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UG Design Education for Sustainability: Designing for Planet & for Life

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There is a clear need to augment and expand Design for Sustainability (DfS) and the ecological design thinking that supports it. In the UK, the Design Council's *Design for Planet* and the Royal Society of Arts (RSA)'s *Design for Life* programmes both support this agenda. As design educators who have spent our careers advancing ecological and sustainability literacies in Design Education for Sustainability (DEfS), we enthusiastically welcome the momentum generated by both programmes. The *Design for Planet* mission aims to upskill 1 million UK designers in green design skills by 2030. The RSA's *Capabilities for Life Framework* presents life-centric mindsets that navigate different perspectives, knowledges, and competences. The Design Council's *Design for Planet* has been highly visible in the online design ecosystem and is the theme for the *World Design Congress London 2025*. We suggest that this prominent institutional attention to DfS and DEfS with strategic visions for transformative learning can help design educators carve out the necessary space and time for sustainability in the curriculum. In this paper, we signpost key aspects of a prospective undergraduate DEfS programme with reference to *Design for Planet* and *Design for Life*. Learning is scaffolded by iteration of key DfS concepts and approaches as students journey through three years and become more capable of engaging with complex problems. DEfS is a process of continually revisiting themes, going a little deeper and wider each time. Students develop capacities to make informed decisions with ecological design knowledge and ecological design thinking alongside other critical green skills. DEfS creates foundational knowledge to mitigate against further environmental harms to reduce both extraction of natural resources (with associated disruptions to ecosystems) and pollution (including greenhouse gas emissions) while simultaneously adapting to environmental challenges including the climate and biodiversity emergencies.

Keywords: sustainability, undergraduate education, Design for Planet, green skills, ecological literacy

Introduction

Design for Sustainability (DfS) in undergraduate (UG) design education provides learners with the basic ideas and practices they need to support sustainable transitions. Building on new momentum generated by the Design Council's *Skills for Planet Blueprint* (2025) and RSA's *Capabilities for Life Framework* (2023), in this paper we draw out core knowledge, literacies, skills, and capacities within a prospective three-year undergraduate design programme. We note the emphasis on skills (Design Council) and capacities (RSA). To these two perspectives we add knowledges and literacies. DfS builds on transdisciplinary hybrid knowledges where the sustainability sciences, social sciences, and



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humanities are integrated with design thinking, design methods, and design skills. We describe ecological literacy (Orr 1992, 2002) as aligned with what the Design Council describes a Green Design Mindset: “a shift from a human-centric to a systemic worldview. How we think determines how we act, and so adopting a Green Design Mindset is essential if designers are to put Green Design Skills into practice” (2025, 10). Design Education for Sustainability (DEFS) supports design responses to both mitigate and adapt to environmental challenges and crises. While DfSE is both environmental and social, in this short paper we focus on environmental sustainability – with approaches that emphasise pluriversal (Escobar 2018; Leitão 2023) and environmental justice (Bullard 1990). We provide a summary of DEFS learning over three years.

Design Education for Sustainability challenges norms in design education. While freely available resources on DEFS are now abundant and easily accessible (Ceshin 2024; Faludi *et al* 2023; Micklethwaite 2022; Watkins *et al* 2021; Irwin *et al* 2021; Wilde 2020; Marttila 2018; Quam 2016; Bhamra & Dewberry 2007), transforming curricula to respond to sustainability agendas is rarely straightforward. Obstacles include difficulties in changing priorities in institutions and amongst teaching staff (Boehnert, Dewberry & Sinclair 2022) and “unlearning unsustainability” (Boehnert & Dewberry 2023) alongside students’ own perceptions on relevance, value, and need (Newton & Ellis 2024). As environmental crises accelerate, the need for DEFS becomes increasingly evident and urgent. The *Design for Planet* and *Design for Life* programmes both emerge as powerful interventions by two highly regarded UK-based institutions to support accelerated ecological design learning. The Design Council’s *Skills for Planet Blueprint* explicitly highlights the critical role of design educators in advancing their agenda (see figure 1). Design for Planet was the theme of the World Design Congress London 2025. The high-profile attention to design learning for sustainability is historically unique and can be mobilised to dramatically advance DEFS in design schools.



