

Leverage Points 2019 – Transformative educational structures (5.4) Friday 8th 10:30-12:30
The TransLAB: A vehicle for the methodical application of transdisciplinarity

The TransLAB: A transformation laboratory to strengthen university transformation on the basis of transdisciplinary methodology

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Focus of this session: How can educational structures promote transformative research? In this session, collaborative methods of experimentation in the academic environment will be discussed, including the transformative role of secondary schools and the role of young researchers as transformers of academic structures. (*Leverage Point - Hebelpunkt*)

Key Words: TransLAB, Sustainable Development, Transformation, Transition, Transdisciplinarity

Introductory remarks

The TransLAB, which was investigated with this research contribution and also proposed for realization at the Faculty 5 Economy, Law and Society of the new BTU Cottbus-Senftenberg at the university in the region Lausitz, is a transformative laboratory with transdisciplinary potentials (BO News, 2013). Its realization is described by the theoretically oriented model stages *structure, organization* and *transformative laboratory*, the *atmosphere circle* as well as the target model *TransLAB-Transition*, and accompanied by the case study carried out on site in the years 2015 to 2018 as a process analysis for the university merger also in practice (Marx, 2017; Müller, Hemmer u. Trappe, 2014, S. 161).

The four theses *knowledge and action, boundary, location* and *reinforcement* are set up in such a way that the activation of TransLAB can be carried out under consideration of specific methodological backgrounds (Marx, 2015; Marx, 2017a). These are *sustainability* and *sustainable development* as the basic structure of *transformation*. It leads, via transdisciplinarity as a central method, to a transition that is characterized first as change, then as transition (Dedeurwaerdere, 2014; Fuenfschilling u. Truffer, 2016; Hopkins, 2009; Klein et al., 2001; Mittelstraß, 2003; Ott u. Döring, 2008; Rogall, 2008; Wagner u. Grunwald, 2015). The research question as to whether TransLAB is an instrument for university transformation or whether it initially only initiates such a transformation and then accompanies it in a target-oriented manner will be discussed extensively. The historically still very young research focus on *transformation science* makes it possible to create new *scientific paths*. Under the condition of transdisciplinarity, analysis and experiment thus help to explore a horizon of knowledge and knowledge that has not yet been experienced to date.

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This article illustrates the contact and fusion of different knowledge contents and the options for action associated with them. A willingness to *intellectual change* is a prerequisite for bringing together knowledge from diverse backgrounds and for appreciating the resulting potential for development. Such a change requires knowledge at universities that is different from the knowledge that has so far mostly emerged from disciplinary work; this means nothing less than the claim to transform research processes and thus the *university itself*. Transformation is not just the implementation of adjustments or reforms, but rather the leading to a process of transition in the sense of the change of an entire system. The present article refers not least to the necessity of transgressing systemic boundaries and limitations.

Real change requires profound (Schäpke et al., 2018). The concrete results of these changes are due to global demands or individual willingness to transdisciplinarily enter into such commitments from a scientific and human point of view assuming competence and ability, for the time, being unambiguously identifiable neither in theory nor in practice correlating with it. Values and criteria of legitimation in the processes of *transformation* and *transition*, or even only aspects of empirical verification, have not yet been identified as capable of majority support in the field of competitive cognitive endeavors (Baier, 2017).

After almost 30 years of transformation-scientific efforts, the TransLAB examined in the context of this work and proposed for realization – in comparison with other transformation laboratories which mostly exist outside a surrounding university location, but at the BTU Cottbus-Senftenberg within a university prescribed structure – is so far unique. A *research approach* like the one presented here, which has been maintained over time and energetically, leads one to expect a long overdue and thus thoroughly new scientific *impact* on *transformation* research (Brock et al., 2018; Singer-Brodowski, 2016).

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Idea and occasion

Before the TransLAB can be used as an *instrument, vehicle, changing machine, protected space* or *incubator* in the case of university transformation in the Lausitz area and with a view to the further development of Faculty 5 at the BTU Cottbus - Senftenberg, it is necessary, after having turned to the genesis of the TransLAB, to show the progressive model-like step from theory in practice application.

