

# Sustainable Transitions through Democratic Design: Insights and Reflections on Doctoral Training

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# Executive summary

This publication presents the doctoral training approach developed by the Sustainable Design through Democratic Transitions (CoDesign4Transitions, CoD4T) Doctoral Network, which brings together eight universities across seven countries to train 13 transdisciplinary Doctoral Candidates (DCs) between 2024-28.

The network addresses urgent sustainability challenges by integrating co-design methodologies with studies of transitions and democratic innovation. The program prepares DCs for diverse career pathways by developing both scholarly expertise and practical competencies. Through its emphasis on democratic design as well as interdisciplinary and transdisciplinary collaboration, the training approach developed by the network demonstrates how academic training can be reimagined to address complex societal challenges while fostering inclusive, participatory approaches to design research.

Drawing from the expertise of numerous experts involved in the network, this publication reflects on the origins of doctoral education in design which has evolved from a blend of studio-based practice and theoretical inquiry, leading to the development of "research through design" where making is a legitimate form of knowledge production. It also identifies the challenges that this field currently faces including preparing graduates for work on complex socio-environmental issues, integrating AI, and meeting demands for hybrid professionals with leadership skills, especially as design expands into services and policy, and presents methods employed and tested by the consortium to address these challenges, which include positioning doctoral candidates as "agents of transition," emphasizing co-production with partners, and reflexive awareness.

At the operational level the publication presents the structure of the training curriculum, as well as new tools developed in the network such as the "PhD Canvas" for research structuring and sense-making sessions to build research communities and facilitate knowledge exchange. Much attention is paid to ethical participation and reflexivity, which are embedded throughout the training architecture, ensuring that research processes are inclusive, respectful, and responsive to community needs. Another important element is the regular self-assessment process, conducted collaboratively between DCs and supervisors, to monitor learning outcomes and inform iterative program improvements.

# Chapter 1. Purpose, audiences, and structure of the publication

Lucy Kimbell, Marzia Mortati, Karol Murlak and Laurene Vaughan

This publication outlines the approach to doctoral training developed by the Sustainable Design through Democratic Transitions (*CoDesign4Transitions*, CoD4T) Doctoral Network. It aims to articulate how the network supports its doctoral candidates (DCs) through a distributed, collaborative, practice-based and democratically grounded training structure and process. The primary audience is academic institutions involved in doctoral training in design and transitions and research funders exploring innovative approaches to doctoral education that respond to urgent sustainability and societal challenges.

As a four-year Marie Skłodowska-Curie Doctoral Network (2024-28), CoD4T brings together eight universities in seven countries (Belgium, Denmark, Hungary, Italy, Poland, Spain, UK), alongside 15 associated partners (APs) working across business, government and civil society organisations (CSOs) and one US-based university. Together, they supervise and support a cohort of 13 transdisciplinary doctoral researchers. Of the 13 people employed and supported through the network, ten of these are funded by the European Commission, two by UK Research and Innovation and one by the Hungarian Government.

CoD4T provides a multi-institutional and intersectoral environment in which DCs develop skills to navigate complexity, engage in democratic co-design, and contribute to sustainability transitions. The training model intentionally combines network-wide collective learning with local supervision and support.

This publication presents the network, its pedagogical approach, themes in doctoral research relevant to the network, the approach to supporting researcher development, the training architecture, that together create a plural, reflexive, and critical environment for doctoral education. It also includes a description of the self-assessment tools that underpin iterative learning in the network.

# Chapter 2. Overview of CoD4T research programme

Lucy Kimbell, Marzia Mortati and Nicola Morelli

The CoDesign4Transitions network explores intersections between co-design, sustainability transitions, service and systems design, democratic innovation and participatory research. Each DC is employed and trained for three years (36 months) with research, supervision, and training collaboratively organized across the network. All DCs also have two secondments in at least one host organization from among the network's partners, at least one of which is in a country other than the DC main residence.

DCs undertake original research aligned with one of three research objectives – although in practice many of their research projects are cross-cutting:

1. Examining the potential and limitations of prototyping to enable democratic participation in achieving climate transitions
2. Analysing the potential and limitations of using materialization and visualisation within democratic co-design for climate transitions
3. Developing forms of design that facilitate practice-systems change through democratic codesign towards climate transitions.

The first research objective investigates the potential of prototyping in the context of transitions and democratic innovation. While experimentation is established as essential for societal transitions, for example, through living labs and evidence-based and deliberative policy-making, design prototyping offers additional capacities which have so far not been widely exploited (Peuket and Vilsmaier, 2021). Thus, examining the potential, limitations and conditions for prototyping to enable mediating societal conflicts in climate transitions offers a leap forward and is the focus of the first research objective.

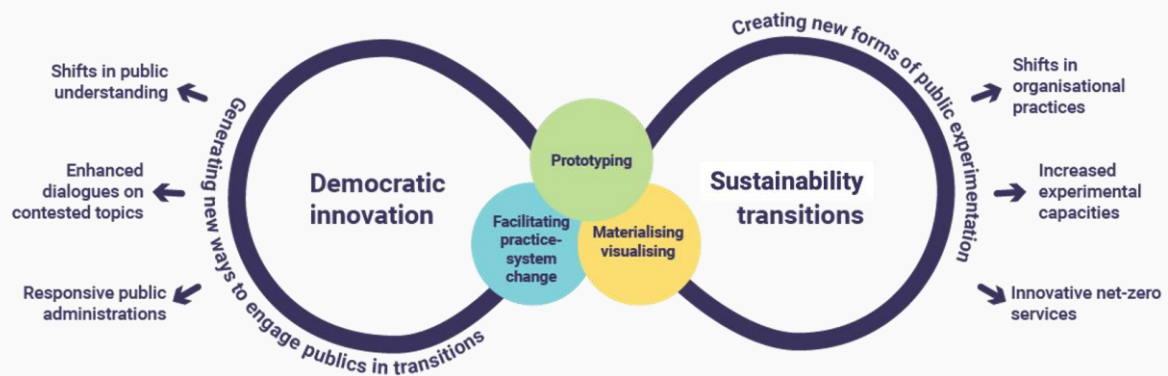
The second research objective examines materialisation and visualisation, a core attribute of design practice and research. Studies emphasise the potential of design for mediating uncertainty and possibility, while experimental interventions in Science and Technology Studies suggest that up-stream engagement of citizens and stakeholders in the datafication and visualisation of complex societal issues are of critical importance to democratic participation (Akama et al., 2018). This suggests an opportunity for a rapid advance by investigating the potential and limitations of materialisation and visualisation within technological-led responses to climate transitions and public participation.

The third research objective shifts the lens from “human-centred” to “more-than-human”

perspectives at multiple levels of society. Approaches from co-design and service design indicate promising developments (Giaccardi and Redstrom, 2020), positioning design as facilitating practice-systems change across levels enabling net zero transitions.

Through the training the network provides, DCs are equipped and empowered to develop new theories, approaches, and validated prototypes for action at the intersection of these broad research objectives benefitting from extensive and varied engagement and training across the network. Figure 1 shows a visualisation of how the research objectives cut across democratic innovation and sustainability transitions.

**Figure 1. Design as connective tissue between democratic innovation and transitions**



The transdisciplinary co-operation, upon which CoD4T is built, is urgent to enable governments, businesses and civil society organisations (CSOs) to develop and deliver multi-level societal solutions required to achieve net zero targets committed to in the Paris Agreement. Design is central to achieving this because of its well-established creative capacities for enabling small-scale experimentation to de-risk solutions through prototyping, synthesising ideas and evidence into materials and visual forms for engaging the stakeholders in exploration of dilemmas and contested topics and facilitating participation in innovative change. In the politicised domain of sustainability transitions, where issues of identity, equity and diversity provoke disruptive responses, design provides a connective tissue essential to engaging publics through democratic innovation towards delivering net zero transitions.

State-of-the-art knowledge in design sub-disciplines provides a partial foundation for efforts to engage the public in co-creating solutions towards climate transitions in:

1. **co-design and social design**: which emphasises creative participation with citizens, public servants, businesses and CSOs in designing (for) transitions through public participation (Simonsen and Robertson, 2013);
2. **design for sustainability**, which allows generation, exploration and assessment of new designs that enable ecological sustainability (Egenhoefer, 2018); and
3. **service and systems design**, recognising working towards systems change holistically by developing new service experiences and processes and configuring value constellations (Sangiorgi and Prendiville, 2017).