An invitation to join our Mission

To ensure Design for Planet becomes part of everyday practice, the Skills for Planet Blueprint needs to be adopted and supported across the design ecosystem.

DESIGN EDUCATORS

Provide the designers of tomorrow with the Green Design Skills they need, using this Blueprint to inform learning material within the courses you create or contribute to. Helping students of all stages develop Green Design Skills should be central to learning outcomes, rather than being viewed as an accessory to Foundational Design Skills.

Only 50% of designers feel that their education has provided them (to a moderate or large extent) with green design skills.⁽¹⁾

The graphic features a green background with white and dark green text. On the right, there is an icon of a person standing next to a presentation board with a sun-like symbol on it.

Figure 1. From the Design Council’s *Skills for Planet Blueprint* (2025, 7) highlighting the role of design educators.

The UK Design Council recently published *Skills for Planet Blueprint* (2025) providing an overview of the core “Green Design Skills,” a “shared language for the design sector,” and an argument for “the vital importance of design to a just green transition” (p.5). The report highlights “a green design skills gap” where “only 43% of designers feel that they have the capabilities to Design for Planet” (p.4) and only “50% of designers feel that their education has provided them (to a moderate or large extent) with green design skills” (p.7). It is worth noting that these statistics represent designers’ perceptions of their own abilities to meet environmental challenges. Since the complexity of environmental challenges is often diminished, the figures are not necessarily representative of sustainability knowledges, literacies, skills, and capacities in design. The *Skills for Planet Blueprint* explicitly does not “stipulate how Green Design Skills should be taught or acquired...[or]...suggest what Green Design Skills look like across different levels of expertise, i.e. at school or in higher education” (p.5). This paper responds by describing hybrid knowledges that supports green skills and what some of these green design skills look like in various stages of undergraduate design education.

