



Pathways to Interdisciplinary and Transdisciplinary Research: the SHAPE-ID Toolkit

Find tools and resources to make informed decisions about interdisciplinary and transdisciplinary research with the Arts, Humanities and Social Sciences, the Sciences, Technology, Engineering and Mathematics, and societal partners.

Annotated Bibliography Collection

on Inter- and Transdisciplinary Research

Abstract

This document compiles annotated bibliographies of the key readings on inter- and transdisciplinary research from the academic literature and from European research policy literature .

Compiled by

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SHAPE-ID consortium members

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The Toolkit provides tools and resources to make informed decisions about interdisciplinary and transdisciplinary research with the Arts, Humanities and Social Sciences, the Sciences, Technology, Engineering and Mathematics, and societal partners.



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SHAPE-ID Annotated Bibliography of Academic Literature on Inter- and Transdisciplinary Research and AHSS Integration

Introduction



This bibliography takes into consideration plural understandings of interdisciplinarity (ID) and transdisciplinarity (TD). It aims to provide insights on key publications representing the different scientific communities that have interdisciplinary research (IDR) and transdisciplinary research (TDR) at the centre of their research. As mentioned in our previous study¹, insights on IDR/TDR and Arts, Humanities and Social Sciences (AHSS) integration are scattered across dispersed bodies of literature. Systematising the features of IDR/TDR and AHSS integration in different thematic contexts is an intricate task that has to cover a wide range of journals and thematic fields.

This bibliography presents relevant publications related to each of the nine tasks the toolkit focuses on. It builds on the systematic literature review of academic literature done for Work Package 2 (see Vienni Baptista et al., 2019; 2020)² and on suggestions drawn by researchers and colleagues in our networks. We do not include the policy literature related to ID/TD, but have compiled a separate bibliography for these texts.

References are organised in alphabetical order in each task, but highlights are offered in each case for the reader to quickly grasp its relevance. Further readings are suggested for those who wish to learn more on specific topics³.

Resources

You can access the bibliography related to specific tasks by clicking on the following headings:

- **Understand Inter- and Transdisciplinary Research**
- **Develop Collaborative Conditions**
- **Co-Create a Research Project**
- **Fund Collaborative Research Projects**
- **Evaluate Inter- and Transdisciplinary Research**
- **Disseminate Inter- and Transdisciplinary Research Findings**
- **Improve Research Skills**
- **Support Collaborative Researchers**
- **Develop a Career in Inter- and Transdisciplinary Research**

Understand Inter- and Transdisciplinary Research [▲](#)

- 🕒 **Barry, A., et al. 2008. Logics of Interdisciplinarity. Economy and Society 37 (1): 20–49. <https://doi.org/10.1080/03085140701760841>**

This paper interrogates three interdisciplinary fields that cross the boundaries between the natural sciences or engineering, on the one hand, and the social sciences or arts, on the other. The fields are: 1) environmental and climate change research, 2) ethnography in the IT industry and 3) art-science. The authors reflect on ID from an innovative perspective, elaborating on three logics that influence collaborative research.

- 🕒 **Klein, J.T. (2017). Typologies of Interdisciplinarity: The Boundary Work of Definition. The Oxford Handbook of Interdisciplinarity (2 ed.), Edited by Robert Frodeman.**

This chapter examines typologies of interdisciplinarity, identifying patterns of consensus and new developments. Its relevance lies in the way the author identifies similarities and differences among multidisciplinarity, interdisciplinarity and transdisciplinarity. It offers a more elaborated understanding of ID and provides the reader with a detailed framework of nuances.

- 🕒 **Klein, J. T. (2005). Humanities, Culture, and Interdisciplinarity: The Changing American Academy. Albany: SUNY Press.**

This book helps to understand the different roles AHSS can play in interdisciplinary research. The author defines the relationship of humanities, culture, and interdisciplinarity, with case studies on the disciplines of literary studies, art history, and music as well as the fields of American studies, African-American studies, and women's studies. This piece can be complemented with a foundational book, also authored by Thompson Klein, **"Interdisciplinarity – History, Theory and Practice" (1990) Detroit: Wayne State University Press).**

- 🕒 **Lau, L., & Pasquini, M. (2004). Meeting grounds: perceiving and defining interdisciplinarity across the arts, social sciences and sciences. Interdisciplinary Science Reviews, 29(1), 49-64. <https://doi.org/10.1179/030801804225012437>**

A series of interviews with lecturers and students (mostly from the Department of Geography at Durham University) provide some of the data for this article, which discusses attempts to bridge gaps between the sciences and the social sciences, and between the social sciences and the arts. This is a good example of the specific complexities that ID entails when integrating dissimilar disciplines. Authors conclude by foreseeing what the fate of interdisciplinary studies may be.

- 🕒 **Lowe, P., et al. 2013. Why Social Scientists Should Engage with Natural Scientists. Contemporary Social Science: Journal of the Academy of Social Sciences 8(3): 207–222. <https://doi.org/10.1080/21582041.2013.769617>**

The authors review some of the key challenges for those striving for a more impactful social science by engaging strategically with natural scientists. It argues that effective engagement depends upon overcoming basic assumptions that have structured past collaborative interactions. This article examines a major research programme that has examined the different assumptions underlying knowledge claims in collaborations between social and natural scientists. As main contribution, authors draw out the lessons for social/natural science in cross-disciplinary engagements.

Further Reading: If you want to learn more on ID/TD, the following handbooks contain comprehensive overviews of main topics within the field:

- 🕒 **Frodeman, R., Klein, J. T., and Mitcham, C. (Eds.). (2017, 2nd Edition). The Oxford Handbook of Interdisciplinarity. New York: Oxford University Press.**

This is one of the most important books in the field. It offers a collection of essays by invited experts in a wide range of disciplines and fields across science and technology, social sciences, humanities, and the professions.

