HERIOT WATT UNIVERSITY

Learning for Sustainable Development: Sector Insights Guide

Kay Hack, Advance HE

Contents

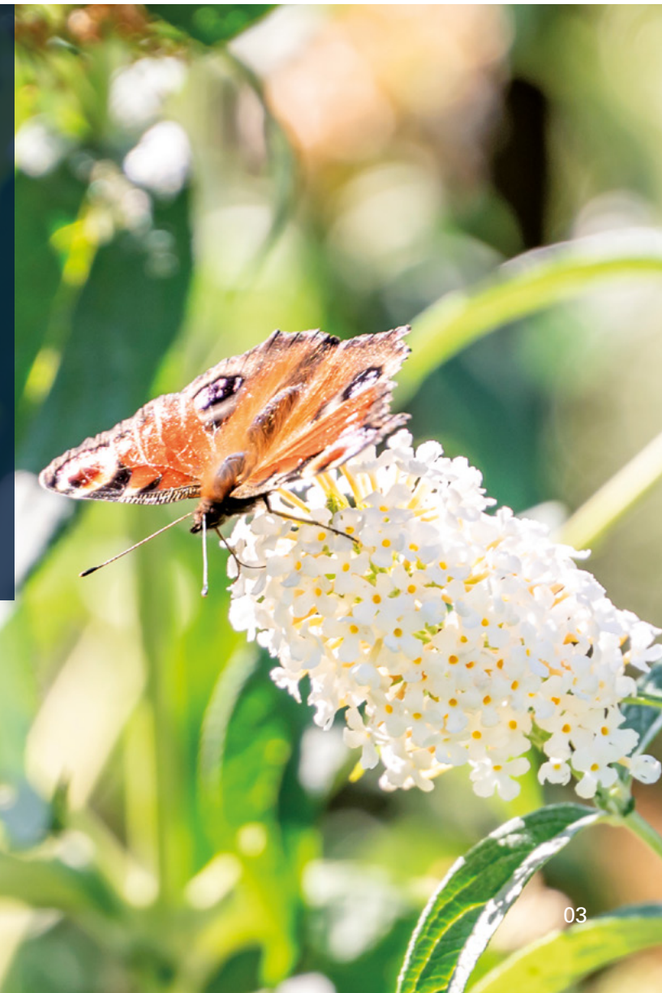
Introduction

This Sector Insights Guide was commissioned by the Learning and Teaching Academy, to support Heriot-Watt University's strategic Global Changemaker Curriculum Framework and its specific dimension, 'Learning for Sustainable Development'. The Guide offers underpinning theory and practical help for staff involved in designing and delivering Learning for Sustainable Development. It introduces this concept and what it means, offers approaches to fostering sustainable learning opportunities, and outlines the need to align sustainability education with both disciplinary knowledge and wider institutional strategic objectives. The Guide is designed to offer current sector perspectives and insights on this theme, and to help advance thinking and practice for course and programme teams as they review, refine, and design programmes of study.

To exemplify the range of sector-wide Learning for Sustainable Development practices, six short learning and teaching global case studies are included in this Guide. The case studies cover a range of academic subject areas, and stages of learning at module, programme, and institutional levels. All provide learning opportunities that link to the 17 **United Nations Sustainable Development Goals (SDGs)** and cover global challenges ranging from climate change, economic growth, reducing poverty, and health and wellbeing. Some involve whole classes, while others involve self-selection to engage with Learning for Sustainable Development. At the end of the Guide, you will find key takeaway messages and a range of further relevant reading.

The endeavour to embed learning for sustainability into the curriculum and co-curriculum is often referred to as Education for Sustainable Development, defined by QAA and HEA in 2014 as:

> **"The process of equipping students with the knowledge and understanding, skills and attributes needed to work and live in a way that safeguards environmental, social, and economic wellbeing, in the present and for future generations."**
>
> **(QAA and HEA, 2014)**



