

Learn More About Education for Sustainable Development (ESD)

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Overview

This guide is a summary of the key concepts, issues, and learning and teaching approaches associated with Education for Sustainable Development (ESD) in higher education.

The guide has been designed to be used in conjunction with the [ESD toolkit](#) resources that provides additional practical 'how to' resources for embedding and enhancing ESD into learning and teaching.

What do you mean 'sustainability' and 'sustainable development?'

As this is not a new topic to many subject disciplines, for the purposes of defining ESD, common definitions include the often-quoted UN definition for sustainability and sustainable development from the [Brundtland Commission report, 1987](#):

Sustainability

"Meeting the needs of the present without compromising the ability of future generations to meet their own needs."

Sustainable Development

"There are four dimensions to sustainable development – society, environment, culture and economy – which are intertwined, not separate. Sustainability is a paradigm for thinking about the future in which environmental, societal and economic considerations are balanced in the pursuit of an improved quality of life."

Competing perspectives on sustainability and sustainable development

There are multiple competing perspectives and worldviews define the problem of sustainability and sustainable development and approaches to potential solutions. It's important in developing ESD that you are clear with your students which, or which combinations of the following diverse perspectives are explicit, implicit, or excluded in your subject discipline:

Worldview	Capitalism with a Green Face	Sustainable Development as defined by the UN	Social Economy	Limits to Growth	Sustainable Cities
Views on sustainability	Economic growth creates capacity for sustainability	Strong states and institutions bring governance mechanisms	Rebalancing global inequalities and restructuring capitalism brings social justice.	The impossibility of limitless growth given the limited ecological capacity.	Cities as systems with design considerations for utilities, waste, and water construction.
Problems to be tackled	Lack of economic growth, market distortions, bad policies (e.g. subsidies)	Lack of global cooperation/ global regimes that manage the global environment; lack of state capacity	Capitalism as a primary driver of injustice	The assumption of infinite economic growth; rising population and consumption	Sustainability and design concerns for large cities (e.g. energy, transport, water/ sewage, green areas, brownfields, building)

Adapted from: [Education for Sustainable Development: a review of the literature 2015-2022](#) (Advance HE, 2023) and [Education for sustainable development and sustainability science: re-purposing higher education and research'](#) (Mochizuki et al, (2016)

What is Education for Sustainable Development (ESD)?

ESD is concerned with providing students the knowledge and the ability to engage with sustainability challenges in the outside world:

“ESD gives learners of all ages the knowledge, skills, values and agency to address interconnected global challenges including climate change, loss of biodiversity, unsustainable use of resources, and inequality. It empowers learners of all ages to make informed decisions and take individual and collective action to change society and care for the planet. ESD is a lifelong learning process and an integral part of quality education. It enhances the cognitive, socio-emotional and behavioural dimensions of learning and encompasses learning content and outcomes, pedagogy and the learning environment itself.” (UNESCO, 2023)

The Quality Assurance Agency and Advance HE definition:

“ESD develops competencies, that is, skills, attributes and values, and how they link to subject knowledge and knowledge of sustainable development. ESD supports learners across all academic disciplines and subject areas to create and pursue visions of a better world.” (QAA, 2021)”

ESD is therefore focused on two key aspects:

1. **Broadening student’s sustainability knowledge** – issues, practices, and the interrelatedness of social, economic, and environmental factors.
2. **Developing student’s sustainability competencies** – skills, values, attributes, behaviours to action sustainable change in the outside world.

In practice ESD is an opportunity to:

- **Build on current effective practice** – aims to build on and enhance current sustainability learning and teaching common in many subject disciplines, and to share innovation.
- **Develop innovative learning and teaching** – that is student-centred, active, transformative, and engages multiple stakeholders to meet current and future societal challenges.
- **Supports other curriculum enhancement themes** – ESD is a cross cutting curriculum theme that can support employability, equality and diversity, decolonisation, students as partners, research, and civic engagement:

Quality Assurance Agency's revised [Education for Sustainable Development guidance](#) (2021)

Recent revisions to the [QAA revised subject benchmark statements](#) (2022)

Professional bodies

Many professional statutory and regulatory bodies (PSRB's) have revised their expectations for sustainability in accredited programmes. For example: [The Institute of Engineering and Technology \(IET\) AHEP4](#) (p3)

Students

The National Union of Students (NUS) has conducted [10 years of research on education and sustainability](#) capturing student's increasing demand on this issue. Their [Students Organising for Sustainability](#) organisation supports a diverse range of initiatives to enhance sustainability in the curriculum.