- 🕒 **Hirsch Hadorn, G., et al. (Eds.). (2008). Handbook of Transdisciplinary Research. Berlin: Springer.**

This is a relevant book in the field that focusses on transdisciplinary research. It was the first anthology of essays and case studies applying a transdisciplinary approach to areas such as global and local environment, migration, new technologies, health, and socio-cultural change. It is organised under topics of problem identification and structuring, problem analysis, participation, values, management, education, and integration.

Develop Collaborative Conditions [▲](#)

- 🕒 **Bozeman, B., Gaughan, M., Youtie, J., Slade, C. P., & Rimes, H. (2016). Research collaboration experiences, good and bad: Dispatches from the front lines. Science and Public Policy, 43(2), 226-244. <https://doi.org/10.1093/scipol/scv035>**

This article presents a model of research collaboration effectiveness that incorporates external, collaborator, and team management factors. Based on the results of a qualitative study, the authors analyse insights from US researchers on good and bad collaboration. It is a relevant paper as it draws on positive and negative factors influencing collaboration that can be taken into account at the early stage of a project.

- 🕒 **Klein, J. T. (1996). Crossing boundaries. Knowledge, disciplinarity, and interdisciplinarity. Charlottesville: University Press of Virginia.**



This book is a foundational piece from one of the most quoted authors in the field of interdisciplinarity. It offers a range of cases of interdisciplinary encounters and collaborations among disciplines. Klein examines how boundary crossing is translated into borrowing between disciplines, increasing specialisation within disciplines, and the attraction of (and funding for) solving complex social and technological problems. We also recommend Klein's forthcoming book (2021) **"Beyond interdisciplinarity: Boundary work, communication, and collaboration"** (New York and Oxford: Oxford University Press).

- **Lyall, C., Bruce, A., Tait, J. & Meagher, J. L. (2011). *Interdisciplinary Research Journeys: Practice Strategies for Capturing Creativity*. London: Bloomsbury Academic.**

This is a practical guide for researchers and research managers who are seeking to develop interdisciplinary research strategies at a personal, institutional and multi-institutional level. The open access book draws on examples from across the social and natural sciences, offering lessons, tips and guidelines for designing projects, managing teams, training, career pathways, knowledge transfer, and evaluation. Pay attention to the boxes and questionnaires at the end of each chapter, these are a valuable resource for newcomers.

- **Prainsack, B., Svendsen, M. N., Kock, L., & Ehrich, K. (2010). *How Do We Collaborate? Social Science Researchers' Experience of Interdisciplinarity in Biomedical Settings*. *BioSocieties* 5 (2): 278–86.**
<https://doi.org/10.1057/biosoc.2010.7>

This article discusses social science researchers' experiences with fieldwork and other forms of interdisciplinary collaboration in biomedical settings. It summarises the main issues identified at particular stages of fieldwork ('getting access', 'inside the field' and 'outside again').

- **Bracken, L. J. & Oughton, E. A. (2006). 'What Do You Mean?': The importance of language in developing Interdisciplinary Research. *Transactions of the Institute of British Geographers* 31, 371-382.**
<http://www.jstor.org/stable/4639981>

An article looking at the importance of taking the time to develop shared vocabularies and understandings in order to produce effective interdisciplinary research. Authors argue that this development of a common language can help in developing relationships of trust that will facilitate research upon physical and human geography. The relevance of the argument holds for relations between different disciplines, including social sciences.

- **Muhonen, R., Benneworth, P., & Olmos-Peñuela, J. (2019). *From productive interactions to impact pathways: Understanding the key dimensions in developing SSH research societal impact*. *Research Evaluation*. 29(10), 34-47 <https://doi.org/10.1093/reseval/rvz003>**

The paper focuses on how Social Sciences and Humanities (SSH) build pathways to societal research impact and develops a typology to capture the ways in which SSH research can influence society. Arguing, that the absence of societal impact of research is not necessarily a sign of uselessness of research in impact assessment, they address the importance of paying attention also to the conditions supporting impact processes.

- **Pohl, C. & Wuelser, G. (2019). *Methods for Coproduction of Knowledge Among Diverse Disciplines and Stakeholders*. In: Hall K., Vogel A., Croyle R. (Eds.) *Strategies for Team Science Success*. Springer: Cham.**

This chapter is a great introduction to methods for knowledge co-production. It offers a summary of some tools and the vision behind the “td-net toolbox” developed by the Network of Transdisciplinary Research (td-net, Swiss Academies of Arts and Sciences, Switzerland). It provides hints on how to initiate, improve and profit from transdisciplinary research projects.

Further reading: The [Science of Team Science](#) community has a plethora of publications dealing with collaboration and tools to improve it:

- **Leach, J. (2011). *The self of the scientist, material for the artist: Emergent distinctions in an interdisciplinary collaboration*. *Social Analysis*, 55, 143-163. <https://doi.org/10.3167/sa.2011.550308>**
- **Hall K., Vogel A., Croyle R. (Eds.) (2019). *Strategies for Team Science Success*. Springer: Cham.**

This book presents the reader with examples from cross-disciplinary team science, by providing practical strategies for success. It offers scientists, administrators, funders, and others engaged in team science strategies to develop new policies and practices for cross-disciplinarity. Edited by members of the Science of Team Science (SciTS) community, the book allows teams to better understand the dynamics that are at stake in different collaborative institutional and collective settings.

Co-Create a Research Project [▲](#)

- **Bal, M. (2002). *Travelling Concepts in Humanities*. Toronto: University of Toronto Press.**

This book shows a relevant research method for Arts, Humanities and Social Sciences in order to develop integrative processes. It focuses on concepts such as the methodological core for interdisciplinary cultural analysis. The author analyses the roles of meaning, metaphor, narrative, myth, image and other concepts, with particular interests for art history, visual and cultural studies, literary studies, bibliographical studies, and feminist theory.