As a result, design is already integrated into the EU's New European Bauhaus as well as initiatives such as the EU Mission for 100 climate-neutral and smart cities platform. But contemporary design practice and research rooted in industrial logics are not fully equipped to deliver the expectations put upon designers to help businesses, governments and CSOs to work at multiple levels towards achieving transitions to net zero and to address societal conflicts. Design specific knowledge is understood as central to enabling transitions, but it also suffers from low integration with other fields bringing domain-relevant expertise, specifically:

4. **politics and governance** within democratic innovation, including co-production and deliberation (Durose and Richardson, 2016); and
5. **socio-technical approaches to transitioning societies** to net zero across multiple levels (Schot and Geels, 2008).

Combining and integrating these five disciplinary perspectives will leverage the connective capacities of design to forge crucial action-oriented integration between democratic innovation and climate transitions.

To achieve this, CoD4T delivers new research and equips the 13 DCs to work inter- and trans-disciplinary breaking disciplinary silos with the aim of proposing new approaches that integrate theories, concepts and methods from democratic innovation and climate transitions. It uses capacities of design in **prototyping, materialising and visualising** and **facilitating practice-systems change** to better connect democratic innovation and transition studies and go beyond the state-of-the-art in studies of co-design, service design and design for sustainability.

To some extent, such intersections between design disciplines with studies of sustainability transitions and political sciences are already present in the research landscape. Studies within the subdisciplines of co-design and social design (Simonsen and Robertson, 2013) have been attentive to the societal and political implications of designing and have emphasised the irreducible politics involved in designing and in explaining and assessing the uneven and unequal consequences of designs. Traditions of participatory design or co-design have been seen as offering an important corrective, thinking about agency as spread across those affected by

designs by including them in design processes and recognising ‘more-than-human’, pluriversal perspectives (Escobar, 2018).

Meanwhile studies into design and innovation in public services and policy-making have included perspectives from political science, including the concept of agonism (Di Salvo, 2022) and the use of digital visualisation as a means to address societal controversies. While these have provided strong foundations for understanding the designing of services and digital interactions as constitutive of social relations and thus political, they have neglected broader contributions in studies in political science (Kimbell et al., 2022). Design has been identified by researchers in policy studies as of increasing importance. For example, studies have suggested design principles for achieving urban innovation (Li et al., 2021), engaging with publics in policymaking (Vesnic-Alujevic et al., 2019), experimental formats for policy-making on science, technology and innovation (Deserti et al., 2020) and producing democratic designs (Saward, 2021). With the growing digitalisation and datafication of policy-making and policy services, data governance and data visualisation have emerged as research themes. However, as yet, there have been few studies that connect this research stream to studies of transitions.

Meanwhile, studies in design thinking and the sub-discipline of design for sustainability have integrated perspectives from the social and behavioural sciences, for example, focussing on designing for behaviour change through the integration of social practice theory and design (Kuijter, 2014).

In a third sub-discipline of design focussing on services and systems (Vink et al., 2021), recent research draws on social science and management research on capability building, ecosystems and institutional perspectives. Advances include articulating systems through their materialisation and visualisation so that they might be changed through social innovation (Leadbeater and Winhall, 2021) and articulating the contributions of design (Kimbell et al., 2021) to service ecosystem design. While there is growing research on design in the context of urban services and innovation (Abbasi et al., 2019), there have been few studies that connect this research stream to studies of transitions.

Therefore, while recent studies have to some extent included other disciplinary perspectives (from transitions theory and integrated social and political sciences), they have been carried out in silos, missing the possibility to combine expertise and generate multi-level, action-oriented, synthesised knowledge that makes better connections between democratic innovation and climate transitions. By leveraging design’s connective capacities, associated with prototyping, visualisation and materialisation and facilitating practice-systems change, this network is creating new approaches, new capacities, enhanced dialogues and shifts in understanding, thus leading to innovative and responsive design research.

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# Chapter 3. Doctoral education landscape in design

Marzia Mortati, Laurene Vaughan, Lucy Kimbell and Karol Murlak

## 3.1 Foundations of doctoral education in design

Doctoral education in design has historically drawn on a plural and often contested set of traditions, often shaped by the interplay between theory and practice.

From its origins, design has been a field marked by multiple epistemologies — alternately grounded in studio-based inquiry, scientific rationality, and reflective social engagement. These foundations have developed through diverse institutional contexts, including art and design schools, technical universities, and interdisciplinary research centres, each framing what constitutes valid knowledge and rigour in different ways. The mid-20th century saw efforts to formalise design as a discipline in its own right, distinct from engineering and the arts, in response to the proliferation of designed artefacts in everyday life. This ambition led to the adoption of methods and models from fields such as information theory, mechanical engineering, and the social sciences — efforts that highlighted design's inherently multidisciplinary nature but also revealed the limitations of attempting to codify a single “scientific” design methodology (Simon, 1969; Gregory, 1966; Archer, 1979).

Across global contexts, two dominant strands have shaped the field: one rooted in studio-based, practice-led inquiry, and another grounded in theoretical and methodological engagements with the social sciences and humanities. These traditions have evolved within institutional homes as diverse as art and design schools, technical universities, and interdisciplinary research centres, each framing design knowledge, rigour, and contribution differently.

Over time, it became increasingly clear that design knowledge could not be reduced to a fixed set of universal procedures. Rather, as Schön (1983) and others argued, it is shaped through situated practices and reflective processes — a view that positioned design closer to applied disciplines like medicine and architecture in its epistemological structure. This led to the emergence of research through design (Frayling, 1993; Redström, 2017), which articulated design not just as a subject of inquiry (research about design) or a resource for innovation (research for design), but as a methodology in its own. This established the foundation for

practice-based doctorates, where artefacts, prototypes, and interventions are treated not as end products but as vehicles of epistemic engagement and knowledge production. This orientation has underpinned the development of PhD programs that legitimise **making as thinking** (also embedded within the concept of *Research through Design* – e.g. Redström, 2017), with implications for how epistemological validity is constructed and assessed. It has also resulted in frameworks that have expanded the design research community’s understanding of how practice can embody, provoke, and test ideas in context, and how knowledge can be generated through iterative engagement with real-world situations. Across the last thirty years, this has helped consolidate a distinctive design epistemology that blends interdisciplinary theorising with practice-based research, enabling the codification of the cognitive and creative processes that underpin innovation and knowledge generation in design (Koskinen et al., 2011; Krippendorff, 2005).

Simultaneously, doctoral education in design has been influenced by adjacent traditions in science and technology studies, participatory action research, critical theory, and more recently, transition studies and ecological thinking. These intersections have enabled design research to engage with complex systems, publics, and policies — but also introduced tensions around disciplinary coherence, academic standards, and evaluation criteria.

These historical currents have produced a landscape in which design doctoral education is at once **experimental and uneven**, often contested, and marked by varied supervision practices, funding models, and disciplinary allegiances. The CoD4T network builds on this heritage, acknowledging its fragmentation and roots, and proposing a coherent yet transdisciplinary reconfiguration of doctoral design education — one that holds practice and participation at its core, while embracing methodological diversity, systemic awareness, and democratic commitment. Through this approach, design is centred as a transdisciplinary and transformative practice, because DCs are embedded in real-world contexts, tasked with co-producing with public and private partners, and supported in developing reflexive awareness of positionality, politics, and systemic complexity. Overall, with such approach, CoD4T aims at advancing a mode of doctoral education that is both intellectually rigorous and socially responsive.

## 3.2 Contemporary challenges in doctoral education in design

Doctoral programs in design globally continue to expand, reflecting design's maturation as a recognised academic discipline and its increasing relevance in addressing 21<sup>st</sup>-century challenges (Vaughan, 2017). These programmes face multiple challenges including producing transdisciplinary graduates capable of addressing complex, systemic, and multi-scalar socio-environmental issues, and increasingly integrating artificial intelligence into research practices.

One of the most significant transformations shaping contemporary research environments is the evolving nature of technological innovation. The rise of digital technologies, generative artificial intelligence, and ubiquitous data infrastructures have radically altered both the pace and structure of innovation (Brynjolfsson and McAfee, 2014). Innovation now occurs in open, networked ecosystems, with blurred boundaries between users, producers, and researchers (Castells, 1996; Etzkowitz et al., 1998). In this context, design — with its user-centred, systemic, and anticipatory orientation — has emerged as a critical discipline for imagining and guiding the application of emerging technologies. As a result, doctoral research in design increasingly intersects with fields such as computer science, AI ethics, and data studies. This brings new challenges for supervision and curriculum development, as generative AI alters how students approach research questions, artefact development, and knowledge production (Caillaud and Skec, 2024). The ethical implications of this development are immense and evolving rapidly.

