

Education for Sustainable Development Guidance

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Chairs' foreword

This guidance is intended to assist staff in UK higher education providers (HEPs) seeking to incorporate Education for Sustainable Development (ESD) within their curricula. It represents a major 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 believe that every HEP should adopt the guidance and embed ESD across the curriculum. If we as educators are serious about preparing our students for the future, we must embrace ESD and ensure that every graduate has not only the knowledge and skills but the attributes that will enable them at least to cope and ideally thrive in the face of the multiple challenges they will face across their life course in the 21st century. Chief among these challenges is the interlinked climate and ecological emergency that will bring profound changes to many of the things we currently take for granted. Students with an ESD knowledge will know that the social and economic domains of sustainability depend upon the environment for which there are limits. Social and economic ambitions are constrained by these planetary limits.

We exhort vice-chancellors and principals to support and enable its implementation. Your current and future students expect nothing less of you.

This guidance was planned prior to the global COVID-19 pandemic and executed across the depth of the crisis in 2020 and early 2021. The pandemic resulted in a diverse range of interrelated impacts that spread across all aspects of the higher education sector and is inextricably linked to the sustainable development challenge as we seek a collective solution. We note and applaud the way HEPs rapidly adapted their teaching, assessment and student support to meet the challenges of the pandemic. This provides a valuable precedent which shows that urgent action to address the climate and ecological emergencies across curricula is possible with sufficient innovation, resource and leadership. ESD provides many of the tools that HEPs and students needed to confront these enormous challenges.

We would like 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 (QAA) 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 Catherine 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, business and student communities 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 from 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 HEPs working with students and staff to foster their knowledge, understanding and skills in the area of sustainable development (SD). 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 facilitating ESD as central to curricula framework.

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 Annex) 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

Definition of terms

4IR Technology	A short-hand term for a range of technologies that support cyber-physical interactions including artificial intelligence (AI), robotics, 3D printing, virtual and augmented reality (VR and AR), nanotechnology, cloud computing, big and open data sets, and the Internet of Things (IOT)
Critical pedagogy	Critical pedagogy focuses on issues of inequality, promoting a questioning of dominant power structures and assumptions within society.
EDI	Equality, Diversity and Inclusion
ESD	Education for Sustainable Development is the process of creating curricula, including subject-relevant content and pedagogy to support sustainable development. Please see page 8 for further exploration of this term.
HEAR	The Higher Education Achievement Report is an electronic document produced by a higher education provider that records a student's achievement during their period of study.
LOs	Learning Outcomes: what a learner is expected to know, understand and/or be able to demonstrate after completing a process of learning.
NUS	The National Union of Students is a member led organisation representing higher and further education students in the UK
OECD	The Organisation for Economic Cooperation and Development , an intergovernmental economic organisation with 37 member countries, founded in 1961 to stimulate economic progress and world trade.
PAGE	Partnership for Action on Green Economy , launched in 2013, brings together five UN agencies to coordinate UN action on green economy and assist countries in achieving and monitoring the Sustainable Development Goals
PDP	Professional Development Planning
Precautionary principle	A broad approach to innovations with potential for causing harm when extensive scientific knowledge on the matter is lacking, emphasising caution, pausing and review
PSRBs	Professional, Statutory and Regulatory Bodies
SD	Sustainable Development is an aspirational ongoing process of addressing social, environmental and economic concerns to create a better world. Please see page 8 for a fuller exploration of this term.
SDGs	The United Nations Sustainable Development Goals , 17 global goals published in 2015 for all countries and sectors to work in partnership to address key SD challenges by 2030.

SOS-UK	Students Organising for Sustainability is an NUS educational charity that 'supports students to learn, act and lead for sustainability' (SOS, 2021).
Synoptic assessment	Synoptic assessment is an approach which evaluates the learner's ability to make connections across different components (for example, units or modules) of their programme of study. The interconnected nature of this approach makes it appropriate for the teaching of ESD.
System complexity/ complex systems	A complex system is a system composed of many components which may interact with each other, for example Earth's global climate, organisms, the human brain, power grids, and cities.
Transformative Learning	Transformative learning goes beyond acquisition of skills and knowledge, to support learners in critiquing how knowledge is acquired and communicated. This can lead to changes in thinking, perceptions, beliefs and values which can transform how the learner interprets the world around them.
UNESCO	The United Nations Educational, Scientific and Cultural Organisation , a specialised agency of the UN aimed at promoting world peace and security through international cooperation in education, the sciences, and culture.
Wicked problem	A problem or policy issue that is difficult to solve because of multiple, incomplete, intractable, contradictory, contested and/or changing requirements that are difficult to recognise, often without a single solution

Setting the context

This is the second edition of the QAA/Advance HE Education for Sustainable Development Guidance, the first having been published in 2014. The guidance is intended to be of practical help to higher education providers (HEPs) working with students and staff to foster their knowledge, understanding and skills in the area of sustainable development (SD). 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 facilitated as central to curricula and part of a whole-institution approach to Sustainable Development (SD).

Set against the backdrop of the adoption of the [United Nations Sustainable Development Goals \(2015-30\)](#) (SDGs) in 2015, the guidance has been updated to reflect changes in understanding about, and priorities in, 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 global climate change, local and global biodiversity loss, depletion of natural resources, deforestation, air quality, access to water, hunger, gender equality, and widening inequalities of wealth, health and wellbeing. These are just some examples of key issues that pose existential threats to humanity and require wider and urgent attention in our curricula.

Since the 2014 ESD guidance was published, there have been many changes within the SD space both globally and nationally. In 2015 we saw not only the introduction of the SDGs, but also the adoption of the [United Nations Framework Convention on Climate Change Paris Agreement](#) which **committed the international community to limit global warming to preferably 1.5 degrees Celsius above pre-industrial levels - a challenge that cannot be met without education and research at the heart of solutions.** In 2019, UNESCO recognised the importance of ESD in meeting 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'.

The international crisis of the COVID-19 pandemic changed the political landscape beyond recognition, with many calls to take the opportunity for a SD-led 'green' recovery to build a better world. Recovery from COVID-19 has become central to this area as demonstrated by the integration within the [United Nations Decade of Action to deliver the Global Goals \(2020-30\)](#).

In response to the increasing urgency around SD, and especially climate change and the ecological emergency, the UK Government has set a range of policy and legislation goals. [A Green Future](#), the 25-year plan to improve the environment was published in 2018. This was followed in 2019 by the UK Government declaring [a Climate Emergency](#) and the passing of legislation for UK net-zero Greenhouse Gas emissions by 2050. The COVID-19 crisis led to the introduction of plans for a SD-focused recovery plan in the 2020 - [Ten Point Plan for a Green Industrial Revolution](#) - setting out the approach government will take to support green jobs, and accelerate our path to net zero.

There is considerable 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 2014](#); while 83% would like to see SD actively incorporated and promoted across all courses - up from 71% in 2014.

The workplace is also changing, with graduates less likely to secure ‘jobs for life’ but instead finding themselves navigating portfolio careers or establishing their own enterprises as their careers progress. This type of working demands key competencies and attributes that readily align to ESD, for example creativity, innovation and adaptability. The demands of micro-businesses and start-ups, who rely on innovative developments, are increasingly related to sustainable enterprise and green credentials. As larger employers adapt, they too work towards sustainable innovation.

Society is facing a future that looks entirely different to that which has gone before, and this must be reflected in the organisation and delivery of higher education. The education sector has a key role to play in ensuring its graduates are ready for the environmental, economic and social challenges the world faces. ESD and the competencies and skills on which it rests will play a crucial part in achieving this aim.

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.¹ 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 and enabling staff to engage with the ideas presented in this guidance. It may also prove useful to staff responsible for extracurricular activities.

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 Themes](#). It can also be used as an advocacy document for those wishing to support or progress an ESD agenda in their institution. It provides a point of reference which is designed to help providers in meeting the relevant expectations and practices of the Quality Code but it does not form an explicit part of it.²

QAA has reviewed the process for updating Subject Benchmark Statements and is committed to ensuring the Statements reflect developments and agendas from the higher education sector. Future revised Statements will include sections on how subject communities frame sustainable development in their teaching and assessment models.

Further support and resources

It is recognised that HEPs will be at different stages on the ESD journey. In addition to this guidance, both QAA and Advance HE will run associated workshops, training and webinars, as well as producing further supporting materials to help staff at all levels within a HEP to get started with, and progress, ESD. Resources can be accessed via the [QAA website](#) and [Advance HE website](#).

¹ We refer to courses throughout this guidance but are mindful that in some institutions these may be referred to as programmes.

