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# ARCS OF IMPACT

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## Dilemmas When Designing Beyond Disciplines

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### Abstract

Impact-driven research is increasingly transdisciplinary, with design recognized as providing a valuable contribution to such endeavours. However, integrating design within transdisciplinary research is far from straightforward. While design offers generative, participatory, and systems-oriented approaches, it also introduces dilemmas around collaboration, ownership, power dynamics, and the need to navigate between diverse ways of knowing.

To surface and explore these tensions, we engaged in a two-part inquiry: an online questionnaire and a collaborative session with designers working in a variety of transdisciplinary research projects. Through thematic analysis of the collected reflections, we identified three overarching clusters of dilemmas: The Pragmatism Dilemma, The Positioning Dilemma, and The Provocation Dilemma.

Rather than prescribing fixed solutions, we propose sets of reflective questions aimed at navigating these dilemmas. These questions are intended to support joint, critical reflection in complex collaborative processes. Our aim is to advance discourse on socially engaged scholarship and transdisciplinary design by making explicit the dilemmas that often remain implicit. In doing so, we argue that recognizing and actively navigating dilemmas is a core aspect of transdisciplinary practices. Acknowledging such tensions helps to strengthen both process and outcome in collaborative research.

**KEYWORDS:** transdisciplinary research; design; systemic design; social design; dilemmas

RSD TOPIC: Methods, Methodology, & Theory

## **Introduction**

Complex societal challenges—such as climate change, migration, and digitalization—rarely conform to disciplinary boundaries. They transcend sectors and entangle diverse forms of knowledge. These so-called ‘wicked problems’ (Rittel & Webber, 1973; Buchanan, 1992) are characterized by uncertainty, competing values, and no clear-cut solutions. Engaging with these challenges requires holistic, integrative approaches that can bridge different worlds of knowledge and practice. Design and transdisciplinary research both offer these integrative approaches, with different practices and histories that allowed these practices to evolve.

Transdisciplinary research is defined by two key principles: (1) it focuses on addressing complex, socially relevant issues, and (2) it integrates knowledge and perspectives from outside academic disciplines (Carew and Wickson, 2010; Pohl, 2011; Van der Bijl-Brouwer, 2022). Transdisciplinary research is a co-production of knowledge, where stakeholders are not just consulted but actively involved in defining problems, setting goals, and shaping inquiry (Klein, 2010). It brings together actors from science, policy, industry, and civil society to collaboratively work on social issues that are both socially relevant and scientifically complex (Lang et al., 2012). As such, transdisciplinary research aims to produce more actionable knowledge, stronger relationships between stakeholders, improved decision-making, and, in some cases, meaningful policy changes (Frodeman et al., 2017).

Design is an integrative discipline that brings together practices from the arts (e.g. visualisation, formgiving), humanities (e.g. psychology, sociology) and applied engineering (e.g. physics). Its core characteristic is the ability to bring together diverse forms of knowledge into propositions for change, often through iterative processes of visualisation, prototyping, and testing (Cross, 2006; Lawson, 2006). Over time, the field has expanded in scope: from the design of visual communication and artefacts, to the design of interactions and services, and ultimately to the shaping of complex systems and environments (Buchanan, 1992; Julier & Moor, 2009; Bürdek, 2005).

Because of this integrative and evolving character, design is increasingly recognised as a valuable approach to complex societal challenges (Dorst, 2015). It enables the reframing of problems, the exploration of alternative futures, and the creation of tangible interventions that make abstract or systemic issues actionable (Dorst, 2015; Rempt et al., 2023). In this way, design extends beyond problem-solving for individuals or organisations to contribute to broader processes of societal and systemic transformation.

Transdisciplinary research and design share several key characteristics: both are change-oriented, participatory, boundary-crossing, and reflective in nature (Tromp and Vial, 2023; Gonera & Pabst, 2019). Transdisciplinary research, however, does not necessarily include design, but it increasingly incorporates design as one of multiple methods within collaborative inquiry. The reverse is also true: not all design work includes transdisciplinary practices. In transdisciplinary settings, design is valued for its ability to address complex societal challenges as well as for its role in structuring collaboration, guiding inquiry, and enabling change (Van der Bijl-Brouwer, 2022; Ozkaramanli, 2022). As such, design is emerging as a vital companion to transdisciplinary research. Others have also identified the potential symbiotic relationship between the two: transdisciplinary research benefits from the situated, generative, and reflective qualities of design, while design is enriched through deeper, more rigorous engagement with complex real-world problems and diverse forms of expertise (Van der Bijl-Brouwer, 2022; Gonera & Pabst, 2019; Ozkaramanli, 2022). Yet, designing beyond disciplines is not without its challenges. Designers involved in transdisciplinary research often find themselves navigating difficult dilemmas (Ozkaramanli, 2022). Dilemmas can be defined as the realization that two options exist that both come with gains and losses, yet they cannot be exercised simultaneously (Ozkaramanli, 2016). In other words, dilemmas are forced-choice situations, and choosing one course of action over another brings both advantages and disadvantages (Ozkaramanli, 2016). While often producing discomfort (i.e., doubt, insecurity, inter-stakeholder conflict), dilemmas are also productive phenomena as they stimulate reflection, discussion, and negotiation around the gains and losses presented by each option, which are highly contextual (Castaño, 2017; Neuhoff et al., 2022). The value of