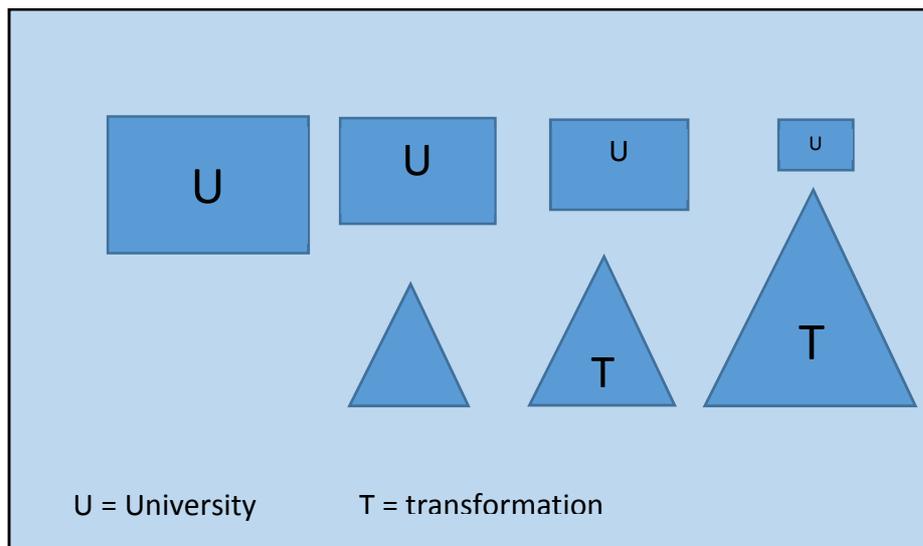


Fig. 1: Long-term re-configuration of systems [Geels \(2005, S. 266\)](#)
(technical structures towards sustainable structures)

To agree to the recording of a transformative need and the effect in the form of path dynamics towards transitions – driven by potentials in processes such as those to think otherwise, or the claiming of other previously unfamiliar patterns. Acceptance of preconditions for this, which are presented transformatively to the university from *social pressure* in the illustration for the long-term reconfiguration of systems. The transformation triangle (T) arises first knowingly and then as a *diffusion* merging with the university. It describes a process with the created pictorial weighting, which can also be threatening, word by word and gives an idea of the dynamics that are thought of processually in order to see a university in such a situation.

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Application

The TransLAB as a vehicle for transformation in complex systems, in which external political and economic influences change rapidly, there are numerous unknown and incalculable factors. There is often a lack of trust and understanding between the parties involved, coordination is weak and the strategic orientation of the actors is not very coherent. Unconventional but emergent governance approaches to these challenges are transition like paths and experiments (Luederitz et al., 2017; Rosenbloom, 2017; van den Bosch-Ohlenschlager, 2010). Framed as a systemic classification, the attempt is made to learn the unknown through experiments, as well as through "learning by doing" and thereby starting from a genuine thirst for research.

Uncertainty, complexity and ambiguity, which emerge as challenges in the experimental (time) spaces, to cope strategically, to navigate transitions into desirable paths and to realize sustainable developments, is research as ambition in concrete terms. Transition labs create space for confidence building in multi-stakeholder settings such as those of system analysis, future vision or intervention development. Emphasising learning in transitions process engineering aspects of transition labs become a central concern experimentally (Wanner et al., 2018; Kemp, 1998; Wieczorek u. Hekkert, 2012).

However, it is not enough to allow a group of actors to experience authentic challenges and to merely expect "transformative learning" Budwig (2015) and then to bring the TransLAB into effect as a *scientific process* (Marx, 2017).