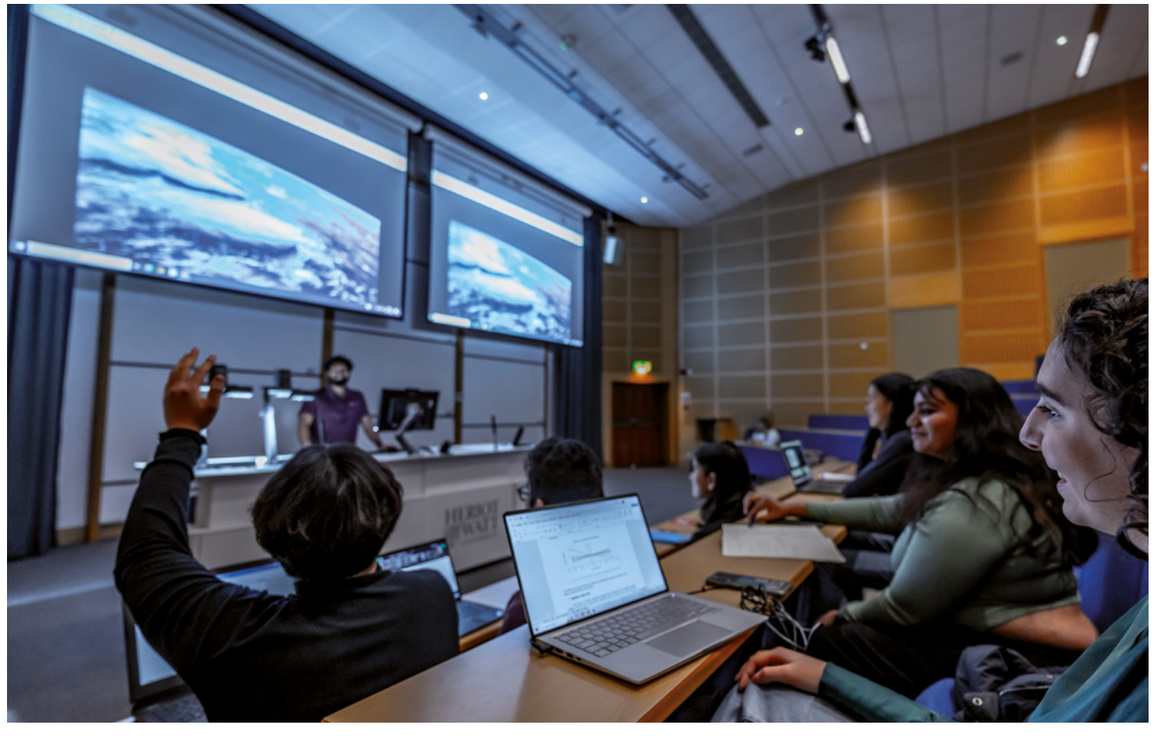
01 Exploring the Learning for Sustainable Development Dimension

In a curriculum aligned with Learning for Sustainable Development, students embrace purposeful and challenge-based learning to connect their studies, their communities, and action for sustainable development. In this Guide, we consider that sustainable development addresses the 'three pillars' of sustainability, which are economic, social, and environmental sustainability. These three pillars are also known as people, planet, and profits (Brundtland, 1987), and provide a framework to consider the impact of organisations, products, services, and technologies.

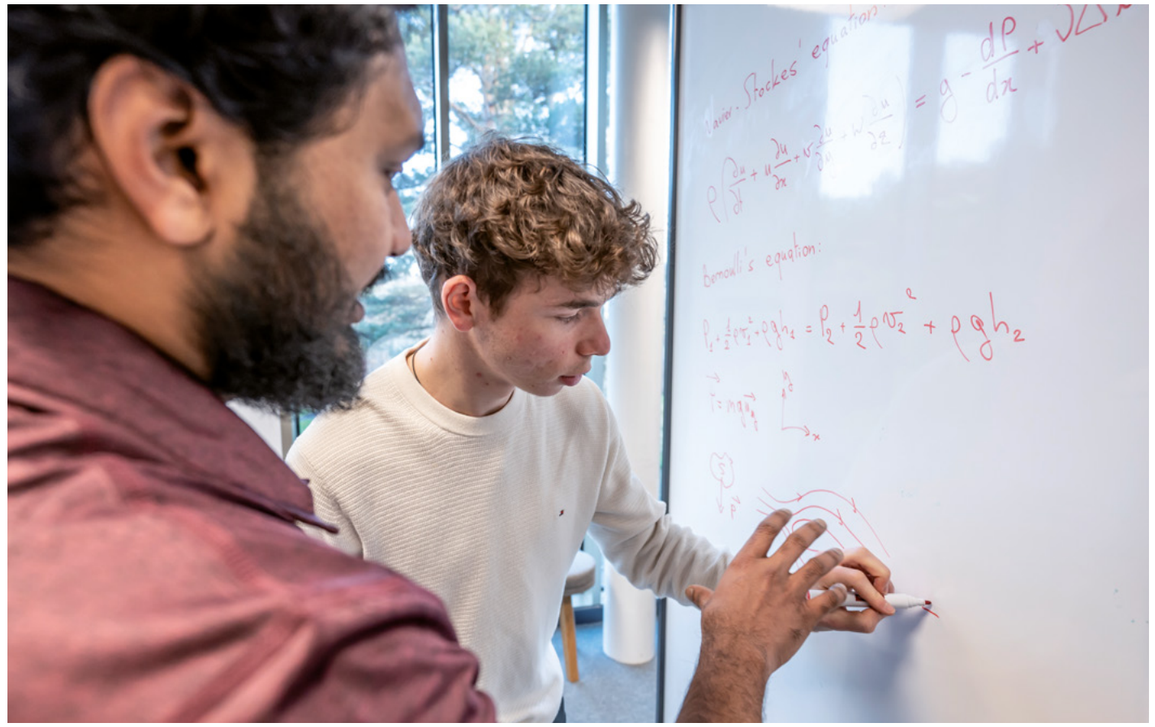
The recently published **Advance HE framework (2024)**, 'Education for Sustainable Development' builds upon this initial model to help current educators across the higher education sector understand how students can develop sustainability competencies. It identifies how both educators and universities can influence the student experience regarding Learning for Sustainable Development.

