3

Organisational structures as challenges to inter- and transdisciplinary collaboration

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Meaningful inter- and transdisciplinary collaboration requires organisational support; yet structures in universities and funding bodies can undermine the very collaborations they call for.

What did the SSH CENTRE project do?

SSH CENTRE (Social Sciences and Humanities for Climate, Energy aNd Transport Research Excellence) is a Horizon Europe project that focused on generating best practices for incorporating both Social Sciences and Humanities (SSH) and inter- and transdisciplinary research into the European Union's climate, energy, and mobility transition policy. The SSH CENTRE project deliberately created spaces for *epistemic experimentation* – i.e. structured collaborations that bridge different epistemic (knowledge) cultures to co-produce policy-relevant knowledge:

Interdisciplinary Collaborations for EU Policy Recommendations

The SSH CENTRE project facilitated nearly 30 novel collaborations between the SSH and STEM (Science, Technology, Engineering and Mathematics) disciplines, for strengthening European climate, energy, and mobility policy. These resulted in three edited books, whereby each Interdisciplinary Collaboration produced a chapter. For more see SSH CENTRE Interdisciplinary EU Policy Book Collection.

Transdisciplinary Knowledge Brokerage Initiative

The Knowledge Brokerage Initiative for sustainability transitions gathered 30 early- and mid-career SSH researchers working on themes of climate, energy, and mobility. These researchers actively engaged in accelerating the transition process towards a carbon-free society by working with six European cities on sustainability issues and brokering SSH knowledge. The researchers organised workshops and produced a range of reports that provided knowledge to support the cities' transitions. For more see Knowledge Brokerage Reports.

This Briefing Note is one of 10 that present the findings and recommendations from the evaluation of these epistemic experiments. For more, see the Introduction to the Briefing Note collection and the Formative Accompanying Research methodology.

Introduction

Organisational structures, especially those related to funding and career assessment, often hinder genuine inter- and transdisciplinary collaboration. This Briefing Note (BN) addresses a frequent contradictory policy logic, where high-level support for inter- and transdisciplinary work clashes with the mechanisms that govern and reward academic research (such as assessment metrics and departmental divisions). Universities and research institutions are usually organized by disciplines, which leads to silos that make inter- and transdisciplinary collaboration difficult. The SSH CENTRE experience confirms that while organisational rules often continue to constrain genuine inter- and transdisciplinary work, carefully designed project-level support and

the skills of individual researchers can create meaningful collaborations. Still, overcoming these challenges requires structural reforms that actively facilitate interdisciplinary engagement rather than merely endorse it in principle.

Problem description and literature insights

A pervasive issue is the 'paradox of inter- and transdisciplinarity', where such research is encouraged at the policy level but is poorly rewarded or inadequately supported by funding mechanisms and academic structures [1,2]. In governmental policy and strategy documents, inter- and transdisciplinary work is often presented as synonymous with innovation, but in many instances, it is used as a politically useful label that does not translate in meaningful research support. As BN4 and BN5 address further, evaluation metrics, policy directives, and associated governance mechanisms tend to rely on rigid, discipline-based classification systems for evaluation and funding, directly contradicting the stated goals of flexibility and inter- and transdisciplinary inquiry [3].

The **structure of academic institutions** is predominantly disciplinary. This affects individuals' professional careers at all stages, from recruitment to promotion and tenure [4]. Typically, publishing within a discipline and teaching in a department counts toward promotion and tenure; in contrast, researchers, especially early in their careers, are often discouraged from inter- and transdisciplinary work [5]. This is also true for doctoral students as well as organizers of doctoral programmes, as the pressure to rapid degree completion is unfavourable for inter- and transdisciplinary research, given the demands on time and resources [6].

Departmental divisions create further logistical and communication challenges to collaboration, for instance, simply by physical dispersion of team members or the lack of dedicated shared spaces for interaction and knowledge of each other's research [7]. The absence of standardised procedures for aspects such as determining which disciplines to include or the integration of findings results in further complications [8].

Funding systems play an important role here. When based on disciplinarity, they often reinforce these disciplinary silos [7]. While funding for inter- and transdisciplinary research has increased, evaluation remains challenging. Review panels, often discipline-specific or focusing on disciplinary autonomy, tend to exhibit bias against inter- and transdisciplinary projects and applicants and favour "low-risk" research [9]. Thus, inter- and transdisciplinary work consistently experiences lower funding success rates in competitive funding rounds compared to more narrowly defined disciplinary research [1].

