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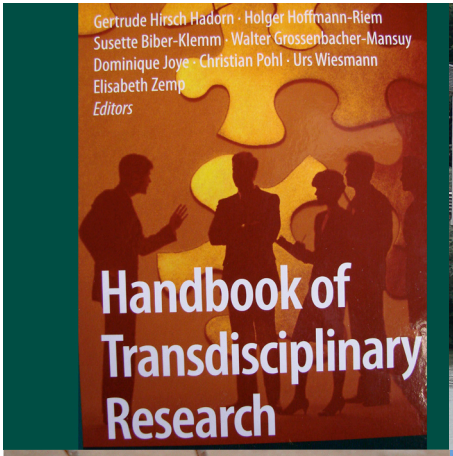
Core Terms in Transdisciplinary Research

by Pohl and Hirsch Hadorn



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Original
Pohl, C., von Kerkhoff, L., Hirsch Hadorn, G., Bammer G., 2008. “Core Terms in Transdisciplinary Research”. In *Handbook of Transdisciplinary Research*, edited by G. Hirsch Hadorn, H. Hoffmann-Riem, S. Biber-Klemm, W. Grossenbacher-Mansuy, D. Joye, C. Pohl, U. Wiesmann, and E. Zemp, chapter 28, p. 427-432. Dordrecht: Springer.

Bilder
Theres Paulsen

Core Terms in Transdisciplinary Research

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Abstract

The following explanations of core terms in transdisciplinary research are meant to guide readers who are not familiar with transdisciplinary research or who are confused by the variety of meanings given to terms. It is important to keep in mind that the explanations refer to the use of terms in the context of transdisciplinary research – they do not provide general definitions. For instance the meaning of 'actor' as described below may not hold from a sociological or psychological perspective and is wrong in the context of a theatre. The explanations are taken from the 'Principles for Designing Transdisciplinary Research' (Pohl and Hirsch Hadorn, 2007) and from the Handbook (Chapter 2). Authors of the Handbook were invited to refer to a preliminary and shorter version of term descriptions when writing their contributions, but they were free to use the terms in their own way.

Keywords: Definition of core terms

Actors: Persons and institutions in public agencies, the private sector and civil society who are involved in one way or another in a problem field (see problem field). Their relation to the problem field is the reason why transdisciplinary researchers work with them. [...] Participatory research (see participatory research) goes beyond doing research on actors, and implies that actors can help shape the research process (see research process). (Pohl and Hirsch Hadorn, 2007)

Applied research: Problems (see problems) for applied research arise from difficulties in describing and explaining the variability of specific processes in a certain type of problem fields (see problem field), and from difficulties in developing specific measures helping an actor (see actors)

to better achieve his/her goals. A discipline (see scientific discipline) or an integrated grouping of disciplines which specialize in a certain problem field as applied research are building the scientific knowledge base for dealing with the diversity (see diversity) and complexity (see complexity) of the selected processes in the problem field. The experience of the actor who requires systems (see systems knowledge) as well as transformation knowledge (see transformation knowledge) to improve practice is providing the knowledge base in the life-world. (Chapter 2)

Basic research: Problems (see problems) for basic research arise from difficulties in describing and explaining a subject by general methods and models. Basic research aims at advancing the state of the art within a discipline (see scientific discipline), which is the only knowledge base to identify problems and structure research questions (see problem identification and structuring). Basic research idealizes and reduces what is going on in real-world settings (see life-world) in order to formulate generally valid explanations. (Chapter 2)

Bringing results to fruition: According to the principle of recursiveness (see recursiveness), bringing results to fruition is a phase of research (see transdisciplinary research process) that does not occur at the end of transdisciplinary research (see transdisciplinary research): It takes place in the course of the research process in order to enable learning processes. Bringing results to fruition is achieved in the form of a real-world experiment (see real-world experiment), so that its impact can be observed and lessons can be learned for the following phase of bringing results to fruition. (Pohl and Hirsch Hadorn, 2007)

Common good: The common good as an ethical principle, however, refers to having the social systems, institutions, and environments on which we all depend work for the well-being of all people. (Pohl and Hirsch Hadorn, 2007) [...] By dealing explicitly with the question of whether proposed solutions serve the common good, transdisciplinary research (see transdisciplinary research) enables those involved to achieve a consensus about solutions – an important condition given the fact that actor (see actors) groups in the private sector, public agencies, and civil society can hold controversial positions. The question how to define the concept of the common good with regard to a specific problem field (see problem field) can be one of the research questions pursued by transdisciplinary research. (Pohl and Hirsch Hadorn, 2007)

Complexity: is used for the interrelations among heterogeneous dimensions, or plural values and norms. Thus complexity is in contrast to simplicity. (Chapter 2)
Diversity: means that empirical dimensions relevant to describing and analysing processes are heterogeneous in the sense that they belong to different disciplines (see scientific discipline) or to the perceptions of different actors (see actors), and that there are plural values and norms that do not fit together in a systematic way. Diversity of and life-world (see life-world) perceptions involved. (Chapter 2)

Interdisciplinary research: refers to a form of coordinated and integration-oriented collaboration between researchers from different disciplines (see scientific discipline). (Pohl and Hirsch Hadorn, 2007).

