplines and settings. Illustrative examples are given in places but these should not be taken as prescriptive or to represent the full range of possibilities; rather to act as a stimulus for thinking and planning.

Educators are encouraged to think about possibilities for innovative approaches to teaching, learning and assessment within their discipline, taking account of any recommendations from professional, statutory or regulatory bodies where relevant. Educators may find that they are already using some of the teaching, learning and assessment methods set out in here, particularly where the focus is on trying to encourage students to 'see the bigger picture' and develop their own values. Many of the approaches outlined here would also be of use in helping to develop students' employability and professional behaviours.

It is important to align both assessment mode and teaching and learning approaches with the graduate outcomes being assessed in order to ensure coherence of the module or programme.

Approaches to teaching and learning

Pedagogical approaches that are particularly effective in the context of education for sustainable development tend to have an authentic aspect, enabling students to relate their learning to real-life problems and situations. There is likely to be a strong interdisciplinary, multidisciplinary or transdisciplinary element, reflecting the interconnected nature of many issues in sustainable development. Experiential and interactive approaches are also particularly well suited to education for sustainable development, particularly where they encourage students to develop and reflect on their own and others' values. Critical reflection on values and assumptions may in some cases lead to what is known as 'transformative learning'. In addition, participatory learning approaches, peer-learning and collaboration - within and beyond the classroom - are encouraged, allowing students to be exposed to multiple perspectives and enabling creative responses to emerge.

Most students will have knowingly or unknowingly engaged in learning about sustainability through their previous formal education or through informal means, and they may have diverse value positions. It is therefore particularly important that prior knowledge and attitudes are taken into consideration in planning teaching and learning activities. Students' learning for and about sustainability while in higher education is not limited to the formal curriculum: wherever possible, teaching, learning and assessment should take account of informal and campus learning opportunities. The use of the campus as a 'living laboratory' where students learn about growing food, resource management, community relationships and local economic impacts provide some examples.

The task of the educator is to provide an environment in which:

- divergent views can be shared and explored in a safe environment
- there are opportunities for deep and critical reflection on students' own perspectives and what has influenced their thinking and practices in this area

- democratic and participatory learning approaches are modelled
- interdisciplinary approaches, systems thinking and holistic thinking are encouraged
- teaching, learning and assessment activities are linked to real-life concerns.

While this can lead to exciting and dynamic learning experiences, it is understood that there are some particular challenges to teaching in this area, and those new to education for sustainable development may welcome more detailed advice and guidance. In a document of this length it is only possible to provide a brief overview of different approaches; however, the many additional resources listed at the end provide generic and discipline-specific examples.

There are a number of teaching and learning methods that are likely to be particularly effective. Depending upon the discipline or the sustainability challenge to be addressed, these may include one, some or all of the following:

- case studies
- stimulus activities
- simulation
- experiential project work
- problem-based learning.

As approaches that are commonly recommended for education for sustainable development, the above examples are discussed briefly below. However, educators are encouraged to think creatively about a wide range of teaching and learning approaches, and to experiment with innovative pedagogies as appropriate to the discipline. It is also important to consider the potential for achieving graduate outcomes through pedagogies such as lectures, seminars, laboratory or studio work, self-directed study and essay writing, which are likely to feature in many programmes.

Case studies

Real-life examples of sustainable development issues - from local to global - and how these have been, or might be, addressed, introduce students to the concept of sustainability in practice. Case studies may be particularly useful in disciplines where the links with sustainable development are not immediately obvious. (For example, using an article concerning waste management for a comparative study of attitudes towards rubbish across cultures and time periods, or as the basis for a translation or statistical analysis activity). They can also be integrated into other teaching contexts, for example, by breaking students into small groups within a lecture to work through some case studies or by students developing a 'wiki' to collate a set of case studies relevant to the discipline. Case studies also provide an opportunity to study a topic or context holistically, thus providing possibilities for interdisciplinary collaboration as students work together to draw resources from their own discipline to the study of a particular issue. For example, a topic such as the current obesity crisis could be examined from a multidisciplinary perspective and linked to other sustainability challenges such as unsustainable modes of transport, the disproportionate impacts of climate change upon the poor, consumerism, fast-food production and distribution, and high animal-protein diets.