The [Liverpool Green Guild research](#) and the [People and Planet](#) league tables provide further evidence for student's increasing demand for sustainability in the curriculum.

Unions

The [UCU Green New Deal](#) (select the 'Curriculum' option) calls for ESD to be implemented across all programmes along with climate change education.

Future skills and employability

Sustainability knowledge and competencies developed through ESD support future skills that our graduates will require in the workplace.

The EAUC/ Change Agents UK [Future graduate skills report](#) highlights the importance of graduates with both the knowledge and technical skills to tackle for example climate change issues but also 'soft skills' important for general employability; communication, presentation, influencing behaviour change, analytic thinking, critical thinking, and team working.

The World Economic Forum's [The Future of Jobs Report 2023](#) (report covers multiple sectors with multiple technical skill & literacy requirements with the emergence of AI and big data etc.) emphasises the importance of creative thinking relative to analytical thinking (as many work tasks become increasingly automated), complex problem-solving, system thinking, and social emotional attitudes that includes curiosity, lifelong learning, resilience, flexibility, and self-awareness.

The Institute of Environmental Assessment and Management (IEMA) support for [green career pathways and green skill development](#) ('green skills' is an umbrella term for the knowledge, behaviours, capabilities and technical skills required to tackle the environmental challenges we face and to unlock new opportunities for growth') similarly emphasises the importance of developing both the technical and softer skills for

environmental sustainability in the economy (transition to net zero economy for example) that include strategic thinking, project management, decision-making, leadership, and effective communication.

How does the university support ESD in its strategies?

ESD currently forms a component of the [Global Citizenship attribute](#) in the [Liverpool Curriculum Framework](#).

The sustainability theme in our institutional [Strategy 2031](#) has an explicit vision for sustainability in our learning and teaching:

“Our students will be empowered as global citizens to make a difference in a changing world. We will:

- Ensure that sustainability is woven into the curriculum and wider student experience, connecting each discipline to the United Nations Sustainable Development Goals and enabling every student to gain relevant attributes, skills and knowledge.
- Create a curriculum for all which is sustainable and inclusive in its content and delivery.
- Empower our students to be engaged citizens within Liverpool, in their wider communities and beyond.”

What does ‘broadening student’s sustainability knowledge’ mean in practice?



For many subjects, as sustainability is already included in learning and teaching – broadening student’s sustainability education might include small refinements or additions to what you teach. As ESD aims facilitate an educational experience that prepares and equips students to engage with complex issues in the outside world, it’s important that sustainability is both positioned within a disciplinary context (not seen by students as a separate set of issues), and provides students with knowledge of sustainability outside of the disciplinary boundaries. For example, through:

Incorporate the UN's Sustainable Development Goals (SDGs)

Introducing students to [the UN's Sustainable Development Goals](#) (SDGs) and through explicit connections between subject content and research where appropriate. This can support students to view sustainability as integral to the subject area and put specific disciplinary issues into a wider global and local context.

Increase student's awareness of the interconnections between social, economic, and environmental factors

Your subject discipline may already cover specific aspects of sustainability in depth (climate science in Environmental Sciences for example) – broadening student's knowledge of sustainability will include introducing students to interconnected social, economic and environmental issues outside of the subject discipline. For example, including the political and cultural impacts of climate change in addition to the core climate science.

Introduce sustainable development concepts and practices

Where appropriate within a subject disciplinary context, introduce student's to sustainable development concepts and practices. For example, data on the impact of human activities through the [Planetary boundaries framework](#), solutions to environmental sustainability problems through systems thinking approaches such as [Circular economy](#), or inequality issues such as [Modern slavery](#).

Link sustainability competencies with employability skills

Embed into the curriculum where appropriate opportunities for students to critically explore and understand how businesses and other organisations are responding (or not) to sustainability challenges and the knowledge and capabilities they will be looking for in our graduates.

This could be through government policies such as the [UK governments Net Zero Strategy](#) or through specific business initiatives such as the [B Corp movement](#), [Environment Social Governance](#) (ESG), [corporate social responsibility](#) (CSR), and [environmental management systems](#) ISO 14001 (EMS).

What are the sustainability competencies?



