

CAUGHT BETWEEN TECHNICAL EXPERTISE AND TRANSDISCIPLINARY STRUCTURE FORMATION: OPPORTUNITIES AND PROSPECTS FOR (INSTITUTIONALISED) COMPETENCE BUILDING IN TRANSFER-ORIENTED RESEARCH USING THE CASE OF THE INNOWEST JOINT RESEARCH PROJECT

Cornelia Kühn ^{1*}, Christine Hobelsberger ², Antje Michel ¹, Verena Graf ², Pauline Hillenbrand ¹ and Gregor Schmidt ³

¹ University of Applied Sciences Potsdam, Germany

² Eberswalde University for Sustainable Development, Germany

³ Brandenburg University of Applied Sciences, Germany

Keywords:

Transdisciplinary research
Competence expansion
Knowledge transfer

Article history:

Received: 15 January 2026
Revised: 24 April 2026
Accepted: 5 July 2026

To cite this article:

Kühn, C., Hobelsberger, C., Michel, A., Graf, V., Hillenbrand, P. & Schmidt, G. (2026). Caught Between Technical Expertise and Transdisciplinary Structure Formation: Opportunities and Prospects for (Institutionalised) Competence Building in Transfer-oriented Research Using the Case of the InNoWest Joint Research Project. *European Scientific Journal for Dual Higher Education (ESJ DHE)*, 2 (3), 67-80.
<https://doi.org/10.82321/07ma-34m613>

Abstract

Research at higher education institutions (HEIs) is increasingly expected to address societal problems. In this context, transdisciplinary research practice is often referred to as a novel co-creative mode of research. However, collaboration with actors from outside the scientific system in transdisciplinary research projects requires specific competences. The article presents the formats for competence development in transdisciplinary research developed as part of the InNoWest joint research project, as well as the results of their formative evaluation. It outlines the potential and limitations of continuing professional development during project work, and reflects on the possibilities for the institutionalised development of transdisciplinary competences at HEIs. Drawing on the experiences of the German InNoWest joint research project, the article elucidates the ambivalence between transdisciplinary research as a mode of inquiry and the qualification and excellence criteria of scientific institutions, which are often based on technical expertise. The article further examines the conditions required to establish transdisciplinary research within German HEIs.

1 Introduction

Research at higher education institutions (HEIs) is increasingly faced with the challenge of enhancing exchange between science and society to address complex and interdisciplinary societal

* Corresponding author

E-mail address: cornelia.kuehn@fh-potsdam.de

problems such as climate change, social inequality, and technological change (WBGU, 2011; Wissenschaftsrat, 2020). To that end, HEIs should not only function as knowledge mediators, but also actively shape societal development. In this context, transdisciplinary research practice is highlighted as a co-creative approach to knowledge production and decision-making (Bruckermann et al., 2025). It is therefore unsurprising that the Germany-based Society for Research on Higher Education (Gesellschaft für Hochschulforschung, GfHf) has defined the examination of transdisciplinarity and transdisciplinary research as a pivotal subject for its annual conference in 2025 (Gesellschaft für Hochschulforschung, 2025).

However, for a transdisciplinary research project to achieve the desired effects, a change in attitude and additional competences is required on the part of scientists in the areas of communication and process management: In addition to disciplinary expertise, researchers are required to develop competences in areas such as communication, process facilitation, and knowledge integration (Barth et al., 2020; Studer & Pohl, 2024; Theiler et al., 2019). These competences differ substantially from traditional academic skill sets and are often not systematically addressed within existing academic training and institutional structures. As a result, there is a need to understand better how such competences and mindsets can be developed, supported, and embedded within HEIs.

Against this background, this article draws on the case of the German InNoWest joint research project to examine the development of capacity-building formats for transdisciplinary research within a research project context. The article is thereby guided by the following research question:

How can needs-based formats for building competences in transdisciplinary research be formatively developed within an ongoing research project?