The TransLAB and scientific process effects

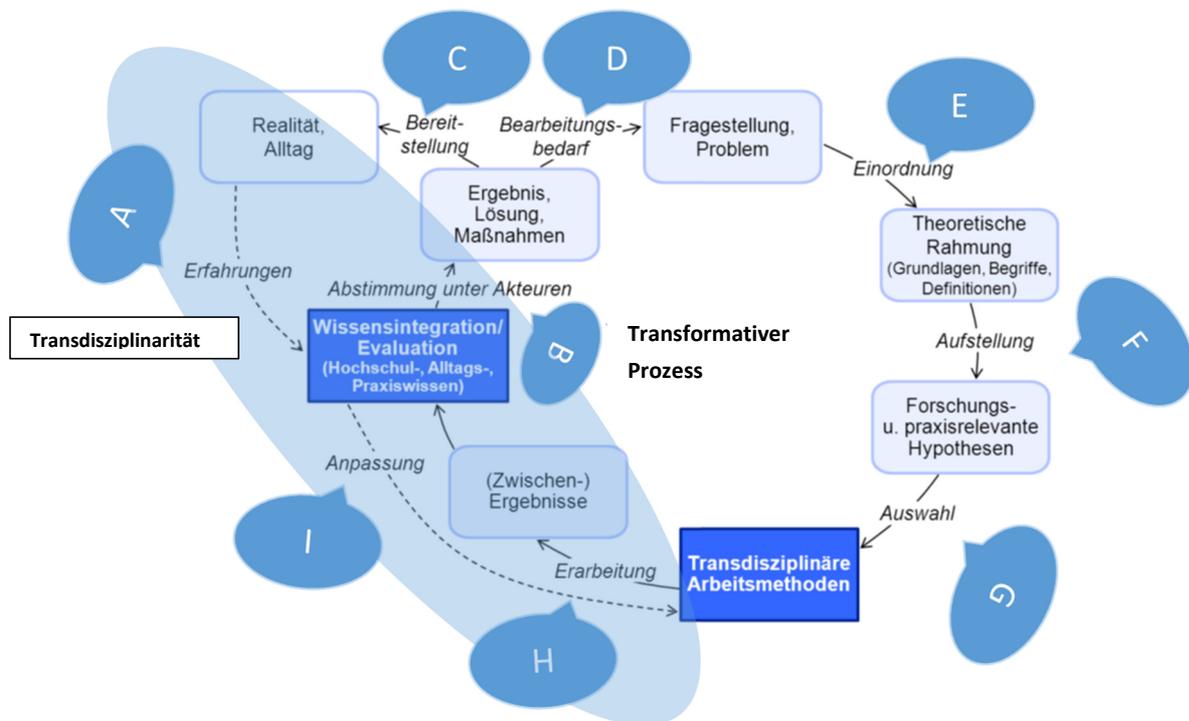


Fig. 2: TransLAB connections extended to own in Müller et al., (2014, S. 161)

Translation (übs. engl.): Realität, Alltag (Reality, everyday life); Ergebnis, Lösungen, Maßnahmen (Results, solutions, measures); Fragestellung, Problem (Question, Problem); Theoretische Rahmung, Grundlagen, Begriffe, Definition (Theoretical framing, basics, terms, definition); Forschungs- und praxisrelevante Hypothesen (Research and practical hypotheses); Transdisziplinäre Arbeitsmethoden (Transdisciplinary working methods); (Zwischen-)Ergebnisse (Interim-results); Wissensintegration / Evaluation Hochschul-, Alltags-, Praxiswissen (Knowledge integration, evaluation, university, everyday, practical knowledge).

Parameter ranges: A Erfahrungen (experiences); B Abstimmung unter Akteuren (Coordination among actors); C Bereitstellung (making available); D Bearbeitungsbedarf (machining needs); E Einordnung (classification); F Aufstellung (lineup, performing); G Auswahl (choice); H Erarbeitung (elaboration); I Anpassung (customization).

A TransLAB model such as the one presented in this paper is understood and further developed by the author as a communicative and at the same time *integrative* as well as *inclusive* methodological vehicle. Previous literature on transformation and transdisciplinary working methods speaks of *knowledge integration*. (Bergmann et al., 2010; Hirsch, Hadorn u. Jäger, 2008).

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The scientific communities of the Sustainability Transitions Research Network (STRN), represented by its protagonists Markard, Geels, Loorbach, Meadcroft, Wieczorek, Hekkert, Rotmann and Grin, as well as the community in Germany dealing with ESD and real laboratories with authors such as Schneidewind, Lang, Bergmann, Jahn, Wagner, Singer-Brodowski, Wanner and Schöpke etc., have so far "only" endeavoured to integrate knowledge. Even Roland Scholz, who began the debate on transdisciplinarity and sustainable transformation at ETH Zurich in the 1990s from a European perspective, speaks of integrative concepts¹. In this respect, it would be a daring step to change from the concept of integrating knowledge to one of including knowledge, which has not yet occurred so far transformation science.

Integration after Scholz u. Binder (2011, S. 381) allows the *typological classification* of the knowledge types *discipline, system, thinking* and *interests*. Scholz adds that *cultural* knowledge as the most difficult to integrate². From the author's point of view, it will in future be imperative to make more efforts to recognise and understand the significance of directions of knowledge as social dynamics and their effects. The *parameter ranges* (PB) A to I represent the ranges of an *emerging knowledge* in the form of a *condensation as a process*, so that individual result steps (system steps) are realized and, after the respective examinations carried out there, a further PB is focused to be exceeded until the final result is achieved. The negotiation modalities taking place in the parameter areas and the individuals acting there also specify these works in scope, quality and connectivity as a normative overall process with corresponding conclusions. If social challenges are to be taken scientifically more seriously and science is willing to make a concrete contribution to them, it must engage in self-reflexive experiments with transformative character and under transdisciplinary conditions. *The TransLAB genesis* and the fact that it was initially applied in „practice“ at Faculty 5 is one such experiment. It was introduced with this founding at the BTU Cottbus-Senftenberg and placed with the first stage, the TransLAB structural and organisational model, as a call to occupy and claim space as a dimensional perspective for ideas on the form from knowledge to action (Scheffer, 2013; Scholz, 2017; Star u. Griesemer, 1989).