The QAA (QAA, 2021) outlines eight interrelated sustainable development competencies (skills, attributes, values) to support ESD. Many of these competencies may well already be developed in your learning and teaching already and can be adapted or enhanced to support sustainability issues and challenges:

Ways of thinking (head)

Sustainability competency	Indicators
Systems thinking Approaching problems that analyse how all the elements within a system influence one another.	Ability to frame contexts holistically, recognise interconnectedness, work across scales, analyse interactions, deal with uncertainty, identify adaptation to system changes.
Future thinking Understanding and meaningfully contributing towards current and future challenges, whether in a local or global context.	Ability to understand and evaluate multiple outcomes, create visions for the future, apply the precautionary principle, deal with risks, understand influences of history.
Critical thinking Conceptualising, applying, analysing, synthesising, and evaluating information.	Ability to question norms, practices, and opinions, reflect on different perspectives, analyse information, assess the credibility of information sources.

Ways of doing (hand)

Sustainability competency	Indicators
<p>Strategic competency Transitioning to sustainable alternatives or developing sustainable solutions to current problems or issues requiring strategy.</p>	Ability to develop and implement strategies and action plans for sustainable development.
<p>Collaborative competency Communicating effectively with colleagues, clients and stakeholders, ethically and professionally across platforms, disciplines, cultures, national boundaries and cyber-physical interfaces.</p>	Ability to learn from and with others, respect different needs and perspectives, tackle conflicts, undertake collaborative problem solving.
<p>Integrated problem-solving competency Responding to complex, ill-defined problems that can include missing, contradictory or contested information.</p>	Ability to work within a discipline and across disciplines, link theory to practice, apply different problem-solving frameworks to complex sustainable development problems.

Ways of being (heart)

Sustainability competency	Indicators
<p>Self-awareness competency Recognising how students' emotions, motivations and personality impact on their actions and behaviours.</p>	Ability to reflect on own values and actions, monitor feelings and needs, support mental resilience.
<p>Normative competency Understanding and reflecting on the norms and values that underpin students' own actions and those of other stakeholders.</p>	Ability to understand and reflect on norms and values underpinning actions, appreciate other worldviews, negotiate fair cross- and inter-cultural approaches.

For more detailed information about each of the eight competencies:

[Education for Sustainable Development guidance](#) (QAA, 2021) pages 20-22.

What learning and teaching approaches can support sustainability competencies?



“In Practice sustainability education requires active, participative and experiential learning methods that engage the learner and make a real difference to the learner’s understanding, thinking and ability to act. These kinds of shifts can be seen as consistent with current wider moves in higher education towards student-centred, diverse and active learning approaches:

- learning to ask critical questions;
- learning to clarify one’s own values;
- learning to envision more positive and sustainable futures;
- learning to think systemically;
- learning to respond through applied learning; and,
- learning to explore the dialectic between tradition and innovation.

UNESCO, 2011.

The learning and teaching approaches that can support sustainability competency development are summarised below:

Case Studies (Critical thinking competency)

Qualitatively rich descriptions of settings, problems, and controversies in sustainable development challenge students to interact with the inherent complexity and uncertainty found in global, regional, and/or local contexts.

Case studies invite students to consider real-world examples and examine issues from a diversity of stakeholder perspectives. Case studies can provide a detailed example of opportunities for students to engage in research with complex human-systems.

Co-teaching (Critical thinking, systems thinking competencies)

Co-taught courses or guest lecturers etc allow for the possibility of having specialists in different fields help students explore interdisciplinary and transdisciplinary topics from two or more distinctive disciplinary perspectives.

Stimulus Activities (Critical thinking, self-awareness competency, normative competencies)

Watching a video, multimedia, or looking at a photograph, poem or newspaper article or reference to a physical object to initiate discussion and reflection. Students may even be involved in producing their own work such as photos taken around the campus to stimulate a discussion on campus greening. Use of videos or externally-produced documents potentially enables the tutor to bring in a wide range of viewpoints for critical analysis, and this approach is feasible even with very large groups.

The use of a discussion may be an attempt to counter-act the risk of the tutor taking a transmissive or authoritarian approach, thereby enabling students to discuss their own and others' views. Discussions potentially enable a range of perspectives to be aired, but they may be confrontational and prove difficult to control, especially if the topic is a controversial one. The tutor needs to be able to encourage listening and self-reflection rather than argument and should be clear about their own role in the discussion for some of the difficulties of neutrality as a tutor position.

Story Telling (Future thinking competency)

Learning is structured around a narrative or story as means of sense making. Story telling can be used to enable teachers or students to share stories and interpret experiences, or situate learners within a story-world in which to participate an unfolding story.

Systems thinking learning activities (Systems thinking)

For example, through visualisations approaches (e.g. [Sray diagrams](#)) or adaption of existing supply Chain Analysis or Life Cycle Assessment activities challenge students to consider sustainability through the lens of a specific product or commodity, understanding its economic, social, and environmental backgrounds, contexts, and effects. While Life Cycle Assessment generally applies to detailed technical evaluations of impacts. This requires accessing and interpreting data from a variety of disciplinary sources. Students often research familiar items, allowing for a clear sense of real-world relevance and personal implications.