These technological shifts are mirrored by changes in the structure of contemporary organisations, where knowledge work is increasingly distributed, project-based, and cross-functional. This transition has created demand for hybrid professional profiles that combine analytical, creative, and managerial skills (Florida and Goodnight, 2005). Designers are increasingly stepping into these strategic roles, where they are expected not only to deliver artefacts or services but to envision futures, lead innovation processes, and facilitate multi-stakeholder collaboration (Brown, 2009; Muratovski, 2016). Doctoral programmes must therefore support students in developing leadership, reflexivity, and systemic thinking, capacities that go beyond disciplinary expertise and require structured exposure to real-world complexity.

At the same time, the societal challenges of our time — including climate change, inequality, migration, and political polarisation — have driven a shift in design's purpose and applications. Design is no longer confined to products or communications but is now active in shaping services, infrastructures, policies, and institutional arrangements (Mortati, 2022; Kaszynska and Kimbell, 2024). As design expands its reach into the public sector, healthcare, and urban systems, doctoral education must prepare students to work in contested spaces, where power dynamics, ethical responsibilities, and long-term change processes are part of the research terrain. This is particularly evident in domains such as design for transitions and design for democracy, where researchers must balance academic rigour with participation, inclusivity, and social accountability.

These developments create methodological tensions with the balance of creative practice with rigorous academic standards. Co-design methodologies across disciplines are increasingly being embraced and present challenges, requiring doctoral candidates to navigate complex power dynamics and ethical considerations with community participants. These demands sit uneasily within traditional academic timelines, evaluation structures, and funding mechanisms. They also raise profound ethical questions about power, representation, and accountability in

design research, requiring strong supervision models and clear frameworks for reflexive, situated inquiry. Doctoral training in design for transitions research proves especially complex, requiring doctoral candidates to engage with systemic change processes across multiple scales and timeframes while maintaining place-based stakeholder relevance. Similarly, design for democracy research presents unique challenges as students navigate power, representation, and systemic change questions while maintaining academic rigor across technological, social, and political domains. Despite these challenges, there is growth in the number of doctoral programs that are focusing on these contexts and approaches.

Finally, career pathway uncertainties plague design PhD graduates. While the relevance of design research is increasingly acknowledged across sectors, academic employment remains competitive, and many industries have yet to fully integrate doctoral-level design expertise. Cardoso et al. (2022) demonstrate that despite changes focusing on "professional" skills acquisition, the master/apprentice supervision model remains dominant in many programmes and this needs to evolve if we are to realise graduate employment success. This creates tension between traditional academic mentorship and professional competency development, particularly acute in design fields where students face dual expectations for scholarly achievement and practical design competence. As doctoral education becomes more outward-facing, it must support students in translating their research into diverse forms of value — whether academic, civic, or professional — and in navigating postdoctoral futures that cut across public, private, and third-sector organisations (Vaughan, 2024).

In light of these paradigm shifts, the CoD4T network contributes a timely and ambitious response. It aligns its training model with the distributed, collaborative, and transdisciplinary conditions of knowledge production today. It also recognises that fostering doctoral education in design today is not only about disciplinary excellence, but about equipping scholars to think systematically, act ethically, and lead collaboratively in a world that demands new ways of knowing and doing.

### 3.3 CoD4T approach to doctoral education in design

Within this evolving landscape, CoD4T offers a distinctive contribution by centering design research in response to planetary challenges and democratic deficits. It positions DCs not just as disciplinary experts but as agents of transition, capable of navigating multi-scalar change processes across institutional, civic, and ecological domains. The network builds on traditions of practice-based and participatory design while pushing toward a systemic and situated approach to inquiry. Specifically, it does this by adopting several specific strategies:

- **Co-production of research** with APs, allowing DCs to carry out their research grounded

in partners' organisational contexts and drawing on expertise associated with different levels of climate transitions, including niches, socio-technical regimes and narratives.

- **Deployment of practice-oriented research**, in response to local challenges via design methodologies oriented to co-creating new solutions. The research work carried out by DCs use this as a way of synthesising disciplinary perspectives and enabling meaningful participatory, experimental, situated co-production of their research, while also complementing this with other research methodologies, including case studies and thematic analysis.
- **Reflexive awareness of the conditions and politics of doing transdisciplinary research**, inviting DCs to be attentive to the varying relations between academic disciplines as well as the variance in dynamic local and global political contexts, the non-linearity in the complex systems they study, and the need for flexibility when engaging with diverse publics.

Doctoral education in this context moves “outside the academy,” and becomes immersed in public institutions, civic organisations, and political spaces. The network’s transdisciplinary infrastructure supports this by embedding DCs within complex real-world ecologies, fostering capabilities in negotiation, facilitation, reflexivity and systems thinking. In doing so, it also questions and extends the traditional academic metrics of success (publications, conferences) by incorporating co-produced outputs, policy engagements, and social learning processes as valid research contributions.

Furthermore, CoD4T acknowledges and leverages as a strength the institutional fragmentation of doctoral design education, in which design research is often pulled between the logics of art, engineering, and social science, by offering a coherent yet plural space for learning, discussing and experimenting. One example of this is the network’s collaborative supervision and distributed learning model aimed at creating new epistemic communities that encourage shared ownership of knowledge and – in the long-term – a redefinition of what it means to “do” research through design.

## 3.4 Training structure in CoD4T

The training approach developed and delivered by CoD4T (Table 1) is structured as a multi-phase journey aligned with eight stages of training and professional development: **Grounding, Transitioning, Formulating, Innovating, Applying, Developing, Translating, and Amplifying**—each corresponding to a distinct stage of learning and research maturity.

- **Grounding** lays the theoretical and ethical foundations, introducing systemic and service design approaches, and fostering awareness of the researcher’s role in shaping change.
- **Transitioning** deepens this foundation by engaging with political science, governance, and activism, while building competencies in data gathering and sense-making across

disciplines.

- **Formulating** supports candidates in defining and refining their research questions within real-world constraints, introducing strategies for innovation and decolonial thinking.
- **Innovating** focuses on prototyping and generating systems and democratic innovations based on analysed data and design methods.
- **Applying** bridges research and practice, enabling candidates to apply transition theory to social design, policy-making, and impact evaluation.
- **Developing** strengthens the ability to turn concepts into prototypes, encourages collaborative and interdisciplinary work, and embeds ethical responsibility in the design process.
- **Translating** promotes mission-oriented thinking and critical reflection on environmental impact, helping candidates align research outcomes with societal needs.
- **Amplifying** prepares candidates for postdoctoral careers, fostering transferable skills, leadership in transdisciplinary collaboration, and long-term professional development.

**Table 1. Network training structure**

Title	Type	Year	Mode	Hosting institution
<b>GROUNDING</b>	Summer school	2024	In-person	University of the Arts London
<b>TRANSITIONING</b>	Winter school	2025	Online	Aalborg Universitet
<b>FORMULATING</b>	Continuous training	2024-2025	Online	Politecnico di Milano
<b>INNOVATING</b>	Summer school	2024	In-person	Moholy-Nagy University of Art and Design
<b>APPLYING</b>	Winter school	2026	Online	Politecnico di Milano
<b>DEVELOPING</b>	Continuous training	2025-2026	Online	University of the Arts London
<b>TRANSLATING</b>	Summer school	2026	In-person	Aalborg Universitet
<b>AMPLIFYING</b>	Continuous training	2026-2027	Online	University of the Arts London

This doctoral training are delivered through a combination of in-person seasonal schools, online intensive training weeks, and a year-long Continuous Training programme, all complemented by institutional and site-specific offerings. Such a structured learning journey guides candidates through a process of intellectual and professional development aligned with the challenges of designing for transitions and democratic innovation.

By progressing through this cycle, doctoral candidates not only build research expertise but also acquire the strategic, ethical, and collaborative capacities required to become agents of systemic, sustainable change. They also develop ethical awareness and reflexivity being introduced early in the programme to shared principles of inclusive, responsible, and democratic research. These values are carried through into research work via structured discussions on research ethics, participation, and positionality, especially in relation to co-design with communities and work in contested urban or policy environments. Throughout their trajectory,

DCs are therefore encouraged to critically reflect on their own role as researchers — examining how power, representation, and systemic privilege shape both the research process and its outcomes. Sessions on decoloniality, more-than-human perspectives, and epistemic justice further strengthen the ethical literacy of candidates, ensuring that research practices are aligned with the network’s commitment to sustainability and equity.

With this structure, CoD4T aims to develop DCs as creative, entrepreneurial and innovative researchers able to operate effectively in a range of settings, work collaboratively across disciplinary silos and organisational boundaries, and be equipped to adapt and respond to current and future challenges with a commitment to converting knowledge and ideas into strategies, policies, programmes and services for public and organisational benefit. In principle, all DCs go through the same training and at the same time adapt it to their own needs and doctoral project in the context of the awarding university they are hosted by and secondment partners.