² 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 ESD and how both SD and ESD are interpreted and defined for the purposes of this guidance. It discusses that ESD is education for and about a sustainable future, through the development of relevant skills, knowledge and competencies, before offering a rationale for it taking prominence across curricula. The introduction of the UN SDGs in 2015 is discussed and presented as the contemporary policy framing for SD when focusing on designing ESD into curricula.

Section 2 discusses how to get started with ESD. It recognises the importance of strategic, institution-level commitment and support when looking to progress ESD, and how ESD can frame and reinforce other institutional objectives. It highlights key players that can help inform the framing and design of ESD across curricula and offers guidance for their contribution and support.

Section 3 focuses on teaching, learning and assessment approaches for ESD. It introduces the key competencies for sustainability, course and module learning outcomes for ESD and guidance about developing learning environments to support ESD. This section can be used alongside the Quality Code's Advice and Guidance on [course design and development](#), to help academics in a practical and applied way.

Section 4 offers an annotated reference and resources list. It 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.



Introducing Education for Sustainable Development

What is Education for Sustainable Development?

Within academic communities there are debates regarding the concept of ‘sustainability’, and the definition of the terms ‘sustainable development’ and ‘education for sustainable development’. This guidance does not contribute to these discussions or the content and application of the [United Nations Sustainable Development Goals 2015–30](#) (SDGs), which are themselves a focus for argument and discussion. Instead, we argue that the aims of the 17 SDGs and what they seek to achieve are necessary for a positive future for life on earth.

For the purpose of this guidance, we refer to the two key terms as follows:

- **Sustainable Development** – an aspirational ongoing process of addressing social, environmental and economic concerns to create a better world.
- **Education for Sustainable Development** – the process of creating curriculum structures and subject-relevant content to support and enact sustainable development.

The United Nations Educational, Scientific and Cultural Organisation (UNESCO) definition of ESD also informs the focus of this guidance:

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

It is important to note that ESD, is not solely about environmental issues as is commonly misconstrued, but focuses on the connections between economic, social and environmental factors. ESD is an educational change agenda grounded in transformative learning and critical pedagogy. 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 and equips us to deliver that vision.

ESD develops competencies, that is, skills, attributes and values, and how they link to subject knowledge and knowledge of SD. ESD supports learners across all academic disciplines and subject areas to create and pursue visions of a better world. A world that recognises the interdependence of environmental integrity, social justice and economic prosperity, while acknowledging that environmental resources are finite and provide the foundation for our society and economy.

The role of higher education in creating a sustainable future

The most significant impact ESD will have is in supporting the knowledge, skills and competencies that students and staff develop to contribute to a more sustainable future. This can only be achieved by HEPs embracing ESD as part of a whole-institution approach to SD that demonstrates leadership in challenging convention and being the change they want to see.

In this respect ESD is about:

1

Supporting students and staff to develop the knowledge, competencies and ability to pursue sustainable visions of the future.

2

Supporting students and staff to appreciate the complexity of our world, the 'wicked problems' that continuously emerge, and how they can personally and professionally contribute to positive change.

3

Challenging, supporting and enabling students and staff to co-design solutions and drive change for sustainability.

Pursuing ESD is not only an academic activity and providers will need to reflect on their commitment to SD across the whole institution and the changes that may be required to fully integrate sustainable practice and development. ESD can serve as a means of uniting research and teaching across an institution (where applicable). It can also facilitate a culture of co-design and collaboration between individuals, groups and organisations across the public, private and third sectors, to tackle SD challenges. These activities can help providers work with communities and positively position their institution as a central driver of SD, if this is not the case already.

Transforming curricula is not a simple task and takes real commitment from an institution to do so. Sometimes, knowing where to start the process is difficult and can seem overwhelming. We suggest that the SDGs may offer a useful entry into ESD, while recognising this is not the only approach. Before we discuss how SDGs can help frame ESD, we will first offer an outline of them.

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 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. The 17 goals are underpinned by [169 targets and 232 unique indicators](#). We recommend that the 17 SDGs be considered as a system, where action on one goal can have positive or negative impacts on one or more of the other goals. Recognising and balancing these negative and positive feedbacks is an important part of SD.



Figure 1: UN Sustainable Development Goals

The SDGs provide a useful starting point for staff and students interested in including SD content and challenges in modules, courses and practice. The breadth of the SDGs and the depth of the targets within each goal means that they can resonate with all academic disciplines and subject areas.

Example from Practice: Framing ESD and the SDGs across media production courses

Bournemouth University is linking its media production courses with the SDGs to ensure [sustainable media production within the Faculty of Media and Communication](#).

While individual goals represent an entry point into disciplinary consideration, it is important that educators **consider the impacts of action on one goal on the other goals**. Responsible Consumption and Production (Goal 12) can influence any programme of study (due to its relevance to the life of all students), and graduate employment clearly relates to Decent Work and Economic Growth (Goal 8). Industry Innovation and Infrastructure (Goal 9) is easily aligned with Sustainable Cities and Communities (Goal 11) and will be applicable to a wealth of subject areas, with Good Health and Well-being (Goal 3) easily aligning to sports, physical activity, psychology, medicine, and professions allied to medicine. Climate Action (Goal 13) transverses across all disciplines due to its impact on all aspects of our lives and requires an interdisciplinary approach.

While these are just examples, they are indicative as to how academics can use the SDGs to engage and take action for ESD. Where an individual goal is used, it should be referenced back to the full set of goals and any positive or negative impacts on other goals identified.

Quality Education (Goal 4), and in particular [target 4.7](#), is particularly instructive for this guidance:



Target
4.7

By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development

SDG4 represents a key mechanism for achieving all of the SDG goals. The importance of ESD in achieving this is reinforced through the UNESCO global framework, [Education for Sustainable Development: Towards achieving the Sustainable Development Goals](#), also referred to as 'ESD for 2030'.

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 staff and students: www.un.org/sustainabledevelopment and <https://sdgs.un.org>.



Getting started with Education for Sustainable Development

Strategic, institution-level commitment

The importance of strategic institution-level commitment and support when looking to progress ESD cannot be underestimated. It is important that HEPs ‘walk the talk’ and explore how fully engaged they are with SD. For example, examining the actions that estates/facilities management teams, students, academics and all departments are taking to ensure the sustainability of the organisation, reducing harmful social and environmental impacts, and contributing to local economies.

Guidance

ESD is best achieved when:

1. ESD objectives, targets and KPIs are part of the institution’s strategic priorities and subsequent strategies and policies.
2. The framing of ESD within the curriculum is included in the validation of new courses and ongoing review of existing courses.
3. ESD is central to the staff and student induction process, as well as staff appraisal and/or promotion criteria.
4. ESD is articulated within quality assurance and enhancement processes.
5. Staff development to enable ESD is fully supported at an institutional level.



The [Green Gown Awards](#) recognise the exceptional sustainability initiatives being undertaken by HEPs across the world, how HEPs are leading the way with their commitment to the global sustainability agenda and proving the value they bring to the economy and society.

ESD as curriculum framing

How ESD is framed across curricula will depend on the context of the activity and the commitment from the institution. Further guidance for the application of an holistic approach to ESD can be found in the Advance HE publication, [The Future Fit Framework \(2012\)](#).

There is an opportunity for ESD to **reinforce other institutional objectives** such as internationalisation and developing global perspectives; decolonising learning; promoting interdisciplinary and transdisciplinary learning; promoting employability and enterprise, and civic engagement; and championing equality, diversity and inclusion. In this respect, **ESD offers an opportunity to frame curricula**, harmonise such activities and provide the context in which all of these institutional priorities can find expression.



Figure 2: ESD intersections across strategic priorities for student success

The process of framing ESD within the curriculum is not a linear one. Instead, it requires ongoing and cyclical reflection and evaluation to consider what has and has not worked well, what can be improved, and how staff and students can continuously evidence the place and importance of ESD. Some HEPs may choose to start with a mapping exercise that examines where ESD already occurs and where it needs strengthening. However, it is important that the process of mapping does not become the focus and that energies are directed towards the outcomes wanting to be achieved.

How the curriculum is designed and delivered in response to ESD concerns may differ according to the subject area, professional focus and pedagogical approach of the discipline. That said, ESD can be used to motivate staff and students to go beyond a focus on their own discipline/subject area and examine how it intersects with others, and how this intersection could help innovative ideas to emerge.

