Chapter 15

Transdisciplinarity within the University: Emergent Possibilities, Opportunities, Challenges and Constraints

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We conclude with some personal reflections on the nature of our transdisciplinary journey, and to review where it has led us as well as some of the challenges and constraints we've encountered. The three of us involved in editing this book represent a triumvirate from disparate disciplines who came together not only as a consequence of our common interest in sustainability, but through sharing a deeper concern that something was not quite right in terms of how the university's disparate disciplines hung together in dealing with sustainability issues; and not just in our university alone, but across higher education more generally. Each of us felt that the academy of disciplines was not addressing the scale or complexity of the intellectual and existential challenge confronting our own society and the wider world. Essentially, amid the silo-ised constraints of the university (should that be 'multiversity'?) that the whole was not greater than the sum of the parts. More broadly, within a world of increasing ecological degradation, social upheaval and economic inequality we were making relatively feeble attempts to address the 'grand challenges' around (un)sustainability. Recognising that such challenges constitute a complex nexus of problems, issues and required expertise, it was evident that our respective disciplines were never going to be capable of addressing these alone. Indeed, in our view it was the very silo-isation of our academic functions of teaching and research that was not just part - but at the very root - of the problem itself.

Thus we were both primed and receptive to an open and ongoing dialogue and 'conversations', undertaken in good faith and humility, with the intention of gaining new insights from other disciplinary perspectives and sources of knowledge in order to be better equipped to develop appropriate questions on sustainability related issues. This was the starting point for our journey. It is one which began with a workshop and continued with a very successful conference on *'Transdisciplinary Conversations on Transitions to Sustainability'*, in addition to a number of disparate initiatives across the university (see Chapter 1 for details).

While the chapters within this book, as well as associated initiatives and efforts at various levels across University College Cork represent only initial steps on a transdisciplinary journey, we feel our experience is instructive. In this final chapter we wish to draw out some broader possibilities and opportunities not just for our own institution but for the contemporary university more generally. We will also reflect on some of the challenges and constraints posed by such an approach.

In rejecting the narrow silo-isation that the dominant modern university construct imposes, a transdisciplinary approach to knowledge generation and construction offers a tantalising range of opportunities and possibilities. One manifestation of a transdisciplinary approach and ethos is the recognition of the inherent (and indeed necessary) value of experiential knowledge outside the walls of the university to complement expert knowledge within. A transdisciplinary approach also inherently recognises the deep interconnectedness that we all are a product of, and hence by extension, a recognition of the reciprocal and recursive interpenetrating relationship that the university and its environs, specifically broader society, necessarily share with each other. While we are aware that there have been initiatives to build genuinely collaborative research partnerships, too often society is regarded as the 'subject' and the 'beneficiary' of academic research.

One recent initiative, however, illustrates the way in which individual academics can place their experience, expertise and energies at the service of civil society which can, in turn,

take a lead in shaping the research agenda while effectively requiring a transdisciplinary approach to be pursued. Drawing on his involvement in a community food initiative in an area of Cork city that has historically witnessed high levels of social exclusion, Colin Sage has worked together with the coordinator of the Cork Healthy City programme to establish the Cork Food Policy Council. Food Policy Councils work to identify and propose innovative solutions to improve local food systems, to draw together diverse data to better inform effective advocacy for food system improvement. There is little doubt that the food system in Cork is not working for the benefit of a majority of residents in the city and surrounding region. The incidence of food poverty is on the rise; rates of overweight and obesity are growing quickly with associated health problems; while the agricultural economy in the wider region is becoming more export-oriented and increasingly disarticulated from the domestic market. Yet there is growing interest in food, not just amongst consumers on above average incomes who can afford higher quality products; but more widely a resurgence of interest in reconnecting with locally-sourced food including with food growing[1].