The doctoral program is by design international, intersectoral, and inter- and transdisciplinary. This creates a delivery mix that includes seminars, lectures, workshops, fieldwork, sensemaking and reflection. Building on this, the training content is organised along five strands as shown in Table 2:

- **Researcher Development**, addressing the needs of DCs to have transferable skills for working in multidisciplinary teams and participate in inter-professional collaboration;
- **Research Practice**, providing DCs with strong grounding in insight generation and sensemaking, critical skills for researchers that need to be capable of identifying and addressing critical gaps while navigating different research paradigms;
- **Design Research**, equipping DCs with critical understanding in topics like co-design and facilitation, circular and sustainable design, service and systems design, practice research methodologies;
- **Climate Transitions**, allowing DCs to navigate and master relevant topics like transition design, transitions theory, systems innovation;
- **Democratic Innovation**, supporting DCs understanding of research linked to democratic innovation, policy analysis and policy-making, and governance.

**Table 2. Overall training structure and five learning strands**

	Researcher Development	Research Practice	Design Research	Climate Transitions	Democratic Innovation
GROUNDING	Introduces reflexive mindset, research identity	Orientation to research paradigms and ethical foundations	Intro to co-design and service design principles	Overview of sustainability frameworks	Positioning design within governance and participation debates
TRANSITIONING	Collaborative working in intersectoral teams	Data gathering & interdisciplinary sensemaking	Design and activism, speculative approaches	Climate policy contexts and actors	Political science, civic tech, and participatory models
FORMULATING	Self-assessment and planning (via CDP)	Research question development and positioning	Practice-based research planning	Situating research within transition frameworks	Framing research in relation to democratic innovation
INNOVATING	Leadership in collaborative settings	Linking analysis to prototyping	Co-design and systemic prototyping methods	Designing for systems change	Tools for institutional and social innovation
APPLYING	Stakeholder engagement and negotiation	Application of research tools in context	Evaluation and validation methods	Operationalising transition design	Policy design, public sector interfaces
DEVELOPING	Ethics of collaboration and care	Longitudinal inquiry and iteration	Refinement of practice research contributions	Assessing impact on socio-technical systems	Managing governance complexity
TRANSLATING	Communication and knowledge transfer	Synthesising findings across methods	Knowledge mobilisation and storytelling	Environmental justice and resilience	Translating insights into policy or public value
AMPLIFYING	Career pathways, peer mentoring	Critical reflection on research process	Positioning design research in wider discourses	Future transitions and emergent systems	Leading civic innovation and participatory change

These five strands of training are underpinned by the collective supervision arrangements within the network. In particular, supervision in CoD4T is conceived as a distributed and dialogical process. Each DC is supported by a primary supervisor at their host institution and additional co-supervisors or mentors from their secondment organisations. The network fosters ongoing dialogue among supervisors through shared tools and structured feedback mechanisms. Supervision is also informed by the plural nature of the network, recognising the varied epistemologies, institutional cultures, and disciplinary orientations that shape doctoral research in design. Regular sense-making sessions, peer debriefs, and shared templates (e.g. the PhD Canvas described in Chapter 6) are used to support coherence across projects while allowing for flexibility and responsiveness to each DC’s context.

Further to top-down or horizontally delivered learning (e.g. lectures, workshops and co-creation sessions), peer learning is another core feature of the CoD4T training architecture. The network recognises that DCs bring a diversity of disciplinary backgrounds, professional experiences, and

cultural perspectives into the programme. This diversity is intentionally leveraged through structured opportunities for horizontal knowledge exchange, including peer review of research canvases, candidate-led reading groups, and regular online sensemaking sessions. In these settings, DCs share reflections, identify common methodological or ethical challenges, and form communities of practice around shared interests such as democratic innovation or climate transitions. Beyond knowledge sharing, these activities foster mutual support, psychological safety, and cohort cohesion, helping DCs navigate the demands of interdisciplinary, transnational research. Peer-led initiatives are supported but not prescribed by the network, allowing DCs to exercise agency in shaping their learning environment and professional development.

To further support the career progression of DCs, CoD4T also implements a range of integrated measures. Each DC undertakes two secondments with APs across different sectors, gaining hands-on experience in diverse organisational contexts, with supervision supported by mentors or co-supervisors based in these host institutions. Throughout their trajectory, DCs also engage in training delivered by partners from academia, industry, civil society, and government, ensuring exposure to a wide array of professional perspectives and practices.

A structured Career Development Plan (CDP) is developed by each DC at the start of the programme, and updated through regular six-monthly reviews in collaboration with their main supervisor. Furthermore, the network provides international and intersectoral platforms for DCs to present and receive feedback on their research through the mid-term and final conferences, as well as via digital dissemination tools. These measures collectively respond directly to contemporary challenges in doctoral education — including the need to navigate complex societal issues, engage ethically in participatory research, and build career pathways that bridge academia and practice. Moreover, they aim to enhance the employability of DCs and support their development as future research leaders capable of working across disciplinary and sectoral boundaries.

Finally, DCs complete structured self-assessment exercises (as detailed in section 7 of this publication) following each major training event, reflecting on the competencies developed across the five core strands of the training. These are reviewed in collaboration with supervisors and feed into the regular updating of each candidate's Career Development Plan (CDP). Additionally, network-wide feedback mechanisms — including post-training debriefs, peer exchanges, and open sensemaking sessions — allow the programme to continuously adapt its content and format. Insights from these evaluations are used by the leadership team to adjust teaching priorities, inform supervisor practices, and maintain alignment between evolving candidate needs and programme objectives.

While developed for the specific needs of CoDesign4Transitions, the training model offers transferable insights for other institutions seeking to advance doctoral education in design and sustainability transitions. Its structure demonstrates how collaborative, practice-based, and reflexive approaches can address longstanding challenges in doctoral training across disciplines.

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# Chapter 4. Perspectives on doctoral education relevant to the network

## 4.1 Design research and interdisciplinarity

Ramia Mazé

Debate about ‘design research’ has unfolded in various and vivid ways over past four decades, when in Europe it started to become institutionalized within universities through third cycle (doctoral) education programmes and research structures. Within the debate, competing rationales have included those arguing for design research in terms of ‘disciplinarity’ or, alternatively, ‘complementarity’. In his paper now regarded as seminal to arts research methodology, Frayling (1993: 4) manifests both positions in his argument that between art/design and science: “There is a lot of common ground. There is also a lot of private territory.”

Rationales for design research as alternately disciplinary or complementary have unfolded and intertwined within wider and ongoing transitions of higher education. Educational reforms such as the so-called “Bologna” process have drawn lines around disciplines (and first, second and third cycles of education within discipline) aimed to harmonize methods, outcomes and quality. Such reforms have in part been motivated by a pan-European ideal to facilitate mobility, and free movement within the common market of goods, services, capital, ideas and people (the spirit of many mobility-based initiatives such as Erasmus and, indeed, MCSA which funds this doctoral training network). Such reforms have, on one hand, articulated and standardized disciplinary boundaries and levels and, on the other hand, aim to integrate design into university structures in ways that are more on par and directly in contact with other disciplines.

In terms of disciplinarity, some have guarded the ‘private territory’ including, especially in the early years of design research, resistance to academization at all. Disciplinary arguments can signal a retreat, a withdrawal into “defensive insularity” (Tonkinwise, 2017: 30), a territorialization in ways that are surprisingly conventional (e.g. in terms that reproduce the traditionally siloed disciplinary structures of the university). However, some such arguments have engaged sensitively with contemporary conditions of higher education, e.g. trends of liberalization and monetization and the uncertainties of our “post-normal” times. Beyond uncritical resistance, examples of the latter positionality include Lange (2016), who engages critically and constructively with disciplinary and university conditions in ways that are not easily sidelined, stereotyped or (mis)aligned with wider anti-intellectual tendencies.

In terms of complementarity, a decade on from Frayling and within the same institution, Kemp (2007) emphasizes the common ground, arguing for arts and design research as “catalysts of social and cultural transformation,” an emergent and complementary “third culture” bridging traditional disciplinary silos within the university. Hellström Reimer and Mazé (2023) have more specifically conceptualized ‘thirdness’ and interrogated how this logic has manifested and involved within doctoral research education in Sweden. Another variation on complementarity is what Tonkinwise (2017) articulates as the “Design Turn” within the university itself, in which design not only enters but leads HE institutional change through a logic of bridging disciplines and silos. Uncritical arguments for complementarity can however risk reducing design to mere diplomacy or blinding us to overly superficial harmonizing policies in HE.

