Chairs' foreword

This guidance is intended to assist staff in UK higher education institutions seeking to incorporate Education for Sustainable Development (ESD) within their curricula. It is an update from the 2014 guidance and has been produced by an expert group drawn from across the sector, with the aim of supporting students from any discipline to acquire the knowledge, understanding and skills necessary to develop values and take actions to transition society towards sustainable futures. The guidance provides a framework to support curriculum design and general guidance on approaches to teaching, learning and assessment. We hope that colleagues at all levels across 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.

We would like to take this opportunity to thank the members of the Advisory Group for their wise counsel and valuable contributions to the guidance, and to the Quality Assurance Agency for Higher Education and Advance HE for their ready acceptance that the time was right for an update of the sector guidance. In particular, we would like to thank Dr Kate Mori, Amy Spencer, Dr Kay Hack and Dr Patrick Baughan for their invaluable contributions to the work of the group. We are also thankful to those who contributed to the sector-wide consultation to help shape the final version.

Professor James Longhurst, University of the West of England, Bristol
Professor Simon Kemp, University of Southampton

Co-Chairs, QAA/Advance HE Education for Sustainable Development Advisory Group
QAA and Advance HE 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 Advance HE. A draft version of the guidance was subject to sector-wide consultation over the period of November 2020 to January 2021 and we are thankful to those who contributed to this process to help 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. It recognises that there are many ways in which this may be achieved and is not prescriptive about delivery. Instead it offers suggestions for use in the curriculum design process and for designing Education for Sustainable Development (ESD) into and across-curricula.

This guidance is intended to complement the UK Quality Code for Higher Education (Quality Code), but it does not form an explicit part of it and is not part of the regulatory environment. The Quality Code sets out the Expectations that all providers of UK higher education are required to meet in relation to academic quality and standards.

Both QAA and Advance HE are thankful to the Co-Chairs, Professors James Longhurst and Simon Kemp, all members of the external advisory group (see Appendix 1) and contributors to the consultation process. It is your contribution that has helped develop this guidance, which we hope is of value for ESD throughout the UK.

Dr Kate Mori, Quality and Standards Specialist, QAA
Dr Catherine Hack, Principal Adviser (Learning and Teaching), Advance HE
Dr Patrick Baughan, Senior Adviser (Learning and Teaching), Advance HE
**Abbreviations**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ESD</td>
<td>Education for Sustainable Development</td>
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<tr>
<td>LOs</td>
<td>Learning Outcomes</td>
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<tr>
<td>NUS</td>
<td>National Union of Students</td>
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<tr>
<td>OECD</td>
<td>The Organisation for Economic Cooperation and Development</td>
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<td>PAGE</td>
<td>Partnership for Action on Green Economy</td>
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<td>QAA</td>
<td>The Quality Assurance Agency for Higher Education</td>
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<td>SD</td>
<td>Sustainable Development</td>
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<td>SDGs</td>
<td>Sustainable Development Goals</td>
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<td>SDSN</td>
<td>Sustainable Development Solutions Network</td>
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<td>SOS-UK</td>
<td>Students Organising for Sustainability (NUS)</td>
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<td>UN</td>
<td>United Nations</td>
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<td>UNECE</td>
<td>United Nations Economic Commission for Europe</td>
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<td>UNESCO</td>
<td>United Nations Educational, Scientific and Cultural Organisation</td>
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Introduction and context

About this guidance

This is the second edition of the QAA/Advance HE Education for Sustainable Development guidance, the first having been published in 2014. Set against the backdrop of the adoption of the United Nations Sustainable Development Goals (2015-30), the guidance has been updated to reflect changes in understanding about and priorities in sustainable development (SD), and the increased urgency for everybody in society to take positive actions in addressing SD issues. The challenge is stark and includes a wide range of interconnected environmental and social issues such as climate change, biodiversity loss, resource depletion, hunger, inequalities of wealth, health, wellbeing and education. These are just some examples of key issues that pose existential threats to humanity and require wider and urgent attention in our curricula.

This guidance has been produced by the Quality Assurance Agency for Higher Education (QAA) and Advance HE working together with the help of a group of experts representing academic, business and student communities. It was subject to consultation from December 2020 to January 2021.

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. It recognises that there are many ways in which this may be achieved and is not prescriptive about delivery. Instead it offers suggestions to inspire, inform and enable Education for Sustainable Development (ESD) to be designed into and across-curricula.

There is academic debate regarding the concept of 'sustainability', and the definition of the terms 'sustainable development', and 'education for sustainable development'. This guidance does not contribute to this debate or the content and application of the UN Sustainable Development Goals. Instead, it is focused on the process of designing ESD into curricula.

For the purpose of this guidance we refer to:

• **sustainable development** as the ongoing process of creating a better world
• **sustainability** as an aspirational long-term goal
• **education for sustainable development** as the process of creating curriculum structures and subject-relevant content to support sustainable development.

Who is this guidance for?

This guidance is primarily aimed at staff involved in curriculum design and course management and delivery, to support them in designing ESD into their courses. However, it is also likely to be of value to senior management teams, those with responsibility for quality assurance and enhancement, and staff involved in directing teaching and learning. Such individuals have an important role in empowering staff to engage with the ideas presented in this guidance.

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. Readers may find it helpful to consider the guidance alongside the appropriate QAA Subject Benchmark Statements and the 12 Quality Code Advice and Guidance

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1 We refer to courses throughout this guidance but are mindful that in some institutions these may be referred to as programmes.
Themes. It may also be useful as an advocacy document for those wishing to support or progress an ESD agenda in their institution.

What is the status of this guidance?

This guidance provides an authoritative point of reference which is designed to support providers in meeting the relevant Expectations and practices of the Quality Code but it does not form an explicit part of it. This guidance has no regulatory function and compliance with it will not, in itself, indicate compliance with any of the regulatory codes or frameworks in use in the United Kingdom.

Structure of the guidance

This guidance is organised into four sections.

Section 1 offers an introduction to how both SD and ESD are interpreted and defined for the purposes of this document. It discusses that ESD is education for sustainable development and not merely about sustainable development, before offering a rationale for it taking prominence across curricula. The introduction of the UN Sustainable Development Goals (SDGs) in 2015 is discussed and presented as the contemporary policy framing for SD when focusing on designing ESD into curricula.

Section 2 moves on to a more applied discussion regarding designing ESD. It discusses how to holistically position ESD across curricula, identifying where the gaps are and how these may be addressed. It further highlights which key players can help inform this discussion, and the key competencies and learning outcomes ascribed to ESD and appropriate teaching and learning approaches.

Section 3 introduces a toolkit of reflective questions, competencies, learning outcomes and approaches to teaching and learning that may prove helpful when designing ESD. This section is designed to be used alongside Section 2, and the Quality Code’s Advice and Guidance on course design and development, to help educators in a practical and applied way.

Section 4 offers an annotated reference and resources list for those who may wish to further investigate the academic debate surrounding ESD. This section also includes a diverse range of additional resources from a variety of organisations with a focus on supporting the design and implementation of SD content across institutions and curricula.
Section 1 - Education for Sustainable Development: What is it and why is it important?

What is ‘sustainable development’?

Before we move on to discussing how ESD is defined for the purposes of this guidance, we first need to introduce the term 'sustainable development.' As highlighted earlier, it is not the aim or the intention of this document to discuss the basis or definitions of sustainable development as we are aware it is subject to many different interpretations. Therefore, for the purpose of this guidance, SD is defined according to the most commonly used and accepted definition from the United Nations (UN) Brundtland Commission, which remains the basis upon which discussions and policies for SD take their genesis.

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

It is important to note that SD is not purely about environmental issues as is commonly misconstrued. It includes a balance of economic, social and environmental factors which are interconnected, overlapping and interdependent.

What is 'education for sustainable development’? Within this guidance we adopt the definition of ESD proposed by the United Nations Educational, Scientific and Cultural Organisation (UNESCO):

'ESD empowers learners to take informed decisions and responsible actions for environmental integrity, economic viability and a just society, for present and future generations, while respecting cultural diversity. It is about lifelong learning, and is an integral part of quality education. ESD is holistic and transformational education which addresses learning content and outcomes, pedagogy and the learning environment. It achieves its purpose by transforming society.' (UNESCO, 2019)

ESD is education for sustainable development and not merely about sustainable development. It is an educational change agenda grounded in transformative learning and critical pedagogy, as well as SD principles. It can be understood as a lens that permits us to look critically at how the world is and to envision how it might be. ESD supports learners across all academic disciplines in developing the subject relevant competencies to create and pursue visions of a better world, one that recognises the interdependence of environmental integrity, social justice and economic prosperity. While SD promotes a balance between these ‘three pillars' of environment, society and economy, there is a recognition that environmental resources are finite, they cannot always be exchanged for financial capital and that they are the foundation for our society and economy.