making such dilemmas explicit has been recognized in design literature, whether this is about addressing personal dilemmas (Ozkaramanli, 2016), social dilemmas (Tromp and Hekkert, 2019; Blaasvær et al., 2022) or inter-stakeholder dilemmas (Castaño, 2017). Articulating these tensions allows designers and teams to surface conflicting values, reflect on trade-offs, and make more deliberate, situated choices, rather than defaulting to implicit norms or reacting unconsciously to constraints.

Previous studies on design in transdisciplinary collaboration have mainly taken a methodological perspective, focusing on design methods for knowledge integration, co-creation, and stakeholder engagement (Sanders & Stappers, 2008; Hoolohan & Browne, 2020; Van der Bijl-Brouwer, 2022), or a disciplinary perspective, looking at overlaps and differences between design, systemic design, and participatory research (Jones & Kijima, 2018; Tromp & Vial, 2023; Neuhoff et al., 2022). There is also research on challenges and dilemmas in transdisciplinary settings (Lang et al., 2012; Arnold, 2021) and on dilemmas designers encounter in their own practice (Ozkaramanli, 2016; Ozkaramanli, 2021). However, the specific setting of *designing within* transdisciplinary research contexts, where designers are embedded in collaborative inquiry alongside other disciplines, remains underexplored. Existing work has not systematically captured the lived experiences and real-time tensions that arise in this context. This paper addresses that gap by articulating the dilemmas that emerge when designing in transdisciplinary research, framing them not as problems to be solved but as tensions to be consciously navigated.

This paper thus maps and reflects on these dilemmas that arise when designing beyond disciplinary boundaries. Drawing on the lived experiences of designers working in transdisciplinary research projects, we examine how these dilemmas emerge in practice and how these are navigated, not by prescribing fixed strategies, as each context demands its own response, but by proposing reflective questions designers can use to guide their decision-making. By mapping dilemmas and offering reflective questions for navigating them, this paper aims to contribute to the discourse on engaged scholarship and transdisciplinary collaboration, offering practical insights into addressing the inherent tensions and trade-offs of this type of work.

## Methods

### About the Research Team, Cases, and Participants

This study is performed and authored by a multidisciplinary team of sixteen researchers affiliated with four cross-departmental design research networks at Delft University of Technology (TUD) and Erasmus University Rotterdam (EUR). Or more specifically: the Erasmus Social Design Hub (ESDH), the Delft Systemic Design Lab (D-SDL), the Connected Creativity Lab (CCL), and the Design Methods Lab (DML). These labs study and apply design to foster transdisciplinary collaboration and enable systemic societal change.

Some of these individuals have been formally trained as designers, others have a background as social scientists, adopting design approaches later in their careers. This mix of backgrounds creates a reflective dynamic: it compels us to articulate what design means to us, and why it continues to shape our work. The transdisciplinary design work takes place in diverse domains, from supporting transitions in the Dutch food system to rethinking youth participation in local policymaking. Here, tensions and dilemmas are regularly encountered, many of which are, at an abstract level, shared across projects, even when contexts differ.

The research consisted of three types of activities: the research team activities, the online inquiry, and a collaborative workshop. Five individuals participated in all three parts of the study. Five people were involved in the research team activities as well as the workshop; one person was involved in the research team activities as well as the online inquiry; and one person was solely involved in the research team activities. Finally, four people were involved only in the workshop. Table 1 provides an overview of each contributor's role(s), research affiliation(s), and educational background.

PARTICIPANT	ROLE	AFFILIATION	EDUCATIONAL BACKGROUND
1 2 3	POI; PW RT;	ESDH ESDH	Industrial Design Engineering
	POI; PW RT;	ESDH; SDL	Industrial Design Engineering
	POI; PW		Industrial Design Engineering

4	RT; POI; PW	SDL SDL	Industrial Design Engineering
5	RT; POI; PW	ESDH; SDL	Industrial Design Engineering
6	RT; PW		Computer Science & Entrepreneurship; Interaction Technology Product design;
7	RT; PW	ESDH	Industrial Design Engineering Industrial Design Engineering,
8	RT; PW	SDL	Sustainable Design Engineering Industrial Design Engineering
9	RT; PW	SDL	Architecture, Urban design, Industrial Design Engineering
10	RT; PW	SDL	Philosophy; Science & Technology Studies
11	RT; POI	ESDH	Industrial Design Engineering Design Research in Climate
12	RT	CCL	Communication Industrial Design Engineering
13	PW	ESDH	Industrial Design Engineering; Biomedical Engineering
14	PW	SDL	Industrial Design Engineering
15	PW	SDL	
16	PW	SDL	

Table 1. Overview of the participants. The following abbreviations are used: Erasmus Social Design Hub (ESDH); Systemic Design Lab; Connected Creativity Lab (CCL). Research Team (RT); Participant Online Inquiry (POI); Participant workshop (PW).

