Disciplinary design and evaluation standards in inter- and transdisciplinary collaboration

5

Vojtěch Gerlich* ✉ gerlich.v@czechglobe.cz
Tereza Prášilová*, Ami Crowther**, Julia Leventon*

*The Global Change Research Institute of the Czech Academy of Sciences – CzechGlobe, Czechia

**Anglia Ruskin University, UK

How funding calls are designed and reviewed determines whether SSH can meaningfully contribute to inter- and transdisciplinary research.

■ 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

SSH researchers often encounter barriers to meaningful engagement in inter- and transdisciplinary collaboration, stemming from disciplinary expectations that are applied during funding call design and review processes of both proposals and research outputs. Funders, call designers, and reviewers act as gatekeepers, determining which knowledge is considered valuable and which collaborations and outputs receive support. When knowledge contributions are defined by disciplinary or STEM-based standards, they block SSH involvement and hinder genuinely integrative inter- and transdisciplinary work.

Building on literature insights, this Briefing Note (BN) first outlines where gatekeeping occurs and delves into the

Social Sciences & Humanities for Climate, Energy aNd Transport Research Excellence

persistent disciplinary standards in science, including how this influences the design of funding calls, the evaluation of proposals submitted to them, and the knowledge outputs produced. It then demonstrates how concrete design choices within the SSH CENTRE project shaped the possibilities for meaningful SSH engagement in inter- and transdisciplinary research. Building upon these two sections, the Briefing Note concludes with recommendations at three levels – the individual, the project and the systemic.

Problem description and literature insights

In the design of funding calls, a fundamental problem is the expectation that inter- and transdisciplinary research should fit into general, discipline-oriented funding calls, despite this being problematic for inter- and transdisciplinary proposals [1]. As such, the literature strongly advocates for the **creation of new funding schemes and dedicated funding streams specifically designed for inter- and transdisciplinary research** to overcome inherent biases in traditional systems [2]. For example, the short-term funding format conflicts with the long-term aspects of inter- and transdisciplinary research, including the necessary negotiation and build-up phase (see BN2 on Time demands), methodologies with a longer duration, and the long-term nature of results [3].

Funding calls often fail to clearly articulate the need for genuine integration of knowledge, methods, and perspectives, distinguishing it from superficial multidisciplinary juxtaposition. Similarly, in cases where funding calls are determined top-down, i.e., using pre-set policy goals alone, they rarely achieve meaningful integration of knowledge [4]. Our Research and Innovation Agenda explores this issue further and offers recommendations for how applied science can be rethought for policy relevance.

When evaluating and reviewing proposals to funding calls, evidence still suggests that **interdisciplinary proposals face lower funding success** [5]. While some reviewers have prior interdisciplinary experience, review panels remain dominated by disciplinary experts who may lack sufficient familiarity with both SSH and STEM or inter- and transdisciplinarity itself [2,6]. The issue is further compounded by a lack of agreed indicators for inter- or transdisciplinary quality, leading reviewers to resort to disciplinary criteria [2,7]. As a result, strong inter- and transdisciplinary proposals may be undervalued even though they meet the call objectives.

These recurring barriers in the design of funding calls and in the evaluation of submitted proposals and outputs in inter- and transdisciplinary collaboration stem from deeper structural issues. A fundamental root cause is the persistence of **disciplinary** (rather than inter- and transdisciplinary) **standards** in science. Other central issues are covered elsewhere in this series of Briefing Notes (BNs): *STEM-based dominance* is discussed in BN4 (Evaluation metrics in inter- and transdisciplinary collaboration) and BN1 (Balancing SSH and STEM contributions), while overall *misunderstanding of the nature of inter- and transdisciplinary work* is addressed, among others, in BN2 (Time demands) and BN3 (Organisational structures).

The issue of disciplinarity is constantly present for inter- and transdisciplinary researchers, since science is, generally, governed by distinct disciplines. Since the 19th century, the norm of the single-discipline expert has become increasingly entrenched, against which inter- and transdisciplinary work often appears unconventional or erroneous [1,8]. Although disciplinary approaches have recently been questioned in the context of urgent, "wicked problems" of the present (e.g., climate change, sustainability, global inequality) [9–11], which cannot be adequately addressed by monodisciplinary approaches, it remains the dominant mode of organizing science [1]. There is a frequent "paradox of interdisciplinarity", where there is widespread policy encouragement for inter- and transdisciplinary research, but it is often poorly rewarded by funding instruments [1,5].