Both disciplinary and complementary rationales have the potential to force us to engage with the possibilities of multi-, inter-, cross- and trans- disciplinarity (in HE and in wider society). Disciplinary rationales can do this by putting disciplines in more direct contact with one another, and complementary rationales can do this by articulating the space between/across disciplines. The phraseology of multi, inter, cross, trans, etc., signals a welcome multiplication and differentiation, in which the spatial connotations of each prefix can help to more precisely position design research in relation to others. The border conditions of/in design research draw our attention to ontologies – not only ‘what is’ design, but design (and design research) as always situated – ‘sited’, ‘situated’, ‘situating’ (Kaszynska and Kimbell, 2024) – within the (co)evolving particularities of knowledge relations within and between disciplines and societal sectors.

In CD4T we will not retreat either into blind disciplinarity nor empty complementarity, but engage early career researchers in critically navigating and constructively positioning themselves within and across diverse ways of knowing. Following Barry et al’s (2008) “three logics of interdisciplinarity,” we may usefully distinguish different types of relationships between disciplines, e.g. modes of relation on terms that are “integrative-synthesis”, “subordination-service,” or “agonistic-antagonistic.” New interactions between differently situated knowledges can also emerge from a kind of ‘agitated interdisciplinarity’, an intensification of the very edges or limits of the disciplines involved, as Homi Bhabha articulates, “a reaction to the fact that we are living at the real border of our own disciplines, where some of the fundamental ideas of our discipline are being profoundly shaken.” While acknowledging the realities of conditions in higher education and knowledge politics among disciplines with high stakes, we can also learn from other brave contemporary movements that influence design research (e.g. “decolonizing”, “ecologizing”, “politicizing” moves) in ways that make us sensitive to the foundations, tensions and limits of knowing in design research.

NOTE: The text above draws from an article published elsewhere (Hellström Reimer and Mazé, 2023).

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## 4.2 Inter- and transdisciplinary research in design

Karol Murlak and Mariusz Wszótek

Complex problems, referred in the literature as ‘wicked problems,’ (Rittel and Webber, 1973) or ‘apporetic problems’ (Kostic, 2024), require complex approaches—not only when proposing solutions but also during the earlier phases of problem study and diagnosis. Research tools, methods, and paradigms drawn from a single discipline or field often fail to provide a comprehensive understanding of these phenomena (Cutler, 2009). Hence, science increasingly turns toward using cognitive tools from several disciplines simultaneously, known as multidisciplinary, interdisciplinary and transdisciplinary research. In research and innovation, these terms reflect varying degrees of integration across fields of knowledge. A multidisciplinary approach engages separate disciplines in parallel, an interdisciplinary approach merges insights across disciplines, while a transdisciplinary approach goes even further, generating a new, unified perspective that surpasses conventional disciplinary boundaries or may lead to the creation of a new field. (OECD, 1972)

As discussed in Chapter 3, Section 1, research in design, by its very nature and origins, has developed a very limited set of fully independent research tools and methods. Much of its methodologies have been borrowed from other disciplines, which, on the one hand, makes this field highly dependent on others, but on the other, makes it well prepared for collaborative work across different fields. Another challenge lies in developing research methods grounded in relevant theories that constitute the foundations of design field. Theoretical grounding enables the discipline to be situated within specific phenomenological frameworks, which, in turn, allows for the systematic construction of a methodology capable of verifying research problems in a theory-informed manner. Otherwise, regardless of the degree of interdisciplinarity or the inclusion of diverse disciplinary contexts, the resulting research may prove unstable and difficult to replicate over time. Relevant theoretical frameworks for design include epistemology and, as a derivative within this context, social systems theory. These frameworks enable the analysis of complex communicative relations within design processes. Particularly useful are constructivist approaches such as Humberto Maturana and Francisco Varela’s theory of autopoiesis and Niklas Luhmann’s social systems theory, which provide tools for understanding design as a process embedded in complex, self-organizing cognitive and social systems.

Of the available degrees of integration across fields of knowledge, the consortium has chosen the two most integrated — interdisciplinary and transdisciplinary — since the aim of the project is not to deepen knowledge in a narrowly defined field, but to merge insights between disciplines and generate new perspective to propose solutions to the problems. In this context,

interdisciplinarity integrates theories and methods across disciplines leading to more comprehensive understanding of problems. The disciplines collaborate and adapt their work based on mutual input leading to the development of all disciplines engaged. Transdisciplinarity goes beyond disciplinary boundaries altogether, creating new, unified theories and methods. It often draws on expertise across the sciences, humanities, and non-academic stakeholders leading to the creation of a new discipline, subdiscipline or a field. (Huutoniemi et al., 2010)

Interdisciplinarity—and to an even greater extent, transdisciplinarity—has long been recognized as a valuable approach to research in design. It offers an efficient, structured and reliable theoretical basis for exploring, understanding and solving the social, economic, political, environmental, and institutional problems (Cutler, 2009). However, there are still gaps in the models for transdisciplinary research and education in design (Muratovski, 2016). By engaging in individual research projects and exchanging insights gained from them with peers and partners, the DCs will explore and apply diverse approaches to interdisciplinary and transdisciplinary research in the context of net-zero transitions and cross-sector collaboration, aiming to address these gaps. In this complex process, the network pays close attention to the evolving relationships between academic disciplines and the need to balance divergence and convergence throughout the study, the non-linear nature of complex adaptive systems, outcome-oriented goals. Contexts will also be an important aspect—particularly the shifting dynamics of local and global political environments and the flexibility needed to engage with diverse publics (Bracken et al., 2015).

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## 4.3 Practice oriented research and research through design

Eva Knutz and Thomas Markussen

In the CoD4T network, doctoral training acknowledges methodological plurality, and is open to the doctoral candidates carrying out practice oriented research and research through design (RtD). Practice oriented research approaches such as action research, practice-led research or ethnography can provide valuable insights into situated practices and transition processes in society, but do not necessarily involve design. Hence, the training weeks, online PhD schools and feedback sessions in the network are carefully planned to provide doctoral students with a firm understanding of design being a multifaceted practice oriented research approach in itself and how it can be intersected with other disciplines. In particular transition design and co-design are foregrounded as these fields provide theory and methods to involve actors from business, public sector and civic society in making sustainable change.

The CoD4T network approaches research through design as a methodology that appreciates processes of making and designing artefacts as the primary vehicle for knowledge production. Yet, artefacts can be conceived as such vehicles in different ways. In some instances, artefacts are designed as ‘techno-material embodiments of research hypotheses’ to be tested and evaluated through controlled experiments (Carroll and Kellogg, 1989; Haynes and Carroll, 2007); other practice oriented researchers craft ‘research artefacts’ such as cultural probes or design games to inquire into people’s everyday contexts (Boehner et al., 2014; Brandt, 2006; Mattelmäki, 2008). Within participatory design and codesign, making toolkits and prototyping are used to co-produce knowledge in collaboration with communities, practitioners and non-designers (Sanders and Stappers, 2008, 2014; Knutz and Markussen, 2022). Still others, explore design provocations to stir critical reflections among research participants on future scenarios (Boer and Donovan, 2012) or set up design experiments as a vehicle for building theory and guidelines (Redström, 2017; Markussen 2017). Being able to make these methodological distinctions is key to the success of the networks’ doctoral projects which are expected to deliver design artefacts such as media prototypes, visualisations, service blueprints and urban interventions on the basis of which policy recommendations, transition frameworks, actionable insights and other forms of knowledge outcomes can be articulated.

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## 4.4 Designing for transitions

Lucy Kimbell and Marzia Mortati

The links between design research and studies of sustainable transitions are intensifying, throwing up questions for each area. Throughout the network, doctoral candidates are exposed to perspectives, concepts, frameworks and empirical research advancing that intersection. The first year of training in the network, for example, included guest lectures, practical workshops and seminars from network members including supervisors in university partners and Associated Partners, who are active in theorising, critiquing and elaborating the capacities of design in relation to sustainable transitions. Doctoral research requires that a researcher identifies their own themes and boundaries in the evolving research landscape. Rather than offering a single point of view, the purpose of these sessions was for the DCs to understand situated contributions by some of the researchers active at the intersection of design and transitions for them to further develop in the network – and contribute to.

One obvious starting point is Transition Design, a term, a framework and an approach introduced by Terry Irwin (2018) developed with colleagues, in particular Gideon Kossoff and Cameron Tonkinwise. As articulated through their work at Carnegie Mellon University (2025), Transition Design aims to design for change at the level of systems, addressing societal problems by combining design methods and skills with understandings of socio-technical systems, acknowledging the political work of analysing and transitioning to new ways of living, being, knowing and doing. It requires a vision, a theory of change, a mindset and posture, and new ways of designing. As an approach, Transition Design can be applied to a topic that is a wicked problem or social and public policy issue, through a set of steps collectively carried out to analyse the current system and propose interventions or changes to it.