Field Work and Field Trips (Systems thinking, critical thinking)

Can be based on issues in the local community and environs, linking theory to real-world examples, which can help students to understand multiple stakeholder perspectives in situ. There is also evidence that outdoor experience is an important precursor to

understanding sustainability and that fieldwork promotes broader benefits for learning by encouraging active and reflective learning among students.

Play-Based, Game-Based Learning and Simulation (Collaboration competency)

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.

Problem-centred learning (Integrated-problem solving, collaboration, future thinking strategic competencies)

Learning opportunities that use real-world issues or problems to increase knowledge and understanding. Problem-centred 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.

(Problem-based learning is defined here as students in groups or individually focusing on a defined problem or issue integrated with other forms of learning and teaching, and not referring to particular 'problem-based learning' approaches e.g. [Maastricht PBL model](#) used in many medical schools etc.)

Problem-centred learning that utilises the following additional approaches will tend to support holistic sustainability competency development as it's closer to engaging students in real-world problem-solving scenarios:

Interdisciplinary learning

The multidimensional nature of many sustainability issues invites, and at times requires a corresponding multi- and interdisciplinary approach to inquiry and learning, setting a challenge for higher education that traditionally remains primarily structured around disciplinary and compartmentalised structures. This may mean finding practitioners in other disciplines and subject areas who are engaged in, or willing to engage in, this challenge, either by introducing more multidisciplinary approaches in collaboration with other disciplines, or by attempting more fully engaged forms of interdisciplinarity.

Participatory action research

Participatory action research emphasises the collaborative nature of the research and the production of knowledge by all participants, especially those non-academic community members who would be considered 'research subjects' in more mainstream research approaches.

Living Labs

A Living Lab is a pedagogical approach where applied learning is promoted through utilisation of the campus or community as a test bed for innovation and progressing sustainable development. Where Living Labs take place within the research domain of an institution, this is both a concept and process for research and innovation implementing potential solutions to the sustainability challenges.

Civic Engagement Projects

Related to the previous two approaches, civic engagement projects (community service learning) enable students to engage in activities intended to directly benefit other people, where the activities are integrated with learning activities in an intentional and integrative way that benefits both the community organisation and the educational institution. The settings, experiences, levels of engagement, and learning potential can vary widely from mere participation in some typical volunteer work with limited problem solving and community interaction to prolonged collaboration on a complex project.

Adapted from: Lozano et al, 2017.

Can you give me some examples of ESD in practice?

A few ideas to introduce students to sustainability issues such as climate change, or inequality issues to develop their critical thinking, systems thinking, and self-awareness competencies in subjects where sustainability is typically not a common subject:

Archaeology

- How cultural heritage can create communities of cohesion and belonging.

English

- Introducing discourse analysis to students through texts such as advertisements.
- Having students critically appraise nature writing.

History

- What is the historical causation for climate change? How should we seek to describe and analyse it?

Nursing

- Discussions about possible effects of climate change on disease distributions (e.g. malaria).
- Discussion of the documented effects of lifestyle changes on health to give an insight into changes now happening in our own population. For example, increasing rates of skin cancer due to popularity of sunbathing.

Music

- What might be the consequences of global warming on the music and music traditions of African peoples and communities who have to leave their homelands due to drought and famine?
- How might music have contributed to the problem? (Example: the glorification of the automobile in popular music.)

Media and communications

- Analyse the ways in which the environment is constructed and contested, by examining the role of science, media and culture in the communication of environmental issues.
- What underlies our consumer and media culture?

Sociology

- Gender inequality and violence – how entrenched emergent needs, and situations social attitudes undermine progress, particularly in relation to women's education and health.

Extracted from: Sterling, 2010.

Other examples

[Integrating Business and Medical Pedagogy to Accomplish the Sustainable Development Goals](#) (case-based learning, SDGs)

"A quality education is one that best fits the present and future needs of an individual within their current society. Case-based Learning (CBL) is inquiry-based learning which allows self-directed learning, logical reasoning, problem-solving and decision-making. CBL enhances knowledge, teamwork and problem-solving skills; it is used worldwide across various healthcare fields. It can tie theory to practice and go beyond traditional learning outcomes to induce deeper learning. The CBL method has been touted as superior in preparing future healthcare professionals. This preparation is a vital step in attaining the progress needed to achieve the 2017 Sustainable Development Goals (SDGs). We believe the CBL approach will not only foster more competent learners, but also is a necessary and sufficient technique to meet the SDGs. We conclude that healthcare pedagogy should embrace CBL techniques in order to realize sustainable development and the healthy planetary goals."