Given that many contributors were both researchers and participants in this study, the boundary between data collection and interpretation was intentionally porous. This insider position enabled deep, practice-based insights, but also introduced potential

biases, such as confirmation bias, or groupthink. To mitigate these risks, we employed several strategies. First, roles were made explicit throughout the process: individuals were asked to reflect on concrete project experiences in the online inquiry, and during the workshop, two facilitators focused on surfacing diverse views. Second, the thematic analysis was conducted iteratively, with the first author carrying out an initial inductive coding process, followed by an online co-analysis session involving four researchers. These multiple viewpoints helped challenge assumptions and refine the coding. Third, preliminary themes and reflective questions were (re)introduced to a broader group, including some participants who were not involved in the original workshop, for feedback and validation. Disagreements on the interpretation of dilemmas, their relationships, or naming were addressed immediately through dialogue among the group.

### **Data collection**

Data collection was done in two stages. First, an online inquiry was sent around to collect initial dilemmas and insights as well as to sensitize participants on concrete experiences with designing in transdisciplinary research (Visser et al., 2005). This was followed by a collaborative workshop where participants came together to further explore, discuss, and deepen the insights that emerged, bringing their diverse perspectives into dialogue.

#### Part 1: Online Inquiry

An online questionnaire was distributed to a group of participants (sent to 12, response rate was 6) affiliated with the aforementioned design labs. Each respondent reflected on one distinct project from their own practice, with the data revealing a diverse range of contexts, challenges, and approaches. This allowed for a first exploration of the nuances and situated nature of dilemmas in transdisciplinary design. But perhaps more importantly, the act of completing the questionnaire prompted some of the participants to reflect on their experiences in advance; it served as a sensitizer (Visser et al., 2005), creating a shared frame of reference and more productive discussions during the workshop. The questionnaire included questions about:

- The stakeholders involved and their roles throughout the different phases of the project;
- The design approach used (e.g., co-creation sessions, design thinking);
- The specific dilemmas encountered during the process, and how these were addressed;
- A reflection on the project's outcome, including how success or failure was evaluated.

### Part 2: Collaborative Workshop

A collaborative workshop was conducted with 14 design researchers working on a wide variety of topics. Five of them had also completed the online inquiry. The goals of the session were to elaborate on findings from the questionnaire, explore additional dilemmas and co-create a map of their connections, and reflect and deepen both the understanding of dilemmas and ways to navigate them through lived experiences of the participants. The entire workshop of two and a half hours was audio-recorded.

The workshop included the following activities:

1. Opening reflection: Participants individually wrote down what "design in transdisciplinary research" meant to them. These responses were read aloud, sparking a group discussion. The goal was to reflect on our diverse viewpoints and backgrounds and establish a shared meaning for the rest of the session.
2. Identifying and mapping dilemmas: Individually, participants listed challenges, trade-offs, dilemmas, and underlying values they had encountered in their own work. Each individual challenge, trade-off, dilemma, or value was written down on a color-coded Post-it note. These were then collaboratively clustered on a whiteboard. The goal was to co-create a map of dilemmas, showcasing their relations with each other. The exercise included a think-aloud reflection on the position and belonging of various dilemmas, and overarching themes.
3. Deep dive in small groups: Participants split into four smaller groups to explore how specific dilemmas manifested in their practice (section 3) and what approaches had helped them navigate these situations (section 4). Importantly,

these were not hypothetical dilemmas and approaches but were grounded in actual experiences from the field. The goal of this final exercise was to explore key dilemmas and ways to navigate them, with contextual insights.

## **Data Analysis**

The collaborative workshop was audio-recorded and selectively transcribed. The first author then conducted an inductive thematic analysis of both the questionnaire responses and the focus group material, drawing on Braun and Clarke's (2006) six-phase framework. This analytical process was iterative and reflexive. All the codes and quotes from the results from the online inquiry, the post-its and the transcribed audio recordings were pasted together on a Miro board. Next, a co-analysis session was held with four fellow researchers to shape and refine the emerging insights. Through repeated cycles of clustering these codes, revising, and rearticulating themes, three overarching clusters of dilemmas were identified. Appendix 1 provides an overview of the themes and corresponding codes, while Appendix 2 presents a snippet of the Miro board showing the messy part of the clustering process.