The UNESCO definition of ESD acknowledges the importance of holistic and transformational education. Such education is not only situated within curricula but also extra, co-curricular and trans-curricular activities. ESD goes beyond the acquisition of information and instead focuses on supporting the development of the competencies, skills, attributes and values required to address SD challenges.
Why education for sustainable development, and why now?

There is clear and pressing evidence that the world is facing unprecedented environmental and social challenges, and a lack of systemic and integrated actions taken in response to these challenges. Urgent areas of concern include, but are not limited to, global climate change, local and global biodiversity loss, depletion of natural resources, deforestation, air quality, access to water, hunger, gender equality, widening inequalities of wealth, health and wellbeing.

These interconnected challenges require an urgent interdisciplinary response across curricula involving course developers, educators and, most importantly, students. There is evidence that students expect SD to be incorporated into their institutional practices and curricula. In the 2020 National Union of Students (NUS) Skills Survey, 91% of respondents agreed their place of study should actively incorporate SD - up from 88% in 2019; while 83% would like to see SD actively incorporated and promoted across all courses - up from 80% in 2019.

Sustainable Development Goals

In 2015, global leaders committed to 'Transforming Our World: The 2030 Agenda for Sustainable Development' (UN, 2015). Central to this agenda are the 17 Sustainable Development Goals (SDGs) as highlighted in Figure 1. The SDGs are comprehensive in focus, with an ambitious aim of uniting countries in trying to address key SD challenges by 2030. They cross political, economic, social, environmental and technological boundaries and require all sectors to collaborate to achieve their aims. The interdisciplinary and interconnected focus of the 17 SDGs makes them an important and useful tool for the current envisioning and future development of ESD. Action to contribute to the SDGs is evident across government, industry and enterprise as well as education.

Figure 1: Sustainable Development Goals
The SDGs provide a useful starting point for educators and students interested in including SD content and challenges in modules and courses. The breadth of the SDGs and the depth of the targets within each goal means that they are able to resonate with all academic disciplines and subject areas. This can provide a relatable gateway into SD from a module and course perspective. To explore the SDGs and the supporting targets, readers are invited to inspect the UN websites which address the SDGs and provide access to resources that may be of value to educators and students alike: www.un.org/sustainabledevelopment and https://sdgs.un.org

ESD (as highlighted in SDG4 ‘Quality education and lifelong learning opportunities for all’) represents a key mechanism for achieving all of the goals. Indeed, one of the targets within SDG4 is 'to ensure that all learners acquire the knowledge and skills needed to promote sustainable development'. UNESCO have reaffirmed their belief in the importance of ESD in achieving the SDGs through the adoption of a new global framework 'Education for Sustainable Development: Towards achieving the Sustainable Development Goals', also referred to as 'ESD for 2030'.
Section 2 - Designing education for sustainable development

How to use this section

This section suggests some of the activities and stages involved with designing ESD into curricula. It can be read alongside Section 3, which offers a toolkit of questions and resources linked to these areas to support curriculum designers and course teams.

The role of higher education in creating a sustainable future

The most significant impact SD will have is on the behaviour of graduates and how they live, learn and work. The competencies - the skills, attributes and values - they develop through their studies can help graduates contribute to a more sustainable future, transforming their thinking so that they have a positive impact throughout their lives. ESD can play a crucial role in this process. In this respect ESD is about:

1. Supporting students to develop the competencies and motivation to pursue visions of the future.
2. Supporting students to appreciate the complexity of our world and the 'wicked problems' we have caused.
3. Challenging, supporting and enabling students to co-design solutions and drive change.

How the curriculum is designed and delivered in response to SD concerns will differ according to the subject area, professional focus and pedagogical habits of the discipline. That said, ESD needs to transcend disciplines to meet the expectations of graduates and the needs of society and employers. It requires transdisciplinary approaches, motivating students to go beyond how their discipline intersects with others, to discover the knowledge that emerges between established fields, providing space for alternative perspectives, innovative ideas and solutions to emerge. All disciplines have an important role to play in achieving a more sustainable future and relationship with the environment on which we depend, as well as ensuring that solutions in one area do not negatively impact another.

Pursuing sustainable futures is not merely an academic activity. Through drawing on relationships with professional and regulatory bodies, local, national and international governance bodies, business and enterprise, local and global communities and interest groups, ESD encourages learners and educators to collaborate widely to effect change. Working with individuals, groups and organisations across the public, private and third sectors is essential to map and follow pathways for societal transformation.

Designing ESD into curricula provides the opportunity to harness the willingness of broader communities to help transform learning. There are successful examples of institution-wide partnerships involving students, academics, professional services and estates teams, often driven by students' unions or other student representative groups, and individual students. Some have also been initiated by individual staff with a passion and drive for sustainable change. Depending on their setting, there is also a need and opportunity to involve individuals, groups and organisations within the provider's local community. These groups as 'drivers' of ESD can be an asset at the curriculum design stages, helping to inform and shape discussions, ensuring SD outcomes effect meaningful change and promoting a whole institution approach.
Positioning ESD within the curriculum

As stated in Section 1, the 17 SDGs (Figure 1) can offer a useful starting point to initiate discussion about ESD in the curriculum. The breadth of the SDGs offers scope for ESD to include learning in relation to, for example:

- the causes of and solutions to poverty
- health, education, social and gender inequalities
- responsible consumption, production and economic development
- climate change and food production.

This breadth can encourage and stimulate discussion surrounding the most appropriate positioning of SD across the curriculum. Situating discussions against the SDGs can assist those involved in curriculum design, course management and teaching to holistically consider how ESD can be designed into the curriculum, not treated as an addition to it.

Diagram 1: The process of positioning ESD within the curriculum

The process of positioning ESD within the curriculum is not a linear one. Instead, it requires cyclical reflection and evaluation to consider what has and has not worked well, what can be improved and how students can be drivers of sustainable development. This is presented as a four-stage approach, which is outlined below.
Stage 1: Consulting key players

Whether or not the 17 SDGs are used as the starting point, curriculum design is a dynamic and ongoing process, and there will be key players beyond the academic community who could help inform the curriculum design process. It may be that these groups are consulted before the curriculum is designed (or redesigned) and that the 17 SDGs act as a cornerstone of such conversations. Some of these groups are highlighted below, but this is far from an exhaustive list and all approaches should reflect the audience, stakeholders and expertise of the institution. Conversations with these groups should be ongoing and iterative rather than occurring solely at the start of the curriculum design process. In this respect, designing ESD into curricula can be a truly co-creative approach.

The student voice

Many students see themselves as having a vested interest in the future of their planet and society, with some actively engaged in campaigning on issues such as climate change and reducing inequalities. The NUS has a voice at national level on a range of issues of relevance to students including SD, and they have created an educational charity, Students Organising for Sustainability (SOS), in response to the climate emergency and ecological crisis. SOS aims to support students to learn, act and lead for sustainability and highlights that thousands of students across the UK are taking action on sustainability across their curricula, campuses and communities.

Capturing student voices as part of the curriculum design process is essential. Conversations with students, course representatives and the SU will help curriculum design teams establish the aspects of SD students think should be pursued, how they may want to collaborate and co-create curricula, which activities may already be happening via SU teams and societies, the types of placement activities students would like to progress, and how students and academics can work closely together to ensure a joined-up approach to designing ESD into curricula.

Employers and enterprise

SD challenges are increasingly recognised as an important aspect of larger businesses - no longer is SD simply the preserve of a marketing department focused on reputation and delivered through Corporate Social Responsibility initiatives. It is increasingly considered to be of strategic importance, with business leaders making the moral case for action. Many large companies are now managing SD issues at board level and there is an increasing need for specialists to help understand and transform companies in response to the environmental and social challenges they face. Through ESD we have the potential to ensure that today's graduates are fully prepared to positively influence the business landscape and position enterprise and industry as a driver of SD. Intrapreneurship, where innovative employees help to drive change, is the number one demand according to many sources.

Enterprising people have an important role to play in SD and the development of green and sustainable entrepreneurship has provided many opportunities for promoting and driving connected thinking that is pro-social, innovative and responsible. Many start-ups are entirely focused on SD creating powerful responses to social issues that need long-term solutions. Unleashing enterprise competencies such as creativity, opportunity recognition, self-determination and adaptability, when combined with the entrepreneurship skills of starting a new business, can be a powerful catalyst for sustainable change. Recognising that value can be added through social, cultural and economic means, enables the realisation of solutions that benefit society as a whole.
By engaging directly with social entrepreneurs, employers and industry, ESD can align with enterprise and entrepreneurship education to add value to the learner’s journey. For further guidance please see QAA Enterprise and Entrepreneurship Education Guidance (2018), the Advance HE Framework for Enterprise and Entrepreneurship Education (2019) and QAA Scotland: Enterprise and Entrepreneurship Development Project (2017).