Of the original contributors to that articulation of Transition Design, Cameron Tonkinwise more generally makes the case that designing is ontological, building on the work of Tony Fry (2012) and others. Understanding transitions as “to be designed” allows bringing to bear the expertise generally found among professional designers to contribute to designing for transitions. The potential here is to recognise opportunities for designing for transitions even if you are a product, communication or service designer.

There are growing intersections between the work of design researchers and academics working within studies of transitions. The fields of Transitions Management or Transitions Governance now have over 20 years of concepts, theories and empirical studies that begin with an assumption that addressing sustainability challenges requires radical transformations of society. Highlighting path dependencies, regimes, niches, experiments, and governance, these fields have foregrounded the institutional lock-ins that inhibit change (e.g. Geels, 2002; Geels

and Schot, 2010; Loorbach et al, 2017). To help translate these concepts and make them more accessible to practice and policy, Hebinck and colleagues (2022) introduced the “x-curve”, a simplified visual framework that helps articulate how as some things emerge in niches, develop and are institutionalised, while others wither away, with periods of crisis and breakdown.

From studies of transitions, frameworks such as the multi-level perspective (MLP) have been integrated into studies in design including a book by Fabiano Ceschin and İdil Gaziulusoy (2020). Ongoing work by Gaziulusoy has led to practical, design-based research in relation to transitions in different contexts including government, research consortiums and business in Australia, Finland, the UK, and Turkey. Niki Wallace (2021) developed a lens on the multi-level perspective and adapted it, towards designing tactical approaches to complex and wicked problems through transition pathways. Other researchers active at this intersection include Sampsa Hyysalo (Hyysalo et al, 2019) working on energy transitions, who among other contributions has experimented with participatory policy and governance processes.

This brief overview has revealed that there are already intersections between studies of design and transitions, to which the network aims to contribute. Concepts and frameworks in studies of transitions management and designing for transitions are providing a strong foundation for the CoD4T network with its orientation to sustainable transitions through democratic design. Further integrating into these developments, work from or related to public policy, policy design and democratic innovation has the potential to bring new capacities to the urgent challenge of achieving sustainable futures – for everyone.

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## 4.5 Designing for institutional and organisational change

Marzia Mortati

Doctoral research that aims to be transformative often requires active engagement with institutions and organisations, with researchers acting not simply as observers or analysts but as active agents of organisational transformation. Organisational change can be triggered by embedding design knowledge within public organisations to cultivate a culture that is open to exploration and innovation, centres on user needs and values experimentation and iteration (Lewis et al., 2020; Tõnurist et al., 2017). In CoD4T, this means preparing DCs to act as embedded change agents within public, civic, and private sector organisations, with a capacity to catalyse innovation through design.

Design has proven particularly valuable in the public sector, where adopting design practices can foster a shift toward more adaptive, participatory, and user-centred modes of working (Tõnurist et al., 2017; Mortati et al., 2025). When embedded effectively, design research can support both external-facing change — such as improving citizen engagement or service delivery — and internal cultural transformation, such as enhancing collaboration and fostering a learning mindset within organisations (Lewis et al., 2020; Steen et al., 2011). This dual focus has been recognised in the literature as a core feature of design-led public innovation. On the one hand, design facilitates reconfiguring services to better reflect societal needs and user capabilities. On the other, it supports rethinking internal practices — including decision-making, experimentation, and staff participation — thus creating a stronger foundation for collaborative governance (Elsbach and Stigliani, 2018; Junginger, 2013). Crucially, effective organisational change requires bridging top-down policy visions with bottom-up operational insights — a tension that design, with its iterative, reflective, and participatory orientation, is particularly well-positioned to navigate (Bason, 2017; Blomkamp, 2022).

One mechanism through which design contributes to organisational learning is the use of reflective practice. Drawing on experiential learning models (Kolb, 1984), change processes often unfold through cycles of experimentation and reflection. When staff are supported to engage in unfamiliar activities — stepping beyond their habitual routines — these “reflection-in-action” moments can become generative touchpoints. They are then followed by “reflection-on-action” where insights are consolidated and practices reconsidered. This iterative rhythm can help organisations develop what some scholars describe as ‘sticky knowledge’ — insights that persist and shape future decision-making (Liedtka, 2011; Magalhães and Proper, 2017). In this way, design research becomes a means not just to implement change but to institutionalise a learning-oriented, future-facing culture.

Three leverage points are particularly relevant when embedding design into institutional contexts:

- Design-based learning frameworks: Integrating design into long-term professional development pathways helps build the internal capacity for innovation in public bodies, such as municipalities or policy labs.
- Organisational co-creation: Involving employees directly in co-design processes fosters shared ownership, nurtures empathy across roles, and supports organisational mindset shifts — though often requiring negotiation with existing power structures.
- Disruptive cultural engagement: Design can act as an "outsider within" — introducing alternative logics, methods, and narratives that challenge institutional inertia and open space for new ways of doing and thinking.

For CoD4T, secondments are conceived as a key mechanism to activate this potential. DCs are encouraged to treat their host organisations not only as sites of empirical study, but as living systems in which design-informed interventions and cycles of learning can be initiated. In doing so, doctoral projects become more than academic exercises — they are anchored in real-world transformation. At the same time, the organisations themselves become co-learners, exposed to the perspectives and tools of design research.

This framing of organisations as collaborators in knowledge production — not merely case study contexts — is central to the CoD4T approach. It reflects a broader commitment to doctoral education that is embedded, experimental, and impactful, capable of both challenging and transforming the systems it engages with.

This is aligned with three critical aspects of design's leverage in institutions: (i) Design-based learning frameworks embedded in long-term processes to enhance organisational innovation capacities in public institutions like city administrations; (ii) Co-creation not just with users but within organisations brings employees into design processes, fostering experiential learning and changes in mindset; (iii) Design culture can disrupt entrenched practices—creating "outside-in" change within hierarchical systems—though this often meets organisational resistance.

Building on this, DCs are guided to use their secondments as learning laboratories initiating design-informed experiments and engaging their mentors and hosting organisation in cycles of action and learning where possible. This also helps shape doctoral projects as change-oriented research, not just academic inquiry, while fostering a mindset of learning-in-practice. By framing organisations as partners in learning, not just contexts of study, CoD4T equips DCs to carry design innovation into systemic spaces—extending the boundaries of doctoral education and amplifying both institutional transformation and doctoral development.

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## 4.6 Participation and ethics in doctoral training

Lara Salinas and Karol Murlak

Ethical participation in academic research is defined as the inclusive, respectful, and equitable engagement of participants in all phases of a study. A Code of Practice guides researchers to ensure that research programmes are delivered in an inclusive, respectful and equitable manner, ensuring participants agency, dignity and rights are prioritised. This is manifest in the principles of voluntary and informed participation; respect for confidentiality and anonymity; the commitment to integrity and transparency; and ensuring the research is worthwhile, with value that outweighs any risk or harm.

In order to ensure ethical participation, researchers must engage in reflective practice and critically assess their biases, assumptions and implications of their work, be attentive to power dynamics, cultural sensitivities, ensuring that participation is meaningful and not merely symbolic. Reflexivity—ongoing critical reflection on the researcher’s own position and the societal impact of the work—is vital to maintaining ethical standards. In collaborative research approaches that emphasize shared inquiry and action, such as participatory design research or participatory action research traditions; ethical participation transforms research into a process of empowerment and mutual learning. In these contexts, actors are not just passive subjects but co-creators of knowledge, actors with agency and contributing to shaping research questions, methods, and outcomes.

The importance of ethical participation is also particularly pronounced in the context of sustainable transitions. Here, researchers address complex societal challenges and involve diverse systems and actors. Ethical participation ensures that research processes are legitimate, inclusive, and responsive to the needs of those most affected by change. By engaging human and more-than-human actors as co- designers, researchers can better reflect upon diverse priorities, foster trust, and mitigate risks of exclusion or unintended harm. This is essential for advancing transitions that are socially responsive, just and equitable.

Ongoing doctoral training and support from the supervisory team play a crucial role in supporting doctoral candidate’s journey as independent researcher, ensuring that doctoral candidates are aware of and adhere to ethical guidelines and that the highest ethical standards are maintained throughout the research.

For the CoD4T Consortium, ethical compliance is of paramount importance given its multidisciplinary scope, its mandate to cultivate the proficiencies of doctoral researchers, and

the involvement of a diverse array of stakeholders, including researchers, participants, policymakers, and external collaborators. This inherent diversity introduces a spectrum of ethical considerations, encompassing, but not limited to, ensuring informed consent, managing sensitive personal data, and addressing potential conflicts of interest.

