English short version of a chapter for the book „Wege der Vermittlung – Intervention – Partizipation“

Original title **„Entwurfsbasierte Interventionen in der transdisziplinären Forschung“**

Design-based Interventions in Transdisciplinary Research

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Keywords: design methods, design-based interventions, integration, knowledge production, transdisciplinarity, design research

Transdisciplinary research approaches complex issues by including heterogeneous perspectives, forms of cognition and knowledge production, as well as different ways of knowing. This can lead to team constellations whose participants not only come from science, but also from other areas of society. Due to their different roles, abilities and thought styles they can provide complementary research contributions. A challenge within heterogeneous project teams is to gain a common understanding of what is considered the problem and pending tasks, as well as facilitating inclusive research between partners with their specific expertises. Greater diversity of all participants involved in the research process requires more intensive communication and new forms of cooperative knowledge production. Different epistemic cultures, theoretical concepts, and methodological approaches need to be bridged and integrated in order to find corresponding answers and to produce socially and culturally robust knowledge. This bridging requires an extended range of methods in transdisciplinary research.

This paper provides an insight into the practice of design-based interventions in the context of transdisciplinary research, its methodology, and transformative potential. Furthermore it shows how design practices can be made fruitful in processes of cooperative and participatory cognition and knowledge production. It explains how working with designs can relate heterogeneous perspectives and bodies of knowledge to one another and create moments of joint thinking through design. After characterizing design and design research, as well as their common methods, commonalities between design research and transdisciplinary research are explored to frame the transfer of design practices to support integration processes in transdisciplinary teams. The use of design methods in transdisciplinary processes is shown and initial findings from the empirical work are presented based on an example from a case study in Transylvania. A concept of different dimensions of integration from transdisciplinary sustainability sciences (Jahn, Bergmann & Keil, 2012) serves as a base to investigate the epistemic, social-organizational and communicative integration capacity of design methods.

In the context of this paper the term design is used twofold: first it describes the design activity in an extended understanding of the term that goes beyond the visual creation and focuses more on the transformative potential of a planning and process-oriented action that turns existing states into desirable ones (Simon, 1969). Secondly, the term is used for the visual artifacts that are produced along this process to illustrate ideas. These designs are developed in a mutual process of thinking and creating. They have both a procedural, open character, as well as a closed nature, which is based in their object status. Designs therefor embody both process as well as product, externalize thoughts and differ from spoken language and text due to their tangibility.

The design thus exceeds *"theory and practice, and not only opens up a new reality, but also new insights."* (Aicher, 1991, p. 195).

The visuality, tangibility and spatial situatedness of designs enable the negotiation of different perspectives. These very characteristics seem to be appropriate to stimulate and promote knowledge integration amongst different participants in a transdisciplinary research process.

With using design practices in transdisciplinary research, in particular for processes of integration and intervention, a field opens up that promisingly broadens the methodological canon for working in heterogeneous teams. In addition, it provides an alternative access to necessary and in-depth understanding of how processes of cooperative and participatory knowledge production occur.