Academic staff

Academic staff and educator capacities are central to ESD implementation within and across curricula. In addition to reflecting on their personal competencies, academic staff can consider ways in which they can use their role to be a conduit for SD. Two key roles of academics are emphasised here - curriculum design and delivery of teaching and learning.

The 17 SDGs, combined with information in the resources annex, can contribute to ensuring that ESD is presented as relevant to the academic's discipline and/or subject area. Beyond this, staff may benefit from professional development activities and this will need support at an institutional level.

Academics are critical enablers of ESD; through their approaches to teaching, assessment and curriculum design they provide learners with the opportunities to gain the key competencies required for SD.

Professional service teams and academic governance

When designing ESD into curricula it will be useful to establish the institutional commitment and the support that may be available. This may be explicit within specific SD strategies, or could be integral to teaching and learning, quality and planning or faculty and/or departmental strategies and aims. Any such strategies will be useful in underpinning a rationale for designing ESD into curricula and requesting support for doing so.

Beyond academic staff there will be a number of professional service teams that can interact with and promote ESD, supporting its design into and across curricula. Business engagement, careers, employability services and placement staff can all play their part. Technicians, estates staff, educational developers, academic support services and quality managers can also positively contribute to discussions about ESD and help support curriculum design teams in achieving their goals.

Senior management - those responsible for the provider's strategies and policies - can ensure that institutional-level ESD commitments are explicit and realised. Such commitment will in turn provide staff development opportunities and enable staff to pursue ESD at the discipline, course and module level and in the design of wider student experience activities and services. Their support can help promote a whole institution approach to designing ESD into curricula and scaffolding what can be achieved via academic governance mechanisms.

Institutional approach

A whole institution approach is beneficial when designing ESD into curricula. However, actions by individuals and groups can be a powerful catalyst for driving ESD discussion and activities across the institution and influencing a shift towards a whole institution approach. There is a lot that individuals can do within their own sphere of influence. ESD can positively influence an integrated approach that supports and promotes an interconnected curriculum offer situated within the mission of the institution. It reinforces other enhancement objectives including internationalisation (for example, developing global perspectives and decolonising learning), interdisciplinary and transdisciplinary learning, promoting wellbeing, employability and civic engagement.
Civic engagement

Through engagement with the needs and priorities of the communities around them, providers can play an important role in local economic, social, cultural and environmental wellbeing of the places in which they are located. This potential contribution is highlighted by the UPP Foundation Civic University Commission. Higher education activities such as teaching, research and knowledge exchange, purchasing policies, engagement with local employers, enterprise and the voluntary sector, can all positively contribute to social, environmental and economic progression and regeneration.

Project-based learning, using authentic examples from local employers or communities, can enhance student understanding of their locality and deepen ties between higher education providers and their locales. Dissertations and work-based learning within the formal curriculum, and volunteering beyond this, can provide students with opportunities to develop agency while enriching their educational experience.

Stage 2: Designing ESD into curricula

Designing ESD into curricula can be achieved via whole curricular approaches, within core and optional modules, as multidisciplinary, interdisciplinary or transdisciplinary approaches or as co-curricular or extracurricular activities. The approach adopted will depend on the context of the activity and the commitment from the institution. Guidance for the application of this holistic approach to ESD can be found in the Advance HE publication The Future Fit Framework (2012).

In these times of uncertainty, with rapid global environmental and social change, there is an increasing shift towards seeking graduates with capacities for adaptation and resilience. ESD supports these capacities by focusing on competencies required to act on or interpret knowledge. It can be useful to think in terms of the competencies that students may expect to develop through engaging with an activity. The importance of competencies within ESD is emphasised by UNESCO:

‘ESD aims at developing competencies that empower individuals to reflect on their own actions, taking into account their current and future social, cultural, economic and environmental impacts, from a local and a global perspective.’

These eight key ESD competencies for all learners of all ages worldwide (Table 1) can be adopted and adapted for higher education.
Table 1: UNESCO's key competencies for sustainability

<table>
<thead>
<tr>
<th>Competency</th>
<th>A student who displays this competency can:</th>
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<tbody>
<tr>
<td>Systems thinking competency</td>
<td>• recognise and understand relationships</td>
</tr>
<tr>
<td></td>
<td>• analyse complex systems</td>
</tr>
<tr>
<td></td>
<td>• consider how systems are embedded within different domains and scales</td>
</tr>
<tr>
<td></td>
<td>• deal with uncertainty</td>
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<tr>
<td>Anticipatory competency</td>
<td>• understand and evaluate multiple outcomes</td>
</tr>
<tr>
<td></td>
<td>• create their own visions for the future</td>
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<tr>
<td></td>
<td>• apply the precautionary principle</td>
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<td></td>
<td>• assess the consequences of actions</td>
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<tr>
<td></td>
<td>• deal with risks and changes</td>
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<tr>
<td>Normative competency</td>
<td>• understand and reflect on the norms and values that underlie one's actions</td>
</tr>
<tr>
<td></td>
<td>• negotiate sustainable development values, principles, goals and targets, in a context of conflicts of interests and trade-offs, uncertain knowledge and contradictions</td>
</tr>
<tr>
<td>Strategic competency</td>
<td>• develop and implement innovative actions that further sustainable development at the local level and further afield</td>
</tr>
<tr>
<td>Collaboration competency</td>
<td>• learn from others (including peers, and others inside and outside of their institution)</td>
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<tr>
<td></td>
<td>• understand and respect the needs, perspectives and actions of others</td>
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<tr>
<td></td>
<td>• deal with conflicts in a group</td>
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<tr>
<td></td>
<td>• facilitate collaborative and participatory problem solving</td>
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<tr>
<td>Critical thinking competency</td>
<td>• question norms, practices and opinions</td>
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<tr>
<td></td>
<td>• reflect on own one's values, perceptions and actions</td>
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<tr>
<td></td>
<td>• take a position in the sustainable development discourse</td>
</tr>
<tr>
<td>Self-awareness competency</td>
<td>• reflect on their own values, perceptions and actions</td>
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<tr>
<td></td>
<td>• reflect on their own role in the local community and (global) society</td>
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<tr>
<td></td>
<td>• continually evaluate and further motivate their actions</td>
</tr>
<tr>
<td></td>
<td>• deal with their feelings and desires</td>
</tr>
<tr>
<td>Integrated problem-solving</td>
<td>• apply different problem-solving frameworks to complex sustainable development problems</td>
</tr>
<tr>
<td>competency</td>
<td>• develop viable, inclusive and equitable solutions</td>
</tr>
<tr>
<td></td>
<td>• utilise appropriate competencies to solve problems</td>
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</table>

These key competencies, emphasising the desired skills, attributes and values that can be developed through ESD, are appropriate for all disciplines and levels of learning, as well as extracurricular activities and work-based learning, while promoting interdisciplinary and transdisciplinary, creative, contextualised and place-based responses to ESD.

For higher education to be a transformational experience, students need to develop their 'ways of thinking' and, as such, critical thinking is a well-established, generic graduate attribute. Systems thinking and anticipatory competency (aligned to futures thinking).
also offer a useful starting point for designing ESD competencies into curricula as they can be applied across most subjects and disciplines.

Critical thinking competency

Critical thinking can incorporate conceptualising, applying, analysing, synthesising and evaluating information, and is therefore an essential competence that allows learners to derive meaning from information. It enables learners to critique the credibility and sources of knowledge, to recognise their own personal assumptions and values, and beyond this, what may have influenced them. It also develops the ability to analyse the thinking process itself, leading to critical reflection and a move beyond the description of an event or process, towards a deeper and more interpretative understanding.

Critical thinking is relevant to all disciplines and subjects, but it is emphasised in ESD because of the need to understand the issues posed by contemporary societal practices and to develop alternative futures.

Systems thinking competency

Systems thinking is a way of approaching problems that analyses how all the elements within a system influence one another. It is the ability to recognise and understand cause and effect in complex systems. Systems thinking requires the identification and classification of the parts of a system and the relationships between them, as well as the analytical skills required to model how the system will behave over time and in response to modifications. Barry Richmond, who coined the term 'systems thinking' in 1994, emphasised that systems thinkers 'position themselves so they can see both the forest and the trees and keep one eye on each', recognising that systems thinking requires attending to how systems operate within different domains and at different scales. Systems thinking is critical in handling the complex challenges facing the world; however, it is not yet widely embedded in graduate attributes or competencies.

Anticipatory competency (futures thinking)

Many accounts of SD have focused on the 'here and now', however, SD is not just about the present, but incorporates a futures-based perspective that ensures we can meet the needs of the present without compromising the ability of future generations to meet their own needs. Anticipatory or futures thinking for SD seeks to foster students' abilities to understand and meaningfully contribute towards current and future challenges, whether in a local or global context. This type of thinking can also help to recognise and address the fears and insecurities that people may have about the future.