Life-world: refers to the human world prior to scientific knowledge. While philosophy (led by Edmund Husserl who coined the term) uses this concept within the framework of both phenomenology and constructivism as a possibility of critiquing and explaining science, Schütz's interpretive sociology links 'life-world' with the concept of the everyday world as a system of meaning: 'Life-world', for him, describes the structural properties of social reality as grasped by the agent. We use the term 'life-world' to mark the difference, within society, between the scientific and other communities (the private sector, public agencies, civil society). It was Mittelstrass (1992) who introduced the term 'life-world' into the definition of Transdisciplinarity (see transdisciplinary research). (Pohl and Hirsch Hadorn, 2007)

Multidisciplinary research: approaches an issue from the perceptions of a range of disciplines (see scientific disciplines); but each discipline works in a self-contained manner with little cross-fertilisation among disciplines, or synergy in the outcomes.. (Chapter 2)
Participatory research: goes beyond doing research on actors (see actors), and implies that actors can help shape the research process (see transdisciplinary research process).' (Pohl and Hirsch Hadorn, 2007) […] The aim of involving social groups is often primarily to integrate various life-world (see life-world) perspectives and interests into transdisciplinary research (see transdisciplinary research). But beyond this, participatory research is also a means of grasping the complexity (see complexity) of a problem (see problems) with the help of local knowledge, of testing the situational relevance and transferability of results, or of finding solutions for what is

perceived to be the common good (see common good) an improving the practice-oriented effectiveness of results. (Pohl and Hirsch Hadorn, 2007)

Problems: are concrete, identified and structured questions within problem fields (see problem fields). Problems cannot be considered as given. Rather, in view of the initial random array of difficulties, it is important in the first phase of transdisciplinary research (see transdisciplinary research process) to determine what concrete problems there are and what they consist of. Research questions then specify these problems in such a way that they can be investigated and hopefully answered. (Pohl and Hirsch Hadorn, 2007)

Problem analysis: To analyse a problem (see problems), the problem statement is divided into sub-questions. These are dealt with and answered in relation to one another, after which the answers to the sub-questions go through a process of integration. Various forms of collaboration and modes of integration can be used to this purpose. As a principle of utmost importance, those involved must encounter one another openly before choosing the form of collaboration and means of integration. Moreover, the principle of recursiveness (see recursiveness) requires that decisions already taken can be reconsidered. The form of collaboration and the means of integration determine the structure and intensity of exchange between those involved. Intense exchange requires a deeper knowledge of one another's positions and a flexible attitude with regard to one's own position. (Pohl and Hirsch Hadorn, 2007)

Problem field: an area in which the need for knowledge related to empirical and practice-oriented questions arises within society due to an uncertain (see uncertainties) knowledge base and diffuse as well as controversial perceptions of problems (see problems). (Pohl and Hirsch Hadorn, 2007)

Problem identification and structuring: is the heart of transdisciplinary research (see transdisciplinary research). Complexity can be reduced by identifying those involved in relation to the requirements of transdisciplinary research (see transdisciplinary research) and by specifying the need for knowledge with respect to the three forms of knowledge. The decisions made on this basis may need to be modified in a recursive (see recursiveness) procedure. To create a bridge between science and practice, the problem (see problems) identified can be reformulated in relation to

actors (see actors) in the life-world (see life-world). This is one of the areas where transdisciplinary research can develop creativity and originality, for example by finding a new way of perceiving things, which works like a bridge between fixed viewpoints. In this phase, the project must already be contextualised: first, by embedding it in science, which is achieved by referring to the state of the art in the relevant disciplines, and by learning from transdisciplinary research on similar problems; and second by embedding it in the life-world, which is achieved by considering existing needs, interests, technologies, regulations, practices and power relations that transdisciplinary research will have to take into account. (Pohl and Hirsch Hadorn, 2007)

Real-world experiment: is a recursive (see recursiveness) application of bringing results to fruition (see bringing results to fruition). ... The effects of a project are observed, with a view to finding surprises (unexpected impacts). As a result, the assumptions, models and explanations developed in the project are revised in such a way that they can explain these surprises (increase of knowledge). New instances of bringing results to fruition are then planned and conducted etc. (Pohl and Hirsch Hadorn, 2007)

Recursiveness: is a general principle of transdisciplinary research (see transdisciplinary research). It points to the iterative procedures that characterises both the entire research process (see transdisciplinary research process) and its individual phases. This implies that the research process has to be shaped in such a way that concepts and methods can be repeatedly tested (see real-world experiment), and that underlying assumptions can be modified if they are found to be inadequate.' (Pohl and Hirsch Hadorn, 2007)
'Recursiveness' means about the same as 'iterativeness': however, 'iterative' is defined by the Oxford English Dictionary as 'characterized by repeating or being repeated', while its denotation for 'recursive' – listed as first occurring in English in 1904 – is: 'involving or being a repeated procedure such that the required result at each step except the last is given in terms of the result(s) of the next step, until after a finite number of steps a terminus is reached with an outright evaluation of the result.' The difference is a fine one but it is relevant in the context of the present publication, where 'recursiveness' is used in the sense of this second OED definition. (Pohl and Hirsch Hadorn, 2007)