To mitigate these concerns, the project has meticulously developed a comprehensive Ethical Research Plan. This plan serves to ensure that all project activities rigorously adhere to established ethical norms and legal stipulations. Through strict adherence to the ethical and legal standards delineated within this plan, the project not only fulfils its regulatory obligations but also significantly enhances its legitimacy and societal value. Ethical compliance is recognized as a continuous process necessitating sustained vigilance, adaptability, and an unwavering commitment to perpetual improvement. This foundational document establishes the framework for this ongoing process, thereby enabling the project to effectively navigate complex ethical landscapes.

## 4.7 Policy research intersecting with design research

Karol Olejniczak

In recent years, there has been growing interest in the possible application of design approaches in the field of public policy. This is clear in publications trends (Blomkamp, 2018; Cairney, 2021; Howlett, Mukherjee, 2020; Peters, Fontaine, 2022), the emergence of new journals (Policy Design and Practice), activities of public institutions such as numerous policy labs experimenting with co-design methods (Olejniczak et al., 2020a; Wellstead et al., 2021) and the growing popularity of service design initiatives (Kimbell, 2015; Liedtka and Salzman, 2018). Within the expanding literature on public policy design, three perspectives can be distinguished (Newcomer et al., 2022: 69). The broadest perspective portrays policy design as a set of conceptual models – a model of causation, a model of intervention, and a model of evaluation (Peters, 2018a). The second approach frames policy design simply as a process of matching policy tools to policy problems (Howlett and Mukherjee, 2020). The last one translates product design techniques into the public service arena (Bason, 2017; Liedtka, Salzman, 2018). For the purpose of this project, we have identified three potential topics or issues that can serve as bridges or links between disciplines, thereby enhancing designers' ability to design impactful interventions. These are very practical and pragmatic elements, as public policy is a practice-oriented discipline (Lasswell, 1951; Wildavsky, 2018).

The first issue is understanding policy problems. Policy challenges are inherently complex, often characterized by multiple stakeholders, conflicting values, and interconnected issues. The literature on public policy can provide designers with two important insights. First, there is a better understanding of the wicked nature of most policy problems (Alforda and Head, 2017; Head, 2022), and how the degree of shared understanding and shared values shape the framing of policy problems (Turnbull and Hoppe, 2019). Second, public policy research provides designers with a more realistic notion that most of the complex policy problems can be ameliorated rather than ultimately solved (Peters, 2018b).

The second issue is articulating theories of change. Every public intervention, whether a service, project, policy, or regulation, implicitly or explicitly operates on a Theory of Change (ToC). A ToC is a narrative that outlines the causal linkages within an intervention, explaining “how” and “why” a desired change is expected to occur in a specific context (Brest, 2010). ToC is a well-established practice in policy design and evaluation (Weiss, 1995; Rogers and Funnell, 2011; Koleros et al., 2024), and its utility has been recently recognized by designers (Simeone et al., 2023). Exploring practical approaches to developing robust Theories of Change can be beneficial for designers. It will prompt designers to consider the mechanisms of change (Lemire et al.,

2020). This covers first-order mechanisms that trigger and sustain change within the target population (Olejniczak et al., 2020b), and second-order mechanisms that spread change across policy systems, enabling institutions and policy learning (Capano et al., 2019). Furthermore, ToC requires articulating the expected outcomes (the vision of actual positive change) and raising awareness of the possible side effects for the system in change.

The third issue is using generative AI as an aid in co-design Processes The advent of generative Artificial Intelligence (Gen AI) presents unprecedented opportunities for applied research and evidence-informed decision-making in policy (Mollick, 2024; Charalabidis et al., 2024; Constantiou et al., 2024). Designers can, together with policy practitioners, explore the potential of Gen AI to augment specific practical tasks such as data collection, analysis, synthesis of extensive body of sources (Nielsen et al., 2025), exploration of users insights, analysis of sentiments among stakeholders, inclusion of perspectives from traditionally underrepresented stakeholders (Rhymer et al., 2024), or even quick prototyping and safe experimentation with various policy scenarios (GovUK, 2024; Richter, 2024; Hein, 2025). Designers can examine opportunities and consider challenges for using gen AI ethically and effectively.

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# Chapter 5. Becoming researchers

## 5.1 Becoming community

Aleksandra Goldys, Carolina Giraldo and Lucy Kimbell

Central to the CoD4T doctoral network is a process of learning and practicing spanning many contexts, using many methodologies, drawing on theoretical experience and approaches of many different institutions and several different disciplines. Although this publication lays out some of the foundations and its wider context, the network's approach allows for evolution and interdisciplinary co-learning over the four years. In particular, it places a strong emphasis on the multi-level formation of community: between the 13 doctoral candidates, between candidates and their several supervisors and mentors, and between candidates and the contexts in which they carry out their two secondments, and across the network as a whole including academic and non-academic partners in nine countries.

Due to the dispersion of candidates between places and institutions, using tools for aggregating knowledge and experiences gives candidates the opportunity to practice research community. For example, the CoD4T network has developed templates enabling them to structure issues important for working on a doctoral thesis or to support collaborative online sensemaking sessions.

To support building this research community we adopted a series of principles:

- Acknowledgement and making use of the diversity of candidates' lived experiences and the diversity of the doctoral completion processes in the various universities
- Valuing the variety of knowledge present in partners including research centres and institutions and secondments hosts
- Being attentive to and reflective about methodologies and choices of research methods to carry out the doctoral research
- Building shared understanding, social bonds and psychological support between candidates.

We recognise that the challenges of doctoral research work require ongoing deep thinking, co-learning and sharing, but also understanding, empathy and friendship. By regularly foregrounding and surfacing the experiences of all candidates, in all their diversity, and facilitating discussions among the DCs in analysing the challenges they experience and the ways they cope with the demands of their projects, we can reach certain common areas of interest. Together the cohort decided to create grassroots, candidate-facilitated working subgroups within the research

community, their own community of practices. Some of these focus on specific approaches important to the candidates' research (e.g. democratic design, democratic participatory practices), areas of interest (e.g. regeneration ecology) or ethical issues and the researchers' own positioning in the context of the communities they are engaged in.

In our network, we consider the creation of a community as a very important condition for overcoming the challenges that have been discussed for years and that the academy faces (Nussbaum, 2010; Collini, 2012) in the neoliberal context. The situation of threats to the academy and the acceleration of complex challenges have recently become more acute, and the ability of the academy to respond to them, often in partnership with other institutions, in a frequently unfavourable political context, is a key issue.

Only mechanisms that sustain the community of researchers have the potential to generate the common good (Filippakou and Williams, 2015). The community of researchers not only enables a more efficient and effective transition through the eight stages of the learning journey in the five areas that we outlined in Table 2 of Chapter 3.4, but also makes doctoral students more resilient to the working conditions in academia (G Gullì, 2009). The majority of doctoral candidates in the CoD4T network want to combine the work of a researcher and/or designer with activism and strong involvement in the situation of the communities in which they undertake and will undertake interventions. Creating and sustaining the conditions for this, and reflexivity about this intent, is therefore central to the network's vision and activities.

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## 5.2 Developing skills in sensemaking

Aleksandra Goldys, Carolina Giraldo and Lucy Kimbell

One of the approaches being used in the network to form and support the building of a research community is “sensemaking”, a term that is well established in management and organisation studies (Weick, 1995). Sensemaking allows for the generation and collection of knowledge from an entire, often diverse, team of people, collective analysis by searching for specific patterns or trends in examples and evidence, acknowledgment of observed differences and tensions, and use of models, frameworks and practices to describe the explored situation and the ability to shape future courses of action.

The basic feature of the sensemaking practice articulated by Karl Weick in the 1990s is that appropriately structured collective reflection can allow for effective action in complex systems. Sensemaking is related to the systems approach, and its individual steps consist in exploring a specific system, mapping its properties, and above all, acting for the effective change of the system (Ancona, 2002).

In the CoD4T network, as soon as the doctoral candidates were appointed, in October 2024 we launched a series of regular meetings bringing them together with Associated Partner Climate KIC. The majority of these meetings have been held online, although in addition, the annual in-person training weeks also include a sensemaking session. This commitment to sensemaking has resulted in building up a shared capacity for jointly generating knowledge, collecting it on a shared virtual board and discussing it. The results include inspiring individual candidates in their doctoral research, as well as building a knowledge commons for the cohort as a whole. This sensemaking capacity is also a benefit for the supervisors and partners in the wider research network. For example, the sensemaking approach informed the design and delivery of the first feedback session on candidates’ progress which took place in May 2025. Since one of the goals of the program is to equip the candidates themselves with the ability to use various approaches and methods that facilitate scientific, professional and activist work, we always invite two DCs to co-create a sensemaking session.

