



Transforming lives and societies through education and research at DCU

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Abstract. Dublin City University identifies *Sustainability* as a core theme underpinning all of the University's activities and strategic goals [1]. DCU is committed to ensuring that all graduates understand the challenges of environmental sustainability and have the sustainability competencies that will equip them to be global citizens, inspired and empowered to take the actions necessary for a sustainable future. DCU undertakes sustainability focused research and works to demonstrate, where feasible, these sustainable solutions within our Living Lab campuses. DCU also works with enterprise and societal communities to engage, inform and support these communities on our joint sustainable journey.

Keyword:

Sustainability Challenges, Education for Sustainable Development, Environmental Sustainability

1. Introduction

Dublin City University, originally established in 1980, is located to the north of Dublin City and is the most significant and comprehensive provider of university education on the rapidly growing and economically important Irish Eastern corridor. There are five campuses - three academic (DCU Glasnevin, DCU St Patricks and DCU All Hallows), one innovation focused (DCU Alpha) and one focused on sports (DCU Sports). In 2021, DCU has over 18,000 students and 2,500 staff.

The DCU cross-institutional *Sustainability Council* has developed a new *Sustainability Charter* and *Climate Action Plan (2021-2026)* to enable and demonstrate our commitment

to transforming ourselves, our institution and the community surrounding us to meet the sustainability challenges including climate change and biodiversity loss. The COVID 19 pandemic has brought many rapid and transformative changes to our personal and working lives and with them additional challenges and opportunities for sustainability.

Irish national [2] and global [3] commitments require urgent radical change to limit the impacts of global climate change. DCU, as an academic institution, is taking a leading role to collaboratively and openly share our learned experiences and to use the power and reach of education to engage and educate current and future generations about the Climate and Biodiversity Challenges. We work to empower, enable and support our community to come together to make the necessary changes.

DCU recognises that we much *walk the walk* as well as *talking (teaching) the talk* and in doing so we undertake an annual carbon footprint of all activities to understand the scale of our operational impacts and to make appropriate decision to reduce these. We are the first university globally to submit to the Carbon Disclosure Project (CDP) [4].

2. Teaching and Learning

DCU is undertaking a radical restructuring of the DCU undergraduate curriculum to future-proof and enhance capacity. The *DCU Futures* plan will transform the learning experience of undergraduate students at DCU, reconceptualising learning opportunities, creating authentic connections between the classroom and enterprise, and embedding the digital literacies, disciplinary competencies and transversal skills, including sustainability competencies, required to truly future-proof our graduates for the rapidly changing workplace.

A key element of the DCU Futures plan will, in the first instance, be to pilot a radically redesigned undergraduate curriculum across nine new or reconceptualised degree programmes and five existing degree programmes. As part of this, we aim to develop our portfolio of programmes to include those with a strong emphasis on sustainable development.

We will introduce a new undergraduate engineering programme in Sustainable Systems and Energy and two cross-disciplinary programmes which focus on the intersection of Social Science and Technology and the impact of technology on individuals (BSc in Global Challenges and Psychology and Distributive Technology). Each of these will have a strong sustainability theme throughout the curricula.

In parallel, under the Transversal Skills aspect of the programme we will;

- design and implement an assessment model for programmes to identify existing opportunities to develop competencies, including contributions to education for sustainability;
- develop resources to support embedding key dimensions of transversal skills in curricular or co-curricular activities (e.g., a Sustainability-related module/micro module) and provide staff and students with access to the resource(s);
- develop and roll out workshops to support the infusion of prioritised transversal skills and competencies, including sustainability competencies to academic staff;
- DCU futures is a blueprint for the future of DCU education. Evaluation is an intrinsic part of the project, and will be used to feed into plans to roll out the model across the university, ensuring that DCU undergraduates graduate with a high competency in

sustainability (to be assessed by Sulitest [5] or similar) by 2030.

DCU recognises that there is a distinction between environmental sustainability education and education for sustainable development we are committed to addressing both.

3. Environmental Sustainability

The impact of increasing anthropogenic greenhouse gas emissions are pushing many of the planetary boundaries outside safe operating limits exemplified in biodiversity loss, ocean acidification and climate change to name just a few [6]. Understanding human impact on the environment and the ramification of this impact is fundamental to transitioning to a sustainable world where social/cultural, economic and environmental needs are balanced appropriately (fig 1).