Scientific disciplines: shape scientific research by forming the primary institutional and cognitive units in academia, on which the internal differentiation of science into specialised curricula, professions and research, is based. Members of a discipline are specialists who build a scientific community. Members communicate within their community, share basic assumptions and examples about meaningful problems, standards for reliable and valid methods, as well as what is considered a good solution to a problem. What modern science gains and preserves is based to a large extend on disciplinary structures. However, boundaries between disciplines are changing: by increasing specialisation through internal differentiation within the disciplines, and by the integration of disciplines. (Chapter 2)

Sustainable Development: is a global socio-political model for changing practices and institutions in order to achieve more equitable opportunities within and between generations while taking into account limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs. Promoting sustainable development therefore necessitates overcoming narrow preoccupations and compartmentalised concerns by involving people from civil society, the private sector and public agencies as actors in participatory deliberation and decision making. Thus sustainable development is a way to conceive the common good as the basic principle of public legislation in a complex world. Agenda 21, a program of the UN, is a comprehensive blueprint of action to be taken globally, nationally and locally. (Chapter 2)

Systems knowledge: addresses questions about the genesis and possible further development of a problem (see problem), and about interpretations of the problem in the life-world (see life-world). [...] Systems knowledge confronts the difficulty of how to deal with uncertainties (see uncertainties). These uncertainties are the result, on the one hand, of transferring abstract insights from a laboratory, a model or a theory to a concrete case underlying specific conditions. Furthermore, empirical or theoretical knowledge about a problem may be lacking, and depending on the interpretation of a problem, these uncertainties may be assigned different degrees of importance, which leads to diverging assessments of the need for action and of target knowledge (see target knowledge) and transformation knowledge (see transformation knowledge). (Pohl und Hirsch Hadorn, 2007)

Target knowledge: addresses questions related to determining and explaining the need for change, desired goals and better practices. [...] In the case of target knowledge, the question is what the multiplicity of social goals means for research, for society's practice-related problems, and for transdisciplinary collaboration between science and actors in the life-world (see life-world). Transdisciplinary research (see transdisciplinary research) faces the challenge of clarifying a variety of positions and prioritising them in the research process (see transdisciplinary research process) according to their significance for developing knowledge and practices that promote what is perceived to be the common good (see common good). This is necessary not only when the need for action has to be identified and objectives have to be determined, but also when describing the systems to which they refer and the possibilities of inducing change. (Pohl und Hirsch Hadorn, 2007)

Transdisciplinary research process: consists of three phases: 1. Problem identification and structuring (see problem identification and structuring) 2. Problem analysis (see problem analysis) 3. Bringing results to fruition (see bringing results to fruition). The importance of each of the three phases must be taken into account when allocating time, finances and personnel. Transdisciplinary research (see transdisciplinary research) does not necessarily progress through the phases in the order mentioned above. (Pohl und Hirsch Hadorn, 2007)

Transdisciplinary research: is needed when knowledge about a societally relevant problem field is uncertain (see uncertainties), when the concrete nature of problems is disputed, and when there is a great deal at stake for those concerned by problems and involved in dealing with them. Transdisciplinary research deals with problem fields (see problem field) in such a way that it can: a) grasp the complexity (see complexity) of problems, b) take into account the diversity (see diversity) of life-world (see life-world) and scientific perceptions of problems, c) link abstract and case-specific knowledge, and d) develop knowledge and practices that promote what is perceived to be the common good (see common good). (Pohl und Hirsch Hadorn, 2007)

Transformation knowledge: addresses questions about technical, social, legal, cultural and other possible means of acting that aim to transform existing practices and introduce desired ones. [...] In the case of transformation knowledge (see transformation knowledge), established technologies, regulations, practices and power relations must be taken into ac-

count. This is the mere consequence of pragmatism, since options for change have to rely on existing infrastructure, on current laws, and to a certain degree on current power relations and cultural preferences, in order to have any chance at all of being effective. When these social, cultural and technological givens are not considered, this leads to the often criticised discrepancy between knowledge and practice. For transdisciplinary research (see transdisciplinary research), the challenge here is to learn how to make what is established more 'flexible'. (Pohl und Hirsch Hadorn, 2007)

Uncertainties of knowledge: Because of empirical diversity (see diversity) and complexity (see complexity), there is debate about which parameters are relevant, how they are connected in concrete processes, and what disciplines (see scientific disciplines) need to be involved. [...] Uncertainties exist regarding the description and explanation of the genesis and possible further development of such problem fields (see problem field). Disputes inevitably exist in the life-world (see life-world) regarding whether and how certain actors' (see actors) practices need to be changed, because the groups directly or indirectly involved have a variety of interests, most of which are often incompatible. (Pohl und Hirsch Hadorn, 2007)

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