- **Bammer, G. (2019). Key issues in co-creation with stakeholders when research problems are complex. Evidence & Policy, vol 15 (3), 423–435, <http://doi.org/10.1332/174426419X15532579188099>**

Gabriele Bammer introduces a special framework named [Integration and Implementation Sciences \(i2S\)](#) as a means to systematically address complex problems. Co-creation processes requires specific skills and abilities to build fruitful settings for research with stakeholders. A practice example from the pharmaceutical domain is analysed to show the relevance of the principles of the i2S framework.

- **Callard, F., & Fitzgerald, D. (2015). Rethinking interdisciplinarity across the social sciences and Neurosciences. London: Palgrave Macmillan UK.**

This book offers an account of how interdisciplinary research across the neurosciences, social sciences and humanities has been the authors' most compelling experience. It draws on a detailed reflection of the implications of boundary crossing and integration between the neurosciences and the social sciences. Pay attention to the questions and insights at the end of each chapter, these are a useful resource for those seeking for answers in collaborative settings.

- **Fisher, E., O'Rourke, M., Evans, R., Kennedy, E. B., Gorman, M. E. & Seager, T. P. (2015). Mapping the integrative field: taking stock of socio-technical collaborations. Journal of Responsible Innovation, 2(1), 39-61, <http://doi.org/10.1080/23299460.2014.1001671>**

By discussing the concept of Responsible Innovation (RI), authors survey a variety of approaches that differ widely in terms of their integrative methods, conceptions of societal context, roles, and aspirations for intervention. They study some “communities of integration” as exemplars, and then provide a framework for comparing the forms, means, and ends of collaborative integration. The importance of the article lies on the features and tensions of engagement that are elaborated for integrative efforts aimed at RI.

- **Lang, D.J., Wiek, A., Bergmann, M., Stauffacher, M., Martens, P., Moll, P., Swilling, M., & Thomas, C. (2012). Transdisciplinary research in sustainability science: practice, principles, and challenges. Sustainability Science 7, 25–43. <https://doi.org/10.1007/s11625-011-0149-x>**

This article synthesises and structures a set of principles and challenges of transdisciplinary research. Considering case studies from Europe, North America, South America, Africa, and Asia, the authors elaborate a conceptual model of an ideal transdisciplinary research process. Over the years, this model has proved to be useful in different settings and has opened new discussions on how to design a transdisciplinary sustainability research project.

- **McDonald, D., Bammer, G., & Deane, P. (2009). Research Integration Using Dialogue Methods. Australian National University.**

Taking integration as a core process in inter- and transdisciplinary research, this book compiles approaches that foster communication in collaborative settings. It draws on insights from an international set of case studies —like



restoration of wetlands, the needs of the elderly, effective disaster response and the future of the airline industry. Its relevance lies in its systematic approach to research integration using dialogue methods to bring together multiple perspectives.

- **Darbellay, F., Moody, Z., & Lubart, T. (Eds.) (2017). *Creativity, Design Thinking and Interdisciplinarity*. Series: *Creativity in the Twenty First Century*. Singapore: Springer.**

This book, at the crossroads of creativity, design and interdisciplinary studies, offers an overview of these major trends in scientific research, society and culture. It is a good example of how to bring together different approaches and communities around interdisciplinary creative design thinking. Building on the challenges encountered by researchers and practitioners, the book constitutes a useful entry point to innovative approaches to collaborative research.

- **Lury, C., Fensham, R., Heller-Nicholas, A., Lammes, S., Last, A., Michael, M., & Uprichard E. (2018) *Routledge Handbook of Interdisciplinary Research Methods*. Routledge: London.**

This handbook discusses a distinctive approach on how interdisciplinary methods are developed and their implications for knowledge production. It offers a wide range of methods and examples from AHSS researchers illustrating the challenges and rewards of ID. Each section is dedicated to an aspect of data handling, from collection, classification, validation to communication to research audiences.

- **Rust, C. (2007). *Unstated contributions: How artistic inquiry can inform interdisciplinary research*. *International Journal of Design*, 1(3), 69-76. <http://www.ijdesign.org/index.php/IJDesign/article/view/201>**

This article contributes to the discussion on the role(s) arts play in interdisciplinary research, by questioning how research in the creative disciplines might contribute to knowledge and understanding. The author says “Research and practice in these fields may deal with matter that changes meaning with time or context, especially in art, where audiences may be expected to complete the meaning of creative works for themselves”. He illustrates, using different examples, how incomplete or tacit contributions to inquiry can be a valuable part of the enterprise of creating knowledge.

Further reading: These articles provide insights on the challenges of integration in inter- and transdisciplinary settings, focusing on AHSS collaboration:

- **Defila, R., & Di Giulio, A. (2015). *Integrating knowledge: Challenges raised by the “Inventory of Synthesis”*. *Futures*, 65, 123–135. <https://doi.org/10.1016/j.futures.2014.10.013>**
- **O' Rourke, M., Crowley, S., & Gonnerman, C. (2016). *On the nature of cross-disciplinary integration: A philosophical framework*. *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of***

Biological and Biomedical Sciences, 56, 62-70.<https://doi.org/10.1016/j.shpsc.2015.10.003>

- ➊ Robinson, B., Vasko, S. E., Gonnerman, C., Christen, M., O'Rourke, M., & Steel, D. (2016). **Human values and the value of humanities in interdisciplinary research.** *Cogent Arts & Humanities*, 3(1), 1123080.