Drawing together representatives from a wide range of stakeholder interests (fish producers, market traders, large retailer, food service, city council, health, community and voluntary sectors), a Steering Committee chaired by Sage meets monthly to discuss and develop policy, strategy and activities. To date it has undertaken a very large-scale launch event (involving the sourcing, cooking and distribution of over one tonne of waste vegetables as 5,000 bowls of curry handed out to the general public); has initiated a short-run media campaign on the siting of fast-food restaurants close to schools; has effectively advocated for more growing space in Cork (a commitment which is now part of the City Development Plan; and is working with a Senior Planner to execute this on derelict sites in the city centre); has embarked upon a conversation with the main regional hospital regarding its food procurement strategy; and has begun research on the forms and extent of food poverty across the city. This list is not exhaustive nor designed to impress: rather it highlights the possibilities for taking a research agenda – in this case comprising sustainable food policy issues – into the public realm and exploring how these may resonate and generate public engagement. At the same time, these issues have become a focus for cross-disciplinary conversations and potential collaborations with colleagues across the University (especially Epidemiology and Public Health) as well as with researchers in other countries also working with new civic food initiatives. This form of transdisciplinarity consequently also has important transnational potential and offers opportunities for comparative, collaborative research – providing funding agencies recognise the enormous social value of such work.

A transdisciplinary ethos also promotes intra-university activities which are outside formal academic and disciplinary structures. The UCC Green Campus initiative is an example of this; a cross disciplinary initiative developed by students and supported by staff from across the university, which among other things resulted in securing the world's first Green Flag for environmental friendliness by a third level academic institution (in 2010) and achieved a number 2 ranking on the 2014 global UI (Universitas Indonesia) Green Metric University rankings list. While this initiative predates the formal transdisciplinary initiatives associated with this this book (see Chapter 1) and has been developed and driven by a committed group of individuals from across the university (both students and staff; academic and administrative e.g. UCC's Buildings and Estates Office) (see Chapter 13), it is certainly a strand among a confluence of institutional initiatives that could be broadly termed transdisciplinary.

Receptiveness to the practice of transdisciplinarity has also underpinned several initiatives which have helped bring disciplines together to create spaces which both legitimise

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[1] Grow It Yourself (GIY) is one of the fastest growing social movements in Ireland over the past five or so years and works to encourage and support individuals to grow their own food.

and promote disciplinary openness in a quest for emergent knowledge and 'greater than the sum of the parts' understandings, typically around issues pertaining to sustainability. These have taken a range of forms including workshops, meetings, symposia, colloquia, conferences, lectures and seminar series, many of which welcomed participants from outside the university. An account of some of the relevant formative events and initiatives is provided in Chapter 1. These fora facilitated a convivial 'safe space', essentially a supportive context from which more formalised initiatives could emerge. These initiatives included the *Environmental Citizenship Research Priority Area* (ECRPA) ('*Sustainability in Society*'), a university supported research vehicle which has inspired this current publication, or the *Centre for the Study of the Moral Foundations of Economy and Society*, a joint UCC and Waterford Institute of Technology initiative launched in November 2015 by President Michael D Higgins under the auspices of *The President of Ireland's Ethics Initiative*[2]. The ethos being cultivated has also underpinned successful funding bids for relevant research projects, for example a Horizon 2020 project on 'a transition to more sustainable energy systems by achieving a practice-based understanding of the social aspects of the energy system'[3] involving the Cleaner Production Promotion Unit (CPPU) and the Institute for Social Science in the 21st Century (ISS21) as part of a wider EU consortium. Another example is an Irish Environmental Protection Agency funded project on Climate Change, Behaviour and Community Response[4] run jointly by the Environmental Research Institute (ERI) and the Department of Sociology [both at UCC]. In the case of the latter, a central axis of collaboration is the co-supervision of doctoral candidate by a sociologist and an engineer.