Stimulus activities

Providing a prompt (such as a poem, dance, artwork, quotation, piece of music or newspaper article) can stimulate discussion or reflection on a sustainability topic. Stimulus activities are well suited to group work and can be open-ended, encouraging students to

extend their thinking beyond the confines of their own discipline. However, a stimulus can also be used as a starting point for a lecture or seminar - perhaps opening with a slide consisting of a painting of a natural scene, followed by a present photograph of the same location to prompt reflection on physical and cultural changes to the landscape. Direct cultural testimonies (including art, music and performance) from people who have suffered the impact of sustainability decisions (including students where relevant) can act as powerful animators of such activities. Short videos can often provide a good stimulus for student discussion, as a natural break during lectures, in seminars or online discussion forums. A series of focused questions about the origin of the stimulus material, the intended audience and the values of the originator, for example, can help students develop skills of critical evaluation which will be important to them beyond the classroom.

Simulation

Activities and projects that simulate real-life situations and encourage students to participate can help develop focused thinking around sustainable development issues, and can contribute to the formation of students' own attitudes and the social norms that they find acceptable. Such activities include role plays, debating, mock trials and gaming, and they can be used across a range of disciplinary and interdisciplinary contexts to help students develop appropriate professional behaviours. Simulation activities can help students understand contested arguments (such as the theoretical, cultural and political debate on globalisation), explore environmental activism and political engagement, and appraise the impact of decisions. Such activities allow students to engage in experiential learning in contexts which are not immediately accessible to undertaking project or practical work, and enable them to explore the impact of different value positions and political perspectives on decision-making in a range of different areas. They might include dramatic or musical representation, or be conducted in a foreign language to develop a range of discipline-specific skills. They allow students to experiment or play at different roles in a safe environment, and can help develop empathy for alternative value positions. Simulation can also help develop students' employability skills, by engaging them with real-world issues and professional behaviours suited to the selected context.

Experiential project work

Experiential, interactive, or participatory activities enable students to engage with sustainability issues at a number of levels, not only in relation to their discipline, but also in terms of reflecting on their own values, attitudes and accepted social norms. Working through issues in an authentic setting is also valuable for identifying potential interdisciplinary or transdisciplinary links. Place-based learning can also be used effectively to embed sustainability in the curriculum. In place-based learning, students work in collaboration with local communities, public sector bodies, businesses and stakeholders to define a problem together, using local knowledge, and jointly devising and implementing solutions that will be locally and culturally acceptable. Place-based learning might include, for example, students working in partnership with a local community group on a 'real-world' project, such as community wellbeing where students can help improve the physical environment, enhance biodiversity, implement local growing schemes, develop healthy eating programmes, or design local transport plans to encourage physical activity. This is a particularly useful approach for an interdisciplinary programme or module, since the expertise of students from different disciplines can be brought to bear on the problem or issue identified. Service learning (a method of teaching that combines classroom instruction with meaningful community service) might also be usefully considered under this category. Experiential learning through internships, placement and community volunteering activities, together with self-reflection could be incorporated if not already part of the curriculum. Fieldwork and action research are other contexts in which experiential project work is commonly used, and which offer great potential for transformative learning around

sustainability. The university campus and local environment provide productive sites for sustainability projects operating on multiple levels: as learning spaces, but also as spaces in which students can make a real-world contribution to positive and lasting change.