<https://doi.org/10.1080/23311983.2015.1123080>

Pohl, C., Thompson Klein, J., Hoffmann, S., Mitchell, C. & Fam, D. (2021). **Conceptualising transdisciplinary integration as a multidimensional interactive process.** *Environmental Science & Policy*, 118, 18-26.<https://doi.org/10.1016/j.envsci.2020.12.005>

Fund Collaborative Research Projects [▲](#)

- ➋ Graf, J. (2019) **Bringing Concepts Together: Interdisciplinarity, Transdisciplinarity, and SSH Integration.** *Fteval: Journal for Research and Technology Policy Evaluation* (48), 33-36.

https://repository.fteval.at/433/1/Journal48_10.22163_fteval.2019.364.pdf

This article addresses the challenges of bringing SSH into collaborative Horizon 2020 projects. It focuses on IDR/TDR and argues that SSH integration is a special case of inter- and transdisciplinarity. The author, as a National Contact Point, offers insights from a funder perspective on why taking inter- and transdisciplinary expertise into account more systematically contributes to both better proposals and improved project implementation for Horizon 2020 and the upcoming “Framework Programme Horizon Europe”.

- ➌ König, T. & Gorman, M. E. (2017). **The Challenge of Funding Interdisciplinary Research: A Look inside Public Research Funding Agencies.** *The Oxford Handbook of Interdisciplinarity* (2 ed.) Edited by Robert Frodeman. DOI: 10.1093/oxfordhb/9780198733522.013.41

The author analyses the role of public funding in ID by specifically looking at two funding agencies—the US National Science Foundation (NSF) and the EU European Research Council (ERC)—and how these bodies (both of which promote interdisciplinarity) claim to identify it. The article highlights the organizational constraints that restrict the funding agencies' capacity to fully embrace novel methods of interdisciplinary collaboration and investigation, which directly affects how this type of research is conducted.

- ➍ Lyall, C., Bruce, A., Marsden, W., & Meagher, L. (2013). **The role of funding agencies in creating interdisciplinary knowledge.** *Science and Public Policy*, Volume 40, Issue 1, pp. 62–71, <https://doi.org/10.1093/scipol/scs121>

The authors argue that national funding agencies play major roles in how interdisciplinary research is conducted and that management of interdisciplinary research programmes and projects is guided and influenced by tacit knowledge. This paper offers an analysis of UK interdisciplinary case

studies and builds five key success factors for interdisciplinary programs and funding interdisciplinary projects. Though the authors focus on the UK, they provide pathways to overcome problematic issues when funding interdisciplinary research that are useful in different contexts.

- **Schneider, F., Buser, T., Keller, R., Tribaldos, T., Rist, S. (2019). Research funding programmes aiming for societal transformations: Ten key stages. Science and Public Policy, Volume 46, Issue 3, pp. 463–478, <https://doi.org/10.1093/scipol/scy074>**

This paper analyses the role of science policy for transdisciplinarity promotion as a way of making research part of societal transformations. The authors focus on how research funding programmes could enhance the implementation of TDR. Based on a discussion with representatives of four TD funding programmes, they created a generic model that shows the key stages relevant to the enhancement of TDR. Recommendations that offer guidance for implementation of future programmes, developed jointly with key actors, are also offered.

- **Stamm, J. (2019). Interdisciplinarity put to test: science policy rhetoric vs scientific practice – the case of integrating the social sciences and humanities in Horizon 2020. In Simon, D.; S. Kuhlmann, J. Stamm, & W. Canzler (editors) Handbook of Science and Public Policy. Edward Elgar Publishing: Cheltenham, pp. 376-399.**

Science policy is experimenting with an increasing push for interdisciplinary research. Researchers and institutions are called to conduct more and better interdisciplinarity and to be open to collaborative research. However, researchers as well as funders confront the challenge of different understandings of ID in science and policy. This chapter looks in detail at these different understandings by examining a particular science policy approach aimed to foster interdisciplinarity: the integration of social sciences and humanities in the European Commission's Framework Programme for Research and Innovation Horizon 2020.

Evaluate Inter- and Transdisciplinary Research [▲](#)

- **Boix Mansilla, V., Feller, I. & Gardner, H. (2006). Quality assessment in interdisciplinary research and education. Research Evaluation 15(1): 69-74. <https://doi.org/10.3152/147154406781776057>**

This article provides a valuable entry point to the complex topic of quality indicators for interdisciplinarity. It systematizes insights from researchers, leading research administrations, science journal editors and social scientists, sharing innovative practices and empirical results from evaluation processes. Core insights regarding adequate processes and criteria for assessing interdisciplinary work are detailed and discussed.

- Klein, J. T. (2008). **Evaluation of interdisciplinary and transdisciplinary research: A literature review.** *American Journal of Preventive Medicine* 35: S116–S123.
<https://doi.org/10.1016/j.amepre.2008.05.010>

Evaluation remains one of the least-understood aspects, the author argues. A foundational work on the topic of evaluation of collaborative practices. This article synthesises seven generic principles that provide a useful framework to think about evaluation, building recommendations based on a literature review and the author's experience. Alongside detailing these principles and their suitability for such a complex task, the author reflects on changing connotations of the underlying concepts of discipline, peer, and measurement.

- Huutoniemi, K. & Rafols, I. (2017). **Interdisciplinarity in Research Evaluation.** In: Frodeman, R., Klein, J. T., Pacheco, R. (eds.) *The Oxford Handbook of Interdisciplinarity (2nd Edition)*. Oxford: Oxford University Press, 1-19. DOI: 10.1093/oxfordhb/9780198733522.013.40

Different understandings of interdisciplinarity make it difficult to evaluate projects and programs that use this approach. At the same time, evaluation processes shape and transform science and scientific agendas. The authors deal with this problem by offering an account of what evaluation of ID involves. Authors provide tools for measuring three properties of ID (breadth, integration and transformation) based on quantitative methods of analysis.