¹ Scholz (2011, p. 22) speaks here of disciplinary interdisciplinarity in transdisciplinary projects. When transdisciplinary working methods pursue a deep inclusive approach, he jumps back and forth between integration and inclusion with this formulation. The brainstorming began with the idea that Transdisciplinarity could be an independent methodological approach, but its embedding would have to take place as described above due to lack of connectivity.

² See the lecture by R. Scholz: How does Big Data Analytics Change Science and the Power Relations among Stakeholder, Transdisciplinary Perspectives, Vienna 2018.

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Theoretically, the correspondence between the two differently sized relational circles of the practical and theoretical sphere of the model in Fig. 2 is to be regarded in such a way that communicative bridges with different qualities described as transitions in the model at positions A: *experiences*, B: *coordination among actors* and C: *provision*, both *motivated by content*, searching for a *system driver* for the first time. Transition processes must make it possible, at the beginning of a phase of development, for existing knowledge to show itself to be part of the transdisciplinary process and to merge with other knowledge what is precisely what distinguishes transdisciplinary work³. Thus, the following theoretical consideration as a conclusion to the first analytical stage of TransLAB can be modified as follows. If it is the case that the allocation of the PBs is clear in so far as the participations taking place and driving them there take place in the form of the disciplinary demands used in each case, then this consideration is both an *opportunity* and a *failure* for transformative developments.

For this reason, the TransLAB will methodologically contribute to the fact that the following four different scientific processes are under development as *integrating, including, neutral* and *rejecting* the knowledge types, to be integrated according to Scholz qualitatively into a new discussion for a qualitative research process as the first central hint from the TransLAB's own methodological analytical capability. The table 1, which has been specially prepared by the author for this purpose, presents an innovative insight into possible constellations of how different a scientific process is when different methods are used and how knowledge effects are shaped differently. To consider such differences in parameter information to be presented in different ways, as an allocation to the four forms of deepening, means to look with which consciousness and under claim of which mediation channels in the way of as transparent a documentation as possible also of the ways of knowledge about it, Becoming as from particular to implementation knowledge, qualitatively visible, is a participatory process to be evaluated.

³ The prerequisites for a merger are low barriers to encounters and a willingness in principle to work together. Such cooperation, for example, is based on empathy, and also on the prerequisites for academic work within the university. *Transdisciplinarity therefore receives a right to have an entitlement within the scientific community, even without external participation.* This promotes, as an example, sustainable social transformations out of the corpus of the university itself. This does not mean to act as a structural and seemingly living entity, no, it is an appeal to all to help shape university development and this begins with the transdisciplinary option as a style of science in a disciplinary garb.

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Table 1: Integration and inclusion of scientific processes (peculiar, 2018)

Prozess	integrating	including	neutral	rejecting
disciplinary	g-1	i-1	n-1	r-1
interdisciplinary	g-2	i-2	n-2	r-2
transdisciplinary	g-3	i-3	n-3	r-3

Starting from the idea of the breakdowns of the processes due to different procedural depths and admission variants, as visualized with the tabular representation of listings, categories emerge that allow different degrees of commitment of science to become visible as a process. Viewed in this way, the categories are *disciplinary*, *interdisciplinary* and *transdisciplinary*, calling for different ways of *dealing with knowledge* and developing them together with other actors. One principle in the negotiation and consideration of respective aspects of knowledge is to take account of knowledge within the classifications in such a way that the participants can recognise areas of competence in a way that is necessary for this.

According to this, the table provide information on hints that can be derived from different straight lines of openness of knowledge accesses or an estimation that it is necessary to recognize higher-value knowledge according to the basis of processual preconceived interpretation. The previous mainstream logic, which can still be found as a disciplinary way of working and thinking in the context of universities, requires such approaches progressively in order to see an extended inclusive spectrum, according to the author's opinion, which should at least increase the chance to legitimize such aspects as suggestions, because to demand them with all one's might. On the basis of these statements it becomes necessary, in the course of the work, to further elaborate and present *inclusive* approaches, which this methodically resembles like progressive form of debate culture, but precisely because of such a starting situation, should be taken seriously⁴. Transdisciplinarity, according to this description, only succeeds in the *inclusive handling* of knowledge.