> **"Education for sustainable development (ESD) in higher education equips learners with the knowledge, competencies and values to tackle interconnected global challenges, and have a positive impact on economic, social and environmental sustainability."**
>
> (Advance HE, 2024)

Learning for Sustainable Development is a key enabler in higher education for developing sustainable citizens, individuals who can reflect on their values and appreciate how their beliefs and experiences shape their actions. Sustainable citizens recognise that, as members of local and global communities, there is a need for them to act for the benefit of all societies and not just their own (United Nations, n.d.; Evennett, 2021).



02 Benefits of Student Engagement with Learning for Sustainable Development



Graduates play a critical role in developing viable, inclusive, and equitable solutions to the economic, social, and environmental challenges the world is facing. The impact they will have on the planet compels those of us working in higher education to equip graduates with the sustainability competencies, skills, and attributes required to meet these challenges (Lozano et al., 2022).

The **Times Higher Education Student Pulse** (2021) showed that 82% of students are keen to live in a way that is consistent with sustainable citizenship. Providing opportunities for students to engage with Learning for Sustainable Development can give them the competencies required to become sustainable citizens.

As businesses and organisations endeavour to meet environmental and social goals, there will be a growing demand for professionals who understand sustainable development principles and can help implement sustainable strategies. Graduates with sustainability competencies can expect wider and more impactful career opportunities.

Today's graduates will also be business leaders of the future and have the ability to inspire others regarding how organisations can advance sustainably. Whether they choose to work directly in sustainability-focused roles or view their chosen field in the context of sustainable principles, their expertise will be valuable in driving a more sustainable and equitable future. The World Economic Forum recognises the growing importance of sustainability in its **Future of Jobs Report (2023)**.

> **"The fastest-growing roles relative to their size today are driven by technology, digitalization and sustainability."**
>
> (World Economic Forum, 2023)

This Report also acknowledges that sustainability jobs make up three of the top ten fastest growing roles, including positions such as Sustainability Analysts, Sustainability Specialists, and Sustainability Managers.