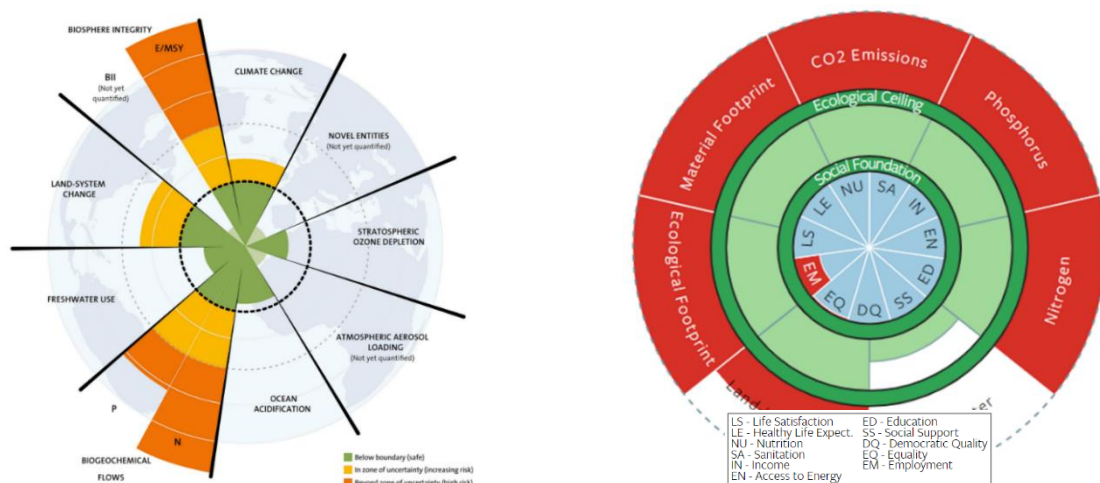


Figure 1. Planetary boundaries as proposed by the scientists in 2009 [7] on the left hand side and on the right is a representation of Irelands impact on these boundaries using a donut economic model [8] from work done in Leeds University [9] on *A Good Life For All Within Planetary Boundaries*.

DCU is working towards ensuring that *all* graduates have a fundamental understanding of *Environmental sustainability*. This series of micro-modules could include for example:

- Principles of Sustainability- Social, Cultural, Economic and Environmental
- Sustainable Development Goals (SDGs) and Global Challenges
- Climate Change, Planetary Boundaries, Carbon Footprints and Budgets
- Global Justice, Human rights, Equality
- Biodiversity (including national and international biodiversity loss and the importance of eco-systems)
- Sustainability DCU (and introduction/review of the actions being taken by DCU to address its own environmental sustainability including An Taisce Green Campus programme etc.)

4. Education for Sustainable Development (ESD)

As opposed to environmental education, *Education for Sustainable Development (ESD)* is more focused on the development of sustainability competencies [10] (fig 2) that seek to equip learners with the knowledge, skills and values that will inspire and empower them to take action to be Global citizens understanding their global and generational interdependencies. These competencies include systems thinking, anticipatory or futures thinking, and collaboration competency (fig 2), many of which are included already in the DCU Graduate Skills competencies and will be further addressed under the DCU Futures Plan for Transversal Skills ‘ways of thinking & tools for thinking’.

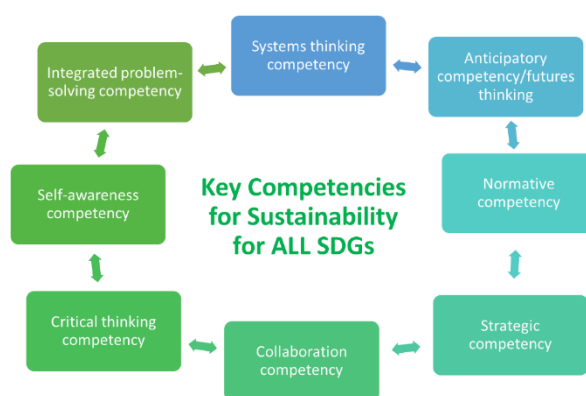


Figure 2. Sustainability Competencies

DCU will work to address the infusion of education for sustainability in programmes and working together with the micro modules on environmental sustainability will provide the environmental context and understanding of sustainability within programmes.

United Nations designated Regional Centre for Expertise in Education for Sustainability (UNU RCE in ESD)



DCU has an established track record in implementing, innovating and researching ESD within and beyond its campuses.

In terms of the latter, the Regional Centre of Expertise in Education for Sustainable Development (RCE Dublin) [11] coordinated and lead by Dublin City University gained recognition from the United Nations University as a centre of excellence in educating, innovating and researching in ESD in 2014.

RCE Dublin has international recognition for excellence in ESD for its work on promoting education for sustainability across all levels of education, and for frontier research on processes and pedagogies for integrating ESD in higher education.

Moreover, RCE Dublin currently contributes to policy recommendations relating to ESD at the global level, through its work with the G20 policy think-tank on matters such as how to monitor and assess progress vis-a-vis SDG 4.7 at local, national and trans-national levels.

Another important example of established ESD expertise in DCU falls within the domain of initial teacher education and teacher professional development for the primary and post-primary sectors, which is coordinated through the School of Science Technology Engineering and Maths (STEM) Education, Innovation and Global Studies [12] and the DCU

Centre for Human Rights and Citizenship Education [13], in partnership with the Development Inter-Cultural Education (DICE) [14] national teacher education network.