⁴ To understand integration as an integration into a larger whole comes from the understanding of the educational language and the concept understood with it. However, the origin: Latin *integratio* = resume can be continued as a renewal. It is important for the author to point out that renewal means innovation [which alone does not mean more than a semantic classification]. Despite a possible inaccuracy, it remains to be concerted that inclusion (origin: Latin *inclusio* = inclusion) designates and thus expresses a fundamentally different conceptual and also social understanding than that of integration. These "socio-political concepts" to be differentiated stand for different models of society. While integration assumes that a society consists of a relatively homogeneous majority group that must be integrated into the existing system, inclusion represents a departure from this two-group theory and regards all people as equal individuals who are part of the whole from the outset.

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The significance of the first TransLAB modification as a structuring and organizational element follows that of the second stage, the TransLAB as a transformation laboratory. The third stage of an atmospheric model and the fourth stage of the TransLAB as a model for transition that can be recognized as a „space inbetween“ make it possible to shift and merge knowledge from practice and theory. Sustainable development, BNE and transformation sciences to become fundamental promoters of higher education transformation. In the context of the debate *on sustainable development and transformation*, knowledge integration shows a related necessity to consider how the knowledge necessary for such a development is discovered, used and claimed. With recourse to the transdisciplinary research process as an integrative approach of [ISOE \(2008\)](#), as well as anticipating an ongoing transition, a stringent and continuous discourse can be found in the course of this lecture. There is a reason for this that dealing with new knowledge and knowledge from sources other than universities is simply a challenge to better understand change as a phenomenon.

The prehistory from the 1970s can be briefly discussed to the effect that a changed assessment of the permeability of knowledge within the university was inevitable. The ISOE model of [Bergmann et al. \(2010\)](#) characterizes a visualized area, which means that social knowledge must be integrated transdisciplinarily from the perspective of the university. The list of the five typological classifications of knowledge that has already been made opens up the topic of the different qualities of integration as a disposition for the continuation of discourse. The question of how typological classifications of different forms of knowledge are to take place is currently to be found in the context of the constantly changing debate on higher education transformation. With the introduction of TransLAB, this debate is given a new facet; with it, the procedural significance as *depth* and *openness* is addressed.

Depth as a qualitative approach within the framework of the transformative initiation at levels 1 and 2 of the TransLAB modifications discuss the urgency of the need to be able to deal with knowledge in a sustainable way at all. *Openness*, on the other hand, characterizes *creative* and innovative potential in the modifications *atmosphere* and *transition*. The comparison with the five-part typology of the previous classification of knowledge and the associated normative ideas of integrating this knowledge methodically reveals itself from the debate to date, but does not establish, from the author's point of view, that interferences are recognised but occur more frequently in the system of integration than that they could be a motive for transformation ([Scholz u. Steiner, 2015](#)).

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Table 2: Effect of knowledge in parameter areas (Pb) (peculiar, 2018)

A bis I (Pb)	integrating	including	neutral	rejecting
a. Experiences	Recognition for other experiences, but always adhering to one's own	Own experiences are less important than those of others	No real interest in what the others have experienced	Only your own experiences are worth something
b. Coordination among actors	Adjustments relevant to interests	Own aspects for the vote are no longer relevant	Actually, you don't need a vote at all	A reconciliation requirement is rejected
c. provision	Knowledge and results are inserted according to one's own interests	Without any doubt posts will be opened	No action or motivation to contribute to it	None of this has anything to do with your own imagination
d. machining needs	Interest in linking the shares of the contribution with those of the output	Joint work against the background of recognition of weaknesses	Processing requirements are cumbersome and the quality is just as good as before	No need, was always good, even without outside help
e. classification	In your own system what is then coordinated with the other	A common classification takes place, "diffusion."	The question does not interest	Your own questions are the right ones
f. lineup	Capacity and resources always weighed against one's own successful perspective	We'll work together	The billing methods are so complicated, then it is left the same	Only one's own constellation and terminology counts
g. choice	heterogeneous	homogen	none possible	none possible
h. elaboration	Preformed causalities are dominant	Now the research begins	What	What
i. customization	<i>discourse</i>	<i>dialogue</i>	<i>monologue</i>	<i>monologue</i>

The table shows process-related assignments of individual decisions of individual actors which depend on the system in which these actors operate and the predominant understanding with which they operate in this system⁵ and with what predominant

⁵ Is the construct of one's own location and thus of one's ability to look out and abstract from such an ability in order to make a discourse into a dialogue, so that one's own learning receives a new priority and does not override a singular success.