[Undergraduate accountancy programme](#) London School of Economics (critical thinking, systems thinking)

"Encourage students to review and analyse a company's performance beyond solely financial measures and a growth mindset. Both of the latter have been key to the study

and practice of accounting and financial management but are insufficient for the changing demands of industry and society.”

[Greening the campus University of Liverpool](#) (Interdisciplinary learning, problem-centred learning)

“The application of real-world projects enables students to apply theory to practice in authentic contexts. Interdisciplinary and intercultural groups enable students to aid problem solving through sharing different perspectives, world views and applying different subject expertise. This case outlines a specific group work approach developed in Environmental Sciences, in collaboration with the Guild of Students and the Sustainability Team in FRCS acting as project clients, focused on ‘greening’ the University campus. Design ideas as an output to group projects were presented to FRCS staff with ideas influencing the development of the University’s estates plan. Modules in Life Sciences and the Management school focused on food security and project management aspects in parallel to this case. Students presented their designs to each other, academic staff and University clients developing important employability skills.”

[Vertically Integrated Projects for Sustainable Development \(VIP4SD\)](#) University of Strathclyde (interdisciplinary learning, applied research)

“VIP4SD represents a reorientation of Higher Education by embedding Research-Based Education for Sustainable Development (RBESD) in undergraduate curricula. Here, students can gain academic credits by working in partnership with their peers from different disciplines and year groups, and with experienced researchers and academics, on ambitious research projects that tackle the Sustainable Development Goals (SDGs).

VIP4SD allows students to remain involved in these projects throughout their University career; returning each year to continually build their knowledge and deliver project outcomes that advance Agenda 2030. From a project perspective, this model provides the continuity required for projects to take on long-term, bold and ambitious research challenges.”

[A living lab approach](#) University of Warwick (interdisciplinary learning, living labs)

“The Division of Global Sustainable Development (DGSD) has an institution-wide remit to promote Education for Sustainable Development, and part of this is encouraging the application of issue-based and response-focused pedagogies. This supports the university’s strategic drive for more interdisciplinary education, by moving away from the teaching of a disciplinary cannon of knowledge, to identifying a real-world issue for exploration using a mixture of disciplinary understanding. In some cases, these learning experiences move entirely beyond concerns with disciplinary identity, but always focus on the most appropriate knowledge to interpret the existence of a concern, analyse and diagnose its nature, with the explicit intention of proposing potential responses. These learning experiences combine subject and academic process learning around the environmental, social and economic pillars of sustainable development, with

employability/citizenship skill gain via specific workshops run by DGSD staff to enable learners to develop and demonstrate some of the UNESCO key competencies for sustainability. Living laboratory opportunities have included projects generated by the building of Highspeed Rail infrastructure between London and Birmingham, through which we also expressly teach research methods; the creation of Visual Campaigns that respond to issues within the current university food system; connection of the University to City via a Coventry Cycle Superhighway. Further information can be found here: [Certificate of Sustainability Consultancy \(Auditing\)](#).

References

[Education for Sustainable Development: a review of the literature 2015-2022](#) (Advance HE, 2023)

[The United Nation report of the World Commission on Environment and Development: our common future](#) (Brundtland report, 1987)

[Connecting Competences and Pedagogical Approaches for Sustainable Development in Higher Education: A Literature Review and Framework Proposal](#) (Lozano et al, 2017)

[Education for sustainable development and sustainability science: re-purposing higher education and research](#) (Mochizuki et al, (2016)

[Education for Sustainable Development guidance](#) (QAA, 2021)

[QAA revised subject benchmark statements](#) (QAA, 2022)

[Monitoring and evaluating ESD in higher education report](#) (QAA, 2023)

[Sustainability Education: Perspectives and Practice Across Higher Education](#) (Sterling, 2010)

[Education for Sustainable Development an expert review of processes and learning](#) (UNESCO, 2011)

[Education for sustainable development: a road map](#) (UNESCO, 2020)

[What you need to know about education for sustainable development](#) (UNESCO, 2023)

Additional resources

[Advance HE Education for Sustainable Development](#)

[The Future Fit Framework](#) (Advance HE, 2012)

[Sustainability Competencies report](#) (European Commission, 2020)

[Key competencies: practical approaches for teaching sustainability](#) (AASHE, 2023)



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