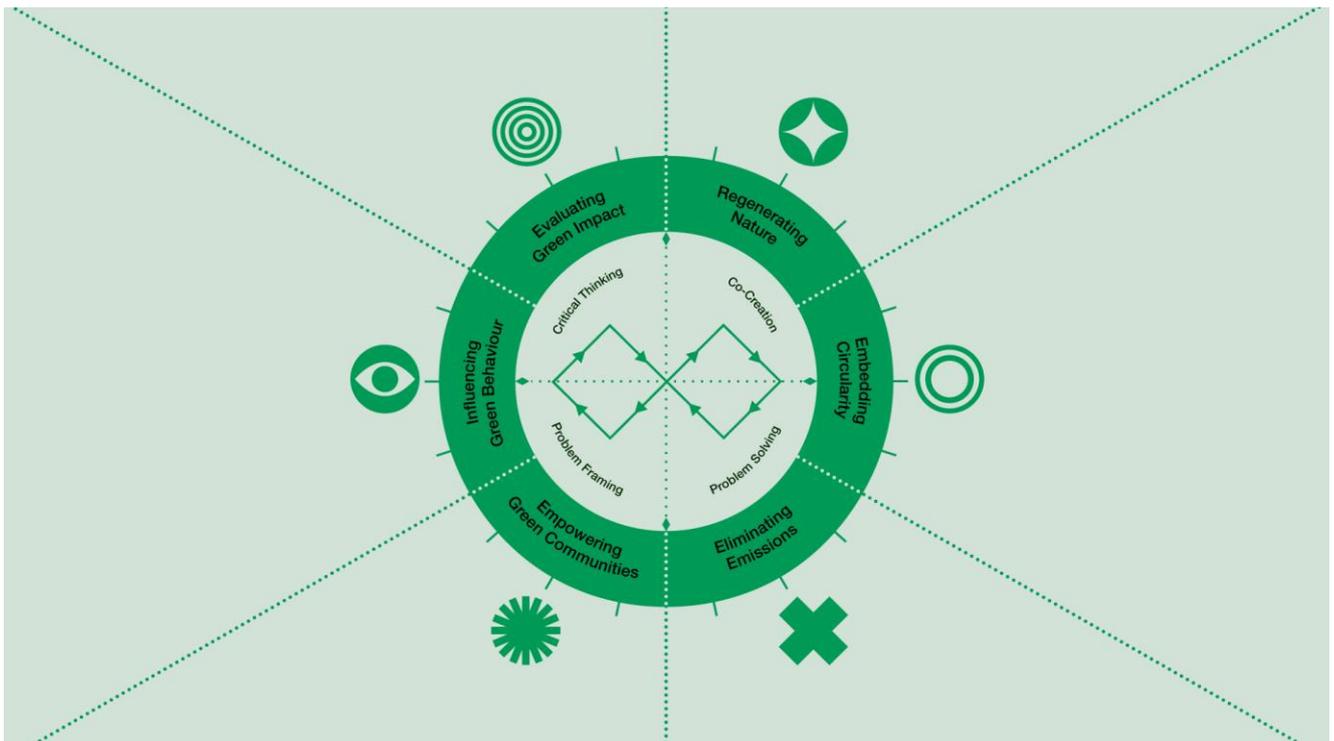


Figure 2. The Skills for Planet Map by the Design Council (2025)

Developing Green Design Skills All Green Design Skills are interconnected and can be explored or applied in any order.

Regenerating Nature	Embedding Circularity	Eliminating Emissions	Empowering Green Communities	Influencing Green Behaviour	Evaluating Green Impact
SKILL 1 Implementing nature-focused strategy	SKILL 4 Implementing circular strategies	SKILL 7 Implementing decarbonisation strategy	SKILL 10 Gathering community insight	SKILL 13 Facilitating green choices	SKILL 16 Setting measurable goals
SKILL 2 Representing nature in decision-making	SKILL 5 Adopting a circular business model	SKILL 8 Analysing emissions data	SKILL 11 Nurturing community stewardship	SKILL 14 Communicating business value	SKILL 17 Reviewing benefits and risks
SKILL 3 Collaborating with nature	SKILL 6 Selecting materials responsibly	SKILL 9 Planning for future climate scenarios	SKILL 12 Prioritising justice and equity	SKILL 15 Sharing success stories	SKILL 18 Iterating based on evidence

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Figure 3. Developing Green Design Skill from the Design Council’s *Skills for Planet Blueprint* (2025)

Learning is scaffolded in undergraduate education by iteration of key DfS concepts and approaches as students journey through three years and become more capable of engaging with complex problems. Ideas introduced in Year One can be later elaborated with critical texts and engaged with through projects and design practice. The core concepts offered in *Green Design Skills Framework* (2025), i.e. regenerating nature, embedding circularity, eliminating emissions, influencing green behaviour, and evaluating green impact (see figure 2) can be introduced in Year One and developed in greater depth over the following years. DEFS is developed as a process of continually revisiting themes, going a little deeper and/or wider each time, allowing students space to wander and do more independent research, particularly at the final stage of their degree. Specific skills (many of which are in figure 3) are developed by engaging with the concepts, putting new ideas into practice, engaging in reflection based on feedback and reiterative processes. We describe DEFS in a prospective undergraduate three-year design programme below.

1. Year One - Introduction

Design for Sustainability is introduced at the start of the first year as a necessary foundation for designing within the planetary boundaries (Steffen *et al.* 2015; O'Neill, *et al.* 2018; Schlesier *et al.*, 2024). Design students are often connected to and inspired by the material world and come to design school interested in 'stuff' of all sorts. A focus on pre-existing interests and design objects can be a useful way to start sustainability conversations with reference to new concepts and wider material and ecological relations. By exploring the tangible aspects of the students' own interests, we move outwards towards the less familiar territory of new sustainability literacies, systems thinking, key concepts, and examples of design interventions.

1.1 Ecological Literacy: Framing and Context Building

A general first level approach introduces sustainability starting with the students' own interests and moving outwards. These explorations can be accompanied by a review of ecological consequences of various design practices while introducing sustainability terms and ideas such as climate change, environmental action, and social justice. Key terms set up the scope of the landscape for design interventions and change. Sustainability is often seen by students as a single-issue thing, e.g., 'recycling' – or a really big thing, e.g., 'climate change' at either extreme. Students can be put off by both. Newton & Ellis' (2024) investigation of communication design students' perception of sustainability in design schools found:

The focus was very much on the tutors to provide the evidence, to narrow the distance of 'the problem' in order for the concept to no longer be an abstract, potentially hypothetical 'thing' happening in another location. These findings reflect that they [the students] value the concept of sustainable practice, but notions related to scale and distance inhibited their ability and willingness to be active in contributing positively to the issue (Salas-Zapata & Ortiz-Munoz, 2019). There is a need to deconstruct sustainability in a manner that can be situated within their immediate frame of reference (p.12).