03 Getting Started with Learning for Sustainable Development

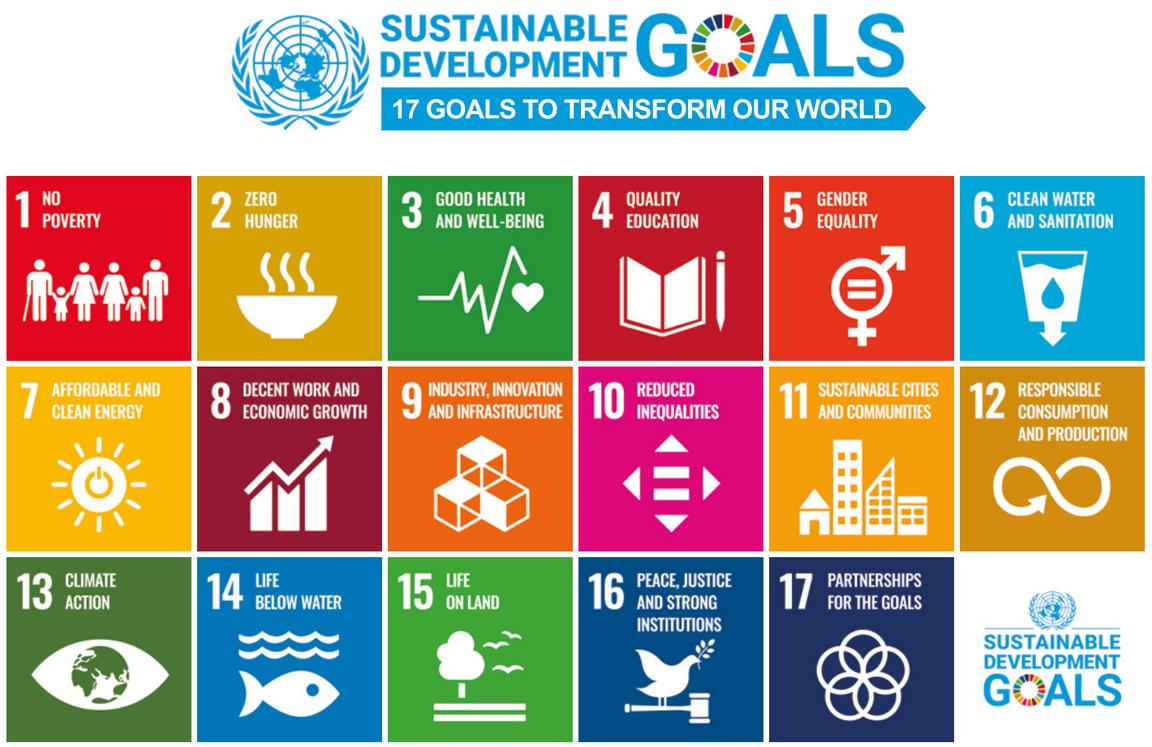


Figure 1: United Nations Sustainable Development Goals (Source: https://sdgs.un.org/goals)

The UNESCO definition of sustainability recognises the need to address the cognitive, socio-emotional, and behavioural dimensions of learning. Emphasis is placed on providing opportunities for students to develop competencies (e.g., skills, attributes, and values) within the context of their academic disciplines, along with acquiring knowledge of sustainable development. Learning for Sustainable Development supports all students to create and pursue visions of a fairer world, one that recognises the interdependence of environmental integrity, social justice, and economic prosperity.

The 17 SDGs agreed by the **UN General Assembly in 2015** (see Figure 1) are ambitious, aiming to unite countries in tackling key challenges related to sustainable development by the year 2030. These goals transcend political, economic, social, environmental, and technological boundaries, necessitating collaboration across all sectors to achieve their 169 targets and 232 indicators.

Given their interdisciplinary and interconnected nature, the 17 SDGs can inspire content and challenges for teaching materials and assessment instruments. Global challenges range from climate change, poverty, health, corporate social responsibility, and water and food crises. The breadth of the SDGs and the depth of the targets within each goal means that they can resonate with all academic disciplines, subject areas, and study levels.

04 Competencies and Learning Outcomes

The UNESCO competencies are not unique to sustainability. Critical thinking, strategic and collaborative practice, and solving complex problems are commonplace among the general competencies of many degree programmes and are linked to employability. However, the application of these competencies to sustainability challenges is what makes them significant in this context.

Effective Learning for Sustainable Development does not necessarily require explicit references to sustainability or the SDGs in learning outcomes, as integrating sustainability concepts and challenges into teaching materials, pedagogies, and assessments can be used to cultivate sustainability competencies (Aznar et al., 2016).

Table 1: The UNESCO sustainability competencies aligned with what a student should be able to know, do and be after an episode of learning.

Sustainability Competency (UNESCO)	A student who displays this competency can:
Systems thinker	• recognise and understand relationships • analyse complex systems • consider how systems are embedded within different domains and scales • deal with uncertainty
Anticipatory (Future thinker)	• 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 thinker	• question norms, practices, and opinions • reflect on one's own values, perceptions, and actions • take a position in the sustainable development discourse
Strategic	• develop and implement innovative actions that further sustainable development at the local level and further afield
Collaborative	• 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-solver	• apply different problem-solving frameworks to complex sustainable development problems • develop viable, inclusive, and equitable solutions • utilise appropriate competencies to solve problems
Self-aware	• 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	• 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

Note: Adapted from Education for Sustainable Development Guidance (Advance HE and QAA, 2021) Teaching Practices.