Policy inputs on Education for Sustainability

Change at a system level must be supported by national governmental policy change. To support this DCU actively contributed to Irish government policy development, for example in early 2021 there was a national public consultation by the Irish Government Department of Further and Higher Education, Research Innovation and Science (Dfheris) on a *National Strategy on Education for Sustainable Development (ESD)* [15]. DCU were involved in several engagements and submissions to this consultation including a formal DCU institutional submission which supported a *collaborative whole of government approach* as well as identifying the need to adequately resource the agreed change measures. There is also a need for further policy development along with policy coherence and educator training that aims to change attitudes, promote value based decisions and promote behaviours to empower transformative action. In addition, a collaborative focus group with focused Sustainability Practitioners from all Irish universities and Dfheris was also undertaken to gain insight into the practicality of embedding sustainability in public universities. DCU will also be making a submission to the EU Public Consultation on Environmental sustainability– education and training in Sept 2021 [16].

Over the past number of years DCU and in particular the *MSc in Climate Change Media and Policy* has contributed to public consultation on the national *Climate Action Plan*. This plan identifies the actions Ireland will take to become a climate neutral economy and resilient society by 2050.

Research, Development and Innovation

DCU is committed to promoting and supporting sustainability research across the University. To achieve this DCU seeks to:

- Identify *Sustainability as a key area of research at DCU* and work to provide the necessary supports to increase the number of researchers working in this area and the level of research income.
- Foster and support researchers to address sustainability issues through DCU *engagement in national and international sustainability focused networks* such as the European Consortium of Innovative Universities (ECIU) and the Global Consortium for Sustainability Outcomes (GCSO).
- Investigate the scale and focus (eg SDG Thematic Areas) of *sustainability related research activity* ongoing across the DCU research community.
- Continue to identify *potential funding instruments* that address sustainability challenges and bring these to the attention of relevant researchers.

There are many research centres and projects at DCU that are sustainability focused, including for example, the DCU Water Institute, the DCU Centre for Climate and Society and an current Science Foundation Ireland Plastics Challenge project Grain-4-Lab that aims to reduce reliance on single-use plastics in laboratories. In addition, there are cross campus initiatives to reduce the direct impact of research such as *The Green Labs initiative* that seeks to identify ways that can reduce the environmental impact of all campus laboratories (teaching and research). This will be done through operational change measures and behavioural change initiatives. There are many areas where DCU has the opportunity to advance research, development and innovation with a sustainability lens.

DCU Living Lab – demonstrating sustainable solutions

As part of our research efforts DCU working with Smart Dublin have established a Smart DCU initiative [17] that where possible and feasible works with the DCU Sustainability Office and DCU faculties and professional units including DCU Estates to demonstrate sustainable solutions in real-time within our on-campus living lab environment. Working with internal and external stakeholders such as innovative spin out companies and local municipal agencies, sustainable solutions including micro-mobility first/last mile solutions, water quality monitoring and waste management solutions can be demonstrated and refined for future deployment. For example, DCU is involved in an e-scooter trial pilot study that is looking to find, among other things, the feasibility of reducing high-carbon modes of transport with the availability of e-scooters to bridge the commuting gap between public transport hubs and to, from and between DCU campuses.

Societal Engagement

As a University, DCU understands the power and reach of education and research efforts but in addition we also recognise the role we play in our community to ensure a greater understanding of the sustainability challenges and the need for a fair and just transition to a sustainable future. We therefore undertake several *non-core business* initiatives to work with our on-campus and local communities to raise awareness and understanding of the scale and urgent need to make substantive changes to our current business-as-usual models. Examples of these include the collaborative green campus programme and the establishment of a sustainable energy community.

Green Campus

A primary focus of the Green Campus programme is that it is student driven and aims to educate and inform all members of the DCU Community, all staff (academic, research, administrative and technical), all students (undergraduate and postgraduate) along with societal groups and enterprise partners who are linked to DCU. Aligned with the international Federation for Environmental Education (FEE) Programme and the National An Taisce Green Campus [18], the DCU Green Campus programme identifies annual action plans aimed at increasing awareness and reducing impact. Such actions include the removal of single use plastics from catering facilities, promotion of active commuting and consumption reduction initiatives such as swap shops.

Sustainable Energy Communities (SEC)

In collaboration with the Sustainable Energy Authority of Ireland (SEAI), in 2019 DCU established a DCU Sustainable Energy Community (SEC). This initiative aims to support DCU community homeowners by informing and advising them on the benefits of better energy efficiency measures in their homes and identifying the grant schemes and mechanisms that can be availed of to support improve energy efficiency and reduced energy consumption in their homes. There has been high participation and engagement at all workshops and DCU is working to roll out phase two and expand the workshops to involve our local communities working with the local residents' associations. Unfortunately, there is a short delay in phase two due to COVID 19 but we expect to roll this out in Q3/Q4 2021. Taking into consideration the changes in work practices under COVID 19 restrictions and the greater demand to be able to work from home this programme can and will continue to make significant contributions.

5. Conclusions

Sustainability is a core theme underpinning all activities at DCU including Teaching and Learning and Research, Innovation and Development. DCU has demonstrated commitment and leadership in the radical restructuring of education programme to ensure that our graduates are truly future-proofed. Sustainability focused research is strongly supported and our campuses are used as living labs to demonstrate sustainable solutions. We do not undertake these actions in isolation but have a strong collaborative focus to work with the broader education sector, our city, our societal and enterprise communities, to support a fair and just transition to a sustainable future for all.

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