Along with making sustainability less abstract, another of the many challenges for design educators the Newton & Ellis paper explores is the work of "counteract[ing] fatalist mentalities linked to notions of scale/severity" (2024, p.3). As design educators we respond to this commonplace problem with attention to HOW the narrative of sustainability agendas is approached. Sustainability educator Stephen Sterling often argues that the framing of sustainability is a site for transformative learning that creates new capacities for change (Sterling 2011). The framing of all ecological and social relations is central to sustainable transitions, as first described by David Orr in his construction of the concept of ecological literacy (1992) – an idea that has profound implications for design (Dewberry 2011, 2018; Boehnert 2011, 2018, 2023). Ecological literacy is generated from emerging understanding of relationships, with emerging epistemologies that prioritise mutually beneficial relationships within complex systems that sustain life. This learning nurtures new capacities to identify and prioritise sustainable options. Ecological literacy supports the protection of natural systems (extending beyond human interests) while promoting societal well-being through improved human health, diverse perspectives, and community engagement. New Green Mindsets described by the Design Council (2025) inform design knowledge and practice to foster learning competencies. This learning enhances employability and prepares design students with future-ready skills to navigate the evolving profession of design (Quam 2016; Micklethwaite 2022). Sustainability transitions by design depend on these values-based learning landscapes (Dewberry 2018) where we develop capacities to do the difficult work of changing unsustainable trajectories.

1.2. Systems: Seeing Relationships and Impacts

We introduce students to systems and systemic thinking (Meadows 2008) in the first year with basic concepts, practices, and tools. Accessible definitions of the key ideas are introduced. Dubberly and Pangaro describe core systemic concepts for designers as: system, observer, types of systems, and framing (2023, 138). A system is a set of elements with a purpose. It will typically have unintended consequences that should be explored before design processes are initiated. The observer (including the student themselves) is part of the system that they observe – a relationship that disrupts earlier approaches to knowledge. Systems vary in scope and characteristics. Some are human constructs, and the description of all are human constructs. Framing is a key concept in systems work and in design as explained by Dubberly & Pangaro:

The frame of systems is a way of looking at the world—searching for systems, interpreting experience in terms of interacting elements, and applying ideas from systems theory. The frame of systems crosses domains and suggests an underlying order. It provides shared language, helping people from different domains to talk with one another about patterns they see recurring (2023, 138).

As design theory moves away from historic ways of knowing that dismiss ecological relations along with the ideas and ideologies that facilitate the exploitation of ecosystems, relational approaches become more widespread. Projects that introduce students to systems can emphasise the value or respectful and regenerative relations. We unearth the invisible by softly introducing ideas of unintended consequences of design decisions and highlighting the impacts of unsustainable practice. For example, we can take something familiar (a product) and map the unfamiliar such as its system and the relationships with ecological systems. This work can manifest physically as a system map with a drawing, collage, or even a network of artefacts to help students start the work of identifying, investigating, illustrating, and ultimately caring about relationships.

1.3. Key Concepts as a Foundation for New Skills and Capacities

Key concepts such as scale, efficiency, effectiveness, and equity can be lightly introduced at an introductory level and expanded in later years. Learners can engage with design at different scales, i.e. product-service-system (Ceschin 2024; Ceschin & Gaziulusoy 2019) and in different places [local-regional-global] where the importance of context and connections is central to design decision-making. For example, in 1st level at the Open University, we use scale to structure design activities, starting with ourselves, thinking about our local community, engaging with wider society to finally considering the scale of global challenges. We explore efficiency in sustainability agendas and the contexts and systems that limit the effectiveness of efficiency approaches, where eco- effectiveness approaches become necessary (Braungart, McDonough & Bollinger 2007). Another key concept is equity. We explore issues such as access to resources and resource scarcity alongside issues of social injustice and the means to meet human needs in different ways. Key concepts for effective work in the DfS space are widely available (Faludi *et al* 2023; Boehnert *et al* 2022; Micklethwaite 2022; Watkins *et al* 2021, Irwin *et al* 2021). Many are threshold concepts that expand the horizons and deepen the capacities of design students to engage with complexity and develop new skills. Threshold concepts (Meyer & Land 2006) are ideas in a discipline that function as “a portal or gateway to subsequent understanding” and are considered “bounded, integrative, irreversible, transformational, and involve troublesome knowledge ...associated with any new conceptual understanding in a given field or discipline” (p. 8). Threshold concepts are part of transformative learning processes that can change what students consider to be possible.