- McLeish, T., Strang, V. **Evaluating interdisciplinary research: the elephant in the peer-reviewers' room.** *Palgrave Commun* 2, 16055 (2016).
<https://doi.org/10.1057/palcomms.2016.55>

This article examines the UK's long experience in evaluating ID. Authors draw conclusions on an in-depth examination of a range of interdisciplinary projects and the work of a UK-based working group of funders and researchers. Five areas of evaluation (publishing, research grants, careers, IDR centres, institutions) demonstrate both commonality and difference in the task of measuring the added value in IDR collaborations. This is a relevant contribution that is suitable for other contexts and countries.

- Pohl C., Perrig-Chiello, P., Butz, B., Hirsch Hadorn, G., Joye, D., Lawrence, R., Nentwich, M., Paulsen, T., Rossini, M., Truffer, B., Wastl-Walter, D., Wiesmann, U., & Zinsstag, J. (2011). **Questions to evaluate inter- and transdisciplinary research proposals.** Network for Transdisciplinary Research (td-net): Berne.
https://api.swiss-academies.ch/site/assets/files/14856/td-net_pohl_et_al_2011_questions_to_evaluate_inter-_and_transdisciplinary_research_proposals.pdf

Building on the argument that there are no widely established and approved criteria and procedures to evaluate inter- and transdisciplinary research, this report discusses the state of the art of the topic based on the experience of the Network of Transdisciplinary Research (td-net, Switzerland) and the academic literature. The authors suggest a number of questions to evaluate

inter- and transdisciplinary research proposals, emphasising the quality of synthesis and integration. They provide useful guidelines on how to conduct such an evaluation by complementing the standards assessing the disciplinary quality of proposals.

- **Wang, Q. Schneider, J. W. (2020). Consistency and validity of interdisciplinarity measures. Quantitative Science Studies 2020 1:1, 239-263. https://doi.org/10.1162/qss_a_00011**

Over the years, scholars have developed different methods to measure interdisciplinarity and its impact. The authors argue that few studies have thoroughly examined the validity and relations between these measures. In this study, they present a systematic review of these interdisciplinarity measures and explore their inherent relations. Their results corroborate recent claims that the current measurements of interdisciplinarity in science studies are both confusing and unsatisfying. A pledge for more caution in science and evaluation studies is discussed in this paper, especially when using these measurements in relation to science policies.

Further reading:

- **Research Evaluation (2006). Special issue on interdisciplinary research assessment. [Research Evaluation 15\(1\)](#)**

Disseminate Inter- and Transdisciplinary Research Findings [▲](#)

- **Adler, C., Hirsch Hadorn, G., Breu, T., Wiesmann, U. & Pohl, C. (2018). Conceptualizing the transfer of knowledge across cases in transdisciplinary research. Sustainability Science, 13 (1), 179-190. <https://doi.org/10.1007/s11625-017-0444-2>**

Transdisciplinary research tackles wicked problems at the interface between science and society. This requires the transfer of knowledge between different types of researcher and stakeholder. Because a more profound understanding of this process is still needed, knowledge transfer is extensively discussed in the literature. This article specifies the challenges of knowledge transfer in TDR by distinguishing TDR for policy from conventional evidence-based policy, which relies on generalizing findings, such as randomized controlled trials.

- **Kueffer, C., Hirsch Hadorn, G., Bammer, G., van Kerkhoff, L., & Pohl, C. (2007). Towards a publication culture in transdisciplinary research. Gaia, 16(1), 22–26. <http://www.oekom.de/gaia>**

Authors detail and analyse the constraints that transdisciplinary researchers and practitioners face in order to publish their research results. Though this

article was written in 2007, it addresses the main questions for scholars and journal editors when dealing with the publishing process of IDR/TDR. Authors discuss possible steps for creating a more sophisticated and strategic approach to the role of publishing in the development of transdisciplinary research as an important and legitimate research endeavour.

- **Kukkonen, T. and Cooper, A. (2017). An arts-based knowledge translation (ABKT) planning framework for researchers. Evidence and Policy.** <https://doi.org/10.1332/174426417X15006249072134>

This article presents Arts-based knowledge translation (ABKT) processes as a means to social change on societal challenges. ABKT uses diverse art genres (visual arts, performing arts, creative writing, multimedia including video and photography) to communicate research with the goal of catalysing dialogue, awareness, engagement, and advocacy towards the transformation of social reality. Authors elaborate a framework, derived from empirical case studies, to assist researchers in knowledge translation of their outcomes.

- **Pohl, C., Wülser, G., Bebi, P., Bugmann, H., Buttler, A., Elkin, C., Grêt-Regamey, A., Hirschi, C., Le, Q. B., Peringer, A., Rigling, A., Seidl, R. & Huber, R. (2015). How to successfully publish interdisciplinary research: learning from an Ecology and Society Special Feature. Ecology and Society, 20 (2), 23.** <http://dx.doi.org/10.5751/ES-07448-200223>

What are the factors that hinder or support publishing interdisciplinary research? What does a successful interdisciplinary publishing process look like? Authors in this article address these questions based on the empirical data collected from case studies. According to their analysis, an ideal-typical publishing process necessitates, among other things, (1) a strong, interdisciplinary coordinator, (2) a clear shared vision of integration and a common framework, (3) flexibility in terms of money and time, (4) a certain sense of timing regarding when and how to exchange results and knowledge, (5) subject editors who are familiar with the specific project and its interdisciplinary merits, and (6) reviewers who are open minded about interdisciplinary efforts. Very relevant beyond the disciplines of ecology and society.