Within universities and academic institutions, the **method of allocating resources** can also influence opportunities for inter- and transdisciplinary research. For example, the way overheads are allocated between disciplinary departments can shape whether such collaborations are rewarded and resourced or discouraged through a negative impact on departmental finances [5]. Further, although many research grants are now inter- or transdisciplinary, departmental structures can create pressure for authorship within individual disciplines by rewarding lead authorship – whereas inter- and transdisciplinary work often leads to shared authorship or involves a collaboration with many partners, which is often not counted within departments [5].

Similarly, **academic reward systems** often fail to adequately incentivize inter- and transdisciplinarity. This is related to the departmental control over faculty hiring, promotion, and tenure decisions that prioritize individual disciplinary efforts over collaborative interdisciplinary ones. An example would be the recruitment of a person with a strong publication record in their discipline ahead of someone with fewer publications but who has invested their time in meaningful inter- or transdisciplinary collaborations. There is a "vicious circle" where a lack of organisational support leads to low participation by able researchers, hindering the development of strong intellectual foundations for inter- and transdisciplinary research and the ability to assess its quality [10].

The presence of organisational barriers to inter- and transdisciplinary collaboration also influences the **professional culture** and behaviour of individual researchers. Those engaged in inter- and transdisciplinary fields often face greater difficulties in career advancement, which can diminish motivation and heighten uncertainty about initiating or maintaining such work. Compared with traditional, discipline-based research, inter- and transdisciplinary research typically require more effort and a broader range of skills (particularly in teamwork and communication) due to the absence of shared mental models, languages, and assumptions across disciplines [4–8].

Manifestation in the SSH CENTRE

The SSH CENTRE created supportive conditions for fostering collaborations between SSH and STEM disciplines and overall use of SSH in climate, energy, and mobility research. However, research carried out within the project was not isolated from the organizational structures where scholars were employed, educated, or collaborating. Organisational barriers experienced by participants of SSH CENTRE experiments included siloed organisational structure despite formal support to inter- and transdisciplinarity, metric-driven systems discouraging experimental and risk-taking work, and lack of support for collaboration manifesting in unawareness of potential collaborators from other disciplines.

Participants repeatedly described the policy-practice gap: despite formal encouragement from funders and university councils, these institutions often do not support inter- and transdisciplinary collaboration in practice. Organisational support is, nevertheless, essential, as it can create conditions conducive to inter- and transdisciplinary work. In the interdisciplinary book chapters, researchers from SSH and STEM disciplines collaborated on chapters consisting of policy recommendations on EU's Green Deal climate, mobility, and energy strategies. Coming from institutions organized by disciplinary departments, some of them mentioned rather tokenistic declarations of inter- and transdisciplinary work at their institutions:

> *[T]he way that universities are structured nowadays, it actually makes it much more difficult to collaborate, even though*

> *everybody at universities, everybody at research councils is saying "Oh, we want people to collaborate and to do things together", but the structural reforms that are necessary to enable that are not there.* (MEXP8, Interdisciplinary Collaborations)

The SSH CENTRE could not initiate wide structural reforms by itself. However, as one of the aims of the project was to stimulate effective collaborations between SSH and STEM, it offered substantial support for inter- and transdisciplinary work through its epistemic experiments. In fact, the SSH CENTRE was regarded by most of the researchers as encouraging for further inter- and transdisciplinary scholarship and for the establishment of new inter- and transdisciplinary partnerships.

> *The collaboration was in general really great. We are really happy to have known each other and we are still trying to collaborate in the future.* (FECR5, Transdisciplinary Knowledge Brokerage Initiative)

> *For me, the expectations were completely met and even exceeded because from this first experience, (…) we want to keep on our collaboration and to develop it and to apply for new projects, new initiatives together.* (FEXP3, Interdisciplinary Collaborations)

> *I appreciate the opportunity to collaborate with my colleague from STEM. And it was interesting because we established new form of cooperation, and we are working together on start-ups and new technologies. And I believe that this cooperation will last (…) several years and we will develop new approaches and products (…).* (MEXP3, Interdisciplinary Collaborations)

This was in striking difference with the lack of support for collaboration by their home institutions mentioned by some researchers. Fragmentation of research institutions into disciplinary-organised departments is one of the main causes, manifesting in obstacles as simple as unawareness of potential partnerships.