On the basis of the findings and the general project experiences, the possibilities, as well as the challenges, of establishing transdisciplinary research and respective capacity-building formats in a more institutionalised way at German universities should also be discussed. To provide a more comprehensive contextual framework for the experiences that are being discussed in this paper, the article begins by briefly outlining transdisciplinary research as a novel research approach in its changed scientific mode (2). It then contextualises the InNoWest research network as the case context and outline the research design of our study to explain the conception and methodology of our approach to the reflexive, iterative development of formats to promote transdisciplinary research practice, and its formative evaluation (3). The detailed presentation of the individual offerings, their objectives, and the insights gained from their application and formative evaluation subsequently serves to reflect on their contribution to the project goals of InNoWest and their potential for promoting transdisciplinary research skills (4). Finally, the insights presented in chapter 4 regarding the formative development and evaluation of a portfolio of offerings aimed at expanding competences in transdisciplinary research are summarised and reflected upon within the context of scientific practice. This practice is situated between subject-matter expertise and transdisciplinary structural development. This is done by relating the key findings of our research to the discourse on the structural integration of transdisciplinary research within the current scientific system in the German-speaking region: On the one hand, with regard to its growing importance in addressing societal crises, and on the other hand, concerning its comparatively low recognition relative to disciplinary expertise in terms of excellence funding and career paths (5).

2 Transdisciplinary research: Origins and characteristics

2.1 Understanding of the term "transdisciplinary research" and its origins

To situate the experiences of formative competence development as a case study of implementing transdisciplinary research competences within German higher education structures, the specifics of transdisciplinary work in its origins and principles will be briefly explained here. In recent decades, the scientific system within HEIs and non-university research institutions has undergone a marked increase in specialisation and differentiation across various disciplines. This functional specialisation is increasingly confronted with societal challenges that, due to their

complexity, cannot be divided into problems that can be solved within a single discipline. Rather, an integrated approach is required. This challenges the self-understanding of science and the previous practice of knowledge production, and novel approaches to research that transcend disciplinary boundaries appear necessary.

This context gave rise to a political agenda in the 1990s to make science more societally oriented (United Nations Conference on Environment and Development, 1992). The 2011 flagship report of the German Advisory Council on Global Change was also influential in its call for an understanding of science as a driver of transformation, with the aim of overcoming the major challenges of our time (WBGU, 2011). Finally, in 2020, the German Council of Science and Humanities (Wissenschaftsrat) recommended that basic research and application-oriented research be viewed more as a continuum and that framework conditions be created in the science system for a "sovereign openness of the science system towards society" (Wissenschaftsrat, 2020, p. 5). In order to address societally relevant issues and in line with the demands of this political agenda, various forms of cooperation between science and societal practice have become established within science alongside interdisciplinary research. These include citizen science and open science, as well as user-centred research and real-world laboratories. These approaches may have different objectives and methods, but they also overlap and cannot always be clearly separated from one another (Grunwald et al., 2020, pp. 106-114). Transdisciplinary research fits into this diversity of co-creative research practices (Bundesministerium für Bildung und Forschung, 2023; Bruckermann et al., 2025).

The term transdisciplinarity now has a tradition stretching back more than 30 years, and there are various interpretations. Two of these are referred to here as "schools of thought of transdisciplinarity" (Lawrence et al., 2022, pp. 47-49): Transdisciplinarity, as it is understood especially in the American context, refers to the unification of different scientific knowledge in an effort to overcome disciplinary boundaries and open up new topic-specific fields of research. The other "school of thought" (particularly in the European context) explicitly involves societal actors, for example from politics, administration, business, associations, and citizens' initiatives in the research process in order to achieve societal impact with the research project. This societally oriented understanding of transdisciplinarity with its integrative concept of research practice has been developed particularly in environmental and sustainability science. These approaches to transdisciplinary sustainability research are informed by research questions that emerge from real-life problems, with the objective being to shape these problems and achieve societal transformation (Jahn et al., 2012, pp. 1-10). The InNoWest research network is based on this understanding of transdisciplinary sustainability research.