The anticipatory competence seeks to develop the learner's ability to understand and evaluate multiple futures - possible, probable and desirable - and to create their own vision for the future. It seeks to 'futureproof' students with the knowledge, skills, attributes and values that will enable them to think about the consequences of actions and to contribute to a future in which systems and societies can be adapted to ensure a sustainable future.

Stage 3: Deciding course and module learning outcomes for ESD

In higher education, course and module\textsuperscript{2} learning outcomes act as a means of outlining expected learning and knowledge accumulation. Learning outcomes are an established part of how we define, assess and quality assure higher education. Beyond subject specific

\textsuperscript{2} We are mindful that not all courses are modular and this terminology may need to be used interchangeably with 'unit' or other descriptions of learning episodes.
knowledge, the learning outcomes utilised in ESD draw on the key competencies outlined in Table 1 and include ways of thinking (systemic, critical, reflective, anticipatory and holistic) and ways of practising (collaborative, interdisciplinary, reflexive, solutions-focused and with agency). Learning outcomes that interconnect subject-specific knowledge, skills and attributes with ESD competencies are critical for designing ESD into curricula.

ESD aims to recognise the requisite values and ways of thinking and practising that will empower learners to make informed decisions and evaluate the consequences of their actions for current and future stakeholders - all of which can be encouraged via the competencies and learning outcomes at course and modular level.

Course and module-level learning outcomes should flow from the cross-cutting ESD competencies discussed during Stage 2. When designing modular-level learning outcomes, academics should be guided by the course-level learning outcomes. Where these outcomes refer to SD, the module leader should consider what role the individual module plays in enabling students to achieve the course-level outcomes.

Where there are no relevant SD course-level learning outcomes, an individual academic may wish to encourage the course leader to consider revisions to the course framing and core outcomes to include SD. Where no course-level SD outcomes exist, module-level learning outcomes can still incorporate a SD focus as most appropriate to the module, but these should articulate to course-level outcomes too.

SD activities can be included in the content of sessions and activities of the module. Examples of how this might be done include:

- use of data on SD issues
- inclusion of a debate with students on the relevance of SD issues to the module ('how might the learning on this module help someone to take action on an issue referenced in the SDGs?')
- reference to academic journal material from the discipline with a SD focus
- introduction of an organisation relevant to the discipline/profession which is explicitly committed to SD and/or the SDGs
- consideration of professional, statutory and regulatory (PSRB) bodies focus on SD
- identification of one or more SDG targets which are relevant to the module
- inviting an external speaker with expertise to speak about SD in relation to the subject/discipline area, or
- inclusion of research which brings a SD focus to the module topic.

In deciding learning outcomes, and subsequent design of teaching and learning activities, academics should work in course teams to agree the desired outcomes and to map out the journey to achieve those outcomes throughout the modules and years of study. This exercise could identify the most suitable points at which to introduce students to core SD principles and issues and to develop their depth of engagement.

In Section 3, we present competencies and associated learning outcomes that may be used as an indicative guide to assist in developing and incorporating SD across curricula. Readers may also find UNESCO’s publication about ESDG's Learning Objectives informative. This guide identifies indicative learning objectives for all 17 SDGs and suggests topics and learning activities for each.
Stage 4: Developing learning environments to support ESD

ESD requires constructively aligned teaching, learning and assessment activities designed to meet key SD competencies and learning outcomes. It should provide learning experiences that transform the ways of thinking and practising, empowering students to become informed advocates of SD. Teaching and assessment practices that provide these transformational experiences for students require opportunities to hear alternative viewpoints, reflect on experiences, and address real-world challenges. ESD can be accessed in the formal curriculum, extracurricular and co-curricular activities and in work-based learning, or working with community groups. The developmental and integrative nature of the competencies will benefit from an assessment strategy that incorporates self-and/or peer assessment, synoptic assessment, and assessment for and as learning.

ESD requires a learning environment in which:

- interdisciplinary or transdisciplinary learning approaches are facilitated
- learning is inclusive and accessible for all
- policies support synoptic assessment
- extra and co-curricular opportunities are provided and recognised.

Wherever possible, teaching, learning and assessment should take advantage of the learning opportunities afforded by the campus and the local community, as well as online environments. The use of the campus and community as a 'living laboratory' where students learn about, for example, community development, local governance, business and economic relationships, as well as food production and management of natural resources, can offer valuable and authentic learning experiences.

The benefits of blended learning, combining in-person and digital teaching and learning activities are increasingly recognised within higher education. Blended learning introduces more flexibility than students may have traditionally been accustomed to and can help to facilitate self-directed learning, where students have more control over the pace and the spaces in which they learn. Used creatively, digital teaching and learning provide a sustainable and inclusive, immersive learning experience with new opportunities for students to interact with their teachers, peers and other professionals and communities external to their institution, as well as with data and images from across the globe. However, for it to be deployed equitably and successfully it needs to be part of a cohesive digital strategy involving the development of digital capabilities for staff and students and access for all to the requisite devices and connectivity.
Section 3: A toolkit to inform the ESD process

How to use this section

This section can be used alongside Section 2 to support the design of ESD into curricula. It offers a range of reflective questions and learning outcomes that may be helpful in deciding the ESD focus.

Reflective questions to support designing ESD into curricula

Informing the conversation/stakeholder engagement with the curriculum

Through conversations and consultation with key players identified in Section 2 of this guidance, curriculum designers may wish to consider the following:

- What do students, particularly those on the course of study, see as a priority for the integration of ESD into this curriculum? What do they want to learn, experience and contribute?
- What challenges does the subject area face regarding the environmental and social changes that are taking place?
- How is SD addressed by the employers of graduates from this subject area? How can we prepare graduates to help employers meet SD challenges? What SD challenges and critiques do these organisations face from legislation and wider civil society and how might they respond?
- What are the SD needs, interests and priorities of civic society connected with the provider, for example, local communities, voluntary groups, and public sector organisations? Which of these might your students be able to engage with?
- How is the provider engaged with SD? What actions are estates/facilities management teams taking to 'green' the organisation? What relevant research does the provider conduct? Which of these might your students be able to learn from and engage with?
- Is the students' union (or other student representative body) active in SD-related activities? Do they run any clubs or societies that may interact with curricula?
- Regarding stakeholder input, what are the core educational priorities for embedding ESD into your course, in terms of content, connection and experience? How can stakeholders co-facilitate this happening?
- Which key players are interested in partnering to create educational experiences (living labs, case studies, experiential learning, simulation activities, projects) linked to these priorities?

Integrating at the curriculum design level

These questions may be particularly useful for curriculum designers.

- What understandings and experiences of ESD related to your subject area do you want every student on your course to have? How can this be incorporated into your course-level learning outcomes?
- Some students on your course will wish to explore the link between the subject area and SD more deeply. What understandings and experiences do you wish to offer them, and how can this choice be provided?
- What themes, case studies and questions arising from SD would support the core educational priorities for ESD you have identified?
• What ideas and perspectives can you utilise from other disciplines and subject areas, to promote an interdisciplinary/transdisciplinary approach? How can students be challenged beyond the conventions and ways of knowing of their subject?
• What educational experiences can most effectively address course and subject priorities and engage students with the eight UNESCO competencies?
• How can a meaningful interdisciplinary experience be offered? What are the barriers to interdisciplinary learning (if any) and how can these be overcome?
• How can the key players consulted earlier be connected to the educational experience?
• Are students provided with and supported to develop opportunities to put ESD learning into practice, to 'live what they're learning'?
• How can your course encourage students to seize and shape opportunities and to respond to authentic SD challenges beyond the institution?
• Does your course offer multi-disciplinary approaches to the curriculum that develop networks, increase interactions and create wider experiential opportunities linked to ESD?
• What approach will be taken when evaluating the integration of ESD into course design?
• Are there any institutional key performance indicators that designing ESD into curricula may support? How can you use this to gain traction for ESD?
• Is there a staff development need to enable any of the above considerations to progress? If so, which internal and external support could you utilise?

**Student experience beyond the curriculum**

These questions may be particularly useful for institutional leads.

• Does student induction include a focus on SD, including an understanding of what your institution is doing, and how the students can contribute?
• Are students represented on institutional/localised committees that focus on SD?
• Are staff and students involved in conversations beyond the committee structure about ESD?
• Do the volunteering and extracurricular activities you promote cater for students wishing to engage with SD challenges?
• Is your careers service able to guide students who wish to actively contribute to SD challenges in their careers?
• Is your careers service able to provide students with information on the social and environmental performance of potential employers? Is it able to effectively support students who wish to take such considerations into account in their career search?
• Have all graduates had curricular, co-curricular and extracurricular opportunities to develop a range of ESD competencies in order to be future change leaders through their civic and professional lives?