In a constructively aligned curriculum, only learning outcomes that can be demonstrably achieved through assessment are identified. This can result in the omission of value-based competencies from course descriptors. However, it is important to find ways to maintain focus on these competencies through teaching practices and learning materials as they play a significant role in shaping a sustainable future (Noy, Capetola, and Patrick, 2021).

Learning for Sustainable Development calls for a shift from practice that focuses on the acquisition of knowledge and skills to an emphasis on values, attitudes, and behaviours that promote sustainability. This requires teaching, learning, and assessment activities that are constructively aligned to foster sustainability competencies, helping students apply their academic knowledge and skills to sustainability challenges. It should offer transformative learning experiences that encourage students to develop their ways of thinking and practising, whilst reflecting on personal values, enabling students to become sustainable citizens and informed advocates of sustainable development.

Learning for Sustainable Development aligns with active, participatory, and experiential learning, which provides the opportunity to examine diverse perspectives and engage in dialogue to develop solutions to complex problems and gain a holistic understanding of sustainability issues. Evidence suggests that the most effective teaching methods for developing sustainability competencies include real-world experiences, problem-based learning, project-based learning, and case studies (see Section 7.0). However, the context-specific nature of these methods, such as curriculum or discipline learning outcomes, is often overlooked in research, which questions the generalisability of the findings. Educators play a pivotal role in adopting and adapting these methods within the context of their subject knowledge, pedagogy, and understanding of their students (Vogel et al., 2023).

> **"…cognitive, functional and affective competences are developed through practical, reflective, problem-based learning experiences in interactive, collaborative and paradigm-challenging creative learning spaces."**
>
> (Davidson, Prahalad and Harwood, 2020)

05 Assessment for Sustainable Development Learning

The developmental nature of sustainability competencies benefits from a focus on **the process** rather than **the product of learning**. Assessment criteria should be designed to prioritise how students reach a viable solution to a problem rather than simply focusing on the problem's solution. Given students in the same cohort may be undertaking assessments on different sustainability topics, assessing the process of learning also provides parity across the required assessment task.

Varied assessment methods are possible in sustainability learning, including posters, group/individual presentations, podcasts, reflective reports, and grant writing exercises. Learning that is problem-, project-, or inquiry-based has been suggested to be an effective approach for Learning for Sustainable Development, whereby students collaborate to analyse and propose solutions to real-world sustainability problems (Vogel et al., 2023). Problems suggested by businesses, charities, or community groups, and/or those that require knowledge and methods from multiple disciplines, provide a valuable context for learning (see Case Study 7.5). Authentic assessment tasks (see Case Study 7.2) can also help mitigate some of the assessment challenges that have arisen through the proliferation of generative AI tools such as ChatGPT.

06 Putting Learning for Sustainable Development into Practice

The sustainable development educational literature describes a typology of approaches for integrating Learning for Sustainable Development into the curricula, providing extra-curricular activities that are open to all as well as cross-disciplinary curricula incorporated into all degree programmes (Vogel et al., 2023). Institutional or holistic approaches to sustainability, evidenced through institutional practices and values, can be influential in transforming the students' explicit understanding of sustainability. Involving students in co-creating the approach to integrating sustainability into their curriculum can model collaborative values and develop agency. Mature models of Education for Sustainable Development provide students with opportunities to progress their understanding of sustainability issues alongside their disciplinary knowledge throughout their degree programme, allowing them to undertake capstone projects that sit at the nexus of their academic discipline and sustainability.

Table 2: Typology of approaches to integrating sustainability into the student learning experience

Approach	Examples
1. Extra or co-curricular course	MOOCs, field trips, or service learning.
2. Integrated into existing modules	Reflective journaling or authentic assessments triggered by real-world sustainability issue.
3. Elective or core module	Delivered by sustainability experts.
4. Dedicated sustainability education across a degree programme	Core sustainability modules, sessions, or streams embedded across the degree programme.
5. Inter-disciplinary or trans-disciplinary modules or streams	Modules offered across cognate discipline areas or across the university. Transdisciplinary approach triggered by partnership with external stakeholders.

(Adapted from Vogel et al.'s (2023) Education for Sustainable Development: A Systematic Review of the Literature).