This disciplinary approach shapes the **design of funding calls**, the **evaluation of proposals** submitted to them, and the **knowledge outputs** that are produced. On the design side, disciplinary norms inform the structure of calls and templates, which often assume mono-disciplinary outputs and short-term methods, leaving little space for negotiation, integration, or long-term inter- and transdisciplinary approaches. On the evaluation side, disciplinarity produces reviewer mismatch and a lack of appropriate evaluation criteria. Reviewer mismatch refers to a situation where proposals are assigned to reviewers who are ill-equipped to evaluate all parts of an interdisciplinary project [2,5]. Reviewers, anchored in their own fields, may also penalise unconventional approaches and favour their own scientific views (called "cognitive cronyism") [12]. Furthermore, there can be a misalignment of evaluation criteria with the objectives and methodologies of inter- and transdisciplinary proposals. As many reviewers apply their own disciplinary perspectives and disciplinary quality criteria, many inter- and transdisciplinary research proposals have difficulty obtaining funding [13]. These difficulties can also extend to the peer review of research outputs, particularly when they are judged by disciplinary standards and expectations.

Manifestation in the SSH CENTRE

As part of the SSH CENTRE project, epistemic experiments were conducted that created space for inter- and transdisciplinary collaboration – both between SSH-STEM researchers and between researchers and municipalities (see the first page). These opportunities offered through the SSH CENTRE project took the form of research funding calls. This format allowed us to observe the processes of designing and evaluating funding calls, as well as the opportunity to identify challenges associated with inter- and transdisciplinary cooperation and the involvement of SSH disciplines. Importantly, we were able to explore the funding and collaboration processes, as well as the production of outputs (book chapters and knowledge brokerage reports).

The 29 Interdisciplinary Collaborations funded through the SSH CENTRE project were selected from applications received to an open call. The internal criteria were established by the book editors, who were members of the SSH CENTRE consortium. These criteria were informed by commitments made when designing the overall project, with these commitments in turn aligning with the Horizon Europe framework and the funding call that funds the SSH CENTRE project. In practice, this meant that some strong chapter

Social Sciences & Humanities for Climate,
Energy aNd Transport Research Excellence

proposals with a local focus were dropped despite the importance of the topic because the link to EU-scale policy was not explicit in the proposal.

> *One of the chapters we were excited was from a country in Central and Eastern Europe, but it was on agriculture, and it was very locally focused so they couldn't do the link with European policy making (…). At the end that was a pity (…) because we found that agriculture is a very important topic, but obviously, as the books needed to be very linked with policy at the European level, we couldn't accept that.* (Project Partner 1, Interdisciplinary Collaborations)

This project partner mentions a broader issue of the imperative of European-scale applicability, which is addressed by our Research and Innovation Agenda in a section on recognition of local manifestations of sustainability challenges and solutions.

An important criterion when selecting the Interdisciplinary EU Policy Collaboration teams was that the SSH and STEM researchers had not previously collaborated across the SSH-STEM boundary of the group (previous collaboration within SSH-only or STEM-only researchers was allowed). This created a relatively strict criterion for applicants, as it meant that they had to find suitable collaborators across the disciplinary divide.

> *I think there was a constraint [that] you should not have worked together before within the same SSH and STEM team [i.e. across SSH and STEM]. That was still, I would say, fine, but it's a constraint nevertheless, because the first people who comes to your mind when you would like to write a book chapter or a paper is the ones you already have a connection with.* (Project Partner 2, Interdisciplinary Collaborations)

The selection committee was concerned because new applications were initially slow to come in and they received many queries about this criterion; they thus considered extending the call. However, the committee ultimately decided against doing so, as the goal was to publish the books by September 2024, and further delays caused by issuing another call would have meant less time for the teams and editors. It also became apparent that the calls submitted allowed for the selection of high-quality proposals that met the evaluation criteria. This, however, illustrates the trade-off between procedural flexibility and hard project deadlines; building functioning interdisciplinary teams requires long-term relationship-building and trust, which can conflict with time pressures. Ultimately, tight timelines narrow the space for adaptive proposal design.

The committee further debated how to treat STEM-heavy proposals with tenuous SSH links, as well as the inverse – SSH-led interdisciplinary teams with weak links to STEM disciplines. In either direction, imbalanced interdisciplinarity leads to tokenism.