Further reading:

- **Colantonio A, Kontos PC, Gilbert JE, Rossiter K, Gray J, Keightley ML. (2008). After the crash: research-based theater for knowledge transfer. Journal of Continuing Education in the Health Professions. 2008 Summer; 28(3):180-5.** <http://doi.org/10.1002/chp.177>
- **Holbrook, B. J. (2017). Peer Review, Interdisciplinarity, and Serendipity. In Frodeman, R., Klein, J. T., and Mitcham, C. (Eds.) (2nd Edition). The Oxford Handbook of Interdisciplinarity. New York: Oxford University Press.**



- Leahey E, Beckman C, Stanko T. 2015. **Prominent but less productive: the impact of interdisciplinarity on scientists' research.** *Administrative Science Quarterly*. 62(1), 105-139. <https://doi.org/10.1177%2F0001839216665364>

Improve Research Skills [▲](#)

- Barth, M.; Bruhn, A.; Lam, D. P.M.; Bergmann, M.; Lang, D. J. (2020). **Capacity building for transformational leadership and transdisciplinarity.** *GAIA - Ecological Perspectives for Science and Society, Volume 29, Number 3, 2020*, pp. 195-197(3). <https://doi.org/10.14512/gaia.29.3.12>

The article presents the first experiences of the Postdoc Academy for Transformational Leadership (designed to develop the next generation of leaders in sustainability and transformation research) and the platform tdAcademy (a continuously evolving knowledge base for transdisciplinary research). These are two initiatives from German scholars to improve capacity building, empowerment and networking opportunities particularly for Early Career Researchers.

- Fam, D., & O'Rourke, M. (2020). **Interdisciplinary and Transdisciplinary Failures: Lessons Learned from Cautionary Tales (1st ed.)**, London: Routledge. <https://doi.org/10.4324/9780367207045>

Opening a new space for reflection on inter- and transdisciplinary research, this book provides insights for researchers and practitioners on what failure in ID/TD entails. Based on a set of case studies, each chapter synthesises lessons learned and key take-away points for the reader on what hinders ID/TD, or causes it to fail, in different settings. It is a timely offering that allows problems or obstacles to be anticipated when embarking oneself or a team in collaborative research settings and how to overcome those constraints.

- Leahey, E. (2016). **From Sole Investigator to Team Scientist: Trends in the Practice and Study of Research Collaboration.** *Annual Review of Sociology* 2016 42:1, pp. 81-100.

This article reviews trends in the practice and study of research collaboration, focusing on journal publications. It provides a useful classification of types of collaboration. Based on such types, the author analyses the drivers of collaboration and its consequences for both individual researchers and for science more generally. Some examples are the impact of collaboration on the contributing authors and their work, the use of multiple methods and measures, and research integrity. An interesting perspective when assessing our own skills as “integrative” researchers and practitioners.

<https://doi.org/10.1146/annurev-soc-081715-074219>

- Smolka M, Fisher E, Hausstein A. (2020). **From Affect to Action: Choices in Attending to Disconcertment in Interdisciplinary Collaborations.** *Science, Technology, & Human Values*. <https://doi.org/10.1177/0162243920974088>



Integrative researchers tend to be positioned as either adversarial outsiders or co-opted insiders when participating in interdisciplinary projects. This article shows the affective implications these roles might have and project them as possibilities for productive engagements across disciplinary divides. This analysis contributes to scholarship on the role of affect in successes and failures of interdisciplinary collaboration. It is a relevant perspective as this field of study is growing in IDR/TDR.

- **O'Rourke, M., Crowley, S., Eigenbrode, S., and Wulfhorst, J.D., Eds. (2013). *Enhancing Communication and Collaboration in Interdisciplinary Research*. Thousand Oaks: SAGE.**

This book is a useful tool for individuals or teams that are developing an inter- or transdisciplinary project. It includes theoretical perspectives, case studies, communication tools, and reports from different institutional contexts, all focusing on how to improve communication in collaborative settings. The reader will find other resources in each chapter that complement the strategies presented in the book.

- **Bergmann, M., Jahn, T., Knobloch, T., Krohn, W., Pohl, C., & Schramm, E. (2010). *Methods for transdisciplinary research: A primer for practice*. Frankfurt/Main: Campus Verlag.**

This is a systematic compilation of transdisciplinary case studies that elaborate on methods and tools for knowledge integration to approach complex problems. During the research process new knowledge is produced by integrating different problem perceptions and knowledge bases from sciences and societal practice; the aim is to contribute to both societal and scientific progress. This book supports scholars in the conceptualisation and execution of transdisciplinary research projects and is of high relevance for teaching as well.

Further reading:

- **Fam, D., Palmer, J., Riedy, C., and Mitchell, C., Eds, (2017). *Transdisciplinary Research and Practice for Sustainability Outcomes*. London: Routledge.**

Support Collaborative Researchers [^](#)

- **Bammer, G., O'Rourke, M., O'Connell, D. et al. (2020). *Expertise in research integration and implementation for tackling complex problems: when is it needed, where can it be found and how can it be strengthened?* *Palgrave Commun.* 6, 5. <https://doi.org/10.1057/s41599-019-0380-0>**

Expertise in research integration and implementation is an essential component of tackling complex societal and environmental problems. Much of the expertise is tacit and is used intuitively by researchers, practitioners and funders. Authors in this article coming from diverse scientific communities



explore three questions: (i) When is expertise in research integration and implementation required?; (ii) Where can expertise in research integration and implementation currently be found?; and (iii) What is required to strengthen expertise in research integration and implementation?. Authors conclude that building a knowledge bank and a coalition of researchers and institutions will ensure that this expertise and its application are valued and sustained.

- **Boone, C. G., Pickett, S. T. A., Bammer, G., Bawa, K., Dunne, J. A., Gordon, I. J., Hart, D., Hellmann, J., Miller, A., New, M., Ometto, J. P., Taylor K., Wendorf, G., Agrawal, A., Bertsch, P., Campbell, C., Dodd, P., Janetos, A. and Mallee, H. (2020). **Preparing interdisciplinary leadership for a sustainable future.** *Sustainability Science*, 15, 1723–1733 (2020), <https://doi.org/10.1007/s11625-020-00823-9>**

Current complex and multidimensional problems demand effective leadership for inter- and trans-disciplinary institutions. Based on the diverse experiences of 20 institutional leaders, the article shows ways to cultivate appropriate leadership qualities and skills, especially the ability to create and foster vision beyond the status quo, collaborative leadership and partnerships, shared culture, among others. A valuable framework that articulates the major facets of leadership in inter- and trans-disciplinary organizations (learning, supporting, sharing, and training) constitutes the main contribution of this paper.