The transdisciplinary ethos has also extended to teaching and learning. Relevant outputs have included an open public seminar series on *Sustainability and Modern Society* held in 2012 under the auspices of UCC's Centre for Adult Continuing Education in conjunction with the ECRPA, and from 2016, a new university wide module on *Sustainability*, delivered by twenty academics from across the university and open to students, staff and the public. We have also engaged in a number of transdisciplinary teaching initiatives at undergraduate level such as, for example, bringing students of modules in 'Sociology of the Environment' and 'Sustainability in Process Engineering' together as part of a joint assignment, and in infusing undergraduate programmes with an ethic of transdisciplinarity and sustainability through specific interventions and modules (Byrne, 2012; Byrne 2014; Byrne and Mullally, 2014). This work has attracted positive external recognition: the editorial of the *Institution of Civil Engineers Proceedings* journal *Engineering Sustainability* - within which an award winning paper on incorporating context and complexity into engineering education was published (Byrne and Mullally, 2014) – noted approvingly that 'In my view at least, Cork's students are being prepared for a world that is increasingly connected and increasingly collaborative; for a fulfilling and successful public and private life.' (Whitehead, 2014, p.239)

An open transdisciplinary ethic on sustainability related issues has also permeated research outputs produced by the authors in their respective research areas of sustainable food production and consumption (Sage, 2012; Goodman and Sage, 2014; Sage, 2014; Sage, 2015), governance and sustainable development in Ireland (Mullally and Motherway, 2009; Mullally, 2009; Ó Tuama and Mullally, 2011; Mullally, 2012) and engineering education (Byrne and Fitzpatrick, 2009; Byrne, 2012; Byrne et al., 2013; Byrne, 2014; Byrne and Mullally, 2014).

Of course, this account merely represents some personal stories and engagements and does not claim to come near to relating the countless interactions and initiatives which are occurring within and without the university which might be deemed to have a transdisciplinary

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[2] http://www.president.ie/en/the-president/special-initiatives/ethics
[3] http://www.entrust-h2020.eu/
[4] http://www.ucc.ie/en/eri/projects/climchang/

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aspect or in doing so, to address issues around sustainability. We hope to have demonstrated the enormous potential and possibilities which abound, particularly as we move towards a widening recognition of interconnectivity and complexity. However, such an approach is not so amenable to the counting of neatly identified quantifiable research outputs, and in this fact lies one of the many constraints that this type of work entails. Within a framework where success and excellence are measured in explicit terms based on quantifiable system *outputs*, as opposed to (and as a proxy for) the reality of internal system *processes*, transdisciplinary work is always going to be problematic. Meanwhile, the increasingly competitive research environment tends to actually promote ever-greater silo-isation and atomisation, whereby collaboration across disciplines is generally regarded as being in the service of economic growth, often and as part of an uncritical (and uncriticizable) ideology of techno-optimistism (see Barry, Chapter 6).

Given the nature of a now thoroughly globalized (and increasingly, homogenized) society, it is of course to be expected that a transdisciplinary ethos which would envisage a 'complex unity' (Morin, 2008, p. 33), that is, a 'unity amidst diversity and diversity through the unity' (Klein, 2004, p. 524), would be one which would be marginalised at a number of levels. Thus it is wholly unsurprising that research funding bodies and policies at both national and international levels have been slow to recognise and promote genuine transdisciplinarity, with a tendency for tighter research budgets to support 'business as usual' silo-isation. Social scientific funding, invariably regarded as the poor relation compared to that directed toward the physical 'hard' sciences and Information and Communication Technologies (ICT) is often judged by its capacity to generate innovative tools that might support technological projects which promote and facilitate increased economic growth. Indeed, in this worldview, widely embraced by policymakers, 'technology' (or, in its abbreviated form 'tech') is increasingly conflated with ICT and has come to increasingly be represented by 21st century drivers respectively towards big data, data analytics and the Internet of Everything as potentially unproblematic solutions.

In this context, the European research imperative is instructive as it is indicative of world trends; the stated European Research Infrastructure Consortium (ERIC) objective is 'for the EU to become the most competitive and dynamic knowledge-based economy in the world' (EC, 2015). Thereafter, funding projects are awarded separately under a range of silo-ised areas; social sciences and humanities in one silo, environmental sciences in another, physical sciences and engineering make up another domain and so on (ESFRI, 2008, p.12). And even within this construct, social sciences and humanities funding is heavily skewed towards building of technological infrastructure, with all the major projects relating to data archives, language technology infrastructure, digital humanities and database gathering of socially related surveys and statistics (ESFRI, 2008, pp. 19-23). This is in line with European research goals: the ERIC website under 'Backgrounds and Objectives' notes (EC, 2015):

> Research infrastructures play a vital role in the advancement of knowledge and technology. Scientific progress would be impossible without state-of-the-art super-computers or, for instance, large-scale laser systems. Responding to challenges like climate change is also greatly helped by environmental research facilities such as deep-sea-floor observatories or icebreaker research vessels, to name only a few.