07 Learning for Sustainable Development: Case Studies

The short case studies in this section are structured around the typology of approaches to integrating sustainability into the student learning experience (see Table 2).

7.1a Case Study: Extra or Co-curricular Course

Student Volunteering Project: Sustainable Development Goals Consultancy Challenge for Local Charities
University College London (UCL), UK

This student-led project offers no-charge consultancy to charities across London, with the aim to provide solutions to actual sustainable development challenges. The initiative is managed by the UCL Careers Service and the UCL Students' Union. Projects are varied and have included devising fundraising communication strategies, undertaking business development planning, and investigating the extension and viability of services offered by social enterprises.

Students work in small groups and are given a modest amount of funding to undertake the weeklong activities. To prepare each group for their role, two training sessions on project management and consultancy skills are provided by UCL. The weeklong challenges start with a structured session organised by the host charity. This session covers a project brief, how the project connects to the UN SDGs, project planning activities, and reporting expectations.

At the end of the week, the project groups present their work and final report to all student participants, host charities, and a judging panel. The event offers a valuable opportunity for students to reflect on their learning, skills development, and the impact of their SDG-based consultancy activities.

Further information: **https://studentsunionucl.org/consultancy-challenge**

7.1b Case Study: Extra or Co-curricular Course

Sustainable Development Escape Rooms
Keele University, UK

Escape room style activities or 'treasure hunts' that require students to work in teams to solve problems and navigate challenges are growing in popularity. Keele University has devised an escape room with a sustainability twist that is linked to Keele's Green Festival. The Festival showcases the innovative and collaborative approaches the University has undertaken with regards to sustainability.

Students sign up as a team for the escape room activity and complete a series of online challenges, with the goal to break out of the room. The escape room process enables students to test their knowledge about sustainable development issues. This type of activity can also be used as an induction activity for new students and as a team building exercise.

This gamification approach helps students develop their knowledge and understanding of sustainability issues such as climate change, social justice, and health and wellbeing, alongside developing their collaborative working, critical thinking, and problem-solving skills.

Further information: **https://www.keele.ac.uk/library/news/2024/march/escapetothelibrary/escape-to-the-library.php#!**

7.2 Case Study: Integrated into Existing Modules

Integrating Authentic Assessment in Existing Modules to Embed Sustainability
University of Glasgow, UK

The University of Glasgow's Adam Smith Business School utilises authentic assessment as a central part of its approach to teach sustainable development in three economic modules. This involves providing a real-world challenge as an authentic assessment, where students are invited to select a sustainable development problem such as poverty eradication, reducing inequalities, or encouraging economic growth. The assessment is framed so students apply their knowledge and

skills to the task and make recommendations to a relevant fictitious practitioner, to simulate the types of tasks Economics graduates might encounter as professionals in the workplace.

To understand students' perceptions of this authentic assessment approach, feedback is collected and analysed at the end of each module. The data thus far reveals that students perceive their sustainability literacy and sustainability awareness to improve through this assessment type. Students also report enhancements to their employability-related competencies, including resourcefulness, communication, and problem-solving skills.

Staff reported that the switch to authentic assessment tasks promoted student curiosity and critical thinking, and provided opportunities for students to derive creative and practical solutions to sustainable development challenges.

Further information: Kushwah, Navrouzoglou and Cheng (2024).

7.3 Case Study: Elective or Core Module

Integrating a Joint Core Sustainability Module in Business-Related MSc Programmes
University of Greenwich, UK

The implementation of compulsory sustainability teaching for MSc programmes in the School of Accountancy, Finance and Economics at the University of Greenwich is designed to help equip all students on these programmes with the requisite sustainability knowledge and skills in a bespoke core module. The module focuses attention on students' future professional practices through coverage of the UN SDGs.

Using a case-based learning approach, students are exposed to different dimensions of sustainable development, with case study scenarios resembling real-world examples of business ventures connected to sustainability. This integration into the case studies enables students to understand the wider implications of business on society and environment, so that students are better prepared for the evolving employment market.

Student feedback is positive, and highlights how the module has provided personal and professional development, promoted ethical decision-making, and afforded a forward-thinking mindset. Overall, this curriculum design approach of incorporating a core mandatory sustainability module has enabled all students to engage equitably in sustainability learning and the values and principles that underpin sustainable development.