1.4. Examples: Inspiration Spaces and Interventions

We introduce environmental problems by reviewing the consequences of design products, services, and systems alongside adaptive responses in the Design for Planet programme and other design for sustainability initiatives. We use the Planetary Boundaries / Earth System Boundaries (ESBs) framework (Rockström *et al*, 2023) for understanding environmental harms on various scales. Linking examples to scientific research and to examples of design for sustainability, we situate principles and practices in wider institutional frameworks. At this stage we explore examples of circular economy, biomimicry, reuse, etc. extending the landscape and the scope for design interventions for positive sustainable change.

2. Year Two - Putting Ideas into Practice

Year Two expands on Year One by exploring ideas and practices in practical ways with transdisciplinary content, practice-based activities, peer learning, and working together to deepen learning on all themes.

2.1. Ecological Literacy: Framing and Context Building

In the second year, learners engage with more sophisticated discussions about the transdisciplinary nature of work in mitigation and adaptation to environmental changes. We explore climate change mitigation trajectories such as carbon and ecological measurement tools. Strategies for understanding and reducing emissions are investigated along with debates on what scales these can be most effectively used and limits to ‘techno-fixes’. We consider the wider ecological system overshoot beyond a reductive focus on carbon emissions with exploration of biodiversity loss associated with unsustainable design and development. We discuss implications for humans and more-than-human futures and connect to futuring practices. In Year Two we introduce transdisciplinary lenses on all these problems to reveal different ways of framing and contextualising environmental problems. Transdisciplinary engagements give students the building blocks they will need to engage with practices such as Transition Design (Irwin, Tonkinwise & Kossoff 2021) and develop deeper levels of ecological and sustainability literacies. Perspectives from the environmental humanities, ecopsychology, and ecological economics enable wider and deeper learning processes necessary to support more transformative work in design for sustainability.

2.2. Systems: Seeing Relationships and Impacts

Following the introduction to systems in Year One, in Year Two we introduce and use systemic design (Jones 2017; Sevaldson 2013) tools and practices to deepen understanding of systemic relationships and their consequences. Systemic design is a foundation for understanding and responding to complex environmental challenges and a foundational design skill according to the Design Council (2021, 2025). We show students how to map relationships, flows of materials, processes, and systems to reveal the value of circularity and how design can support circular economies. We explore what the circular economy looks like if only partial aspects of the system are engaged (e.g. production and not consumption) – to highlight the need for holistic approaches. We explore tools for investigating the unintended consequences in design such as the Innovation Landscape Matrix (ILM) (Dewberry *et al* 2024). Exploring the expanded context of design opens questions on where power sits and where the discussion of ecological economics such as donut economics (Raworth 2018) becomes relevant.

2.3. Key Concepts as a Foundation for New Skills and Capacities

Year Two students are ready for a historical and theoretical overview of the expanding scale of innovation in design for sustainability – from insular to systemic with an expansion of the sustainability focus (Ceschin 2024). We revisit efficiency and add in sufficiency with ideas on design within planetary boundaries, e.g. ecological economics, growth and productivity debates. We introduce established principles such as the Jevon paradox and the rebound effect that demonstrate that an increase in efficiency in resource use will often generate an increase in resource consumption rather than a decrease. For this reason, a focus on efficiency alone is insufficient in sustainability agendas. We explore strategies of ecodesign to respond to ‘rebound’ with an emphasis on life cycle thinking, material flows, material input per unit of product or service, and wider ideas of sustainable production and consumption. Issues of equity are not just nice things to include, but essential aspects of transitions to sustainability due to the participatory nature of ecological transitions. Year Two is a space for more in-depth work on social and climate justice, pluriverse, decolonising design, and degrowth.