> *I'm trying to establish several similar collaborations, but [Institution H] and [Nationality C] system of universities are extremely fragmented, there are a lot of people who are doing something like me, but we do not know about [each other]. And this is ineffective.* (MEXP3, Interdisciplinary Collaborations)

One SSH-STEM collaboration formed between researchers from two departments residing in the same building and the same corridor, which, nonetheless, would not happen if it were not for the SSH CENTRE project; they were not aware of the research carried out in the other respective department and did not interact.

> *It feels quite weird that even though we're so close together geographically, we don't communicate. Because (…) when I talked about it with my promoter, it was like "Oh yeah that's a very cool idea because indeed we don't work together enough between those two research groups" and I'm like "But how does that happen". It's very funny that it needs some kind of a trigger, like middle person, to form this kind of connection.* (MECR1, Interdisciplinary Collaborations)

Scientists mentioned that they often do not know who they should reach out to, and expressed interest in matchmaking and cross-pollination events to "know what other departments can and cannot achieve" and to "showcase examples [of Interdisciplinary Collaborations] that did work" (MECR1).

Notwithstanding the limitations that organizational structures placed on inter- and transdisciplinary work, there were also positive experiences that supported collaboration within the SSH CENTRE. For instance, researchers considered having previous inter- and transdisciplinary experience to be very beneficial to such collaborations.

> *I think having some people who had worked in this realm before was really super helpful because they knew what to expect already.* (FECR6, Transdisciplinary Knowledge Brokerage Initiative)

Taken together, these findings confirm that inter- and transdisciplinary collaboration does not fail for lack of willingness, but for lack of structural enabling conditions. Building on what worked in the SSH CENTRE, the following recommendations outline how to create those conditions at individual, project, and systemic levels.

Recommendations at individual, project, and systemic levels

The recommendations highlight what individual researchers can do to make their contributions visible and press for change, what projects can implement to mitigate structural barriers in practice, and what systemic reforms are required if universities and funding bodies are to align their support with their stated ambitions for inter- and transdisciplinary research.

Recommendations at the individual/researcher level

- Proactively connect across silos in your institution to counteract structural fragmentation – even in small steps (informal seminars, joint teaching, collaborations over coffee).
- Join or initiate inter- and transdisciplinary researcher networks or early-career groups that lobby for recognition, training, or shared infrastructure.
- When carrying out inter- and transdisciplinary research projects, identify, clarify and keep the focus on three key aspects that motivate researchers: the practical importance of the work, the learning opportunities offered by the project and the possibilities for career advancement.

Recommendations at the project level

- Invest additional support to bring researchers together physically and in training to develop interactional expertise (the ability to understand other disciplines and communicate effectively) [11,12].

- Hold regular structured sessions where participants reflect on institutional barriers encountered and feed them into recommendations for funders/universities.
- Embed learning about effective inter- and transdisciplinary practices so they do not have to be "re-invented on every occasion" [11].

Recommendations at the systemic/broader academia and funding level

- Dedicate inter- and transdisciplinary funding: establish funding streams explicitly dedicated to inter- and transdisciplinary research, which helps ensure these proposals are not dismissed in the first review stage [11].
- Tailor evaluation processes appropriately for inter- and transdisciplinary research: ensure adequate training for staff and select external review panel members for their experience in inter- and transdisciplinarity [11].
- Provide more recognition for early career inter- and transdisciplinary researchers and acknowledge, reward, or encourage cross-disciplinary collaboration beyond traditional metrics. Implementing the Declaration on Research Assessment (DORA) principles and using narrative CVs are promising pathways to recognizing qualitative achievements [2].
- Develop mentorship schemes tailored to researchers working in inter- and transdisciplinary research in order to help them expand team network and collaboration [13].
- Create permanent research-focused academic posts for inter- and transdisciplinary scholars to address their lack of access to disciplinary teaching posts [2].
- Support inter- and transdisciplinary PhD training that includes resources for methods from more than one discipline [11].

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