

Making a difference by marking the difference: constituting in-between spaces for sustainability learning

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Transdisciplinarity as a mode of addressing sustainability challenges was a guiding principle in establishing Germany's first Faculty of Sustainability at Leuphana University of Lüneburg in 2010. The different study programs offered by the Faculty embody this principle in different ways, but they all rely on the idea that it is important for students to constitute learning spaces in-between established scientific and societal fields. Students have to identify boundaries, understand different cultures of knowing and practice, and conduct integrative research by bridging gaps between knowledge fields, practices and related values as well as interests and objectives. In this paper, we focus on one module in the Master's Program in Sustainability Science and present how students constitute and learn in these in-between spaces through boundary-work with the aim to gain capacities required to contribute to sustainability transitions.

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Introduction

Transdisciplinary research and learning spaces emerge in-between existing fields of knowledge and action, in a kind of 'no man's land' [1]. 'No man's land' — as described by Graham Fairclough — are 'places that do not belong exclusively to one person but are shared and used by many people as a common good. [...] As a place of complex resources shared in common, they reflect community and collectivity, but at the same time they lay outside and challenge many norms of 'society'.' [1].

In this paper, we elaborate on the potentials of conceptualizing transdisciplinary research and learning in

sustainability science as practices in the 'no man's lands' of in-between spaces. The in-between relates here to established scientific or societal fields, that is, academic knowledge fields (disciplines, subdisciplines, interdisciplinary knowledge fields) or societal domains such as science, civil-society, politics, administration and economy that represent shared resources, practices, norms and objectives. Joint transdisciplinary research and learning activities that use multiple resources (e.g. knowledge and abilities), follow multiple objectives (e.g. epistemic and transformational) and challenge multiple societal norms (e.g. scientific and political) constitute the in-between spaces.

We refer to transdisciplinarity as a mode of research that complies with the following requirements: '(a) focussing on a societally relevant problem; (b) enabling mutual learning processes among researchers from different disciplines [...], as well as actors from outside academia; and (c) aiming at creating knowledge that is solution oriented, socially robust [...], and transferable to both, the scientific and social practice.' [2]. Whereas in interdisciplinary research the in-between is established between academic knowledge fields, in transdisciplinary research and learning, in-between spaces emerge from the differences of various knowledge fields *and* fields of action. We argue that by explicitly addressing these differences, in-between spaces become sources of learning in sustainability [3,4] for all people involved and provide opportunities to link knowledge production and societal transformation.

When we implement them in higher education, transdisciplinary projects offer students the opportunity to establish and reflect on the development and characteristics of these in-between spaces. Students learn to prepare for integrative research by differentiating between knowledge fields, practices and values, interests and objectives [5,6] as a basis for integration. Thereby students learn how to change perspectives and create mutual understanding in heterogeneous research constellations. The exploration of the otherness of the other further enhances the understanding of their own perspective, knowledge or study field as well as of their social background. This exploration also allows for a reflection of the students' own values, interests, objectives and culturality.

In the following, we first outline characteristics and challenges of constituting in-between spaces for sustainability learning. We then present some basic ideas of a

central module in the Master's Program in Sustainability Science at Leuphana University of Lüneburg so as to exemplify how boundary-work allows for the constitution of in-between spaces in transdisciplinary research and learning in higher education. Next, we outline how this boundary-work can support students' reflexivity, in particular concerning themselves as representatives of a certain knowledge field or epistemic community [7,8] and how students can learn how to change perspective when addressing boundaries explicitly. Finally, we elaborate on opportunities and challenges of transdisciplinary in-between spaces for sustainability in study programs. Our contribution relies on the conceptual development of the transdisciplinary research and learning format presented as well as on its implementation in nine courses during the last three years.

In-between spaces for sustainability

Already in 1992 the United Nations addressed the need to deepen collaboration between the scientific and technological community and the general public to foster sustainable development (Agenda 21, Chapter 31.1). Since then, many approaches have evolved with the aim to develop transdisciplinary sustainability research as a new research culture that can bridge existing societal gaps in sustainability learning. Emerging from different backgrounds, these attempts have addressed different gaps: on the one hand gaps within the academic body of knowledge, that is, transdisciplinarity in a sense of 'true interdisciplinarity' [9]. On the other hand they have also addressed gaps separating societal spheres, for example, the academic sphere from the economic, political, or civil society sphere and thus knowledge production from decision making and societal transformation [2].

The transdisciplinary approach to sustainability learning in higher education of Leuphana University of Lüneburg refers to the latter, that is, to the creation of transdisciplinary research spaces in-between existing societal domains and to the integration of a wide range of resources and practices as well as interests, objectives and norms in sustainability research [10]. In so doing, the concept of research is not limited to academic research and its quality criteria but refers to the diverse resources and practices that contribute to better understand unsustainable situations and to foster transformation towards sustainable development. In this sense, the goal, rather than the method or theory, define the concept of research.

In order to create transdisciplinary research and learning spaces that enable integration, it is essential to make differences visible, approachable and tangible. These differences are based on the multiplicity of cultures of knowing and acting. There may be epistemological and methodological differences between representatives of different disciplines as well as differences in what they consider to be robust knowledge or a sustainability

problem. There may also be differences in the reasons why team members engage in a sustainability research project — ranging from purely epistemic goals to personal interests or advocacy. The process of differentiation allows for research spaces to emerge in-between. By jointly approaching differences, a web of meaning and relations constitutes an in-between space. Being a truly shared activity, this process is of diastatic character [11], that is, in such a process difference is not identified relating to pre-existing entities but in the course of relating to each other and thus performed in an act of differentiation. In-between spaces of such diastatic character are relational spaces and only exist while being performed [11]. Thereby boundaries have a (paradoxical) double role: both their existence and their extinction are constitutive of in-between spaces. In this perspective, boundaries (as demarcations of differences) are constitutive of shared research spaces and differences turn out to be a potential rather than an obstacle for research of sustainability. They serve as a source for creating spaces that enable sustainability learning and transformation.

As a consequence, transdisciplinary research and learning do not only need integration, as highlighted by many authors [12–14], but also differentiation as the other side of the coin. When outlining four dimensions of fundamental challenges in interdisciplinary and transdisciplinary research (i.e. cognitive-epistemic, social-organizational, communicative, factual-technical), Jahn [15] clearly indicates that integration includes and requires differentiation. However, often both in theory and in practice of transdisciplinarity, we tend to pay less attention to differentiation than to integration.

Transdisciplinary research and learning spaces in Sustainability Science

In the Master's Program 'Sustainability Science' at Leuphana University of Lüneburg, the constitution of and working in interdisciplinary and transdisciplinary research and learning spaces is a key component of the curriculum. Students are trained in subjects relevant for sustainability, ranging from the humanities and social sciences to natural sciences with the freedom to design a substantial part of their curriculum. Owing to the heterogeneity and wide range of subjects as well as due to the diversity of perspectives characteristic of sustainability science, each student creates his/her own professional profile in-between and beyond established knowledge fields. Students receive support both through courses that provide the theoretical and methodological foundations of sustainability science and through courses dealing with principles of and methods for interdisciplinary and transdisciplinary research. However, asking students to frame their own learning space as sustainability scientists is a demanding task. Therefore, one capstone module of the Master's

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