The data did not only reveal dilemmas, but also how designers navigated them in practice. Participants shared concrete experiences of shifting roles, adapting strategies, and making context-specific decisions. These reflections were used to formulate the reflective questions presented in this paper. The preliminary dilemmas and questions were then shared with a broader group of design practitioners, some of whom had participated earlier in the process, to further deepen the findings.

## **Findings**

Three overarching clusters of dilemmas were identified: The Pragmatism Dilemma, The Positioning Dilemma, and The Provocation Dilemma. While presented as distinct categories, these clusters are interconnected and often overlap in practice. Rather than offering rigid typologies, they serve to illustrate the balancing acts that researchers may encounter when designing beyond disciplines.

Each cluster is unpacked through examples from our study of how such dilemmas might manifest in transdisciplinary research projects. An overview of the clusters and the subdilemmas is presented in Table 2. Each dilemma illustrates key dimensions of its respective cluster, offering contextualized expressions of underlying tensions. "It can be a choice between..." These examples are not exhaustive but exploratory: they offer a range of contextual expressions that reflect the situated, often messy nature of design work in complex collaborations. Quotes from transcribed sessions illustrate how these dilemmas were experienced and articulated by practitioners themselves. The dilemmas are not isolated either; they often co-occur or reinforce one another in practice. By naming and articulating them, we aim to support more intentional reflection and critical decision-making when engaging with design in transdisciplinary research.

<i>Clusters</i>	<b>The Pragmatism Dilemma</b> <i>Dilemmas regarding time and the process, oftentimes a value like "inclusivity" or "rigor" clashes with practicality. Do you move forward or slow down?</i>	<b>The Positioning dilemma</b> <i>Dilemmas regarding roles and ownership (designers take on) within transdisciplinary collaboration. Do you lead or facilitate?</i>	<b>The Provocation dilemma</b> <i>Dilemmas regarding how systems and stakeholders are challenged. Trust and expectations often play a significant role. Do you create friction or harmony? The</i>
<i>Focus</i>	The structure of the process that is followed	The role of the designer in the process	purpose of the process
<i>Subdilemmas</i>	Fast delivery vs. thoughtful exploration	Driving the process vs. enabling ownership	Being a provocateur vs. being a mediator

	Practical progress vs. focus on inclusivity	Researching vs. generating	Designing for emergence vs. maintaining legitimacy and trust
	Having a more productive session vs. being totally transparent		Tangible output vs. enabling systemic change

Table 2. Overview of the clusters and subdilemmas.

### Cluster 1: The Pragmatism Dilemma

This cluster of dilemmas reflects the tension between choosing to take action to deliver tangible results and choosing to take the time to build relationships, reflect, and deepen understanding. A fitting metaphor might be a microwave versus a slow cooker (see Figure 1). Design is often brought into transdisciplinary research because of its actionability: its ability to make ideas concrete and to prototype interventions. At the same time, designers can play the role of the “slow cooker”, bringing stakeholders together, focusing on the process of sense-making through (many) iterations.

Figure 1. The metaphor of the microwave vs. the slow cooker. Source: Susanna Osinga.



Next, specific dilemmas identified during the session will be discussed. Each dilemma illustrates key dimensions of the choice between doing and deepening, offering contextualized expressions of underlying tensions. “It can be a choice between...”

Fast delivery vs. thoughtful exploration: Richness, depth, and flexibility often come at the expense of speed and efficiency. Taking the time to understand the context and align perspectives can delay tangible outcomes. Yet, this slower pace can be essential for developing shared understanding and trust. At the same time, pushing ahead and “just doing it” may help maintain momentum, but can risk oversimplification, loss of nuance, or weakened methodological rigor. Time is a crucial factor in this balancing act. Moreover, some stakeholders may have limited availability, making activities such as full-day co-creation sessions impractical or even exclusionary.

*“There are a lot of settings or contexts where people are like: ugh, what is this design thing, we want to get to work, cut the bullshit, let’s get to the point.”*

*“You need quite a bit of time to understand each other, get to know each other. [...] Before you can really get to work. Which is actually already part of the work, but people don’t always see it like that.”*

Practical progress vs. focus on inclusivity: Involving a diverse range of stakeholders is often seen as essential to meaningful transdisciplinary work. Expanding the network and creating opportunities for broader participation, for instance, by providing multilingual or multimodal materials, can foster inclusivity but also increase complexity and costs, as well as causing delays. There is also a risk of forcing inclusion where it may not be welcomed or feasible. Some groups may not have the time, interest, or capacity to participate, even when incentives are offered. In such cases, pushing too hard for inclusion can feel both unfair and ineffective. The dilemma, then, is how far to go in trying to include every voice, recognizing when efforts support meaningful engagement and when they may unintentionally divert energy away from making tangible progress.