The 17 SDGs (Figure 1, page 10) can offer a useful starting point to initiate discussion about ESD in the curriculum and help to expand both staff and students' understanding of their role in the world. Questions can be derived from the SDGs in order to raise interest, clarify relevance and provide opportunity for innovative thinking. For example, students can be encouraged to ask:

- How will my actions impact on the causes of, and solutions to, poverty?
- How can my thinking respond to issues surrounding health, education, social and gender inequalities?
- How can I help to facilitate responsible consumption, production and economic development?
- How do I positively respond to the problems associated with climate change?

These and similar questions can encourage and stimulate discussion surrounding the most appropriate positioning of ESD across the curriculum. Situating discussions against the SDGs can assist those involved in curriculum design, course management and teaching to holistically position and recognise ESD across the curriculum, and not treat it as something that needs to be separately added to it or 'bolted on'.



It is essential to learn about sustainable development throughout any degree course, as the future of the planet and climate change affects every single individual, and each individual should be made aware of the situation and how to be more sustainable.

Bitsy Pout, 2nd Year Student, University of Southampton



Consulting key players

Whether or not the 17 SDGs are used as the starting point, positioning ESD within the curriculum is a dynamic and ongoing process and there will be key players beyond the academic community who can inform this process. The aims of the 17 SDGs and how they can be applied to the subject/discipline could underpin these conversations.

Some of these groups are highlighted below, but this is far from an exhaustive list. 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](#).

It is important when consulting with key players that we do not build in discrimination from the outset by talking with only a small sub-section of the population. Less represented groups can help shape and drive contribution to ensure diversity and inclusion within the curriculum. [Target 10.2](#) of the SDGs is instructive in this respect:



Target

10.2

By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status

Students

Engaging with students, course representatives and students' unions (SUs) will help academics establish the aspects of ESD students think should be pursued, and how they want to develop relevant knowledge, skills and competencies. Such efforts will help identify ESD activities that may already be happening via SU teams and societies, the types of placement activities students would like to progress, and how students, academics, operational and support staff can work closely together to ensure a joined-up approach to position ESD across curricula. Alumni should not be forgotten in this process as, based on their educational experiences, they can bring to life the opportunities they have found beyond their education.

NUS has a voice at national level on a range of issues of relevance to students including ESD and decolonising education, and they have created an educational charity, [Students Organising for Sustainability \(SOS-UK\)](#), in response to the climate emergency and ecological crisis. SOS-UK 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.

Students have been instrumental in establishing ventures that have a sustainability purpose as their primary goal. [Enactus](#) is an example of this in action, being a global network where university students work with academics and business leaders 'to create a better, more sustainable world'. [Enactus UK](#) is where students in UK universities apply the vision, energy and entrepreneurial spirit to develop innovative solutions to complex sustainability problems, providing a powerful example of the transformative work that can be achieved by values-driven students from a range of discipline areas.



Guidance

Discuss with students what their expectations and priorities are for the integration of ESD within their curriculum for now and future years. Ask current students and alumni what they would want to learn, experience and contribute.

If they are not already active, try to engage the students' union (or other student representative body) in ESD-related co-curricular activities, through, for example, clubs or societies that may interact with the taught curriculum.

Consider the understanding and experience of ESD that you want every student to have, and how this can be incorporated into course-level learning outcomes. Think about the understanding and experiences you wish to offer them, and how this choice can be provided, and sequentially build, across the years of study.

Provide students with, and support them to develop, opportunities to put ESD learning into practice and to 'live what they are learning', with, for example, opportunities for volunteering and extracurricular activities.

Include ESD during student induction, covering an understanding of what your institution is doing and how students can contribute.

Ensure that students are represented on institutional/localised committees that focus on ESD and they are part of conversations that happen beyond the committee structure about ESD.

Students who wish to take SD considerations into account in their career plans should be supported to do so. Encourage your careers service (where applicable) to provide students with information on the social and environmental performance of potential employers and enterprise.

Students should be supported to develop their enterprise and entrepreneurial skills that can lead to ventures that positively contribute to SD.

Obtain feedback from students to inform designing subject-relevant ESD into curricula. ESD should be part of module, end-of-course, placement and work experience feedback.



Examples from practice: Students as Sustainability Representatives

At Keele University, the Sustainability Voice Representatives programme engages students as co-creators for curriculum development. At the annual Student Voice conference, reps are trained by sustainability staff at the University to enhance their understanding of Education for Sustainable Development and their role as reps to influence and progress this in their academic programmes.

Students from any programme can put themselves forward to be a Sustainability Voice Representative and represent sustainability issues on their course. Students then ask members of their programme cohort about sustainability in their programme and this leads to the addition of 'sustainability in the curriculum' as an agenda item for School Voice Committees.

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. 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. Equally, many start-ups are entirely focused on SD, creating powerful responses to social issues that need long-term solutions.

Enabling ESD competencies and attributes such as creativity, opportunity recognition, self-determination and adaptability, taught through enterprise and entrepreneurship, can be a powerful catalyst for sustainable change. For further guidance, see:

- [Enterprise and Entrepreneurship Education Guidance](#) (QAA, 2018)
- [Framework for Enterprise and Entrepreneurship Education](#) (Advance HE, 2019)
- [Enterprise and Entrepreneurship Development Project](#) (QAA Scotland, 2017).



Guidance

Ensure every graduate has an opportunity to engage with and shape solutions to SD challenges within and beyond the institution.

Create partnerships with enterprising individuals and companies who can contribute to educational experiences such as, for example, [living labs](#), case studies, experiential learning, simulation activities and research projects.

Ask graduates and employers (including social and/or sustainability enterprises) how they address SD, to identify the challenges they face from legislation and wider civil society, and how they respond.

Ensure graduates are ready to help their future workplace(s) meet SD challenges and that they recognise the importance of creativity and a willingness to try new approaches in doing so.



Examples from practice: Industry-education partnership for sustainability

For their [Radical Sustainability project](#), the University of Gloucestershire joined forces with acclaimed sustainability pioneer [Interface](#). Students from eight courses submitted assessed coursework, with finalists invited to join the Radical Sustainability masterclass with Interface to learn from the best alongside local business leaders. At the masterclass, students pitched their work to compete for professional experience prizes with Interface and were given a bespoke professional skills workshop based on Interface's innovative Re-Entry programme.

Radical Sustainability shows ESD in action as an industry-education partnership. It combines the [University's specialism in course-embedded ESD](#) with an ongoing series of engagement events connecting the applied sustainability learning of students with over 100 professionals in different industry sectors.

Academics

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

To lead and enable ESD, it is crucial that staff are given opportunities that allow for critical reflection on their own knowledge, skills and competencies. There are resources that will help academics and these can be found in the useful resources and references section on page 39.

Staff development ideas

A consideration of the 17 SDGs and their suggested [learning objectives](#) can help scaffold discussions between academics and key players regarding their relevance and how they can be accommodated within the curriculum. To enable this, staff may require institutionally-driven professional development - workshops that highlight the 17 SDGs and discussion about their associated learning objectives, before moving on to group work to establish how these can be incorporated into the content of modules and courses. Students could lead these sessions and be involved with co-creating content.

Staff who have already designed ESD into curricula can share practice where appropriate. Where this is not possible, staff from other institutions where ESD is championed and such work has already been progressed can be approached to lead staff development sessions.



Guidance

Ensure that academics are supported and able to:

1. Understand ESD and the UN SDGs in the context of their own discipline/subject area and associated professional contexts (including how their discipline/subject area may entrench and reproduce unjust and unsustainable thinking and/or practice).
2. Understand the UNESCO sustainability competencies (see Table 1, page 20) and integrate them as part of course and module outcomes.
3. Facilitate teaching and assessment approaches that support the development and assessment of sustainability competencies.
4. Facilitate interdisciplinary and transdisciplinary teaching practices and assessment.
5. Create opportunities for the sharing of ESD ideas, knowledge exchange and experiences across the institution.
6. Have conversations with key players to enable ESD learning and contribution beyond the curriculum.



Examples from practice: Knowledge Exchange for Sustainability Education

Established in 2008, the University of the West of England's (UWE) [Knowledge Exchange for Sustainability Education](#) (KESE) group is a cross-university staff team that works to progress education for sustainable development through curriculum mapping, staff development, student engagement and celebration. The group comprises of a representative from each academic department, the sustainability team and the SU. Its core purpose is to provide a means for discussion of ESD within the University. It shares examples of good practice across the institution and supports staff who are seeking to include ESD within their modules and programmes. Led by the Associate Professor for ESD, KESE takes responsibility for the annual ESD report and sets the agenda for the annual ESD Action Plan. KESE regularly reports on its activities to UWE's Sustainability Board. KESE is the recipient of an [Advance HE CATE Award](#).

