Dialogue session learning for governing sustainability transitions
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The dialogue session started with an introduction to the topic and session outline provided by Johannes Halbe. Learning concepts can come to make a powerful theoretical contribution to transformative science drawing upon findings from such various research fields as social-ecological systems research, organisation science and adult education. A learning lens supports action-oriented research by identifying learning-specific challenges (what general societal challenges demand learning, and how is learning itself challenged in the context of transitions?), subjects (who learns? and on what level?), and supportive learning factors (how can we actively facilitate learning and under what conditions does learning take place?). Having a closer look at learning processes can furthermore help to understand obstacles, outcomes and impacts at various social levels, such as the individual level (e.g., behavioral change), group level (e.g., a joint vision) and societal level (e.g., discursive change).

The session built upon three sessions at the IST 2016 conference in Wuppertal that aimed at promoting the establishment of a thematic research network on learning in sustainability transitions. Several follow-up activities, such as webinars and the preparation of a special issue, showed a marked interest of scholars in the transition research as well as natural resource and educational science communities to further develop theoretical thinking about and methodological approaches for learning in sustainability transitions, see: http://www.tias-web.info/tias-activities/learning-community.

The dialogue session addresses several learning research avenues that were identified as particularly relevant and promising for the sustainability transitions community:

• Further development of learning concepts that are applicable in transitions research, such as multi-level learning frameworks connecting learning processes at the micro-level (e.g., individual and group learning) to macro-level learning processes (e.g., structural change at the societal level).

• Transfer and translation of insights on learning from other research fields, such as natural resource management or pedagogy that are relevant for sustainability transitions.

• The role of informal and incidental learning processes in sustainability transitions, and opportunities for their support.

• The importance of types of interaction, social processes (e.g., tensions and conflicts), and leadership for outcomes and impacts of learning processes, such as joint vision development or collective action.

• The consequences of sustainability transitions in the making for understanding and fostering learning processes.

After the introduction, Geeske Scholz provided a speed talk on how social dynamics shape outcomes and impacts of learning processes in the scope of sustainability transitions. Several conditions can
foster learning, such as trust, commitment and reframing. These conditions can even reinforce each other.

Barbara van Mierlo started the discussion with invited experts (John Grin and Heila Lotz-Sisitka) and the general audience by posing three questions:

1. Why has learning in sustainability transitions so little been operationalized, discussed and studied in transition studies?

John Grin: John considers learning at crucial for understanding transitions since transitions are about experimenting and dealing with unforeseen events. Learning in transitions is even much more radical than learning in general. Based upon prior research, good conditions for learning are regime instabilities, crises and surprises. At the niche level, actors can facilitate second-order learning, e.g., by introducing new ideas and solutions. In general, learning is used in transition literature but not with precision. There is a lack of attention in the transition research community; learning scholars should try to make it easier to study learning by developing and translating learning concepts for sustainability transitions research.

Heila Lotz-Sisitka: Heila agrees that there is little attention to learning in sustainability transitions research. The fact that learning is not adequately defined points towards the need for real interdisciplinary collaboration in teams, in particular cooperation between education scientists and transition scholars.

2. Learning mostly related to projects and niche development. What about learning by incumbent actors, in regimes and by regimes?

John Grin: If there is no learning in the regime, a transition is a revolution. A regime is capable of learning in different ways. Intermediary actors play an important role in such learning processes. They help experimenting and translate what has been learned back to a regime.

Heila Lotz-Sisitka: We indeed learn everywhere, also in policy systems. However, they are underutilized as fora for learning, which again points to the lack and necessity of interdisciplinary teams.

3. Transitions are profound processes of conflict (pressure, tensions, competition between niche and regime). Learning in contrast, portrayed as a consensual process of drawing lessons. What is the role of conflicts? Source of learning or hindering learning?

John Grin: We must understand learning under conditions of conflict. One can definitely learn from conflict, but it is unclear how to deal with conflicts constructively. For instance, conflicts can arise due to different problem definitions. To solve this conflict, viewpoints need to be synthesized and partly transformed. Trust plays a central role in dealing with conflicts. Trust is generally understood as being about relating and developing relationships. In addition, micro-meso interactions matter fundamentally as do relations. Trust can be created but it must also be maintained through practices.

Heila Lotz-Sisitka: Heila agrees that dissonance is key to learning. In particular, contradictions are source of expansive learning. A process facilitator can support the constructive handling of conflict, for instance by providing new ways of thinking.
The reflections by John Grin and Heila Lotz-Sisitka were followed by a general discussion with the audience using the fishbowl format. The following topics were discussed:

**Conceptualization of learning**: Learning in transitions occurs at, and transcends multiple levels, from the microlevel, of interpersonal interaction, to inter-organisational levels. From niches to regimes and vice versa. Learning may occur at the level of socio-technical regime but is especially elaborated for niches. We need different learning concepts for different units of analysis. Learning by individuals is quite different from learning by organizations or regimes.

It was discussed whether we can actually call the latter learning (i.e. learning in organizations and regimes). Organizational learning can be understood as learning of individuals in the organizations or also by the organization as a whole. In general, it was stated that we sometimes talk about actors in an unreflective way. Actors may e.g. refer to a political agency, an organization or an individual. It is true that organizations act in a particular way because of organizational practices. Organizations may act as unitary actor. However, organizations also tend to have non-conformists, which act differently. These non-conformists are important for transitions. A way of dealing with the issue of unit of analysis is by looking at discourses and chains of events.

For interdisciplinary cooperation it is needed that we develop conceptual frameworks and engage in cases together. “Policy entrepreneurs” is an interesting concept, as they can navigate across niches and regimes.

**Power and learning**. Sometimes it appears that research traditions about learning “black-box” power, while transition scholars black-box learning. This suggests that the connection between power and learning, perhaps via agency and/or leadership, would be an interesting topic for scientific exploration. Policy learning would be the logical choice to connect the two. The Advocacy Coalition Framework may be a useful framework to understand implementation, policy design and formulation across coalitions.

Some audience members proposed to keep power and learning separate. From the perspective of a political scientist power is the ability to pursue an interest without learning. Others think that powering and learning are intertwined. Thus, learning was understood as the capacity to draw upon structure, if structure changes, power changes. If you learn how the rules of the game work, you have more power.

**Role of learning in transition research**

A lively discussion took place on the ways learning helps to explain transitions (i.e. large-scale systemic change). In addition, some challenges for a learning perspective were formulated. Thus, learning is not inherently positive (e.g., unlearning). Yet, in the transition sciences learning is very normative. In general, the fields of learning and transitions are currently too far apart. We need to make a translation of learning concepts to make them usable for transition research. However, it was also stated that we should not only ask what learning traditions have to offer to transition management but also what transition studies have to offer to learning theories.