**Strategic, institution-level questions**

This section recognises the importance of strategic institution level commitment when looking to progress ESD. Departments, staff and committees which focus on academic standards, quality and enhancement are a vital part of the ESD process. In this respect, the following questions may be useful for staff who are able to effect change at an institutional level by supporting academic colleagues involved in designing ESD into curricula.

• How is a commitment to ESD incorporated into institutional education strategy? Are any strategic objectives, targets and KPIs adopted?
• Is a discussion about ESD and the curriculum incorporated into the annual review of each programme?
• Is ESD, and how it is incorporated within curricula and the student experience, part of academic appraisal and/or promotion criteria?
• Are new academics introduced to institutional strategies and drivers for ESD as part of their induction process?
• How can ESD positively contribute to your institution's cross-cutting agendas such as equality, diversity and inclusion (EDI), decolonisation, inclusivity and accessibility of the curriculum, civic engagement, widening access and participation? How may explicitly articulated and integrated ESD objectives help strengthen such cross-cutting activities?
• Is an institutional commitment to ESD presented to all new students as part of their induction process?
• Can institutional and localised academic quality and standards committees help academics and course teams in designing ESD into the curriculum?
• How can quality assurance and enhancement staff, and the academic development unit (or similar) at your institution, enable course teams to design ESD into curricula?
• Do you get feedback from students to inform designing ESD into curricula? Is subject-relevant ESD part of student survey questionnaires, module feedback, end-of-course feedback, placement and work experience feedback?
• What approach is/can be taken to evaluate the efficacy of ESD?
• Do academics understand the SD context of their own subject area and associated professional contexts? If not, how can you enable this?
• Are academics encouraged to create opportunities for the sharing of SD ideas, knowledge exchange and experiences across the institution?
• Do academics have the knowledge and skills to facilitate discussion of SD from different disciplines, subjects, places, cultures and generations? If not, how can this be enabled at an institutional level?
• Can academics critique different perspectives on SD dilemmas, issues, tensions and conflicts within their subject area? If not, how can this be enabled at an institutional level?
• Do academics have the knowledge and capacity to include ESD competencies and learning outcomes in developing learning and assessment activities? If not, how can this be enabled at an institutional level?
• Are educators supported to align ESD with enterprising and entrepreneurial behaviours?

ESD competencies

The eight key competencies identified by UNESCO (see Table 1) are designed for all learners of all ages, and therefore need to be contextualised for a higher education setting. Table 2 outlines some indicative learning outcomes, reflecting the knowledge, skills, attributes and values that students might be expected to develop to enable them to be active and reflective citizens and to advance SD.

The outcomes are not prescriptive and alignment with competencies is indicative only. They are not intended as an exhaustive checklist required to meet a competency, but as a guide to inform module or course design or enhancement. Educators are therefore invited to select and modify these outcomes as required to meet the discipline, context, level and credit-rating of the module.
Table 2: Learning outcomes aligned with key competencies for SD

<table>
<thead>
<tr>
<th>Learning outcomes</th>
<th>Knowledge</th>
<th>Skills</th>
<th>Attributes and values</th>
</tr>
</thead>
<tbody>
<tr>
<td>A student with systems thinking competency can:</td>
<td>Describe the relationships between environmental, social and economic systems, at scales from the local to the global level</td>
<td>Recognise and understand relationships</td>
<td>Think systemically, in terms of recognising connections and interactions between factors and understand that actions often have multiple consequences</td>
</tr>
<tr>
<td></td>
<td>Identify the tensions between the 17 SDGs and recognise their interconnections</td>
<td>Analyse complex systems</td>
<td>Deal with uncertainty</td>
</tr>
<tr>
<td></td>
<td>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</td>
<td>Consider how systems are embedded within different domains and scales</td>
<td>Appreciate the root causes of unsustainable development, including environmental, social and economic actions, and the links to cultural considerations</td>
</tr>
<tr>
<td></td>
<td>Identify that positive or negative environmental change may arise from economic growth</td>
<td>Work with interconnectedness and complexity in a systemic context</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Describe how power structures and political systems influence SD</td>
<td>Work with socio-ecological systems</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Have functional knowledge of tipping points, resilience and feedback loops</td>
<td>Assess a problem from different scales and perspectives</td>
<td></td>
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</tbody>
</table>
# Learning outcomes

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Skills</th>
<th>Attributes and values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A student with anticipatory thinking competency can:</strong></td>
<td><strong>Generate and evaluate different models of SD to assess their likely impact, within the context of their own discipline or area of study</strong></td>
<td><strong>Be flexible and resourceful and adapt their problem-solving mindset to fit changing or unforeseen circumstances</strong></td>
</tr>
<tr>
<td>• Identify the risk that system complexity can lead to unexpected, potentially adverse or novel outcomes</td>
<td>• Use historical knowledge and an understanding of the consequences of past actions to envision how futures may be shaped</td>
<td>• Imagine and envision sustainable futures</td>
</tr>
<tr>
<td>• 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</td>
<td>• Understand and evaluate multiple outcomes</td>
<td>• Connect with their heritage and culture when looking to the future</td>
</tr>
<tr>
<td>• Identify the causes and possible solutions to inequity at intragenerational and intergenerational global levels</td>
<td>• Create their own visions for the future</td>
<td>• Apply an awareness of intergenerational fairness to decisions and planning</td>
</tr>
<tr>
<td>• Identify that natural systems have non-negotiable limits and may become unstable or collapse if subjected to excessive pressures or changes</td>
<td>• Apply the precautionary principle</td>
<td></td>
</tr>
<tr>
<td>• Identify risks and uncertainties associated with the transformation of the natural environment</td>
<td>• Assess the consequences of actions</td>
<td></td>
</tr>
<tr>
<td>• 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</td>
<td>• Evaluate risks and their potential impacts</td>
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</tr>
<tr>
<td></td>
<td>• Identify future scenarios and use them to inform decision making</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Use backcasting and forecasting skills in planning strategic activities</td>
<td></td>
</tr>
</tbody>
</table>

- Be flexible and resourceful and adapt their problem-solving mindset to fit changing or unforeseen circumstances
- Imagine and envision sustainable futures
- Connect with their heritage and culture when looking to the future
- Apply an awareness of intergenerational fairness to decisions and planning
<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Skills</th>
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</tr>
</thead>
<tbody>
<tr>
<td>• Identify the wide range of human cultures in existence, and understand both the benefits and the challenges that these cultures present in terms of ESD</td>
<td>• Tackle and negotiate SD conflicts with an awareness of different perspectives and motivations</td>
<td>• Negotiate SD values, principles, goals, and targets, in a context of conflicts of interests and trade-offs, uncertain knowledge and contradictions</td>
</tr>
<tr>
<td>• Demonstrate that both unsustainable and sustainable practices take place in an evolving context, necessitating adaptability in policy and planning responses</td>
<td>• Identify the opportunities to support and develop a progressive and resilient culture that encourages citizens, professions and institutions to put learning into practice</td>
<td>• Understand and reflect on the norms and values that underlie one's actions</td>
</tr>
<tr>
<td>• Identify the interactions between human communities and ecological systems, and be able to assess the potential impacts upon each other</td>
<td>• Debate and explore fairness and justice, including social justice</td>
<td>• Engage with and understand different world views</td>
</tr>
<tr>
<td>• Identify ethical questions and use ethical frameworks</td>
<td></td>
<td>• Appreciate and value different cultural contexts</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Skills</td>
<td>Attributes and values</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
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<td>------------------------------------------------------------</td>
</tr>
<tr>
<td>Identify the root causes of unsustainable development, including environmental, social and economic actions, and the links to cultural considerations</td>
<td>Identify SD strategies to help build consensus, facilitate and mediate progressive discussions among interested parties (stakeholders) to help resolve dilemmas and conflicts</td>
<td>Practise decision-making and analyse consequences</td>
</tr>
<tr>
<td></td>
<td>Develop and implement innovative actions that further SD at the local level and further afield.</td>
<td>Reflect on their actions and behaviours</td>
</tr>
<tr>
<td></td>
<td>Use planning and assessment tools to identify and address challenges and opportunities</td>
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</tr>
<tr>
<td></td>
<td>Implement a plan they have designed</td>
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</tr>
</tbody>
</table>
## Learning outcomes