*“How far do you go for inclusion? How much effort do you put in for that group that you can’t reach? They probably don’t want to participate. Even if you give them money, they don’t want it, and they also don’t have the time; they have other things. So it also feels unfair to force this inclusion.”*

*"If you include many different expertises, you probably need a lot of time for understanding each other's expertise, and that also creates more time burden."*

Having a more productive session vs. being totally transparent: Transparency with stakeholders is often valued in transdisciplinary processes. However, providing complete transparency in methods, processes, outcomes, feelings, and expectations is not always straightforward or desirable. Sharing too much information too early in a process can overwhelm participants, lead to confusion, a less productive session, or even stifle open dialogue in some cases. When confronted with detailed results, complex data, or unresolved tensions, stakeholders may feel hesitant to contribute freely or may defer to those with more expertise or confidence. This is particularly sensitive when power asymmetries are present. Moreover, time constraints often require strategic decisions about what to share, when, and with whom. Balancing openness with clarity, and inclusivity with efficiency, becomes a challenge.

*"Transparency is a super nice value that we always try to ensure, but it can also come with uncomfortable situations or with a lot of sharing that is also time intensive."*

## **Cluster 2: The Positioning Dilemma**

This cluster of dilemmas is centered around how you give form to your role as a designer: do you lead from the front, or do you create space for others to lead? Establishing genuine ownership is difficult when participants have limited time, unclear roles, or competing priorities. Designers often shift between being the metaphorical marker, drawing lines, making decisions, and pushing the process forward, and the blank Post-it, holding space, prompting contributions, and inviting others to shape the agenda and outcomes. This balance is visualized in Figure 2. Both roles can be valuable, depending on the moment and the needs of the collaboration. But these shifts are rarely straightforward. This dilemma raises deeper questions about ownership, power, and sustainability: who gets to define direction, who takes responsibility, and what happens to ideas and energy once the designer steps back?

Figure 2. The metaphor of the marker vs. the empty Post-it. Source: Susanna Osinga.



Next, dilemmas that came forward in the session will be presented, showing the dilemma between leading and facilitating in context.

Driving the process vs. enabling ownership: In many projects, designers are expected to take the lead: making decisions, structuring the process, and ensuring progress when other stakeholders have limited time, resources, or motivation. While this leadership can be crucial in moving a project forward, it also carries the risk of creating dependency. If the project revolves too heavily around the designer's drive, stakeholders may struggle to maintain momentum once the designer steps away. This raises a dilemma: how to provide enough direction to keep the process alive, while at the same time fostering ownership among stakeholders so that the project can sustain itself in the long term.

*"They [other stakeholders] expected us to design things and decide what the next session was going to be about, what we were going to research. And we wanted to open it up to them [...] but they didn't even seem to want that role. [...] They didn't maybe also have the time to work on it."*

*"Why does everyone keep looking at me for answers in a co-creation process?"*

*"How much do we as initiators steer the design process, and how do we take into consideration the input of participants?"*

Researching vs. generating: Design is often seen as a generative force—creating new ideas, concepts, and alternatives. In transdisciplinary research, however, designers are tasked not only with generating ideas but also with conducting research and guiding collective inquiry. This dual responsibility can create tension: should the focus be on

generating ideas or on researching and understanding the problem and other stakeholders more deeply? The dilemma arises when designers are unsure whether to lead with creativity or immerse themselves in the research process. This conflict can manifest during co-creation sessions, when shaping project goals, or in defining one's role. Designers must continuously evaluate which approach is more relevant in any given moment, as both roles—generating and researching—bring distinct value to the process. However, balancing the two is rarely straightforward, and shifting from one to the other can lead to confusion.

*“Increasingly, I saw this project not going in the right direction. And I was sitting on my hands for a long time. And at one point, I started partaking in the project. So my role shifted, and I was conflicted about that, and also frowned upon by the group at first. [...] In a way, I was not catering towards the scientific or even to the project goals per se, but I was more catering towards the large impact goals.”*

*“I was also intervening in a situation, which was also a research situation. [...] But taking on an even more proactive role in that research situation also has a larger impact on the findings that you are going to get.”*

### **Cluster 3: The Provocation Dilemma**

This cluster of dilemmas explores a fundamental tension in the role of the designer: should you aim to challenge the system more radically, or prioritize keeping stakeholders comfortable and engaged to build support for emerging ideas? Some degree of friction is often necessary to spark new thinking, but pushing too far, too fast can trigger resistance, defensiveness, or withdrawal. Incremental, comfortable changes, on the other hand, are more likely to gain traction, yet may not address the deeper systemic issues at stake. Designers may find themselves navigating between stepping into a metaphorical rocket, innovative, bold, but potentially intimidating or difficult to follow, and stepping into a steam train, reliable, steady, and easy to board, but slow - see Figure 3. Both have value: the rocket can disrupt and reimagine, while the steam train can build trust and potentially carry more people along. The challenge lies in knowing how to balance friction with harmony.