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understanding these actors move in it⁶. This procedural connection leads to a reference to the idea of the effect of knowledge and science introduced by the statements in Table 1 to discuss the introduction of a transdisciplinary methodology to the perspectives associated with *integration* and *inclusion*. Corresponding discourse locations and assessments to the effect that transdisciplinarity is only a mode, as in the real-laboratory discussion at [Schäpke et al. \(2018\)](#) in Table 1: Core characteristics of real-world laboratories present the TransLAB characteristic introduced here differently: Transdisciplinarity is an indispensable prerequisite for being able to accept transformative challenges, and the mode is an option for scientific thinking and action (Gibbons, 2008). At the latest since [Buggle and Piaget \(1965/2001\)](#) and [Jantsch \(1970\)](#) is an indispensable attitude towards a hermeneutic "something" that is yet to be discovered, which is of such significance for the individual personality that a mere mode is too short-sighted in comparison. It is a matter of creating a future field with which, according to [Lewin \(1946\)](#), a field of science is meant, but also a way of science that is to be met with multidisciplinary curiosity in such a way that a creative driver for scientific work can assert itself as a transdisciplinary attitude (hermeneutically referred to as being)⁷ ([Mantzavinos, 2006](#)).

This would be tantamount to an expansion of science itself as a boundary object and thus a renewal of the self-understanding of the actors concerned with it as "vehicles" as abstract as they are real historical subjects ([Marx, 1867](#)). Changes in the sense of the transformative challenges, however, remained in line with the framework guidelines of transdisciplinary knowledge of geopolitical interests and the associated enforcement mechanisms and strategies.

⁶ The principle of generalizing internalized rules as a source of prejudice are: Every person feels more or less competent in a certain area of life. He has made the experience that he can rely on his assessment in his area. "I can rely on my judgment." This belief can be uncritically extended by the mind to other areas of the same person's life without there being sufficient justification. Cf. to this: *The Psychology of Decision* (Pfister et al., 2017).

⁷ The psychologist Kurt Lewin (1898-1947) had already dealt with Taylor's scientific management in 1920 and pointed out that the strict division of labour led to monotony. "The work itself must be valued, no matter how much time it takes", and "psychological needs" must be taken into account. In 1944, Kurt Lewin founded the Research Center for Group Dynamics (RCGD) at MIT (Massachusetts Institute of Technology). Here he developed the so-called laboratory and sensitivity trainings (T-Groups). The aim of these is to sensitize the participants to the effects of their own behavior on the group. The reciprocal interactions and the resulting dynamics in the group are reflected in the "here and now" and new behaviors are consciously developed together. Action Research emerged from this in 1946. It is a methodology for researching social change that is carried out through a repetitive spiral of three steps: 1st Planning: Gathering information about behavior and 2nd action: Performing social intervention in the field. The third reflection on the results of the intervention are exploring social changes.

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Outlook

The theories as TransLAB modification mentioned here are the basis of ideal-typical transition perspectives whom with the help and through the experiment as an innovative boundary object framed in Case for higher education transformation as methodological challenges. Methodological implementation like auxiliary positions for the presentation of the content requirements under consideration of the relevant process parameters within the framework of a scientifically conducted transformative debate follow the principle of the creation of a basic population (called triangulation in social science use), which ensures that different qualitative and quantitative data are discussed together as transitions. The relevance of these transitions will be discussed in four stages against the background of an interdisciplinary and transdisciplinary debate on patterns and vehicles as components of transformation research and as a framework for transition management through the TransLAB. Finally, such outlooks are compared with the conceptual logic of Transition Management (TM), Transformation and Sustainable Development (BNE) and reveal a harmony of methodological change as a prerequisite for a comprehensive methodological reorientation based on transdisciplinary methodology as a *space between content and structure* (interspace) which makes it possible to thematise a first structured approach to higher education transformation and thus also to achieve the goal of such a transformation.

„Field-responses“ from the four-part-TransLAB-modification to transformative challenges

Assumption one *knowledge and action – semantics and hermeneutics*

Assumption two *border – new paradigm inclusion*

Assumption three *location – orientation and meaning*

Assumption four *reinforcement – self-esteem and self-impact (feeling, consciousness)*

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