Problem-based learning

Problem-based learning approaches can be used to good effect in teaching and learning about sustainability, since they provide opportunities for student-led, collaborative work which can be focused on a real-world problem or issue. This approach is equally suitable for both single and multi-discipline teaching. Problem identification is also an important skill that can be developed through this route. Problem-based learning is particularly suited to complex, multi-faceted issues ('wicked problems') which are not amenable to simple problem-solving. In problem-based learning scenarios, students are usually given an area of interest and are expected to define various aspects of the problem, identify where they can gain further information, research as a group and report back with a solution, or several potential solutions, to the problem posed. The role of the teacher (often described as a facilitator) in this context is to guide and support rather than direct the learning explicitly. In some cases, a facilitator with expertise in teaching but without specific subject content knowledge is used to ensure that students take ownership of the problem. This leads to the development of a more democratic classroom environment, and reduces the possibility that the lecturers' views will be transmitted, rather than allowing opportunities for reflection and challenge. Problem-based learning can also involve client-led briefs that lead to 'real-world' changes and therefore can be used to enhance the impact of teaching and learning, as well as offering opportunities to link with local employers and enhance student employability. Problem-based learning approaches can lead to deep and transformative learning on the part of students and develop a wide range of skills.

Approaches to assessment

There are a number of ways in which students can be assessed for achievement of the graduate outcomes identified in this document, and it is likely that a variety of methods will be used. Teaching, learning and assessment should be constructively aligned, ensuring that the assessment task and pedagogic approaches reflect the learning outcomes which students are expected to achieve. The mode of assessment should be institutionally appropriate and align with local assessment policy and processes.

Assessment should provide opportunities for students to demonstrate achievement of graduate outcomes in the core areas of global citizenship; environmental stewardship; social justice, ethics and well being; and futures thinking. In this context, it is also likely to involve:

- formative tasks that enable the development of critical thinking and problem-solving
- opportunities to apply these skills to real-world problems
- synoptic assessments that explore the relationship between students' main academic discipline and sustainability
- activities that encourage affective learning in the domains of values, attitudes and behaviours.

Assessment in education for sustainable development can also benefit from:

- engaging the perspectives of other interested parties (stakeholders)
- peer contributions.

As with assessment practice more generally, students should be given equal opportunities to demonstrate achievement of intended learning outcomes through the use of inclusive approaches.

For higher education providers who wish to consider formally recognising learning from extracurricular activities, QAA has recently published a toolkit which may be of practical assistance in this context.¹⁹

Appendix 2 features four illustrative examples of approaches to teaching, learning and assessment in the education for sustainable development context which educators may find helpful in stimulating thinking and planning.

The learning environment

The learning environment has an important role to play in education for sustainable development, as does the support available for staff and students. Students' learning relates not only to the formal curriculum but also to the campus environment, the local community and the culture of the institution. Links between these different areas should be encouraged, not least because the physical learning environment forms an important part of the educational context - and influences both *what* and *how* students learn. Students are increasingly cognisant of 'hidden curriculum' messages which can run counter to what they are being taught through the formal curriculum (for example, if the university is not sustainable in its estates management, this may undermine formal teaching around sustainability). There is often significant potential to make use of the campus and estates management in teaching and learning.

As part of continuing professional development, staff may benefit from support in overcoming barriers to participatory and interactive forms of learning, as well as in implementing new approaches to teaching, learning and assessment. Enabling student involvement in the development of curricula is another area where staff might benefit from training and support. Learning environments which are flexible and adaptable provide the greatest scope for the participatory, collaborative approaches which are beneficial to education for sustainable development. However, there is often much scope for making better use of resources currently available, and even small changes to curriculum and pedagogies can make a significant difference to students' learning. Modelling good practice in teaching and learning, as well as in other areas, is also an important part of creating a positive learning environment for students. As well as experimenting with creative pedagogies, this might also include using fewer paper resources, or developing blended learning approaches to reduce travel and physical resource use.