One of the important elements of sensemaking is generating and discussing specific examples of actions to be taken. Sensemaking allows making visible and sayable collected knowledge and asking “What we should do now?” It allows participants in the sensemaking process to observe threads, issues or non-obvious, including previously unconsidered issues, and to integrate them into action plans at the level of individual doctoral research, but also the cohort as a whole. One such issue discovered during a sensemaking session was the importance and need for a better understanding of the process of selecting literature for research and how it affects the methodology and selection of cases for research.

We consider the practice of sensemaking to be important for dealing with the multiple levels of complexity, the specificity of the contexts in which CoD4T network members conduct research, and the multitude of disciplines and expertise that must be used and activated for research activities and their consequences (Guattari, 2015). Sensemaking allows for achieving the structured pluralism necessary for effective action in the area of sustainability, which is subject to many pressures and tensions (Remig, 2017).

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## 5.3 Writing and publications

Laurene Vaughan

Academic writing holds significant value in the development of a research career for several reasons. It serves as a fundamental mechanism for knowledge dissemination, allowing researchers to share findings and insights with a broader audience. This dissemination enhances the visibility of research, leading to greater societal impact and engagement. When researchers publish their work, it becomes accessible to others in the field and beyond, facilitating further study, collaboration, and practical application.

Moreover, academic writing contributes to increased research impact through citations by other researchers. Each piece of published work adds to the existing body of literature by addressing gaps, building on previous studies, and sometimes challenging existing paradigms. This cumulative knowledge progression is crucial for academic and scientific advancement.

In addition to individual benefits, academic writing fulfills institutional and funding requirements. Many funding bodies, such as the European Union, mandate open-access publication, ensuring publicly funded research is available to the public. This compliance not only meets regulatory obligations but also enhances the profile of both the researcher and the institution by showcasing their contributions to societal development.

Understanding the intended publication's tone, writing style, and requirements—such as methodological focus and the inclusion of images—is essential for crafting effective academic writing. Ensuring the work is ready and strategically timed can increase its impact and reception.

Ultimately, academic writing not only advances individual research careers through recognition and citation but also supports the broader academic community's pursuit of knowledge, driving forward progress across disciplines. Integrating effective writing strategies and overcoming common writing blocks can significantly enhance both the individual researcher's productivity and the quality of academic contributions.

It should be noted that in design and other creative fields, publication as dissemination of research can also include other forms, such as exhibitions, performance and artefacts, which again should be exposed to peer review and the site of such activities is of importance in the manner that a publisher is.

# Chapter 6. Tools for supporting doctoral training and research in design

## 6.1 PhD Canvas

Nicola Morelli, Amalia de Götzen and Luca Simeone

While planning for the network's Spring 2025 Doctoral Training School delivered by Aalborg University, we asked the DCs to help us identify their priorities, needs and wants. Most DCs reported feeling a bit disoriented and needing some support to establish a narrower focus for their research. Some DCs also mentioned that they were a bit stressed as they did not have extensive experience with academic writing.

The organizing team of the PhD School responded by co-developing with other supervisors what we call the 'PhD Canvas', a visual template that could help the students break down their research into smaller components (e.g., high-level research approach, positioning in relation to research fields, connections between key literature, etc.).

We see this as a prototype that will continue to be iterated during the network. Figure 1 shows the (blank) first version of the PhD Canvas used by the DCs and supervisors in April 2025. Figure 2 shows an example of a PhD Canvas, which the organizing team pre-filled as an example and a guide for the students.

As a starting point, each DC worked individually on their own PhD Canvas. Throughout and after the Spring 2005 Doctoral Training School, the DCs went through various feedback sessions when their PhD Canvases were shared and commented by each other and by supervisors. In the coming months, we plan to keep working on the PhD Canvas, adding further 'boxes' along the way, reconfiguring the layout and relationships between the boxes.

While it is early to draw conclusions on the potential and limitations of this tool, we can offer some preliminary reflections:

- The format of the visual canvas invites experimentation, and it is often associated with ‘drafting’, ‘outlining’ and ‘testing out’ ideas. These qualities might have reduced some of the pressure that the DCs felt in relation to presenting their research. The visuality of the PhD Canvas also resonated well with the design background of some (or most) of the DCs.
- The canvas prompted the DCs to adopt the same vocabulary to describe their research, which was still unformed and at an early stage. This standardization might have helped as the DCs could more easily compare their PhD Canvases and provide feedback to each other.

**Figure 2. First iteration of the PhD Canvas (blank)**

The figure shows a blank PhD Canvas form with the following sections:

- PhD canvas**: You can use this canvas iteratively to help you steer your PhD research.
  - Name
  - Date
- Official description from the DoA**
- Working title**
- Overall research trajectory**
  - High-level research approach
  - Positioning in relation to research fields
- Research question**
- Uncertainties**
- Key literature** (table with 4 rows and 2 columns)
- Connections between key literature**
- Key methods for data gathering and analysis** (table with 4 rows and 3 columns)
- Parking lot**
- Significant references mentioned in my canvas**
- Additional notes**:
  - gaps (knowledge, evidence...)
  - What is already known? Some summary of the evidence you already have? Focus just on your chosen or chosen and designs
  - In the coming months, we will and further broach in this canvas (e.g. results, contributions, joint/rips concerns, policy makers who our research might be relevant too, etc.)
  - How starting from the DoA in some areas, we can add a block called research or like research plan (P.D. or 100 words or similar)

Logos for co-design 4transitions and the European Union are visible at the bottom right.



## 6.2 Self-assessment

Mariusz Wszótek and Karol Murlak

To support reflexive learning and ensure that doctoral training remains aligned with the objectives of the network, a self-assessment tool for DCs was introduced during the Winter School in the first year. This tool is designed to help DCs evaluate their achievement of learning objectives. Conducted in consultation with supervisors, the self-assessment process enables candidates to identify whether they have acquired key competencies or need to undertake further actions to strengthen them. These competencies include knowledge and skills in sustainability transition research, design research, research practice, and researcher development.

The process has a dual purpose: it facilitates personalised reflection and planning for each DC, while also enabling the network leadership to monitor training quality and identify potential gaps or areas for improvement across the programme. During the pilot implementation, all 13 DCs submitted completed assessments in collaboration with their supervisors, achieving a 100% completion rate. The results inform iterative adjustments to the Course Descriptions and Teaching Content and reinforce the network's commitment to democratic, adaptive, and competency-based training.

Reflexivity is embedded at multiple levels of the CoD4T training architecture. At the individual level, DCs engage in structured self-assessment in collaboration with their supervisors after each training event. These assessments serve as reflective checkpoints for evaluating learning outcomes, identifying skill gaps, and adjusting research or training trajectories accordingly.

Reflexivity also operates through dialogical formats such as post-training debriefs, peer exchanges, and network-wide feedback sessions. These moments enable participants to critically engage with the content, format, and relevance of the training programme. This feedback loop is essential to maintaining alignment between the evolving needs of doctoral candidates and the overarching goals of the network, ensuring that training remains both meaningful and transformative.

A qualitative self-assessment method was selected to evaluate doctoral candidates' progress toward defined learning outcomes. The self-assessment takes the form of a survey composed of both standardised Likert-scale questions and open-ended items. These questions address various aspects of the training experience, including perceived acquisition of competencies, engagement with sustainability transition research, and overall learning effectiveness.

The process is conducted according to the following protocol:

1. The WP4 team distributes the self-assessment form to each DC and their Supervisor on the final day of training week.
2. The DC and Supervisor complete the form together during a post-training meeting and submit it to the WP4 team within four weeks.
3. The WP4 team reviews and synthesises the collected data to produce a summary report, which informs internal evaluations and network-wide pedagogical decisions.

This approach supports both individual development and systemic improvement through regular feedback loops, consistent documentation, and dialogical supervision.

The implementation of a structured self-assessment process has provided the network with rich insights into the evolving learning needs and competencies of Doctoral Candidates. Carried out collaboratively between each DC and their supervisor, these evaluations covered four key domains: sustainability transitions research, design research, research practice (ethics, equity, open science), and researcher development.

Candidates appreciated the diversity of perspectives, yet frequently requested more time for synthesis, discussion, and methodological framing. Many expressed a need for consistency and continuation between sessions and greater opportunities for active learning. Practical workshops on transition design were seen as intellectually stimulating. However, some DCs noted the intense pace of delivery and wished for more opportunities to connect the approach to their own projects through iterative application and peer dialogue. Sessions on ethics and open science provoked deep reflection, especially through experiential formats like museum visits. DCs called for more applied discussions, case studies, and institutional support to navigate ethics procedures and understand open science in context. While sense-making activities were valued, candidates highlighted the need for intentional cohort-building structures and spaces for co-reflection.

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