Professional service teams and academic governance

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

Beyond academic staff there will be a number of professional service teams that can interact with, promote and/or lead the facilitation of ESD within curricula. Business engagement, careers, employability and enterprise 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 curriculum design teams in achieving their goals – discrete training on ESD can empower them to fulfil this aim.

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.

Guidance

Ensure that ESD objectives, targets and KPIs are part of the institution’s strategic priorities and subsequent strategies and policies.

Ensure that staff driving quality assurance and enhancement have knowledge and understanding of ESD and how they can enable its positioning across curricula.

Ensure that curriculum validation and review templates, and other appropriate teaching and learning templates, drive a focus on authentically evidencing ESD engagement at course and module level.

Think about how SD is considered holistically across the institution, not just at curriculum level, and how this could interact with curricula.

Develop mechanisms for evaluating the impact and efficacy of ESD to demonstrate outcomes and drive continuous enhancement.

Enable opportunities for the sharing of SD ideas, knowledge exchange and experiences across the institution and with key players.



Communities

Through engagement with the needs and priorities of local, national and international communities, HEPs can play an important role in the economic, social, cultural and environmental wellbeing of society. This potential contribution is highlighted by the [UPP Foundation Civic University Commission](#) and its recommendation that HEPs should create [Civic Agreements](#), that is a civic strategy, rooted in a robust and shared analysis of local needs and opportunities, and co-created with local partners. 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 HEPs 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. Ensuring marginalised and underrepresented voices within the community are heard is an essential part of this process.



Guidance

Consider the SD needs, interests and priorities of communities connected with the provider, for example, local communities, voluntary groups and public sector organisations, and how students may be able to engage with and help them address SD challenges.

Consider how links to local, national and international communities can provide an opportunity to promote equality, diversity and inclusion as part of an ESD agenda.

Enable students to work with communities of practice, as well as place-based physical communities, to contribute positively to SD.



Example from practice: Extra-curricular engagement with local communities

[Transition St Andrews](#) was founded in 2009 by staff and students at the University of St Andrews. Since then, the group has started more than a dozen projects to tackle waste, grow their own food, rewild St Andrews, facilitate greener ways of travel and cultivate a local sharing economy.

The projects provide opportunities for extracurricular engagement through practical action in the University and wider community.

Staff and student-led projects include a suite of community gardens, St-And Reuse, whereby students' unwanted 'stuff' is collected at the end of the academic year and shared with community groups or the next student cohort; Bike Pool and maintenance; Skillshare and Toolshare; Green Film Festival; a food hub; Bioblitz; and more.

Students have explored activist and action approaches, developing skills in third sector governance, fundraising and leadership, as well as developing the [Transition University Guide](#) to share lessons with other universities.

Teaching, learning and assessment for Education for Sustainable Development

Key competencies for sustainability

ESD develops the competencies required to act on, question or interpret knowledge. 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.

UNESCO, 2017

The eight UNESCO key competencies for sustainability (Table 1, below) are aimed at all learners of all ages worldwide and can be adopted and adapted within higher education through alignment with appropriate learning outcomes (Table 2, page 24).

	Competency	A student who displays this competency can:	
Subject knowledge and knowledge of all SDGs	Systems thinking competency	<ul style="list-style-type: none"> recognise and understand relationships analyse complex systems consider how systems are embedded within different domains and scales deal with uncertainty 	Ways of thinking
	Anticipatory competency (Future thinking)	<ul style="list-style-type: none"> understand and evaluate multiple outcomes create their own visions for the future apply the precautionary principle assess the consequences of actions deal with risks and changes 	
	Critical thinking competency	<ul style="list-style-type: none"> question norms, practices and opinions reflect on one's own values, perceptions and actions take a position in the sustainable development discourse 	
Subject knowledge and knowledge of all SDGs	Strategic competency	<ul style="list-style-type: none"> develop and implement innovative actions that further sustainable development at the local level and further afield 	Ways of practicing
	Collaboration competency	<ul style="list-style-type: none"> learn from others (including peers, and others inside and outside of their institution) understand and respect the needs, perspectives and actions of others deal with conflicts in a group facilitate collaborative and participatory problem solving 	
	Integrated problem-solving competency	<ul style="list-style-type: none"> apply different problem-solving frameworks to complex sustainable development problems develop viable, inclusive and equitable solutions utilise appropriate competencies to solve problems 	

Subject knowledge and knowledge of all SDGs	Competency	A student who displays this competency can:	Ways of being
	Self-awareness competency	<ul style="list-style-type: none"> reflect on their own values, perceptions and actions reflect on their own role in the local community and global society continually evaluate and further motivate their actions deal with their feelings and desires 	
Normative competency	<ul style="list-style-type: none"> understand and reflect on the norms and values that underlie one's actions negotiate sustainable development values, principles, goals and targets, in a context of conflicts of interests and trade-offs, uncertain knowledge and contradictions 		

Table 1: UNESCO's key competencies for sustainability

Situating ESD competencies central to curricula can transform how staff and students view issues related to SD. This can lead to both parties questioning their own and societies' **ways of thinking, ways of practicing and ways of being, which is central to a transformational learning experience.** This can be unsettling at first, but is the start of a transformative journey that can lead to a more sustainable future.

Ways of thinking

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](#) emphasises 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 competencies.

Anticipatory competency (futures thinking)

ESD must include a futures-based perspective to evaluate the impact of current activities on future generations. Anticipatory or futures thinking for ESD 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 by helping to develop 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. This requires both forecasting and backcasting, that is, defining a desirable future and working backwards to identify policies and programs that will connect the desired future to the present.

Critical thinking competency

Critical thinking can include 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.

Ways of practicing

Strategic competency

Transitioning to sustainable alternatives or developing sustainable solutions to current problems or issues requires strategy. Strategic competency includes core employability skills such as goal setting, time and resource management, and implementing and evaluating a course of action. Effective strategists identify and evaluate the obstacles to change and leverage driving forces to assist them in achieving positive outcomes. They engage with stakeholders to develop and deliver change projects through consultation, co-production, co-creation and/or co-delivery.

Collaborative competency

Graduates will be expected to communicate effectively with colleagues, clients and stakeholders, ethically and professionally across platforms, disciplines, cultures, national boundaries and cyber-physical interfaces. This requires that students have opportunities to practice their group management skills and develop their self-awareness. Learners should be enabled to create visions, analyse problem solutions, conduct sustainability assessments, and develop strategies with stakeholders who may have different perspectives and priorities.

Integrated problem-solving competency

ESD involves complex, ill-defined problems that can include missing, contradictory or contested information. Typically, such problems require multidisciplinary and interdisciplinary knowledge and research methods and address different value systems and conflicting priorities. Problems in ESD can yield a number of viable solutions which need to be evaluated with the views of different stakeholders in mind. Building on their problem-solving skills, students will broaden their focus by integrating knowledge and research methods from other disciplines and subject areas to develop and evaluate viable solutions to authentic, real-world problems.

Ways of being

Self-awareness competency

Through self-awareness competency, students are encouraged to recognise how their emotions, motivations and personality impact on their actions and behaviours. Through recognition of their individual context, students can develop a sense of agency and responsibility to drive sustainable action within their own environment, be it their local community or the wider society. Contemplative and reflective practices can be useful in developing self-awareness, in particular of mental and emotional health, and identify strategies for self-regulation.

Normative competency

Students with normative competency are able to understand and reflect on the norms and values that underpin their own actions and those of other stakeholders. Informed by concepts of justice, equity, inclusion and responsibility, students are equipped to identify biases and barriers to sustainable action. These values can be applied to various scenarios including problem analysis, comparing visions, evaluating actions and building strategies. Normative competency may therefore be considered a cross-cutting competency.



Example from practice: Assessment tasks to develop self-awareness and collaborative competency

[Compassion in HE](#) offers evidence-based, practical support to any teaching practitioner on how to embed self-awareness and collaborative competencies into university group work. The resources provided, including bite-sized videos for students and staff, assessment tasks and rubrics, aim to develop understanding and encourage critical reflection of group behaviours.

Course and module learning outcomes for ESD

Course and module³ learning outcomes provide an established approach for defining and assuring the knowledge, skills and attributes that a learner will have gained following their successful completion of that unit of learning. Course and module-level learning outcomes for ESD should interconnect subject-specific knowledge and skills, sustainability competencies and the 17 UN SDGs (Figure 1, page 10).

ESD aims to enable 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.

Where there are currently no relevant ESD course-level learning outcomes, academics are encouraged to explore revisions to the course framing and core outcomes so as to include ESD, or to translate existing approaches so as to make ESD more overt.