> *For instance, there was one [application] that we all quite liked, but on closer inspection, [it] turned out that they just didn't have any STEM background. (…) We had to pull them [out] even though I think we're all kind of expecting that we're going to accept them. We thought they'd be an SSH led project, empowering SSH led project teams, but actually, it was just complete tokenism and there wasn't any STEM in it.* (Project Partner 3, Interdisciplinary Collaborations)

Paradoxically, it was helpful to focus on the disciplinary background of individual applicants and to evaluate and categorise it quite strictly – thereby ensuring the interdisciplinary character of the collaboration. Referring to the literature insights above, this shows the importance of clear evaluation and dedicated inter- and transdisciplinary criteria to counter monodisciplinarity and to support genuinely integrative work.

Similar selection dynamics were evident in the Transdisciplinary Knowledge Brokerage Programme. Here, the selection committee sought not only disciplinary diversity when identifying successful applicants, but also alignment in how applicants conceptualised key themes such as 'energy communities'. Strongly divergent epistemic framings were judged unproductive, so panels intentionally selected teams that were different in discipline but convergent in goals. At the same time, inclusion criteria such as gender balance and Global South participation were given weight in the selection process, although external structural barriers – most strikingly visa restrictions – still excluded some selected participants. This demonstrates that even when inter- and transdisciplinary calls are carefully designed for fairness and inclusivity, external systems and rigid timelines may undermine these intentions.

Disciplinary standards also posed challenges to the researchers when producing their book chapters, particularly in the peer review process. Chapters submitted to the Interdisciplinary EU Policy Collaboration book series were subjected to double-blind peer review. In the second interview series, 7 of 15 researchers commented on this process. Several of them expressed appreciation for the level of detail included, with the overall peer-review process being regarded as very thorough – but this too has sometimes been considered a complication. As this project was of an interdisciplinary nature, the reviewers were drawn from a variety of SSH and STEM disciplines. This diversity of perspectives ensured that the reviewers contributed a range of insights that might not have been apparent to the authors. As researchers noted, it improved the quality of chapters, but it also often added another

> *layer of complexity (…) [to the] already complex writing process that we [the researchers] faced because of our [disciplinary] differences.* (FEXP2, Interdisciplinary Collaborations)

Assessment processes can hinder or facilitate inter- and transdisciplinary work. For example, in the context of the peer-review process, researchers frequently mentioned strict limits on the number of words and figures that did not allow for flexibility. Yet, if slightly exceeding the limit improves the overall quality, many felt it could have been justified. Researchers from SSH disciplines experienced this limitation in the literature review section, which some felt restricted their ability to contextualise their research more broadly. A researcher from a STEM discipline pointed out that only one equation could be included in the entire chapter, so he created an online appendix to explain the model he used. Despite these reservations, scientists noted that the limitations contributed to the conciseness of their chapters.

> *I think it forces you to write sentences (…) maybe into a style that's a bit different, that you wouldn't use normally. But from the other side, I have all the understanding for the*

Social Sciences & Humanities for Climate, Energy aNd Transport Research Excellence

editors (…), you have a fixed limit because otherwise you can go haywire and everyone can submit a bit what they desire and then you don't have a good structure in the rest of your book. (MECR1, Interdisciplinary Collaborations)

The SSH CENTRE's calls and review processes illustrate how concrete design choices – such as the scale of policy relevance required, eligibility rules for team composition, time constraints, criteria for balancing SSH and STEM, reviewer expertise, and even formatting limits – directly shape the possibilities for meaningful SSH engagement in inter- and transdisciplinary research. While some mechanisms support inter- and transdisciplinarity and improved quality, others sideline valuable perspectives or reinforce disciplinary defaults. These findings highlight the pivotal role of call design and review practices (of both proposals and outputs) in either enabling or constraining genuine integration.

Recommendations at individual, project, and systemic levels

As the design and evaluation of funding calls take place at the systemic level, this is where the most decisive changes are required. Yet, meaningful progress also depends on how projects structure their collaborations and how individual researchers present and defend interdisciplinarity in their work.

Recommendations at the individual/researcher level

- Explicitly demonstrate interdisciplinarity: show how SSH and STEM are integrated in your research proposals.
- Learn to "translate" across disciplines: justify methods in terms legible both to SSH and STEM evaluators/reviewers.

Recommendations at the project level

- Emphasise SSH contributions: SSH issues need to be deeply integrated into the concept phase (setting the project direction), not merely added on later as a tool for knowledge transfer or impact generation [9].
- Balance inclusivity with feasibility: balance SSH and STEM participation without lapsing into tokenism, ensuring teams are integrative rather than artificially mixed.
- Provide mentorship and leadership: guidance (as in the Knowledge Brokerage programme) can help manage epistemic differences and ensure alignment across diverse framings.
- Ensure adequate time and flexibility: recognise that achieving genuine integration, particularly in collaboration with non-academic stakeholders, requires significant time to build mutual understanding and shared frameworks [2] (see also BN2 on Time demands).