- **Fam, D, Clarke, E, Freeth, R, et al. (2020). **Interdisciplinary and transdisciplinary research and practice: Balancing expectations of the ‘old’ academy with the future model of universities as ‘problem solvers’.** *Higher Education Quarterly*; 74: 19– 34. <https://doi.org/10.1111/hequ.12225>**

This paper highlights changing expectations of academics in producing alternative research outcomes in collaborative, practice-based research. Through a series of workshops with 20 researchers, the authors identified the tensions behind these outcomes. These tensions reflect the authors' experiences of working in three international sustainability projects, with recommendations for universities seeking to implement interdisciplinary and transdisciplinary doctoral and postdoctoral programmes. This piece has broader relevance as it is co-authored by group of young researchers from different countries and learning cultures.

- **Pfirman, S. & Martin, P. J. S. (2017). **Facilitating Interdisciplinary Scholars.** In: *The Oxford Handbook of Interdisciplinarity (2ed.)* Edited by Robert Frodeman. DOI: 10.1093/oxfordhb/9780198733522.013.47**

This chapter explores approaches to interdisciplinary scholarship with comparison to disciplinary traditions in higher education. The authors investigate the particular challenges of interdisciplinary research, teaching, and service for scholars throughout a scholarly career. Ideas to support interdisciplinary faculty are presented, from the creation of the position, to the point of hire, and through a career timeline to tenure and post-tenure review.



Special challenges in interdisciplinary scholarly productivity, scholarly recognition, evaluation, promotion, and funding are examined.

Further reading:

- Fam, D., Smith, T., & Cordell, D. (2017). **Being a transdisciplinary researcher: Skills and dispositions fostering competence in transdisciplinary research and practice.** In D. Fam, J. Palmer, C. Riedy, & C. Mitchell (Eds.), *Transdisciplinary research and practice for sustainability outcomes* (pp. 77– 92). London, UK: Routledge.
- Holm, P., Goodsite, M. E., Cloetingh, S., Agnoletti, M., Moldan, B., Lang, D. J., ... Zondervan, R. (2013). **Collaboration between the natural, social and human sciences in Global Change Research.** *Environmental Science & Policy*, 28, 25– 35. <https://doi.org/10.1016/j.envsci.2012.11.010>
- Lyall, C., & Meagher, L. R. (2012). **A masterclass in interdisciplinarity: Research into practice in training the next generation of interdisciplinary researchers.** *Futures*, 44, 608– 617. <https://doi.org/10.1016/j.futures.2012.03.011>

Develop a Career in Inter- and Transdisciplinary Research ▲

- Bridle, H., Vrieling, A., Cardillo, M., Araya, Y., Hinojosa, L. (2013). **Preparing for an interdisciplinary future: A perspective from early-career researchers.** *Futures*, Volume 53, 2013, Pages 22-32, <https://doi.org/10.1016/j.futures.2013.09.003>.

This article analyses an approach to fostering the skills required for successful cross-disciplinary collaboration from the perspective of an interdisciplinary group of early-career researchers. Authors conclude that “specially designed encounters” are an effective means to support the development of future interdisciplinary researchers, with a major advantage of this approach being the opportunity for open communication. The ultimate aim is to generate a space to develop more innovative and high-impact research that delivers solutions to the challenges facing humanity in the future.

- Hein, C. J., Hoeve, Ten, J. E., Gopalakrishnan, S., Ben Livneh, Adams, H. D., Marino, E. K., & Weiler, C. S. (2018). **Overcoming early career barriers to interdisciplinary climate change research.** *Wiley Interdisciplinary Reviews: Climate Change*, 9(5), e530. <http://doi.org/10.1002/wcc.530>

This article presents the results of a bibliometric analysis and survey of early to mid-career scientists from 56 countries. Survey results confirm the pervasive conflict between the need for interdisciplinary climate-change research and its potential detriment to career advancement. Alternative mechanisms for encouraging incorporation of interdisciplinary science at early career stages are also analysed, highlighting funding of interdisciplinary seed grants,



fellowships, and junior faculty networks. These results prove to be useful for other fields of knowledge, sharing similar constraints.

- **Kelly, R., Mackay, M., Nash, K.L. et al. (2019). Ten tips for developing interdisciplinary socio-ecological researchers. Socio Ecol Pract Res 1, 149–161. <https://doi.org/10.1007/s42532-019-00018-2>**

Individuals face barriers to their development as effective interdisciplinary researchers. To help overcome these barriers, this article provides practical advice for early career researchers and their mentors in the form of 10 tips. They are presented here to empower present and future generations of interdisciplinary researchers in their endeavour to solve contemporary socio-ecological challenges worldwide.

- **Klein, J. T., & Falk-Krzesinski, H. J. (2017). Interdisciplinary and collaborative work: Framing promotion and tenure practices and policies. Research Policy, Volume 46, Issue 6, Pages 1055-1061. <https://doi.org/10.1016/j.respol.2017.03.001>.**

The article offers a detailed synthesis of findings from literature and models for practices and policies that recognize interdisciplinary and collaborative work in the promotion and tenure process. Authors discuss a number of studies that call for widening definition of what counts for consideration used in interdisciplinary promotion and tenure, to include innovative, applied, and commercial research and development. The overriding lesson to emerge is the importance of a systematic and informed approach.