For degree programmes that are also accredited by PSRBs, there are a range of approaches to SD. Some professions have prescriptive criteria that address sustainability directly, while others provide broad reference to sustainability issues giving course designers sufficient scope to orient curricula towards ESD. A minority of professions make no reference to sustainability, which restricts but does not eliminate the opportunity to incorporate ESD into the core curriculum. If the prescribed professional competencies can be aligned with the sustainability competencies (Table 1, page 20) this can provide course designers and educators with opportunities to use SD as a theme to develop professional competencies.

Learning outcomes aligned with key competencies for SD

Table 2 (page 24) outlines some indicative learning outcomes, reflecting the knowledge, skills and competencies 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, interpret, and modify these outcomes as required to meet the discipline, context, level and credit-rating of the module.

UNESCO's publication about [ESDG's Learning Objectives](#) also identifies indicative learning objectives for all 17 SDGs and suggests topics and learning activities for each.

³ 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.

Table 2: Learning outcomes aligned with key competencies for SD
 (informed by UNESCO (2017), ESDG Guidelines (2014), and Giangrande et al (2019))

Learning outcomes		
Knowledge	Skills	Attributes and values
A student with systems thinking competency can:		
<ul style="list-style-type: none"> ▪ Describe the relationships between environmental, social and economic systems, at scales from local to global level ▪ Identify the tensions between the 17 SDGs and recognise their interconnections ▪ Recognise that a collective effort is not necessarily just a simple sum of each individual's effort, but is likely to be more complex and have multiple drivers that may be personal, political or communal ▪ Identify that positive or negative environmental change may arise from economic growth ▪ Describe how power structures and political systems influence SD 	<ul style="list-style-type: none"> ▪ Recognise and understand relationships ▪ Analyse complex systems ▪ Consider how a system's constituent parts interact and operate at different scales and across time ▪ Work with interconnectedness and complexity in a systemic context, synthesising diverse information and data to offer a range of potential solutions ▪ Identify the interactions between social, economic and environmental systems ▪ Assess a problem from different scales and perspectives 	<ul style="list-style-type: none"> ▪ Think systemically, in terms of recognising connections and interactions between factors, and understand that actions often have multiple consequences ▪ Deal with and manage uncertainty ▪ Appreciate the root causes of unsustainable development including environmental, social and economic actions, and their links to cultural considerations ▪ Identify the factors that have the biggest potential for driving constructive change

Learning outcomes		
Knowledge	Skills	Attributes and values
A student with anticipatory thinking competency can:		
<ul style="list-style-type: none"> ▪ Identify the risks associated with complex systems that can lead to unintended consequences or negative cumulative effects ▪ 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 ▪ Identify the causes and possible solutions to inequity at intragenerational and intergenerational global levels ▪ Identify that natural systems have non-negotiable limits and may become unstable or collapse if subjected to excessive pressures or changes ▪ Identify risks and uncertainties associated with the transformation of the natural environment ▪ 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 	<ul style="list-style-type: none"> ▪ Generate and evaluate different approaches to SD and assess their likely impact, within the context of their own discipline/subject ▪ Use historical knowledge and an understanding of the consequences of past actions to envision how futures may be shaped ▪ Develop, understand and evaluate multiple outcomes ▪ Create their own visions for the future ▪ Apply the precautionary principle ▪ Assess the consequences of actions ▪ Evaluate risks and their potential impacts ▪ Identify future scenarios and use them to inform decision making ▪ Use backcasting skills - starting with defining a desirable future and working backwards to identify policies and programmes that will connect that to the present ▪ Use forecasting skills - looking at past trends and present conditions to extrapolate anticipated future outcomes 	<ul style="list-style-type: none"> ▪ Be flexible, resourceful and adaptable to fit changing and/or unforeseen circumstances if it is likely to have a positive outcome for SD ▪ Imagine and envision sustainable futures ▪ Consider the impacts, both positive and negative, of heritage and cultures when planning for the future ▪ Apply an awareness of intergenerational fairness to decisions and planning ▪ Be prepared to learn from others and consider their perspectives ▪ Learn to unlearn when situations and contexts demand alternative solutions ▪ Demonstrate an open mindset to new approaches to problem solving

Learning outcomes		
Knowledge	Skills	Attributes and values
A student with critical thinking competency can:		
<ul style="list-style-type: none"> ▪ Draw upon scientific evidence and scholarly research to develop understanding of SD and the impact of human activity upon it ▪ Identify the rationale for encouraging behavioural change, where existing practices are shown to have a negative impact on the human and natural environment ▪ Identify change makers who have made positive contributions and draw upon their practices to enhance understanding 	<ul style="list-style-type: none"> ▪ Present a simplified view of a concept ▪ Identify and formulate critical questions and problems ▪ Assess new information and continuously incorporate it into existing models as they develop ▪ Critically assess and analyse SD issues within the context of their own discipline/subject area or future profession/career intentions ▪ Analyse, synthesise and evaluate data and information and reach well-reasoned conclusions and solutions, testing them against relevant criteria and standards ▪ Differentiate evidence based conclusions from opinion and conjecture 	<ul style="list-style-type: none"> ▪ Demonstrate the capacity for independent, evidence-based integrated thinking as the foundation for developing their personal ethical code ▪ Evaluate the consequences of their own actions and of collective actions ▪ Reflect on their own values, perceptions and actions, comparing and contrasting them to others who may have influence ▪ Take an evidence-based position in the SD discourse ▪ Recognise their assumptions and evaluate the potential implications and consequences of them

Learning outcomes		
Knowledge	Skills	Attributes and values
A student with strategic thinking competency can:		
<ul style="list-style-type: none"> Identify the root causes of unsustainable development, including environmental, social and economic actions Understand how emotional and cognitive awareness can influence decision making Identify then enact changes to actions or behaviours where existing practices have a negative impact Appreciate how aspects of their own discipline contribute positively or negatively to SD Understand the risks and uncertainties associated with the transformation of the natural environment 	<ul style="list-style-type: none"> Link the environmental, social and economic actions to cultural considerations Evaluate the impact of and connections between the activities of different generations, demographic groups and cultures, recognising that there may be competing factors between them Identify SD strategies to facilitate and mediate progressive discussions among interested parties (stakeholders) to help resolve dilemmas and conflicts Develop and implement innovative actions that further SD at the local level and beyond Use planning and assessment tools to identify and address SD challenges and opportunities 	<ul style="list-style-type: none"> Practise decision-making and analyse consequences of decisions made Undertake reflection on actions and behaviours Integrate thinking as a foundation for developing their personal ethical code Demonstrate flexibility and resourcefulness and adapt a problem-solving mindset to fit changing or unforeseen circumstances Demonstrate a commitment to lifelong learning

Learning outcomes		
Knowledge	Skills	Attributes and values
A student with collaborative competency can:		
<ul style="list-style-type: none"> Understand the value of collaborating with others offering different knowledge, views and experiences Identify and critique differing approaches to collaboration Recognise group management strategies Recognise verbal and non-verbal communication skills and their role in group cohesion Recognise the goals, skills and needs of others as part of successful collaboration 	<ul style="list-style-type: none"> Communicate effectively through listening, clarity of expression and constructive inquiry Engage in interdisciplinary discussion to inform their thinking about sustainable futures and seek holistic, creative solutions to problems Identify the importance of encouraging and enabling individuals and organisations to work together to create new knowledge Clearly communicate complex SD issues to others Facilitate and mediate progressive discussions among interested parties (stakeholders) to help resolve dilemmas and conflicts Listen actively and critically Connect, adapt and synthesise what they learn Address conflict and develop mediation skills Utilise appropriate leadership styles 	<ul style="list-style-type: none"> Learn from others including peers, professionals, expert groups and communities Deal with conflicts in a group Facilitate collaborative and participatory problem solving Assist others through peer learning Question norms, practices and opinions Understand and respect the needs, perspectives and actions of others Empathise with the views and experiences of others Collaborate equitably across gender, ethnicity and other groups