Further information: **https://blogs.gre.ac.uk/greengreenwich/education-sustainable-development/**

7.4 Case Study: Dedicated Sustainability Education Across Programmes of Study

Embedding Sustainability Learning and Teaching Across Degree Programmes
University College Cork, Ireland

To align with strategic ambitions, University College Cork has developed the SDG toolkit for teaching and learning. The toolkit helps staff identify, visualise, and reflect on their curricula and the 17 UN SDGs along with underlying targets and indicators. Toolkit users are asked to score curricula for each of the SDGs to determine if they are covered in a rigorous manner or if they are more superficially addressed, or if they are not included. The Toolkit also contains a number of prompt questions to encourage staff to identify when, where, and how their degree programme explicitly links to the SDGs. This mapping enables staff to determine the dedicated sustainability learning elements across an entire degree programme.

Staff workshops that encourage reflection on their SDG findings are also included, to enable further integration of SDGs into teaching activities, assessments, and programme learning outcomes. The project also has curated resources for staff to integrate sustainability concepts into the student learning experience (e.g., sustainability videos, graphics, and case studies).

The SDG Toolkit is licensed under a Creative Commons Licence and is available to other individuals and institutions free of charge.

Further information: **https://www.ucc.ie/en/sdg-toolkit/teaching/tool/**

7.5 Case Study: Inter-disciplinary or Trans-disciplinary Modules or Streams

Vertically Integrated Projects for Sustainable Development (VIP4SD)
Strathclyde University, UK

Strathclyde University's VIP4SD programme offers undergraduate students the opportunity to collaborate on UN SDG-related research through working together with students from different academic year groups. VIP4SD embeds research-based sustainability in undergraduate curricula, as each VIP4SD project addresses at least one of the 17 UN SDGs. Students gain academic credits by working in partnership with their peers from different disciplines and year groups, along with experienced researchers and academics, on ambitious research projects that tackle SDG issues such as poverty, climate change, and health. Collaborators include the NHS, the Scottish Government, and the Association of Commonwealth Universities. VIP4SD allows students to remain involved in these projects throughout their degree, as they return each year to the project to build their knowledge and deliver project outcomes that continually advance the SDG agenda.

This SDG aligned programme was established in 2016. It enables students to develop their research skills, build their confidence, and develop their group work capabilities, while providing a sense of agency and engagement. This model also provides the continuity required for projects to take on long-term, bold, and ambitious research challenges.

Further information: **https://tinyurl.com/2vxcmyz2**

08 Key Takeaways About Learning for Sustainable Development

1. Learning for Sustainable Development aims to equip students with the knowledge, skills, values, and agency to address global challenges such as climate change, inequality, and resource depletion, while empowering them to make informed decisions and take collective action for the benefit of all societies.

2. There is no single pedagogic approach to Learning for Sustainable Development, however approaches that are recognise as the most effective are those that are authentic, involve challenge-based learning, and include interdisciplinary approaches that involve engaging students in real-world problems and solutions that require collaboration across disciplines and perspectives.

3. The UNESCO sustainability competencies and the Heriot-Watt Graduate Attributes can help degree programme teams to identify what students should know, do, and embody. This will equip them to contribute to leaving the world in a better state than they found it. Helping students identify and articulate where, when, and how they are developing these competencies will support their future career success and employability.

4. Guiding students towards recognising their role and influence in shaping a sustainable future demands the cultivation of students' self-awareness and negotiation skills, ones that will enable them to navigate conflicts of interest and uncertainty.

5. Beyond learner outcomes and competencies, Learning for Sustainable Development can contribute to broader strategic priorities that impact on graduate success. These priorities include internationalisation and developing global perspectives, promoting employability and enterprise, community engagement, mental health and wellbeing, and progressing equality, diversity, and inclusion both within and beyond higher education institutions.

6. Universities have a critical role in developing the next generation of sustainable citizens, who are essential for making the world a more equitable place to live and work. Today's graduates will have a persistent impact on the environmental and social challenges that the world is facing. The topics covered, as well as the teaching and assessment practices adopted by educators, will influence the knowledge and competencies developed by students. Teaching practices should address the head (cognitive), hand (skills), and heart (values) to empower students, enabling them to have a positive impact throughout their lives.

About the Author

Dr Kay Hack, PFHEA is the Principal Adviser (Learning & Teaching) based at Advance HE. Her role involves promoting teaching excellence within and beyond the STEM subject areas, supporting strategic leadership development, and managing change projects in higher education institutions.