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<thead>
<tr>
<th>Knowledge</th>
<th>Skills</th>
<th>Attributes and values</th>
</tr>
</thead>
<tbody>
<tr>
<td>A student with collaborative competency can:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Understand the value of collaborating with others offering different</td>
<td>• Engage in interdisciplinary discussion to inform their thinking about</td>
<td>• Learn from others including peers, professionals, expert groups and communities</td>
</tr>
<tr>
<td>knowledge, views and experiences</td>
<td>sustainable futures and seek holistic, creative solutions to problems</td>
<td>• Deal with conflicts in a group</td>
</tr>
<tr>
<td>• Identify the importance of empowering individuals and organisations to</td>
<td>Identify the importance of empowering individuals and organisations</td>
<td>• Facilitate collaborative and participatory problem solving</td>
</tr>
<tr>
<td>work together to create new knowledge</td>
<td>to work together to create new knowledge</td>
<td>• Assist others through peer learning</td>
</tr>
<tr>
<td>• Clearly communicate complex SD issues</td>
<td>Clearly communicate complex SD issues</td>
<td>• Address conflict and develop mediation skills</td>
</tr>
<tr>
<td>• Facilitate and mediate progressive discussions among interested parties</td>
<td>Facilitate and mediate progressive discussions among interested</td>
<td>• Utilise appropriate leadership styles</td>
</tr>
<tr>
<td>(stakeholders) to help resolve dilemmas and conflicts</td>
<td>parties (stakeholders) to help resolve dilemmas and conflicts</td>
<td>• Question norms, practices and opinions</td>
</tr>
<tr>
<td>• Listen actively and critically</td>
<td>• Listen actively and critically</td>
<td>• Understand and respect the needs, perspectives and actions of others</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Empathise with the views and experiences of others</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Collaborate equitably across gender, ethnicity and other groupings</td>
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<tr>
<td>Knowledge</td>
<td>Skills</td>
<td>Attributes and values</td>
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<tr>
<td>--------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>A student with critical thinking competency can:</td>
<td>A student with critical thinking competency can:</td>
<td>A student with critical thinking competency can:</td>
</tr>
<tr>
<td>• Draw upon scientific evidence and scholarly research to develop understanding of the environment and the impact of human activity upon it</td>
<td>• Abstract and present a simplified view of a concept</td>
<td>• Demonstrate the capacity for independent, evidence-based integrated thinking as the foundation for developing their personal ethical code</td>
</tr>
<tr>
<td>• Identify the rationale for encouraging behavioural change where existing practices are shown to have a negative impact on the human and natural environment</td>
<td>• Identify and formulate critical questions and problems</td>
<td>• Evaluate the consequences of their own actions and of collective actions</td>
</tr>
<tr>
<td></td>
<td>• Assess new information and incorporate it into existing models</td>
<td>• Reflect on their own values, perceptions and actions</td>
</tr>
<tr>
<td></td>
<td>• Critically assess and analyse SD issues within the context of their own discipline, area of study or future profession</td>
<td>• Take an evidence-based position in the SD discourse</td>
</tr>
<tr>
<td></td>
<td>• Analyse, synthesise and evaluate data and information and reach well-reasoned conclusions and solutions, testing them against relevant criteria and standards</td>
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</tr>
<tr>
<td></td>
<td>• Recognise and evaluate the implications and consequences of their assumptions</td>
<td></td>
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</tbody>
</table>
Learning outcomes

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Skills</th>
<th>Attributes and values</th>
</tr>
</thead>
<tbody>
<tr>
<td>A student with self-awareness competency can:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Identify and evaluate their own competences and learning needs</td>
<td>• Employ leadership for SD by challenging assumptions and negotiating alternatives to unsustainable current practices, especially within their own discipline or area of study</td>
<td>• Clarify their own views on ways that SD can be achieved in different local and global communities and circumstances</td>
</tr>
<tr>
<td></td>
<td>• Actively implement or contribute to changes that promote SD within the scope of their own learning experience and study environment</td>
<td>• Maintain healthy mental and emotional states and be aware of their mental and emotional health and have the abilities to:</td>
</tr>
<tr>
<td></td>
<td>• Take responsibility for their own learning and skills development</td>
<td>‒ reflect on their own values, perceptions and actions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>‒ reflect on their own role in the local community and (global) society</td>
</tr>
<tr>
<td></td>
<td></td>
<td>‒ continually evaluate and further motivate their actions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>‒ be aware of and engage with their own emotions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>‒ make meaning in the work they do</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Skills</td>
<td>Attributes and values</td>
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<tr>
<td>--------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Describe the potential for their discipline to interconnect with other</td>
<td>Use and apply established frameworks and methodologies for analysing</td>
<td>Utilise appropriate competencies to solve problems</td>
</tr>
<tr>
<td>disciplines or areas of expertise and make creative leaps forward</td>
<td>the impact(s) of a behaviour or process, utilising the skills and</td>
<td>Communicate effectively with others to identify solutions to complex problems</td>
</tr>
<tr>
<td>Describe how aspects of their own discipline or area of study contribute</td>
<td>expertise developed through their own area(s) of study</td>
<td>Listen critically when presented with alternative ideas or frameworks</td>
</tr>
<tr>
<td>to SD</td>
<td>Apply different problem-solving frameworks to complex SD problems</td>
<td>systems of thought</td>
</tr>
<tr>
<td>Identify and respect the different ways of knowing</td>
<td>Develop viable, inclusive and equitable solutions</td>
<td>Work effectively in multi-disciplinary and interdisciplinary groups</td>
</tr>
<tr>
<td>Understands the academic norms of a discipline and explore disciplinary</td>
<td>Effectively engage with real-life problems relevant to SD</td>
<td>Value academic norms and epistemology from different disciplines</td>
</tr>
<tr>
<td>integrity</td>
<td>Combine different sources and types of evidence, drawing from different</td>
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</tr>
<tr>
<td></td>
<td>disciplines to view and address a problem</td>
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</table>
Approaches to teaching, learning and assessment in ESD

Curriculum design and delivery for the sustainability competencies outlined in Table 2 requires a positive learning environment that can be fostered via the following approaches:

- teaching, learning and assessment activities that are linked to real-world issues
- divergent views that can be shared and explored safely
- opportunities for critical reflection on students' own perspectives and what has influenced their thinking and practices in this area
- democratic and participatory learning approaches that are modelled to provide meaningful engagement with mentors and peers
- a recognition of emergent ideas on decolonising the curriculum and different paradigms of knowledge that are critiqued within a culturally appropriate context
- space for alternative ways of thinking that are practiced and developed
- teaching, learning and assessment activities that are inclusive and accessible for all.

Teaching and assessment practices that are particularly effective in the development of sustainability competencies address real-world problems and issues. They use authentic artefacts, or triggers, and incorporate interactive learning approaches that encourage students to engage with ideas and the subject material across disciplines, communities and nations. Triggers for thinking can come from (but are not limited to):

- news articles
- case studies
- social media including YouTube videos, tweets, Instagram images
- open educational resources including MOOCs
- art including paintings, music, poetry, sculpture and dance
- 3D printed models of landscapes
- immersive virtual reality experiences
- augmented reality
- public data sets
- drone footage.

Appropriate triggers explored via active teaching practices, such as those outlined in Table 3 below, can raise sustainability issues and provide the environment for students to develop their SD competencies. These competencies can be evidenced through the curriculum and extracurricular and co-curricular activities, through an assessed or less formal approach. The developmental nature of competencies benefits from formative assessment and placing a focus on the process rather than the outcome of learning. The conceptualisation of assessment as both 'for' and 'as' learning is useful in this respect.

Authentic assessment instruments such as blogs, vlogs, websites and wikis engage students and provide a way for them to showcase their learning and share it with interested stakeholders. Table 3 includes illustrative examples of how triggers can be used in combination with teaching approaches to develop sustainability competencies. Educators are encouraged to think creatively about a wide range of teaching, learning and assessment practices and triggers as appropriate to the subject.
## Table 3: Teaching practices and illustrative examples applicable to develop key competencies for SD