Learning outcomes		
Knowledge	Skills	Attributes and values
A student with integrated problem-solving competency can:		
<ul style="list-style-type: none"> ▪ Describe the potential for their discipline to interconnect with other disciplines or areas of expertise and make creative leaps forward ▪ Describe how aspects of their own area of study contribute to SD and connects to the UN SDGs ▪ Appreciate research methods from different disciplines ▪ Understands the academic norms of a discipline and explore disciplinary integrity 	<ul style="list-style-type: none"> ▪ Use and apply established frameworks and methodologies for analysing the impact(s) of a behaviour or process, utilising the skills and expertise developed through their own area(s) of study ▪ Apply different problem-solving frameworks to complex SD problems ▪ Develop viable, inclusive and equitable solutions ▪ Effectively engage with real-life problems relevant to SD ▪ Combine different sources and types of evidence, drawing from different disciplines, to view and address a problem 	<ul style="list-style-type: none"> ▪ Utilise appropriate competencies to identify and solve problems ▪ Communicate effectively with others to identify solutions to complex problems ▪ Listen critically when presented with alternative ideas or frameworks, systems and ideas ▪ Work effectively in multidisciplinary and interdisciplinary groups ▪ Consider academic norms and ways of thinking across different disciplines and subject areas, bringing them into play as appropriate

Learning outcomes		
Knowledge	Skills	Attributes and values
A student with self-awareness competency can:		
<ul style="list-style-type: none"> ▪ Identify and evaluate their own competences and learning needs ▪ Understand their own heritages and cultures ▪ Identify the importance of empowering individuals and organisations to work collaboratively ▪ Understand how power structures and political systems influence SD ▪ Identify the wide range of human cultures in existence and understand both the benefits and the challenges that these cultures present for SD 	<ul style="list-style-type: none"> ▪ Employ leadership for SD by challenging assumptions and negotiating alternatives to unsustainable current practices, especially within their own discipline or subject area ▪ Actively implement or contribute to changes that promote SD within the scope of their own learning experience and study environment ▪ Take responsibility for their own learning and skills development ▪ Facilitate and mediate progressive discussions among stakeholders to resolve dilemmas and conflicts 	<ul style="list-style-type: none"> ▪ Clarify their own views on ways that SD can be achieved in different local and global communities and circumstances ▪ Access and engage with their own and other cultures and heritages ▪ Maintain healthy mental and emotional state and be aware of their mental and emotional health, in particular to: <ul style="list-style-type: none"> ▶ reflect on their own values, perceptions and actions ▶ reflect on their own role in the local community and global society ▶ continually evaluate and further motivate their actions ▶ be aware of and engage with their own emotions ▶ make meaning in the work they do

Learning outcomes		
Knowledge	Skills	Attributes and values
A student with normative competency can:		
<ul style="list-style-type: none"> ▪ Identify the wide range of human cultures in existence, and understand both the benefits and the challenges that these cultures present in terms of SD ▪ Demonstrate that both unsustainable and sustainable practices take place in an evolving context, necessitating adaptability in policy and planning responses ▪ Identify the interactions between human communities and ecological systems, and be able to assess the potential impacts upon each other ▪ Identify ethical questions and use ethical frameworks ▪ Identify practical interventions for sustainability challenges 	<ul style="list-style-type: none"> ▪ Tackle and negotiate SD conflicts with an awareness of different perspectives and motivations ▪ Identify the opportunities to support and develop a progressive and resilient culture that encourages citizens, professions and institutions to put learning into practice ▪ Debate and explore fairness and justice, including social justice ▪ Develop alternative solutions that provide new opportunities for engagement with SD 	<ul style="list-style-type: none"> ▪ Negotiate SD values, principles, goals and targets, in a context of conflicts of interests and trade-offs, uncertain knowledge and contradictions ▪ Understand and reflect on the norms and values that underlie one's actions ▪ Engage with and understand different world views ▪ Appreciate, critique and value different cultural contexts

Developing learning environments to support ESD



Example from practice: Capstone projects

Working in interdisciplinary teams, Bioscience students at the University of Leeds use enquiry-based learning to integrate, extend, critique and apply the knowledge and skills developed throughout their degree, creating outputs and outcomes which address civic and societal issues, SDGs or other grand challenges in their capstone projects.

Transformational higher education calls for a shift from practice that focuses on the acquisition of knowledge and skills to an emphasis on values, attitudes and behaviours. This requires [constructively aligned](#) teaching, learning and assessment activities designed to meet key ESD competencies and learning outcomes. It should provide learning experiences that transform the ways of thinking and practising, enabling students to become informed advocates of SD and to provide opportunity for practical interventions, including activism.

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
- learning spaces including the campus and outdoor environments are fully utilised to provide alternative locations to develop and express the competencies of ESD.

Guidance

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, health and wellbeing, local governance, business and economic development strategies, as well as food production and management of natural resources, can offer valuable and authentic learning experiences.

Identify the challenges the subject area faces regarding the economic, environmental and social changes that are taking place. Consider how the course can broaden its literature and resources to include diverse voices in ESD and perspectives from underrepresented communities.

Use ideas and perspectives from other disciplines to promote a meaningful multi, inter or transdisciplinary experience that challenges students beyond the conventions of their subject.



Identify any barriers to interdisciplinary learning and think about how these can be overcome. Teaching beyond the perspective of a single discipline/subject area provides opportunities to develop networks, increase interactions and holistic approaches to both developing sustainability competencies and meeting the aims of the 17 UN SDGs.



Example from practice: The campus as a living lab

The University of Plymouth has a ‘living lab approach’ that uses the campus, and a sustainability hub on campus, as a space for student innovation, co-creation and research. At the same time, the city of Plymouth is utilised as a vibrant space for place-based learning where students are engaged with education as sustainability, partnering with community organisations, employers and enterprises to contribute to compassionate change. One example of this place-based practice is the [Low Carbon Devon Internship Programme](#). This programme, funded through the European Regional Development Fund, offers short-term paid internship opportunities to students and recent graduates in order to work on carbon reduction projects with locally-based enterprises.

The provision of blended learning, combining in-person and digital teaching and learning activities, has accelerated in response to the COVID-19 pandemic. Blended learning can give students more flexibility than they 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, inclusive and immersive 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 information 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.



Example from practice: Blended learning using ESD principles

London College of Fashion has developed a free online course using ESD principles – [Fashion and Sustainability: Understanding Luxury Fashion in a Changing World](#) – as an introduction to sustainable fashion, from materials choices and business issues to creative practice. Winner of a Green Gown Award and developed in partnership with fashion group Kering, it is the first open-source online course in fashion and sustainability, reaching over 70,000 learners in 192 countries in its first three years. It is part of the College’s [development of ESD across its entire course offer](#), including a ‘Better Lives’ blending learning unit delivered to all first year students.



Example from practice: Interdisciplinary learning to address SDGs

The University of Strathclyde’s [Vertically Integrated Projects for Sustainable Development programme](#) represents an acclaimed exemplar of embedding Research-Based ESD in undergraduate curricula. It aims to develop students’ key sustainability competences, within the context of their core discipline, and to inspire, educate and equip students to work collaboratively, across disciplines, now and in the future, in pursuit of the SDGs.



Guidance

Use real-world problems and think creatively about a range of teaching and assessment practices to develop sustainability competencies (see Table 3, page 36, for examples).

Use group-based work within and beyond the course, subject, university or community to develop collaborative competencies through meaningful discussions with peers and other stakeholders.

Use play-based approaches, including game-based learning and simulation, to provide an environment for students to explore alternative scenarios and practice and develop alternative ways of thinking, allowing students to take risks, experiment with new approaches and learn through failure.

Provide opportunities for critical reflection on personal perspectives and that of others, to consider what has influenced their thinking and practice in this area. The [Iceberg Model](#) is a tool that can support systems thinking by identifying the values and beliefs that are the root cause of the policies and practices that lead to unsustainable actions or events.

Use authentic artefacts, or triggers, that inspire curiosity and incorporate interactive learning approaches. Traditional academic sources such as case studies, journal articles, and external speakers with a SD focus or expertise can provide a stimulus to ESD activities. Other triggers can include current topics from news articles or social media posts. New technologies including virtual and augmented reality, 3D printing and drones, and access to public data sets can motivate and engage students through authentic and immersive learning as well as developing familiarity with 4IR technologies. Using triggers from the arts including paintings, music, poetry, sculpture and dance can provide the shift in thinking for students from all disciplines required to develop creative solutions.

Include opportunities to understand different knowledge areas and ways of thinking from other disciplines. Objects can provide a neutral trigger for interdisciplinary and transdisciplinary practices. For example, a plastic flip-flop can bring together a diverse range of disciplines and subjects including archaeology, geology, engineering, manufacturing, logistics, marketing, social sciences, law and ethics to consider its life-cycle and promote discussion of values, globalisation and social justice and the interconnection between economic, social and environmental factors.

Consider how different learning spaces and activities (including group work, online or outdoor environments) may be designed to be inclusive, accessible and meaningful for a range of identities, backgrounds and characteristics (including ethnic or national background, gender, disability, neurodiversity, socio-economic status, previous education, and religious or cultural identities) and their intersections.