Recommendations at the systemic/broader academia and funding level

- Ensure both programme officers and academic reviewers (of proposals and outputs) receive adequate training to distinguish genuine inter- and transdisciplinarity from superficial multidisciplinarity. Review panels evaluating inter- or transdisciplinary funding proposals must be composed of external members selected for their experience in interdisciplinarity, and review panel discussions should dedicate time at the outset to establish a shared understanding of the program goals and criteria for judging inter- and transdisciplinary proposals [2].
- Where the goal is genuine knowledge integration, encourage bottom-up inter- or transdisciplinary approaches, whereby questions arise from the scientific or stakeholder community, rather than relying solely on strategic top-down approaches [4].
- Explicitly acknowledge SSH disciplines: funding calls, such as those within Horizon Europe climate, energy, and mobility topics, should explicitly consider and report which specific SSH disciplines they are focusing attention on, rather than using SSH as a generic blanket term [9].
- Cross-funder collaboration: when multiple funders invest together, sharing ownership and modelling good inter- and transdisciplinary collaborative practice (e.g., good communication and collective vision), success is enhanced [2]. The UK's Rural Economy and Land Use Programme (RELU) is an example of joint funding and decision-making by multiple research councils, including specific seed-corn funding mechanisms to build novel inter- and transdisciplinary partnerships [14].

Acknowledgements

Social Sciences & Humanities for Climate, Energy aNd Transport Research Excellence

References

1. Salmela M, Vienni-Baptista B, Cheas K. Towards the Recognition of Interdisciplinary and Transdisciplinary Researchers. Minerva [Internet]. 2025 Feb 28 [cited 2025 May 14]; Available from: https://doi.org/10.1007/s11024-025-09578-y

2. Lyall C, Bruce A, Marsden W, Meagher L. The role of funding agencies in creating interdisciplinary knowledge. Sci Public Policy. 2013;40(1):62–71.

3. Pischke EC, Knowlton JL, Phifer CC, Gutierrez Lopez J, Propato TS, Eastmond A, et al. Barriers and Solutions to Conducting Large International, Interdisciplinary Research Projects. Environ Manag N Y. 2017;60(6):1011–21.

4. Välikangas A. The Limited Role of Social Sciences and Humanities in Interdisciplinary Funding: What are Its Effects? Soc Epistemol. 2024 Mar 3;38(2):152–72.

5. Bromham L, Dinnage R, Hua X. Interdisciplinary research has consistently lower funding success. Nat Lond. 2016;534(7609):684–7.

6. Woelert P, Millar V. The paradox of interdisciplinarity in Australian research governance. High Educ. 2013;66(6):755–67.

7. Klein JT. Evaluation of Interdisciplinary and Transdisciplinary Research. Am J Prev Med. 2008 Aug;35(2):S116–23.

8. Wagner CS, Roessner JD, Bobb K, Klein JT, Boyack KW, Keyton J, et al. Approaches to understanding and measuring interdisciplinary scientific research (IDR): A review of the literature. J Informetr. 2011 Jan 1;5(1):14–26.

9. Sonetti G, Arrobbio O, Lombardi P, Lami IM, Monaci S. '"Only Social Scientists Laughed"': Reflections on Social Sciences and Humanities Integration in European Energy Projects. Energy Res Soc Sci. 2020 Mar;61:101342.

10. Chung JY. Stakeholder-engaged research: a multidisciplinary historical analysis. Res All [Internet]. 2024 Jul 10 [cited 2025 Apr 17];8(1). Available from: https://journals.uclpress.co.uk/r4a/article/id/3227/

11. Singh P. Understanding Researchers' Positionality in Integrating and Designing the Transdisciplinary Research Process and Outcomes: A Case Study of Thriving Agriculture Project. PennState University; 2025.

12. Gläser J, Laudel G. Governing Science: How Science Policy Shapes Research Content. Eur J Sociol. 2016 Apr;57(1):117–68.

13. Schneider F, Buser T, Keller R, Tribaldos T, Rist S. Research funding programmes aiming for societal transformations: Ten key stages. Sci Public Policy. 2019;46(3):463–78.

14. Lowe P, Phillipson J. Barriers to Research Collaboration across Disciplines: Scientific Paradigms and Institutional Practices. Environ Plan A. 2009;41(5):1171–84.