- **Lyall, C. (2019). Being an Interdisciplinary Academic. How institutions shape university careers. London: Palgrave Pivot.**

Developed from interviews with researchers pursuing an interdisciplinary career, this book highlights the importance of interdisciplinarity in the academic landscape, and examines how it is understood in the context of the modern university. The author explains misunderstandings about the nature and politics of ID, while highlighting its potential and relevance for the future of research. This book is a timely piece that summarises the main constraints, anguishes, and fears that an interdisciplinary career presents, identifying how a resilient researcher can craft their own research trajectory to view interdisciplinarity as a truly embedded approach.

Further reading:

- Lindvig, K. (2018). The implied PhD student of interdisciplinary research projects within monodisciplinary structures. Higher Education Research & Development, 37(6), 1171– 1185. <https://doi.org/10.1080/07294360.2018.1474343>**



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¹ Vienni-Baptista, B., Maryl M., Wciślik P., Fletcher I., Buchner A., Wallace D. & Pohl C. (2020) Final report on Understandings of Interdisciplinary and Transdisciplinary Research and factors of success or failure, H2020 Project “Shaping interdisciplinary practices in Europe”. <https://doi.org/10.5281/zenodo.3824839>

² Vienni-Baptista B., Maryl M., Wciślik P., Fletcher I., Buchner A., Wallace D. & Pohl C. (2019) Preliminary Report of Literature Review on Understandings of Interdisciplinary and Transdisciplinary Research, H2020 Project “Shaping interdisciplinary practices in Europe”. <https://doi.org/10.5281/zenodo.3760417>

³ We recommend the Tour D`Horizon, which is an extensive survey done annually by the td-net (Switzerland). This bibliography of Inter- and Transdisciplinarity –started in 2003 – focuses on selected publications, which we gather through expert surveys. The compilations of publications from the annual surveys of most important literature and the theme-specific surveys are made available on our the webpage: www.transdisciplinarity.ch



SHAPE-ID Annotated Bibliography of Policy Literature

**Introduction**

This short bibliography includes some key recent policy reports and statements on inter- and trans-disciplinary research. It is an introduction to a large literature rather than an exhaustive list, and follows SHAPE-ID's overall focus in highlighting resources with a particular relevance to increasing the participation of Arts, Humanities and Social Sciences (AHSS) researchers in such research.

Resources

- The 2016 *Crossing Paths* report from the British Academy focuses on how academics can forge interdisciplinary careers and whether the right structures are in place to support interdisciplinarity across the research and higher education system. <https://www.thebritishacademy.ac.uk/publications/crossing-paths/>
- This position paper from the European Alliance for Social Sciences and the Humanities is a response to the 4th European Commission (EC) monitoring report on the integration of Humanities and Social Sciences in Horizon 2020 (see below). The authors discuss their concerns about the ineffectiveness of these processes. <https://eassh.eu/Position-Papers/easshsshintegration4threportfnl.pdf>
- The EC has set targets for integration of the Humanities and Social Sciences in inter- and trans-disciplinary Horizon 2020 funded projects, including those addressing societal challenges. The fifth of their reports monitoring progress toward these targets for participants, budgets and disciplines was published in 2020. <https://op.europa.eu/en/publication-detail/-/publication/4f198f8e-4599-11eb-b59f-01aa75ed71a1/language-en/format-PDF/source-search>
- INTREPID was a 32-country network aiming to better understand how to achieve more efficient and effective interdisciplinary research in Europe. Their third report examined different understandings of inter- and trans-disciplinarity. <http://intrepid-cost.ics.ulisboa.pt/intrepid-reports-and-policy-briefs/>
- In 2014 a group of high profile research organisations released the Leiden Statement on the role of the Social Science and Humanities in global research, arguing that these disciplines are 'indispensable to understanding and addressing contemporary global challenges and to grasping emerging opportunities'. <https://www.leru.org/files/Leiden-Statement-Full-paper.pdf>
- The League for European Research Universities (LERU) has published two important reports in this area. One outlines the benefits of partnerships



between the creative arts and universities, including recommendations for best practice in such activities. <https://www.leru.org/files/Creative-Arts-and-Research-Intensive-Universities-A-Crucial-Partnership-Full-paper.pdf>

- The second report showcases a selection of interdisciplinary research projects undertaken in member universities, arguing that such research complements disciplinary research, but that making it more visible and effective 'requires significant levels of investment and commitment'. <https://www.leru.org/publications/interdisciplinarity-and-the-21st-century-research-intensive-university>
- This 2016 factsheet produced by NET4Society, the Network of National Contact Points of Societal Challenge 6, outlines their recommendations for the successful integration of Social Sciences and Humanities in Horizon2020 projects. https://www.net4society.eu/files/170110_Factsheet_Expert%20meeting_INT_EGRATION_def.pdf
- The Organisation on Economic Co-operation and Development (OECD) has a long history of working in this area. Their 2020 report includes 28 case studies illustrating how transdisciplinary research can be used to address societal challenges. <https://www.oecd.org/science/addressing-societal-challenges-using-transdisciplinary-research-0ca0ca45-en.htm>
- This 2014 report outlines the results of research commissioned by the Global Research Council (GRC) into national funding bodies' policies on inter- and trans-disciplinarity amongst a sample of GRC participants. https://www.globalresearchcouncil.org/fileadmin//documents/GRC_Publications/Interdisciplinarity_Report_for_GRC_DJS_Research.pdf
- Produced as part of the 2013 European Commission Horizons for Social Sciences and Humanities Conference, the Vilnius Declaration outlines the case for the value and benefits of integrating Social Sciences and Humanities in inter- and trans-disciplinary research, and conditions for their successful integration in Horizon 2020 research projects. https://erc.europa.eu/sites/default/files/content/pages/pdf/Vilnius_SSH_declaration_2013.pdf

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