Educators will benefit from an awareness of institutional policies, activities and initiatives that have a bearing on sustainability. While beyond the remit of this guidance, it will be beneficial if the curriculum and teaching and learning strategies align with other institutional strategies, for example, those on employability, internationalisation, research, and operational sustainability. This enables coherence and consistency: higher education providers that have sought an integrative approach have embedded education for sustainable development more successfully than those that have not. Professional, statutory and regulatory bodies can also act as a driving force in making changes to practice - particularly where sustainability elements form part of the requirements.

¹⁹ QAA (2013) *Recognising achievement beyond the curriculum: A toolkit for enhancing strategy and practice*, available at: www.qaa.ac.uk/Publications/InformationAndGuidance/Pages/Recognising-achievement-beyond-the-curriculum-toolkit-13.aspx.

Questions that educators may ask themselves

Educators may find it useful to ask themselves certain questions in order to generate ideas and reflect on their practice. They may also find it useful to think about some of the questions that students may want to ask. Some examples of questions educators may ask include the following.

Debating sustainability/sustainable development

- How does education for sustainable development relate to my subject area or discipline?
- To what extent am I already covering sustainable development issues referred to in this guidance? How can I make those features more explicit?
- What types of sustainable development case studies exist within, and are applicable to, my discipline?
- Where knowledge is contested, or values are involved, what position will I take in a presentation or discussion? Should I state my views at the outset?
- How will I handle the provisional and ever changing nature of knowledge about sustainable development?

Engaging students

- How can I help students develop interdisciplinary thinking and encourage them to take a holistic approach?
- If many of my students perceive sustainable development as solely or primarily an environmental issue, how can I ensure they understand the balance between society, economy and environment?
- The words 'sustainability' and 'sustainable development' do not resonate with the vocabulary commonly used in my discipline. What alternative words and concepts could I use to engage my students?
- What vocabulary might need to be shared in order for us to engage in multidisciplinary discussion?
- How can I make best use of students' prior learning about sustainable development to enhance the curriculum?
- How can I encourage students to understand a range of cultural perspectives on problems relating to sustainable development?
- How can I involve students in the development of the education process?

Engaging colleagues

- How can I engage my colleagues and teaching team in this?

The learning environment

- How can I provide learning opportunities that have authenticity, enabling students to relate their knowledge and skills to real-life problems, both locally and globally?
- How do I create a learning environment in which the personal views of individual students about sustainable development can be safely shared and evaluated?
- To what extent is cultural diversity reflected in the student body? How can I adapt for similarities and differences?
- Are there ways in which it would be appropriate for me and/or my students to explore and evaluate sustainability practices within our own institution?

Resources

This section brings together a selective number of sources, signposted by theme, which may be useful to those who are new to education for sustainable development.

The student perspective

Drayson, R, Bone, E, Agombar, J, Kemp, S (2013) *Student attitudes towards and skills for sustainable development* York: Higher Education Academy, available at: www.heacademy.ac.uk/resources/detail/sustainability/2013_student_skills_final_report.

A major longitudinal survey of student attitudes, interest and expectations around sustainable development and education for sustainable development.

National Union of Students *Students' Green Fund*: www.studentsgreenfund.org.uk.

The HEFCE-funded Students' Green Fund supports student unions to develop and deliver transformative student-led initiatives promoting sustainability across the higher education experience. Information on recent and current funded projects can be found on the website.

Disciplinary and interdisciplinary curriculum development

Dawe, G, Jucker, R, and Martin, S (2005) *Sustainable development in higher education: current practice and future developments*, A report for the Higher Education Academy, available at: www.heacademy.ac.uk/resources/detail/sustainability/dawe_report_2005.

This report investigates how different disciplines are engaging in education for sustainable development.

Jones, P, Selby, D, and Sterling, S, ed. (2010) *Sustainability Education: Perspectives and Practice across Higher Education*, Earthscan.

This is an edited collection of articles exploring how sustainability relates to a range of academic disciplines. It may be helpful for those looking to find ways to connect sustainability to their disciplinary area. Disciplines covered include nursing, law, drama and music, media and cultural studies, theology, social work, languages and linguistics, economics, initial teacher education, engineering, earth and environmental sciences, and business.