The developmental nature of competencies benefits from formative assessment and placing a focus on the process rather than the product of learning. Assessment criteria should be designed to prioritise how students reached a viable solution to a problem in preference to the problem solution. Authentic assessment instruments such as blogs, vlogs, websites and wikis engage students and provide a way for students to showcase their learning and share it with interested stakeholders. The conceptualisation of [assessment as both 'for' and 'as' learning](#) is useful in this respect.

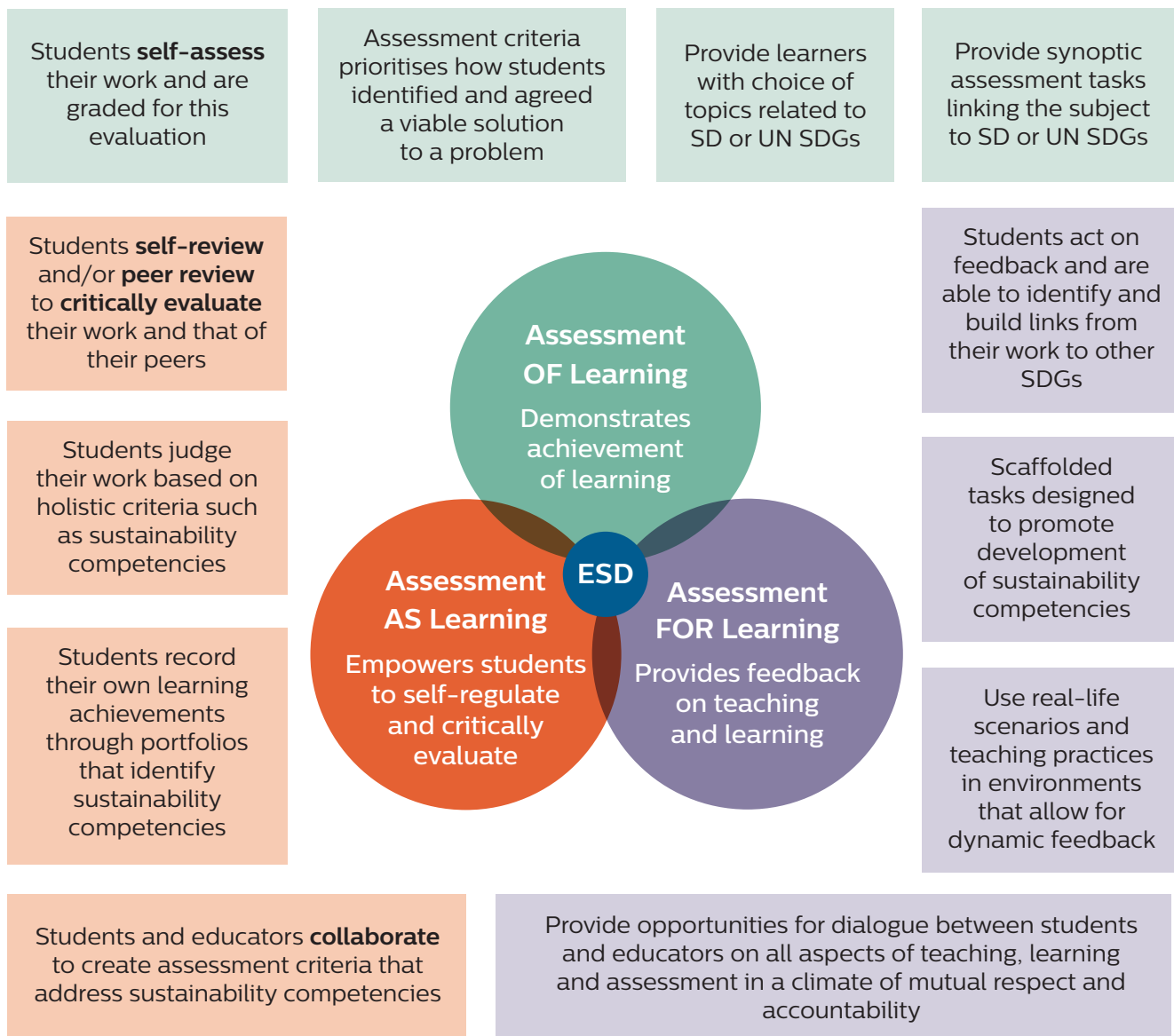


Figure 3: Assessment for, as and of Learning for SD

(Adapted and available under CC BY licence from the [National Forum for the Enhancement of Teaching and Learning in Higher Education](#))

Sustainability competencies can also be developed through extracurricular and co-curricular activities and evidenced via a range of non-formal routes including micro-credentialling, digital badges, CVs, LinkedIn profiles, professional development planning or the HEAR report.

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 or discipline.

Table 3: Teaching practices and illustrative examples applicable to develop key competencies for SD

Teaching practice	Definition	Illustrative examples
<p>Collaborative learning</p> <p>A method of learning that is often self-organised and occurs outside of the formal learning environment</p>	<p>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 think 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.</p>	<p>An interdisciplinary, international project to create dementia friendly communities.</p> <p>Design projects around global challenges or SDGs to encourage learning between disciplines and year groups, and other communities outside of the institution.</p>
<p>Enquiry-based learning</p> <p>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</p>	<p>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.</p>	<p>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.</p>

Teaching practice	Definition	Illustrative examples
<p>Play-based or playful learning</p> <p>A range of structured or semi-structured approaches that allow students to explore approaches, scenarios, actions and consequences in a safe learning environment</p>	<p>Game-based learning</p> <p>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.</p> <p>Gamification</p> <p>Gamification refers to the use of a pedagogical system that was developed within gaming design but which can be implemented within a non-game context.</p> <p>Serious play</p> <p>A playful mode of activity that incorporates the cognitive, social and emotional dimensions, and remains intentionally open to emergent outcome.</p> <p>Simulation</p> <p>Simulations of real-life situations through role plays, debating, mock trials and gaming encourage students to develop their thinking around ESD 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.</p>	<p>Phylo is an ecosystem building game where players try and build food chains to create a stable ecosystem while disrupting their opponents.</p> <p>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.</p> <p>Ask students to adapt an existing game or create a new game that links their discipline to one or more of the UN SDGs.</p> <p>The use of the LEGO® SERIOUS PLAY® to co-create innovative solutions for clean energy incorporating technical, social and business perspectives.</p> <p>The use of a simulation game to teach disease epidemics and pandemics.</p>
<p>Learning through storytelling</p> <p>A process in which learning is structured around a narrative or story as a means of sense-making</p>	<p>There are a variety of approaches to learning through storytelling including:</p> <ul style="list-style-type: none"> ▪ 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. 	<p>Students use digital storytelling to integrate ideas from across their studies and build their digital and professional identities.</p>

Teaching practice	Definition	Illustrative examples
<p>Problem-based learning (PBL)</p> <p>A style of active learning, PBL refers to learning opportunities that use real-world issues or problems to increase knowledge and understanding</p>	<p>Students work together in small groups, typically facilitated by educators. 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.</p> <p>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. It provides an environment for creativity, risk-taking and learning through failure, as well as innovative thinking.</p>	<p>Engineering for People Design Challenge from Engineers Without Borders is a design challenge that can be integrated into undergraduate courses. It allows students to explore the ethical, environmental, social and cultural aspects of engineering design.</p>

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.

In order to have the widest access to supporting materials, we have avoided those behind a paywall and the resources listed below are freely available. We thank all those who supplied references and additional resources during the consultation and have tried to include these where possible.

Please note that all weblinks were last accessed and correct on 29 March 2021.

ESD international policy and strategy frameworks

ESD develops the competencies required to act on, question or interpret knowledge. The importance of competencies within ESD is emphasised by UNESCO:

UNESCO

Global Education Monitoring Report: Inclusion and education: all means all (2020)

<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 other 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.

Education for Sustainable Development Goals: learning objectives (2017)

<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.

Education for Sustainable Development Lens: A Policy and Practice Review Tool (2010)

<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 also relevant to all tertiary education. Coverage includes overview of ESD principles and how they relate to mainstream education goals, reviewing ESD practice and policy, quality assessments and learning outcomes in ESD.

Global Education Monitoring Report (2016)

<https://en.unesco.org/gem-report/report/2016/education-people-and-planet-creating-sustainable-futures-all>

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 the 2015 Incheon Declaration for Education 2030, while communicating the urgency of SD issues in relation to education systems.