09 References and Further Useful Reading

Advance HE (2024) *Essential Framework for Enhancing Student Success: Education for Sustainable Development*. Available at: **https://www.advance-he.ac.uk/knowledge-hub/framework-education-sustainable-development** (Accessed: June 2024).

Aznar, P., Ull, M. A., Piñero, A. and Martínez-Agut, M. P. (2016) 'Competencies for sustainability in the curricula of all new degrees from the University of Valencia (Spain)', in *Routledge Handbook of Higher Education for Sustainable Development*, London: Routledge.

Davidson, J., Prahalad, V. and Harwood, A. (2020) 'Design precepts for online experiential learning programs to address wicked sustainability problems', *Journal of Geography in Higher Education*, 45(3), 319–341. doi: **https://doi.org/10.1080/03098265.2020.1849061**

Evennett, H. (2021) *Education (Environment and Sustainable Citizenship) Bill (HL)*. Available at: **https://lordslibrary.parliament.uk/education-environment-and-sustainable-citizenship-bill-hl/** (Accessed: September 2023).

Kushwah, L., Navrouzoglou, P. and Cheng, W. (2024) 'Embedding sustainability in existing curriculum by using authentic assessments, rubrics, and formative assessments: A case study'. In: Wall, T., Viera Trevisan, L., Leal Filho, W. and Shore, A. (eds) *Sustainability in Business Education, Research and Practices*. World Sustainability Series. Springer, Cham, pp. 241-254.

Lozano, R., Barreiro-Gen, M., D'Amato, D., Gago-Cortes, C., Favi, C., Martins, R., Monus, F., Caeiro, S., Benayas, J., Caldera, S., Bostanci, S., Djekic, I., Moneva, J. M., Sáenz, O., Awuzie, B. and Gladysz, B. (2022) 'Improving sustainability teaching by grouping and interrelating pedagogical approaches and sustainability competences: Evidence from 15 worldwide higher education institutions', *Sustainable Development*, 31(1) 349-359. doi: **https://doi.org/10.1002/sd.2396**

Noy, S., Capetola, T. and Patrick, R. (2021) 'The wheel of fortune as a novel support for constructive alignment and transformative sustainability learning in higher education', *International Journal of Sustainability in Higher Education*, 22(4), 854-869. doi: **https://doi.org/10.1108/IJSHE-08-2020-0289**

QAA and HEA (2014) *Education for Sustainable Development: Guidance for UK Higher Education Providers*. Available at: **https://www.advance-he.ac.uk/knowledge-hub/education-sustainable-development-guidance-uk-higher-education-providers** (Accessed: June 2024).

QAA and Advance HE (2021) *Education for Sustainable Development Guidance*. Available at: **https://www.advance-he.ac.uk/knowledge-hub/education-sustainable-development-guidance** (Accessed: June 2024).

Times Higher Education (2021) *Introducing the Student Pulse*. Available at: **https://www.timeshighereducation.com/hub/consultancy/p/introducing-student-pulse** (Accessed: September 2023).

Times Higher Impact Rankings (2024) *University Impact Rankings for 2024*. Available at: **https://www.timeshighereducation.com/impactrankings** (Accessed: June 2024).

UNESCO (2017) *Education for Sustainable Development Goals: Learning Objectives*. Available at: **https://unesdoc.unesco.org/ark:/48223/pf0000247444** (Accessed: June 2024).

United Nations (2015) *Transforming Our World: The 2030 Agenda for Sustainable Development*. Available at: **https://sdgs.un.org/** (Accessed: September 2023).

United Nations (n.d.) *Global Citizenship*. Available at: **https://www.un.org/en/academic-impact/global-citizenship** (Accessed: September 2023).

United Nations (1987) *Our Common Future (Brundtland Report)*. Available at: **https://www.are.admin.ch/are/en/home/media/publications/sustainable-development/brundtland-report.html** (Accessed: May 2024).

Vogel, M., Parker, L., Porter, J., O'Hara, M., Tebbs, E., Gard, R., He, X. and Gallimore, J-B. (2023) *Education for Sustainable Development: A Review of the Literature 2015-2022*. Available at: **https://www.advance-he.ac.uk/knowledge-hub/education-sustainable-development-review-literature-2015-2022** (Accessed: November 2023).

World Economic Forum (2023) *The Future of Jobs Report 2023*. Available at: **https://jp.weforum.org/publications/the-future-of-jobs-report-2023/** (Accessed: May 2024).

HERIOT WATT UNIVERSITY

November 2024