The language employed appears blind to the ethical basis of societal unsustainability or the need to explicitly link this to the practice of science and envisage their inherent interconnectedness. Rather it characterises science in a wholly reductionist fashion, as a utilitarian tool to develop big technologies. Big science, it seems, represents not just the best but *the unique* answer to *big* problems such as climate change, while the broader context such

as societal unsustainability in the face of a growth and consumption culture of reduction and separation are ignored. In this context, interstitial and cross disciplinary research projects can only be considered an expensive and unnecessary imposition upon institutional research budgets.

However, as we have argued in this book, and as is quite evident from among the chapters (in particular those which consider nanoparticles and possible energy systems (Chapters 10 and 12 respectively), as well as those that address the precautionary principle (Chapters 7 and 8)) there really can be *no* progress towards sustainable outcomes *unless* we first recognise the inherent complexity and ineliminable uncertainty that *always* pertains in complex social, economic and ecological domains. Accordingly, we must endeavour to employ *all* the tools available to us, in the form of *all* relevant disciplinary and experiential (including non-expert) knowledge, and this will inevitably lead to recourse to the epistemological transcendence of transdisciplinary approaches. It is only then that we not only appreciate the value of, but understand the absolute need for the inherent knowledge and wisdom that the humanities and the social sciences can bring to the table in characterising and addressing contemporary 'nexus' issues and 'grand challenges' around (un)sustainability in concert with (equally necessary) scientific, technical, legal and economic inputs. The value of these disciplinary approaches, couched as they are with metaphor, stories and appeal to the human as well as to the sacred, and best exemplified in the chapters of Barry (Chapter 6) and Keohane (Chapter 9), are necessary constructs to help us envisage a new and sustainable future characterised by genuine human flourishing. In fairness, this is something which is gradually becoming clearer to research funding agencies, though as with the project of transdisciplinarity itself – as a nascent journey of transformative change – initial progress is always going to be slow.

There is hope therefore that in light of an emerging vision – a vision which finds expression across all disciplines in various manifestations and which builds upon human wisdom as exemplified though our rich tapestry of cultures and traditions – that a new path can be charted. This new vision is one which at its heart recognises the deep interconnectedness across all of reality; between the social, ecological and techno-economic, and would thus see the folly and danger in a single focus on reductionism (disciplinary and otherwise) in response to contemporary 'nexus' problems that previous approaches have spawned. In light of this re-imagining opportunities and imperatives abound; interdisciplinary and transdisciplinary research becomes a *sine qua non* for considering nexus problems around unsustainability (while grounded and informed of course by disciplinary knowledge and norms), while the university raises up its vision and takes a central place in both its local and global community as its re-envisions its role in a broader context as one of recursive conversation within its situated society. This is a vision which would see the university as a key player in helping realise our species' imperative for local and global human flourishing. While such vision has been to-date sadly generally absent, there exist *loci* of alternative practices: Michael Crow's vision of the New American University at Arizona State University comes to mind as a potentially promising early attempt (McGregor and Volckmann, 2011, pp.21-49).

Recognition of Morin's concept of '*unitas multiplex*': unity in diversity (Morin, 2008, p. 4) would facilitate the development of a transdisciplinary ethos through the core of the university's work. A university and (trans)national research programme envisaged in this way would at its core involve a search for truth and meaning, and while it would recognise that there is inherent truth and wisdom in all disciplines, it would also recognise that such truth cannot be all encompassing and definitive – other diverse disciplinary perspectives and knowledge are both required and must be embraced. The result is a lack of hubris, replaced by a humility and respect for the other with a goal for shared knowledge on a common journey.

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