<table>
<thead>
<tr>
<th>Teaching practice</th>
<th>Definition</th>
<th>Illustrative examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Collaborative learning</strong></td>
<td>A method of learning that is often self-organised and occurs outside of the formal learning environment.</td>
<td>An interdisciplinary, international project to create dementia friendly communities. TEDI-London Summer School: Dementia friendly communities. Design projects around global challenges or SDGs to encourage learning between disciplines and year groups, and other communities outside of the institution. Vertically Integrated Projects</td>
</tr>
<tr>
<td></td>
<td>Collaborative learning takes place offline in small groups or online via social networks utilising social media and other collaboration tools. The needs of the group are determined by the needs of the individuals that constitute it and not by an externally imposed goal. The crowdsourcing of ideas is one example of collaborative learning in which individuals request input into a project or thought piece through their personal learning networks. Collaborative learning is a social process in which knowledge and meaning is co-constructed and can lead to creativity and open innovation.</td>
<td></td>
</tr>
<tr>
<td><strong>Enquiry-based learning</strong></td>
<td>An approach based on self-directed enquiry or investigation in which the student is actively engaged in the process of enquiry facilitated by a teacher</td>
<td>The Enhancing Fieldwork Learning project demonstrates the use of affordable, ubiquitous technologies such as iPads, digital cameras with social networks and apps to enhance learning and engagement in the field, to maximise the learning experience for all students at all stages of the fieldwork. <a href="https://enhancingfieldwork.org.uk/resources">https://enhancingfieldwork.org.uk/resources</a></td>
</tr>
<tr>
<td></td>
<td>Enquiry-based learning uses real-life scenarios and students investigate topics of relevance that foster the skills of experimental design, data collection, critical analysis and problem solving.</td>
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</tr>
<tr>
<td>Teaching practice</td>
<td>Definition</td>
<td>Illustrative examples</td>
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</tr>
<tr>
<td><strong>Games-based learning</strong></td>
<td>The integration of games or game mechanics into learning experiences to increase engagement and motivation. Games which are goal-oriented, have strong social components and replicate real-world experience are effective learning tools. Gamification refers to the use of a pedagogical system that was developed within gaming design but which is implemented within a non-game context.</td>
<td>Phylo is an ecosystem building game where players try and build food chains to create a stable ecosystem while disrupting their opponents. <a href="http://www.labnews.co.uk/article/2030239/game-theory-phylo">www.labnews.co.uk/article/2030239/game-theory-phylo</a> The Sustainable Strategies Game aims to stimulate collaborative engagement in business strategy making that promotes sustainability literacy skills, the adoption of sustainable practices, and the sustainable use of common resources. <a href="http://www.labnews.co.uk/article/2030239/game-theory-phylo">Sustainability Strategies Games</a></td>
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<td><strong>Learning through storytelling</strong></td>
<td>A process in which learning is structured around a narrative or story as a means of sense-making. There are a variety of approaches to learning through storytelling including: • narrative pedagogy, which encourages teachers and students to share stories and interpret experiences • narrative-centred learning environments, which situate learners within a story-world (sometimes using virtual or augmented reality) in which they participate in an unfolding story.</td>
<td>Students use digital storytelling to integrate ideas from across their studies and build their digital and professional identities. <a href="http://lti.lse.ac.uk/students-as-producers-lse/">http://lti.lse.ac.uk/students-as-producers-lse/</a></td>
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<tr>
<td>Teaching practice</td>
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<td><strong>Problem-based learning (PBL)</strong></td>
<td>A style of active learning, PBL refers to learning opportunities that use real-world issues or problems to increase knowledge and understanding. Students work together in small groups typically facilitated by teachers. PBL is a student-centred approach and, at each step of the learning process, the students must decide what they know or can do already and what they need to know or learn how to do in order to continue. They then have to find that knowledge or learn a skill and incorporate this into their developing framework of understanding and competency. This approach is appropriate for interdisciplinary and interprofessional learning, and to support students in problem identification, and envisioning and evaluating alternative outcomes. Problem-based learning is particularly suited to complex, multi-faceted issues ('wicked problems') which are not amenable to simple problem-solving.</td>
<td>Engineering for People design challenge from Engineers Without Borders: A design challenge that can be integrated into undergraduate courses which allows students to explore the ethical, environmental, social and cultural aspects of engineering design. <a href="http://www.ewb-uk.org/the-work/design-challenges/engineering-for-people-design-challenge">www.ewb-uk.org/the-work/design-challenges/engineering-for-people-design-challenge</a></td>
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<td><strong>Simulation</strong></td>
<td>Simulations of real-life situations through role plays, debating, mock trials and gaming, encourage students to develop their thinking around SD issues and can contribute to the formation of students' own attitudes and the social norms that they find acceptable. They can be used across a range of disciplinary and interdisciplinary contexts to help students develop appropriate professional behaviours.</td>
<td>The use of a simulation game to teach disease epidemics and pandemics. <a href="https://europepmc.org/backend/ptpmcrender.fcgi?accid=PMC5967445&amp;blobtype=pdf">https://europepmc.org/backend/ptpmcrender.fcgi?accid=PMC5967445&amp;blobtype=pdf</a></td>
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Section 4: Annotated references and resources

This section outlines key references and resources within ESD. It will be useful for those who wish to delve further into the subject area, track some of the historical development of ESD and gain a fuller understanding of its approaches and potential for impact.

Please note that all weblinks were last accessed on 4 December 2020.

ESD international policy and strategy frameworks

UNESCO

https://unesdoc.unesco.org/ark:/48223/pf0000373718
The 2020 GEM Report assesses progress towards Sustainable Development Goal 4 (SDG 4) on quality education and its 10 targets, as well as related education targets in the SDG agenda. The Report also addresses inclusion in education, drawing attention to all those excluded from education, because of background or ability.

https://unesdoc.unesco.org/ark:/48223/pf0000247444
The UNESCO document is the key publication supporting the Education 2030 Agenda. It frames ESD with reference to the delivery of the UN SDGs while exploring learning objectives in relation to the SDGs, and the integration of ESD principles in curricula.

https://unesdoc.unesco.org/ark:/48223/pf0000190898
Output developed by UNESCO linked to the Decade of Education for Sustainable Development (DESD), to assist reorientation of education at school level and relevant to all tertiary education. Prepared by recognised global ESD experts, piloted in three of five UNESCO regions (Africa, Asia, Latin America and Caribbean) to include regional and country views. Coverage includes overview of ESD principles and how this relates to mainstream education goals, reviewing ESD practice and policy, quality assessments and learning outcomes in ESD.

Global Education Monitoring Report (2016)
Key report monitoring the state of education and need for educational reform to deliver the SDGs and 2030 Agenda for Sustainable Development. Links sustainability, education and development agendas. The report cites 2015 Incheon Declaration for Education 2030 while communicating the urgency of SD issues in relation to education systems.

https://unesdoc.unesco.org/ark:/48223/pf0000230171
Closing report on the UN Decade of ESD, points to leadership challenges in embedding ESD in higher education as well as the need for staff development, capacity-building and institutional networks. Developed by the Decade of ESD monitoring and evaluation expert group, supported by commissioned papers from various global experts in ESD and sustainable development.
Overview of the International Frameworks on Education for Sustainable Development (PowerPoint presentation)
https://unfccc.int/sites/default/files/resource/2%20UNESCO.pdf
Provides an overview of ESD frameworks in the context of the United Nations Framework Convention on Climate Change (UNFCCC), the Paris Agreement, the UNESCO 2030 Sustainable Development Agenda and the UNESCO Global Action Programme on Education for Sustainable Development.

Framework for the Implementation of Education for Sustainable Development (ESD) beyond 2019
https://unesdoc.unesco.org/ark:/48223/pf0000370215
The proposal for a new framework for Education for Sustainable Development (ESD) beyond 2019 and the comments and observations of the Executive Board.

Education for Sustainable Development: An Expert Review of Processes and Learning (Tilbury, D, 2011)
https://unesdoc.unesco.org/ark:/48223/pf0000191442
This review provides advice on the choice of tools for ESD. It explores the alignment of commonly accepted learning processes with ESD, while also considering the contribution of ESD and related learning opportunities to sustainable development.

What is Education for Sustainable Development? (2019)
https://en.unesco.org/themes/education-sustainable-development/what-is-esd
Provides a short description of ESD and a link to information on the UN Decade of ESD, the Global Action Programme (GAP) on ESD and the GAP commitments.

Rethinking Education - Towards a global common good? (2015)
https://unevoc.unesco.org/e-forum/RethinkingEducation.pdf
This publication contributes to rethinking education and learning in the context of a rapidly changing world facing significant environmental challenges. It seeks to stimulate public policy debate and calls for dialogue among all stakeholders. It is inspired by a 'humanistic vision of education and development, based on respect for life and human dignity, equal rights, social justice, cultural diversity, international solidarity, and shared responsibility for a sustainable future'.

Education for Sustainable Development - A roadmap (2020)
https://unesdoc.unesco.org/ark:/48223/pf0000374802
This roadmap sets out the next stage of UNESCO action on ESD following completion of the Global Action Programme (GAP) (2015-2019). Identifies five priority action areas for delivering ESD's key role in achieving the 17 SDGs and the individual and societal transformation required to address the urgent sustainability challenges. Contains a link to a toolkit with resources to support implementation within the five priority areas of Advancing Policy, Transforming Learning Environments, Building Capacities of Educators, Empowering and Mobilising Youth, and Accelerating Local Level Actions.

ESD for 2030 - Toolbox
Non-UNESCO resources

**Accelerating Education for the SDGs in Universities: A guide for universities, colleges, and tertiary and higher education institutions** (Sustainable Development Solutions Network (SDSN), 2020)

The Sustainable Development Solutions Network (SDSN) promotes integrated approaches to implement the SDGs and the Paris Agreement on Climate Change, through education, research, policy analysis, and global cooperation. This publication aims to help universities, colleges, and tertiary and higher education providers implement and mainstream 'Education for the SDGs' within their institutions.

**Truly Civic: Strengthening the connection between universities and their places**

The final report of the UPP Foundation Civic University Commission, highlighting the potential contribution providers can make in the local economic, social, cultural and environmental wellbeing of the places in which they are located.