Figure 3. The metaphor of the rocket vs. the steam train. Source: Susanna Osinga.



Next, dilemmas from the session will be grouped, each showing aspects of the tension between creating friction and fostering harmony.

Provocating vs. Mediating: In transdisciplinary projects, ideas and directions brought into the process can either challenge existing assumptions and practices, or align more closely with established perspectives and ways of working. Disruptive inputs, such as questioning dominant framings or exposing systemic tensions, can provoke reflection and open space for transformation. Yet, they also risk alienating participants if perceived as too radical or destabilising. Conventional contributions, on the other hand, can create consensus and strengthen collaboration, but may also reinforce existing limitations and inhibit systemic change. The dilemma lies in finding the right balance: when to bring in disruptive insights that unsettle, and when to provide conventional inputs that stabilise and connect.

*"I had one project [...] where we wanted to share our findings and we wrote a publication about it. And they [the client] thought it was too honest and critical. And they said: if it is like this, we are not going to share it. It can not be published. [...] You are almost, sort of, touched on your academic integrity, but at the same time you want to create impact through your research and you need your client for that. And they need to stay on board. How do you go about that?"*

*"The designers [...] wanted to challenge the stakeholders to really let them think differently about the future. But at the same time, there was only so much radicality they could propose because they also needed those stakeholders to see a role in the future in order to onboard them in the transition. How much do you push them, and*

*how much do you let them see their role? Because they need to make the change, the designers aren't going to change the system."*

*"Sometimes you design things and then other stakeholders find things not to their liking or too radical, and their commitment kind of drops."*

Emergence vs. Structure: In transdisciplinary projects, designers often navigate the tension between fostering emergent, provocative insights and providing structure that stabilizes the process. Designing for emergence, encouraging unexpected ideas, reframing problems, and experimenting with novel approaches, can surface tensions, challenge assumptions, and open space for deeper learning and systemic change. At the same time, too little structure can lead to confusion, disorientation, or disengagement among participants, limiting the impact of these provocations. Conversely, imposing structure, through clear agendas, defined goals, or familiar methods, can create comfort and facilitate collaboration, but may also dampen disruptive insights and constrain opportunities for reframing the problem. The dilemma lies in balancing these approaches: when to provoke and unsettle, and when to guide and stabilize, in order to create meaningful reflection, learning, and transformation.

*"Sometimes it [the outcome] is defined by the project brief and by the client, and it is also a promise that you have to fulfill. And this can also create all kinds of tensions. For example, we often already define all kinds of outputs in the project proposal to cater to the needs of the client, but [in doing so] are restraining our design space."*

*"We use the Double Diamond to legitimize what you are going to design, but then you are immediately put into the mold of a linear process."*

*"If you create vagueness, that creates wiggle room. But then it also means we might not understand each other. And do we still have the same expectations of what's going to be the outcome of the project?"*

Fulfilling the brief vs. Pursuing systemic change: Designers are often tasked with delivering concrete outputs, such as policies, toolkits, papers, or products, that demonstrate progress, provide legitimacy, and meet the expectations of stakeholders or clients. These deliverables are important for accountability and for creating a sense of closure in projects. At the same time, an exclusive focus on predefined outputs can

limit opportunities for deeper, systemic impact. Some of the most meaningful change, such as shifts in relationships, perspectives, or institutional practices, do not always fit neatly into the form of a deliverable. The dilemma lies in how far designers should stay within the boundaries of a given brief to satisfy stakeholders, and when it may be necessary to deviate in order to create more lasting systemic change.

*“Sometimes the means becomes the goal. Whether it is a policy or a toolkit or a paper. Even designers, they want to get to a design. Like a design in the sense of a product or something, or a service. But sometimes that is also not the best solution for the impact you want to create. Sometimes it’s something else, if you look at the whole system.”*

### **How these dilemmas might be navigated**

The dilemmas described in this paper surfaced through reflection on practice, moments in which designers were required to make difficult decisions in complex, collaborative environments. As mentioned before, these dilemmas do not lend themselves to simple or universal solutions. Instead, they demand situated judgment, shaped by context, values, relationships, and timing. In Table 3 questions are presented; these were not directly posed by participants, but inferred by the team of authors to invite designers to return to these dilemmas not as abstract categories, but as questions that may guide reflection, spark conversation, and support more intentional ways of working.

These guiding questions may be discussed individually or with a team, not to “solve” the dilemmas, but to explore how they manifest in a specific context, and how they might be consciously navigated.