2.4. Examples: Inspiration Spaces and Interventions

In Year Two we explore practices and examples so that ideas of design for change are grounded in familiar themes, for example: food, water, wastes, digital services, urban design. External design briefs such as the UK RSA’s *The Design for Life Awards*, are useful in approaching global challenges to help students engage with wider dialogues and disciplinary discourses. Structured exercises in circular design, regenerative design, systems mapping, theories of change, speculative design, future and storyboards can be vehicles for students to encounter and use new themes and ideas. At this stage, we offer an introduction to design research methods and ethics in DEFS.

3. Year Three - Identity and Independence

Year Three is a projects-based year where learners shift from a directed learning approach to embracing greater levels of independent learning. The themes introduced in earlier years are reinforced through reading, discussion, and debate with a greater emphasis placed on critique, demonstrating systemic understanding through data gathering, dialogue, and negotiation. An array of Green Design Skills are cultivated as students develop capacities for responsible design in a world characterised by significant environmental and social challenges. At this level of learning, students develop their own ideas for dissertation topics to build their own design responses to complex sustainability themes. Linking ecological thinking to design thinking and action, students create insightful and critical contributions. Design research is a vital skill for DEFS when complex problems require collaboration across transdisciplinary knowledge domains. With increased emphasis on independent research and design development, we define spaces for project-based learning framed by ecoliteracies and sustainability themes introduced in earlier stages. Design projects allow learners to deepen their understanding of ecological and systemic concepts, bridging theoretical and abstract ideas with possible real-world application. Projects can demonstrate how problems can be seen from multiple positions and different viewpoints to engage pluriversality (Escobar 2018). The RSA’s *Capabilities for Life Framework* (2023) presents “life-centric worldviews” (including mindsets, values, stories and expectations) to frame the development of diverse knowledges and skills and for multiple views held simultaneously. This approach recognises that plural perspectives and scales of understanding support learners to grasp concepts of plurality. As the RSA’s capabilities framework demonstrates, being cognisant of different worldviews and values - and the position you hold (in terms of values and attitudes) in these spaces - is a part of sustainable reflective thinking and practice. This practice supports graduating designers in developing their capacities to advocate for ecologically informed and just transitions.

Reflections

Some UG design programmes across the world are already embedding elements of content suggested in this prospective undergraduate degree. They remain 'the unusual' and not the mainstream. More effective sustainable transitions will depend on a much wider uptake of new transformative approaches to education – integrating knowledge as well as imagination, mindsets, and values alongside creative problem solving and systems thinking. Despite this imperative, making space for sustainability content in the design curriculum is rarely straightforward or uncontested. As such this paper presents a prospective overview of an undergraduate DEfS curriculum rather than an actual description. In the authors' experiences, it has often proved difficult within traditional design discipline curricula to find sufficient credit space for ideas of sustainability to be comprehensively introduced and developed alongside all other demands for subject knowledge and skills development. This is why, in the UK anyway, we tend to see postgraduate courses specialising in DEfS. While these postgraduate courses are increasingly necessary, it is difficult to introduce sufficient sustainability literacies in one year of postgraduate education. We look forward to being part of a growing academic community that welcomes a step change in learning and practice for sustainability.

In the UK, the Design Council's *Design for Planet* and the Royal Society of Arts (RSA)'s *Design for Life* programmes are both generating momentum that design educators can use to catalyse transformative action across institutions. With ecological boundaries overshooting and impacts of climate change already experienced by many, there is an urgent need to transform undergraduate design education to reflect DEfS across all stages of learning. We offer a vision of a programme where ecological literacies are embedded in all theory and practices, and in the landscape of designing in, for, and with, society. If it is impossible to embed these types of ecological and sustainability knowledges, literacies, skills, and capacities into an entire programme, at the very least, this type of comprehensive education in DEfS should be available for those who are willing to take environmental challenges seriously. DEfS aims to reframe the scope of design, and its importance to the green transition, not only with designers, but across sustainability sectors and within the popular imagination.

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