**Consultation on Further and Higher Education and the Sustainable Development Goals (2018)**

A report on a consultation event in January 2018 to explore tertiary education students’ capacities to address real-world local and global challenges, within the context of the UN Sustainable Development Goals (SDGs).

**Making the green recovery work for jobs, income and growth** (Organisation for Economic Co-Operation and Development (OECD), 2020)

This policy brief focuses on how countries can create opportunities for a green and inclusive economic recovery from the COVID-19 pandemic that will significantly enhance the resilience of economies and societies in the face of both the severe recession and accelerating environmental challenges.

**UK policy frameworks with reference to ESD**

**Implementing the Sustainable Development Goals (UK Cabinet Office and Department for International Development, 2019)**

This website highlights some of the ways that the Government is supporting the delivery of the Sustainable Development Goals.

**UK’s Voluntary National Review of the Sustainable Development Goals (Department for International Development, 2019)**

UK’s first Voluntary National Review taking stock of progress towards the Sustainable Development Goals.
Well-being of Future Generations (Wales) Act 2015
Welsh Policy on Education for Sustainable Development is guided by this Act.

Learning for Sustainability (Education Scotland, 2016)
Learning for Sustainability is a cross-curricular approach to creating coherent, rewarding and transformative learning experiences in Scotland. Written in 2016 but also links to the Scottish Vision 2030+ Action Plan (2019).

The Educational Outcomes of Learning for Sustainability: A Brief Review of Literature (Christie, E, Higgins, P, 2020)
www.gov.scot/publications/educational-outcomes-learning-sustainability-brief-review-literature/pages/1
A Report for the Scottish Government Learning Directorate examining educational outcomes of Learning for Sustainability (LfS) to inform research and policy development in Scotland.

Open education resources
Several open access courses are available to support the development of sustainable development in various contexts including:

Systems Thinking for Sustainability (FutureLearn)
www.futurelearn.com/courses/systems-thinking-for-sustainability
Futures Thinking (Coursera)
www.coursera.org/specializations/futures-thinking
TED talks can provide an insight into complex issues and act as a trigger or stimulation for classroom debate. For example:

Johan Rockström: Let the environment guide our development
www.ted.com/talks/johan_rockstrom_let_the_environment_guide_our_development?utm_campaign=tedspread&utm_medium=referral&utm_source=tedcomshare
Human growth has strained the earth's resources, but as Rockström reminds us, our advances also give us the science to recognise this and change behaviour. Rockström and colleagues introduced the concept of the nine 'planetary boundaries' that can guide us in protecting the planet's many overlapping ecosystems.

Kate Raworth: A healthy economy should be designed to thrive, not grow
www.ted.com/talks/kate_raworth_a_healthy_economy_should_be_designed_to_thrive_not_grow
What would a sustainable, universally-beneficial economy look like? 'Like a doughnut', says Oxford economist Kate Raworth. In this TED talk she explains how we can move countries out of the hole - where people are falling short on life's essentials - and create regenerative, distributive economies that work within the planet's ecological limits.
Student perspectives on ESD and higher education experience

**Sustainability Skills Annual Survey**

A selection of reports published by Students Organising for Sustainability (SOS-UK) that provide the current key evidence of student interest in ESD across UK higher education sector.

**From Art to Zoo Management: embedding sustainability in UK higher and further education (2017)**

This guide has been developed by the Department for Sustainability at the NUS to showcase best practice in the incorporation of sustainability in UK further and higher education courses.

**Employers, enterprise and ESD**

**Enterprise and Entrepreneurship Education: Guidance for UK Higher Education Providers (QAA, 2018)**

This guidance is intended to inform, enhance and promote the development of Enterprise and Entrepreneurship Education across UK higher education. This guidance is not specific to any degree course, subject specialism or level of study. It aims to help academics, educators and practitioners who are seeking to embed enterprise and entrepreneurship across the curriculum and beyond.

**Framework for Enterprise and Entrepreneurship Education (Advance HE, 2019)**
www.advance-he.ac.uk/knowledge-hub/framework-enterprise-and-entrepreneurship-education

Developed in partnership with EEUK, IOEE, ISBE, SFEDI and QAA, the Enterprise and Entrepreneurship Education Framework focuses on the ways in which enterprise and entrepreneurship education can add value to the curriculum.

**QAA Scotland: Enterprise and Entrepreneurship Development Project (QAA, 2017)**
www.qaa.ac.uk/scotland/development-projects/enterprise-and-entrepreneurship-development

This project aimed to support the sector in embedding enterprise and entrepreneurship education within the curriculum. As part of this project, QAA Scotland ran a sector-wide event to encourage the sharing of good practice, produced a webinar series exploring the challenges and successes experienced by higher education institutions across the UK and abroad, and developed a series of case studies outlining progress across higher education providers in Scotland.

**ESD curriculum design tools, frameworks and models**

**The SDG Academy**
www.unsdn.org/sdg-academy

The SDG Academy provides educational content on critical sustainability issues, including free online courses and the SDG Academy Library.
Future Fit Framework: An introductory guide to teaching and learning for sustainability in higher education institutions
www.advance-he.ac.uk/knowledge-hub/future-fit-framework
Practical ESD guidance from Advance HE for academics and curriculum developers, covering module level to wider course design.

Sustainable Development Toolkit: Tutor Resource and Student Activity Series
A series of lesson plans published by Advance HE to help introduce ESD into any course including outlining the intended learning outcomes of each session providing important guidance and support on how to successfully integrate sustainable development into teaching practice.

ESD and professional competencies

Learning for the future: Competences in education for sustainable development (United Nations Economic Commission for Europe (UNECE), 2012)
Competence framework developed by an intergovernmental expert group including ESD expertise from several European countries. Frames sustainable development in terms of competences for educators, using the Delors' principles for 21C education. Associated publication with workshop tools for use in the implementation of the competence framework.

Online Platform of Resources and Leading Practice Publication (University Educators for Sustainable Development, 2016)
www.platform.ue4sd.eu/downloads/UE4SD_Leading_Practice_Publication.pdf
Two online resources that contain best practices from universities across Europe, of training and capacity building courses for academics to deliver ESD in all disciplines, aligned to the UNECE ESD competence framework. Funded by the European Union Lifelong Learning Programme (EU LLP)

ESD in quality assurance and enhancement

Guide to quality and education for sustainability in higher education
http://efsandquality.glos.ac.uk
Resource developed through a Higher Education Funding Council for England (HEFCE) funded project to build ESD capacity through quality assurance and enhancement.

Sustainable Development and Quality Assurance in Higher Education (Fadeeva, Z, Galkute, L, Mader, C and Scott, G (Eds), 2014)
Edited volume with chapters from a range of international ESD specialists experienced in ESD policy and practice, provides case studies of practice in aligning ESD frameworks and quality systems from different countries.
External support and inspiration

*SOS Responsible Futures programme*
https://sustainability.nus.org.uk/responsible-futures/about
SOS have developed an externally assessed accreditation mark to assist all institutions in helping students to gain the skills and experience they need to thrive as global citizens. SOS actively support partnerships between students’ representative groups and institutions through a structured framework of criteria to encourage action on embedding social responsibility and sustainability into formal and informal learning.

*Higher Education Academy Green Academy Programme*
www.advance-he.ac.uk/knowledge-hub/strategy-implementation-second-evaluation-green-academy-programme
The Higher Education Academy’s (HEA) first Green Academy change programme was launched in 2011 to help higher education providers to embed education for sustainable development (ESD) through a cross-institutional partnership approach. This is the second evaluation report.

*SDG Accord*
www.sdgaccord.org
The SDG Accord was launched in September 2017 as a collective response to the Sustainable Development Goals (SDGs) from the world’s universities and colleges. The Accord asks signatories to make a commitment to embed the SDGs into their education, research, leadership, operations, administration and engagement activities.

*UK and Ireland Green Gown Awards*
www.greengownawards.org/green-gown-awards-uk-ireland
The Green Gown Awards recognise the exceptional sustainability initiatives being undertaken by universities and colleges. The Awards have become established as the most prestigious recognition of best sustainability practice within the further and higher education sector.

*International Green Gown Awards*
www.greengownawards.org/international-green-gown-awards
The International Green Gown Awards also provide a source of inspiration and a range of resources.

*United Nations Environment Programme Greening Universities Toolkit V2.0*
Transforming Universities into Green and Sustainable Campuses
The focus of this Toolkit is to provide university staff and students with a selection of strategies, tools and resources intended to inspire, encourage and support universities to develop and implement their own transformative strategies for establishing green, resource-efficient and low carbon campuses.
### Annex: Development Group

Details of the Advisory Group members who produced this guidance are given below:

<table>
<thead>
<tr>
<th>Name</th>
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<th>Institution</th>
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