Dilemma	Guiding Questions
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<b>Pragmatism</b>	<ul style="list-style-type: none"> <li>● How do we balance forward movement with reflection, trust-building, and alignment?</li> <li>● What kinds of knowledge are valued at different moments, and who decides that?</li> <li>● How can time, trust, and money be used to create space for building relationships and for exploration?</li> <li>● When does transparency foster understanding, and when might it overwhelm or stall progress?</li> <li>● How can processes remain open to redirection without losing momentum?</li> </ul>
<b>Positioning</b>	<ul style="list-style-type: none"> <li>● Should the designer guide the process, or create space for others to lead?</li> <li>● How might roles and responsibilities evolve over time?</li> <li>● How are responsibilities negotiated, and who is expected (or willing) to carry them?</li> <li>● How can negotiations around roles remain explicit, fair, and adaptive?</li> </ul>
<b>Provocation</b>	<ul style="list-style-type: none"> <li>● When does discomfort generate learning, and when does it push people away?</li> <li>● How radical can change be without alienating participants?</li> <li>● How much ambiguity is productive, and how much clarity is needed?</li> <li>● When should difficult conversations be surfaced, and when might reframing be more constructive?</li> <li>● How do power, positionality, and purpose shape these choices?</li> </ul>

Table 3. Guiding questions for each dilemma

## Discussion and Conclusion

In this paper, we identified the dilemmas that arise when designing in transdisciplinary research. Central to our contribution is the identification of three overarching clusters of dilemmas: *The Pragmatism Dilemma*, *The Positioning Dilemma*, and *The Provocation Dilemma*. Each of these clusters captures fundamental tensions designers and researchers must navigate when working across disciplinary boundaries. Rather than offering prescriptive strategies, we proposed questions to support situational reflection and conscious decision-making.

These dilemmas emerged through conversations with design practitioners reflecting on their experiences working in transdisciplinary research contexts. While they are grounded in the practice of design, they are not exclusive to it. Some of the dilemmas described may also arise in other forms of transdisciplinary collaboration. As such, they may hold broader relevance beyond the design field. While the three clusters of dilemmas emerged inductively from reflections, they also resonate with existing design and transdisciplinary research literature.

The Pragmatism Dilemma captures the tension between producing measurable progress and taking time for reflection, trust-building, and alignment. Scholars have noted that meaningful engagement and trust-building, particularly in co-creation and participatory design, require time, flexibility, and often an initial slowdown in order to foster alignment and shared understanding (Sanders & Stappers, 2012). Yet, such investments are not always feasible. Newig et al. (2019) found that early engagement with practitioners in transdisciplinary research can reduce traditional academic outputs such as publications, citation rates, and even PhD completion.

The Positioning Dilemma relates to long-standing discussions about the evolving role of the designer. Geenen (2022) articulates a distinction between the designer as a generator—focused on imagining alternative futures and constructing new solutions—and the designer as a facilitator, who supports others in articulating their knowledge and co-creating meaning. These roles can sit in tension, especially when stakeholders expect the designer to lead, but the designer wishes to cultivate shared ownership (Aguirre et al., 2017). Sanders and Stappers (2008; 2012) similarly describe

the importance of designing participatory tools that empower participants while maintaining enough structure to support creativity and learning. These dual roles require designers to continuously assess when to guide, when to step back, and how to structure collaboration without dominating it.

The Provocation Dilemma can also be related to the work by Geenen (2022). One of the roles of design is being provocateur, aimed at exposing tensions, questioning assumptions, and provoking critical reflection. Friction is often seen as something to avoid or resolve, yet from a design perspective, such friction can be a generative starting point, as Van der Bijl-Brouwer (2024) argues. Design can also take up the role of mediator, focused on bridging perspectives, balancing interests, and fostering dialogue. Goss et al. (2024) further highlight the delicate balance designers must strike in navigating this dilemma. They describe a paradox in which designers, sensing a lack of trust, adjust their work to align more closely with stakeholder expectations, yet the safer and less challenging their ideas become, the less confidence stakeholders have in their capacity to create real change.

When comparing these dilemmas across domains beyond design or academia we find similarities. For instance, Brinkman et al. (2025) describe comparable challenges in long-term policy work. Professionals often face a choice between following administrative rules to ensure alignment or challenging them to create space for long-term initiatives, which can generate friction, mirroring the Provocation Dilemma designers face in transdisciplinary research. Similarly, balancing broad stakeholder consensus, which can slow progress, against moving forward with a smaller group, which risks limited support, resembles the Pragmatism Dilemma.

Arnold (2021) identifies numerous context-specific dilemmas in transdisciplinary settings more broadly (not specifically in design). Many of these resonate with the Pragmatism Dilemma we identify for designers, such as “Time restrictions versus sufficient problem framing” and “Limitation of time versus appropriate choice of tools”. These parallels suggest that the underlying dilemmas we identified may resonate beyond academic settings and/or beyond design.