Villiers-Stuart, P and Stibbe A, eds. (2009) *The Handbook of Sustainability Literacy*, multimedia version, available at: arts.brighton.ac.uk/stibbe-handbook-of-sustainability.

Disciplinary and pedagogic experts explore the attributes and skills required to develop 'futures thinking' for sustainability. Chapter topics include ecocriticism, ecological intelligence, cultural literacy and greening business; a range of active learning exercises are presented.

Exploring approaches to teaching and learning

Bessant, S, Bailey, P, Robinson, Z, Bland Tomkinson, C, Tomkinson R, Ormerod, M, and Boast, R (2013) *Problem-Based Learning: A Case Study of Sustainability Education A toolkit for university educators*, available at: www.keele.ac.uk/hybridpbl/pblandesdresources.

This practical toolkit presents a problem-based learning approach, adapted for large-group teaching, as an effective pedagogy for the teaching of sustainability and development of sustainability literacy.

Murray, P (2011) *The Sustainable Self: a personal approach to sustainability education*, Earthscan.

This is a book of practical ideas and examples of activities that educators can use with their students within academic programmes and with their peers within staff development sessions.

Schumacher Institute (2013) *Sustainability toolkit*, available at: www.schumacherinstitute.org.uk/sustainability-toolkit.

Online resource aimed at helping individuals to develop 'systems thinking', and other sustainability-related attributes, in relation to personal and professional lives.

HEA (2006) *Sustainable Development in Higher Education: Current practices and future developments. A progress report for Senior Managers in Higher Education*, available at: www.heacademy.ac.uk/assets/documents/resources/database/id587_sustainable_development_managers_report.pdf.

Progress report into the contribution of different disciplines to the development of sustainability literacy in graduates.

HEA, (2006) *Sustainable Development in Higher Education: Current practices and future developments. A progress report for Employers, Unions and the Professions*, available at: www.heacademy.ac.uk/assets/documents/resources/database/id586_sustainable_development_employers_report.pdf.

Progress report into the contribution of higher education to the development of sustainability literate graduates.

Embedding education for sustainable development

HEA sustainability development site: www.heacademy.ac.uk/education-for-sustainable-development.

The HEA hosts a range of online resources available to support the embedding or inclusion of sustainability into the academic curriculum and student experience.

HEA Green Academy project: www.heacademy.ac.uk/resources/detail/sustainability/ESD_2014/Green_Academy.

Since 2011, the HEA has worked with higher education institutions from England and Wales to assist with institutional change, with a particular emphasis on embedding ESD across the curriculum, and enriching the student experience. The reports from this 'Green Academy' change programme include case studies.

Tilbury, D and Ryan, A (2013) *Leading Curriculum Change for Sustainability, Guide to quality and education for sustainability in Higher Education*, available at: efsandquality.glos.ac.uk.

This resource is the outcome of a HEFCE-funded project which attempted to make connections between education for sustainability and quality assurance and enhancement. It provides practical examples of different approaches to curriculum change at five different Universities.

PRME - Principles for Responsible Management Education: www.unprme.org.

This United Nations initiative aims to 'inspire and champion responsible management education, research and thought leadership globally'. The website includes webinars and teaching resources.

Ryan, A (2011) *Education for sustainable development and holistic curriculum change*, available at: www.heacademy.ac.uk/assets/documents/esd/ESD_Artwork_050412_1324.pdf.

This review and guide is aimed at educators and managers in HEIs and complements the 2010/11 Green Academy.

Sterling, S (2012) *Future Fit Framework: An introductory guide to teaching and learning for sustainability in higher education institutions*, available at: www.heacademy.ac.uk/assets/documents/esd/the_future_fit_framework.pdf.

A practical guide for academics and curriculum developers on teaching and learning for sustainability. The Framework was developed out of the experience of the Higher Education Academy (HEA) ESD Project, which ran from 2006-2011.