Shaping the Future We Want: UN Decade of Education for Sustainable Development (2005–2014) Final Report (2014)

<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 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: Advancing Policy, Transforming Learning Environments, Building Capacities of Educators, Empowering and Mobilising Youth, and Accelerating Local Level Actions.

ESD for 2030 - Toolbox

<https://en.unesco.org/themes/education-sustainable-development/toolbox>

The ESD for 2030 Toolbox provides a set of targeted resources to support users in their work on the five priority action areas laid out in the UNESCO ESD for 2030 roadmap (see above).

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, 2020)

<https://resources.unsdsn.org/accelerating-education-for-the-sdgs-in-universities-a-guide-for-universities-colleges-and-tertiary-and-higher-education-institutions>

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 (UPP Foundation Civic University Commission, 2019)

<https://upp-foundation.org/wp-content/uploads/2019/02/Civic-University-Commission-Final-Report.pdf>

The final report of the UPP Foundation Civic University Commission, highlighting the potential contribution providers can make to 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)

www.stgeorgeshouse.org/wp-content/uploads/2018/05/Further-and-Higher-Education-and-the-SDGs-Report.pdf

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 SDGs.

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

www.oecd.org/coronavirus/policy-responses/making-the-green-recovery-work-for-jobs-income-and-growth-a505f3e7

This policy briefing 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.

The Atlas of Sustainable Development Goals 2020 (The World Bank, 2020)

<https://datatopics.worldbank.org/sdгатlas/>

The Atlas of Sustainable Development Goals 2020 presents interactive storytelling and data visualizations about the 17 SDGs. It highlights trends for selected targets within each goal and introduces concepts about how some SDGs are measured. The Atlas provides a valuable resource for a wide range of teaching activities.

UK policy frameworks with reference to ESD

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

www.gov.uk/government/publications/implementing-the-sustainable-development-goals/implementing-the-sustainable-development-goals--2

This website highlights some of the ways that the Government is supporting the delivery of the SDGs.

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

www.gov.uk/government/publications/uks-voluntary-national-review-of-the-sustainable-development-goals

www.gov.uk/government/topical-events/uk-voluntary-national-review-of-progress-towards-the-sustainable-development-goals

UK's first Voluntary National Review taking stock of progress towards the SDGs.

Sustainable Development Goals: collecting and reporting UK data (Office for National Statistics)

<https://www.ons.gov.uk/economy/environmentalaccounts/articles/sustainabledevelopmentgoalstakingstockprogressandpossibilities/december2020>

ONS collects and publishes UK data on the 17 SDGs and the underpinning targets and indicators. This data provides a valuable resource for a wide range of teaching activities.

Well-being of Future Generations (Wales) Act 2015

<https://futuregenerations.wales/about-us/future-generations-act>

Welsh Policy on Education for Sustainable Development is guided by this Act.

Learning for Sustainability (Education Scotland, 2016)

<https://education.gov.scot/education-scotland/scottish-education-system/policy-for-scottish-education/policy-drivers/learning-for-sustainability>

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 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

This four-week (four hours a week) course will help participants understand how the Symbiosis in Development (SiD) framework helps create the foundations of a sustainable society. The SiD framework combines the theory of systems thinking and sustainability with a practical application method, and teamwork processes to guide projects.

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=tedsread&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. 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.

Climate Change Solutions Simulator (EN-ROADS, Climate Interactive)

www.climateinteractive.org/tools/en-roads/

Free policy simulation model for designing scenarios to limit future global warming. Also provides online resources for educators.

Nations United: Urgent Solutions for Urgent Times

www.youtube.com/watch?v=xVWHuJOmaEk&vl=en

A UN film marking five years since the adoption of the UN SDGs, telling the story of the world as it is, as it was, and as it could be. It focuses on the solutions and action we need to tackle poverty, inequality, injustice and climate change. A useful stimulus resource for educators.

World Values Day

www.worldvaluesday.com/

A useful set of resources for students to identify their personal values and how they align with the SDGs

Student perspectives on ESD and higher education experience

Sustainability Skills Annual Survey (NUS)

<https://sustainability.nus.org.uk/our-research/our-research-reports1/our-research-reports/education-learning-employment-and-sustainability/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 (NUS, 2017)

<https://sustainability.nus.org.uk/resources/from-art-to-zoo-management-embedding-sustainability-in-uk-higher-and-further-education>

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.

Responsible Futures Programme (NUS)

<https://sustainability.nus.org.uk/responsible-futures/about>

Responsible Futures seeks to put sustainability at the heart of education across universities and colleges. It provides 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.

Enactus, UK

<http://enactusuk.org/>

Enactus UK supports students and young people across the country to engage in social action and social enterprise. Website includes examples of student-led sustainability projects.

Employers, enterprise and ESD

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

www.qaa.ac.uk/docs/qaas/enhancement-and-development/enterprise-and-entrepreneurship-education-2018.pdf

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.

Enterprise and Entrepreneurship Development Project (QAA Scotland, 2017)

www.qaa.ac.uk/scotland/development-projects/enterprise-and-entrepreneurship

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 case studies outlining progress across higher education providers in Scotland.

ESD curriculum design tools, frameworks and models

The SDG Academy

www.unsdsn.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 (Advance HE)

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 (Advance HE)

www.advance-he.ac.uk/knowledge-hub/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, 2012)

www.unece.org/fileadmin/DAM/env/esd/ESD_Publications/Competences_Publication.pdf

www.unece.org/fileadmin/DAM/env/esd/Images/Empowering_Educators_for_a_Sustainable_Future.pdf

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 21st Century 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.ue4sd.eu/images/2015/UE4SD-Leading-Practice-PublicationBG.pdf

Two online resources that contain best practice 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.

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)

www.researchgate.net/publication/269219644_Sustainable_Development_and_Quality_Assurance_in_Higher_Education_-_Transformation_of_Learning_and_Society

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

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 first Green Academy change programme was launched in 2011 to help higher education providers to embed 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 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.

Green Gown Awards - UK and Ireland

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. Inspiration and practice examples are published on their website.

Green Gown Awards - International

www.greengownawards.org/international-green-gown-awards

The International Green Gown Awards also provide a source of inspiration and a range of resources.

HE Climate Action Toolkit (Climate Commission for UK Higher and Further Education)

www.eauc.org.uk/climate_action_toolkit

The Climate Commission's toolkit provides HE-specific elements for climate action and provides a range of resources for providers to use covering teaching, leadership, campus management, community engagement and research.

United Nations Environment Programme Greening Universities Toolkit V2.0: Transforming Universities into Green and Sustainable Campuses

www.unenvironment.org/resources/toolkits-manuals-and-guides/greening-universities-toolkit-v20

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.

Principles of responsible management in education

Blueprint for SDG integration into curriculum, research, and partnerships (PRME, 2020)

<https://d30mzt1bxg5llt.cloudfront.net/public/uploads/PDFs/BlueprintForSDGIntegration.pdf>

Provide concepts frameworks and examples to support business schools as they integrate the SDGs into their curricula, research and partnerships.

Carbon Literacy Training Programme

<https://carbonliteracy.com/toolkits/universities-colleges>

A range of carbon literacy toolkits and courses for universities and colleges.

Sustainability Literacy test

www.sulitest.org/en/vision-mission.html

Provides tools to help organisations raise awareness, assess and improve global knowledge on sustainable development and corporate social responsibility among their students, employees, stakeholders and decision-makers.

Higher Education Sustainability Initiative (HESI)

<https://sustainabledevelopment.un.org/partnerships/hesi>

HESI is a UN network coordinating HE action in the form of commitments for sustainability action. It provides institutions with an interface between HE, science and policymaking. Contains a wide range of resources and list of commitments by signatory universities.

A Guide for Applied Sustainability Learning Projects: Advancing sustainability outcomes on campus and in the community (Association for the Advancement of Sustainability in Higher Education, 2017)

<https://hub-media.aashe.org/uploads/>

[A+Guide+for+Applied+Sustainability+Learning+Projects_v1.0_03.03.17_Final.pdf](https://hub-media.aashe.org/uploads/A+Guide+for+Applied+Sustainability+Learning+Projects_v1.0_03.03.17_Final.pdf)

A step-by-step framework for how a programme for applied learning for sustainability can be designed, launched and scaled around two interconnected goals: provide students with exceptional learning experiences in sustainability; and contribute to a workable sustainability solution pathway that - when implemented - can lead to positive sustainability outcomes on campus and/or in the community.

Annex: Education for Sustainable Development Guidance Advisory Group

QAA and Advance HE are grateful for the work of the Advisory Group in producing this guidance.

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