Moreover, The Positioning Dilemma and the Pragmatism dilemma echo themes in systemic and social design literature such as navigating the boundary between leading and facilitating or balancing action and reflection (Van der Bijl-Brouwer, 2024; Tromp & Vial, 2023; Neuhoff et al., 2022). This is perhaps unsurprising given the shared emphasis on working across boundaries and engaging diverse stakeholders. In academic contexts, additional pressures, such as producing publishable outputs or meeting grant deliverables, can amplify dilemmas like the Pragmatism or Positioning Dilemmas, particularly when institutional timelines conflict with meaningful engagement.

While we did not aim to systematically compare transdisciplinary, systemic, and social design approaches, these reflections suggest two key insights. First, some dilemmas may be broadly recognizable across design practices. Second, certain tensions might be amplified or shaped by the institutional and epistemic constraints of academic research. Exploring these distinctions further could clarify how dilemmas manifest differently in academic versus practice-oriented, non-academic contexts, and how lessons from one domain might inform approaches in another.

Several limitations must be acknowledged. Our findings are primarily based on a single collaborative session, complemented by an initial online inquiry. Expanding this research through multiple workshops, ideally involving a broader range of disciplines and institutions, would strengthen its depth and validity. Moreover, this paper draws on our own experiences by gathering personal reflections on such dilemmas from within our research team. This also means that the boundary between researcher and participant is blurred: members of the research team also serve as contributors of empirical material, reflecting on their lived experience within projects. This insider perspective brings depth and richness to the findings, grounded in first-hand experience of navigating design within transdisciplinary research contexts. While it risks biasing the results toward the values and framings of our group, it also reflects a diversity of backgrounds: contributors are affiliated with different universities, research networks, and a few disciplinary traditions, and bring a range of project experiences. This variation strengthens the internal diversity of the sample, even as it remains situated. Although this reflective stance limits the generalizability of our findings, it offers nuanced insights into how dilemmas are experienced and negotiated in

practice—insights that may resonate with others working in similarly complex and collaborative environments.

Future research could extend this inquiry by conducting more workshops. It would also be valuable to examine how expert designers, embedded in long-term transdisciplinary projects, navigate these dilemmas over time through in-depth case studies. Given the situated and evolving nature of these dilemmas, future research should adopt methodologies that allow for close engagement with the messy, everyday realities of transdisciplinary design practice. Approaches such as participatory action research, ethnography, and diary studies could offer deeper insight into how designers make sense of and respond to dilemmas as they emerge in context.

By framing dilemmas not as problems to be solved, but as tensions to be consciously navigated, we open space for more critical, reflective, and context-sensitive practice in transdisciplinary design research. Rather than striving for clear resolutions, acknowledging and engaging with these dilemmas may ultimately strengthen both the process and impact of transdisciplinary collaboration.

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## Appendix 1 - Themes and codes

<u>Themes</u>	<u>Codes</u>
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<p><b>The Provocation Dilemma</b></p> <p><b>Friction vs. Harmony</b></p> <p><b>Rocket vs. Steamtrain</b></p> <p>Dilemmas regarding how systems and stakeholders are challenged - trust and expectations often play a significant role</p>	<ul style="list-style-type: none"> <li>- Conservativeness / resistance to change</li> <li>- Dealing with uncertainty and intuition</li> <li>- Fun/pleasure vs. Functional discomfort and learning</li> <li>- Client/stakeholder trust &amp; expectations</li> <li>- Legitimizing design work</li> <li>- Making radical or little impact</li> <li>- Is reporting useful?</li> </ul>
<p><b>The Positioning Dilemma</b></p> <p><b>Leading vs. Facilitating</b></p> <p><b>Marker vs. Empty Post-it</b></p> <p>Dilemmas regarding roles and ownership (designers take up) within transdisciplinary collaboration.</p>	<ul style="list-style-type: none"> <li>- Role ambiguity and expectations</li> <li>- Ownership and engagement challenges</li> <li>- Authority and power challenges</li> <li>- Lack of time and commitment from partners/other stakeholders</li> <li>- Stakeholders not benefitting from their contribution</li> <li>- Continuity = difficult</li> <li>- Maintaining momentum after projects end</li> </ul>

<p><b>The Pragmatism Dilemma</b></p> <p><b>Doing vs. Deepening</b></p> <p><b>Microwave vs. Slowcooker</b></p> <p>Dilemmas regarding time and the process, often times a value like “inclusivity” or “rigor” clashes with practicality</p>	<ul style="list-style-type: none"> <li>- Transparency slows down the process</li> <li>- Time and resource limitations</li> <li>- Many collaborations or just pushing through</li> <li>- How to be inclusive?</li> <li>- Playing around or focusing on the results</li> <li>- Doing the “right” thing or doing what was planned</li> <li>- Sticking to your principles or being pragmatic</li> <li>- Time for reflecting</li> <li>- Diverse and contradicting opinions during sessions</li> </ul>
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## **Appendix 2 - An overview of collaborating on creating themes in Miro**