Sterling, S, Maxey, L and Luna, H (2013) *The Sustainable University: Progress and prospects*, Routledge.

This edited collection may be useful to those seeking to lead institutional change. It includes institutional case studies and chapters on the student experience, pedagogy and curriculum, and overviews of sustainability-related changes in higher education globally.

University of British Columbia (2013) *Sustainability attributes*, available at: www.sustain.ubc.ca/courses-teaching/sustainability-attributes.

The University of British Columbia's student attributes for sustainability

International and national drivers and frameworks

European Commission High Level Group on the Modernisation of Higher Education (2013) *Improving the quality of teaching and learning in Europe's higher education institutions*, report to the European Commission, available at: www.modip.uoc.gr/sites/default/files/files/modernisation_en.pdf

This report to the EC sets out a vision for higher education in Europe and highlights the importance of ESD.

HEFCE (2009) *Sustainable development in Higher Education*, available at: www.hefce.ac.uk/pubs/year/2009/200903/name,63788,en.html.

In its sustainable development framework, HEFCE sets out its expectations of higher education providers and the support it will make available. At the time of writing, the framework is being reviewed and a revised version is expected to be published later in 2014.

Welsh Assembly Government (2009) *One Wales: One Planet, a new Sustainable Development Scheme for Wales*, available at:
wales.gov.uk/topics/sustainabledevelopment/publications/onewalesoneplanet/?lang=en.

The sustainable development scheme of the Welsh Assembly Government, made under section 79 of the Government of Wales Act 2006. The scheme sets out how the Government intends to promote sustainable development.

Universities and Colleges Climate Commitment for Scotland, available at:
www.eauc.org.uk/uccfcs/home.

The public commitment made by all of Scotland's universities and colleges to address the challenges of climate change and reduce their carbon footprints through this programme delivered by the The Environmental Association for Universities and Colleges (EAUC) and funded by the Scottish Funding Council.

Tilbury, D (2011) *Education for Sustainable Development: An Expert Review of Processes and Learning*, available at:
www.unesco.org/ulis/cgi-bin/ulis.pl?catno=191442&set=53872FC8_3_142&gp=1&lin=1&ll=1.

A report commissioned by UNESCO which provides a review of literature on education for sustainable development and identifies key principles and relevant processes.

United Nations (2012) *Future We Want Outcome Document*, available at:
sustainabledevelopment.un.org/futurewewant.html.

UN Resolution adopted by the General Assembly on 27 July 2012. The document refers to ESD and the role of universities in sustainable development.

UNESCO, Education, *Education for Sustainable Development*. Available at:
www.unesco.org/new/en/education/themes/leading-the-international-agenda/education-for-sustainable-development.

Website containing news, resources, case studies, and online ESD courses.

United Nations Economic Commission for Europe (UNECE) (2012) *Learning for the future: competences in education for sustainable development*, available at:
www.unece.org/environmental-policy/areas-of-work/education-for-sustainable-development-esd/education-for-sustainable-development-esdpublicationshtml/education-for-sustainable-development/2012/competences-for-esd/docs.html.

Guidance developed by an intergovernmental expert group tasked with framing sustainable development in terms of competences for educators.

United Nations Educational, Scientific and Cultural Organization (UNESCO) (2010) *Education for Sustainable Development Lens: A Policy and Practice Review Toolkit*, available at:
www.unesco.org/ulis/cgi-bin/ulis.pl?catno=190898&set=538730A9_3_187&gp=1&lin=1&ll=1.

Sections of this document may help colleagues to connect strategic institutional agendas to educational processes and practice.

Academic quality management

Morris, C and Mason O'Connor, K, *Quality Assurance and Quality Enhancement: twin supports for any sustainability project* in Roberts, C and Roberts, J eds. (2010), *Greener by Degrees: Exploring Sustainability through Higher Education Curricula*, University of Gloucestershire, available at: insight.glos.ac.uk/tli/resources/toolkit/resources/Pages/GreenerbyDegrees.aspx.

This is an e-book that explores different aspects of sustainability within the undergraduate and postgraduate curriculum across a broad range of disciplines. The chapter highlighted considers the links between quality management and sustainability.

Values and principles underpinning education for sustainable development - why it matters

The Earth Charter: www.earthcharterinaction.org/content.

The Earth Charter identifies ethical principles for building a 'just, sustainable and peaceful' global society. It seeks to inspire individuals and to foster collective responsibility. The Earth Charter began as a UN initiative and was carried forward by a global civil society initiative. It was launched in 2000 by the Earth Charter Commission, an independent international entity. The website includes many educational resources.

Online communities of practice

The Sustainability Exchange: www.sustainabilityexchange.ac.uk.

The Sustainability Exchange is an online portal for communication, information, and knowledge-sharing. Run by the EAUC, it combines resources and experience from higher education and sustainable development organisations.

Learning for Sustainability Scotland: learningforsustainabilityscotland.org.

Scotland's UN University Regional Centre of Expertise on education for sustainable development. The website contains news and other links.

Appendix 1: Development Group

Details of the Development Group that produced this guidance are given below.

Dr Laura Bellingham (co-convenor)	Quality Assurance Agency for Higher Education
Professor Debby Cotton	Plymouth University
Virginia Isaac	Inspiring Futures Foundation
Simon Kemp (co-convenor)	Higher Education Academy and University of Southampton
Professor James Longhurst (Chair)	University of the West of England
Professor Stephen Martin	Visiting Professor, University of the West of England and Honorary Professor, University of Worcester
Dr Carl Peters	University of South Wales
Dr Alastair Robertson	University of Abertay
Dr Alex Ryan (alternate with Daniella Tilbury)	University of Gloucestershire
Harriet Sjerps-Jones	University of Exeter and The Environmental Association for Universities and Colleges (EAUC)
Dr Sarah Speight	University of Nottingham
Charlotte Taylor	National Union of Students
Professor Daniella Tilbury (alternate with Alex Ryan)	University of Gloucestershire
Writer up to consultation Rachel Beckett	Technical Editor, QAA
Secretary Will Joice	Development Officer, QAA

Appendix 2: Illustrative examples of approaches to teaching, learning and assessment

Four examples are offered below as an illustration of possible approaches to teaching, learning and assessment in education for sustainable development. They should not be taken as prescriptive or to represent the full range of possibilities, but rather to act as a stimulus for thinking and planning. Each of the examples can be elaborated or adapted by the educator, such as through the use of short films for scene setting, distribution of introductory resources, guest seminars from external experts.

The four examples address the core themes that provide the focus of this guidance: global citizenship; environmental stewardship; social justice, ethics and wellbeing; future-thinking. They are offered from a multi and interdisciplinary perspective, and can be adapted to support the intended learning outcomes of the practitioner in their particular subject area.

Example one: Global citizenship

Global citizenship requires students to consider the global social, economic and environmental implications of decisions and actions.

One example learning activity would be to run a Global Food Conference. Students can be divided into groups and given roles representing developing countries, more economically developed countries (MEDCs), multinational corporations, health experts, engineering and transport organisations, non-governmental organisations, food scientists. These roles are not prescriptive and can be adapted or added to depending upon the discipline or multiple disciplines. The exercise can be introduced using a short film illustrating the global food distribution challenge. Each group is then tasked with developing a proposed programme to address food distribution in a selected part of the world, or to develop a plan to address global food inequity. Each group must present their final work to the class and produce a project plan for submission.

This exercise can address food production, trade barriers, health benefits and impacts of different diets, cultural impacts of food changes, genetically modified organisms, intensive agriculture, environmental impacts of pesticide use, water distribution, water quality, biodiversity loss and enhancement, land management, transport impacts of distribution, local economic benefits of local food sourcing, costs to developing markets of local food production in MEDCs, economic development, waste management, carbon management, and health and wellbeing.

Example two: Environmental stewardship

Environmental stewardship requires students to understand the processes of managing the physical environment, whilst considering the social and economic consequences of planning and actions.

One example learning activity would be to develop a flood response plan for an inland riverside town. Educators can either develop their own flooding case study based on an area located close to their institution, or use recent UK events such as the flooding at Tewkesbury in 2007 or in the Somerset Levels in 2014. Working individually or in groups, students can be tasked with working on one of the following themes: agriculture, local economy, health and disease, property, community relocation, biodiversity, transport and infrastructure engineering. For each theme allocated, the students are required to identify the social, economic and environmental impacts of the flood event. They are then required to propose planning-led solutions to prevent future identified impacts related to their theme. Each

student or group will submit their plan, and the combined work can be redistributed as the cumulative class flood response plan. If the technology and skills are available this exercise could use Geographic Information Systems (GIS) to display impacts and proposed response plans.

This exercise can be run in partnership with any or all of the following local or regional organisations: planning authority, engineering organisation, community group, non-governmental organisation. The final report can be submitted for consideration to any partner organisations, or the work could be presented to representatives for immediate discussion and feedback.

Example three: Social justice, ethics and wellbeing

The consideration of social justice, ethics and wellbeing is central to education for sustainable development. It is necessary to consider the individual and whole communities, both locally and globally.

One example learning activity would be to explore the global impacts of fashion. Students can develop a sustainable management plan for the development of a new piece of clothing such as a t-shirt or a pair of jeans. The plan should incorporate the lifecycle of the article of clothing through cotton production, cotton harvesting, distribution, clothing production, printing, transport, sale, usage, and end of life (disposal or recovery). At each stage of the cycle the social justice issues should be identified in terms of health, wellbeing, labour, salary, education, and fair-trade in terms of the individual and the community. The environmental impacts of each stage should also be identified to demonstrate the overall sustainability implications of the fashion trade.

This exercise can address the impacts of production, trade barriers, personal health, cultural expectations, education, poverty, forced labour, pesticide use, biodiversity loss, carbon management, living wage, water distribution, water quality, land management, transport impacts of distribution, economic development, waste management, sustainable procurement, over-consumption, resource depletion, and personal health and wellbeing. The social justice implications of the global fashion trade are the focal point throughout this exercise.

Students can present their sustainable clothing management plan to the class, or to local retail centres. The work could equally form a resource base on a collaborative website or wiki. Alternatively students could produce an information film demonstrating the sustainability impacts of the global fashion trade.

Example four: Future-thinking

Future-thinking requires students to think about the social, economic, and environmental consequences of current and planned actions for future societies. It also requires consideration of projected paths of economic and social development in terms of areas such as population growth and resource use.

One example learning activity would be to explore the global social and environmental implications of population growth and the economic expansion of developing nations. Students could be required to produce an impact analysis report on the social implications and the environmental impacts of population growth and economic development of either Southeast Asia or Africa.

The reports are required to address three projected population scenarios for 2050, each involving growth where the region attains a level of economic development equivalent

to that of present-day Europe. For each scenario the report could address the social implications in terms of healthcare, personal wellbeing, access to education, access to food, cultural implications of changing diets, religion, obesity, access to water, employment and others identified for consideration by the educator. The report could also address the environmental implications in terms of resource extraction, agriculture, food trade, energy consumption associated with improved infrastructure and use of luxury goods, transport emissions and resource use, waste management, hazardous waste management, biodiversity management and other areas identified for consideration by the educator.

Students could work individually on the same regions of the world, or they could work individually on different regions of the world including MEDCs. If the class work on different regions of the world, reports could be combined to provide a shared resource of a global analysis. This exercise could be completed through the submission of reports. This exercise equally lends itself to a global symposium where students can present their findings to allow all students to gain a wider understanding of different regions of the globe and enhance their future thinking skills.

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