A characteristic feature of transdisciplinary research projects is that research is understood as a learning process: the aim of transdisciplinary sustainability research is not to provide purely scientific answers to societal challenges, but rather to design a process for understanding and changing the complexities of the societal situation (Thompson Klein et al., 2001, pp. 4-5). This requires a diversity of perspectives, experiences, and types of knowledge. The involvement of actors from outside HEIs in the research process is intended, on the one hand, to integrate this necessary relevant knowledge and take the diverse perspectives into account. On the other hand, the solution to complex societal problems should be conceived as a joint learning process with societal practice in order to design and shape collaborative solutions in transdisciplinary processes. The aim here is to promote personal responsibility for challenges so that the jointly developed ideas for transformation can also be implemented in practice. In this understanding, transdisciplinary research therefore involves a different mode of research; a changed way of conducting science: away from a purely knowledge-focused orientation and towards a stronger design orientation.

Three types of knowledge are often used as structuring elements in the research process in transdisciplinary research: 1) system knowledge as knowledge about the complex societal problem, 2) target knowledge as knowledge about the sustainable change to be achieved and the jointly desired future, and 3) transformation knowledge as knowledge about the options for action to change existing practices and introduce desired ones (td-net, 2025). In order to acquire the different types of knowledge, the transdisciplinary research process integrates the partial findings obtained in different ways depending on the research discipline in a problem-oriented and method-guided manner and – in contrast to interdisciplinary research projects – links them with the empirical

knowledge of the practitioners. Methodologically, both academic knowledge and the experiential and practical knowledge of practice partners are systematically processed, methodically reflected upon, and iteratively fed back into the research process during the transdisciplinary research project (Theiler et al., 2019).

Transdisciplinary research in the context of the environment and sustainability is therefore primarily problem-oriented, in that it not only seeks to gain insights, but also to develop solutions to problems. Transdisciplinary research links societal and scientific problems to apply both scientific and practical knowledge and generate appropriate solutions. Transdisciplinary research in this area is also process-oriented, as the question of research quality also includes the quality of the research process. Communicating what has been achieved and what impact was intended is an important part of the critical-reflective research mode. The transdisciplinary research described here is impact-oriented in that impact potential is considered a central element of the research. Both scientific outputs and their impact as well as societal effects are taken into account. Transdisciplinary research is integrative in that it integrates different disciplinary sub-knowledge and practical knowledge as mutual learning processes in the course of the research process (Bergmann & Schramm, 2008; Hoffmann et al., 2019; Jahn et al., 2012; Pohl & Hirsch Hadorn, 2007).

2.2 Challenges and conditions for success in transdisciplinary research

For this form of transdisciplinary research to succeed, in addition to the disciplinary methods of scientific research, methods for integrating knowledge are also needed from different disciplinary perspectives and the non-scientific practical knowledge of the actors involved. Furthermore, moderation methods must be incorporated into the process design to a greater extent than in other research modes to enable the necessary social and communicative framework for transdisciplinary cooperation and knowledge integration. This integration work runs throughout the entire research process – from the joint recruitment of project partners who are identified as key actors in problem-solving, to the joint development of the problem definition, to joint project planning and the developed project design. In an iterative process, the actors involved, the problem definition, and the project design are repeatedly reflected upon and modified as necessary (Theiler et al., 2019, pp. 62-76). At the same time, however, new scientific insights, new research impulses, and increasing reflexivity among scientists naturally emerge because of the transdisciplinary research process (Marg & Theiler, 2023, pp. 635-647).

The challenge of transdisciplinary research lies particularly in integrating the various scientific and societal actors, along with their respective knowledge and different practices of knowledge production, as well as their respective interests and perspectives, throughout the entire research process. This integration operates at several levels: The level of knowledge integration concerns the linking of scientific expertise with everyday practical knowledge. The level of social integration involves connecting the different demands, expectations, and interests of various individuals, groups, and institutions. At the level of communicative integration, different communicative practices such as technical languages and terminology must be jointly clarified (Bergmann et al., 2010, pp. 41-43). In doing so, existing power structures and inequalities must also be recognised and balanced.

In order to ensure that this integration work is successful, there are various methods and tools that can be employed at different times and with different objectives in workshops with practice partners (see, for example, the td-net toolbox: scnat, n.d.; and the toolbox: tdAcademy, 2025). Even though a successful research and integration process increases the chances of successful implementation, the application of transdisciplinary methods and tools alone is not a guarantee of success. When it comes to the project goal of achieving societal transformation, various external conditions naturally also play a role, and these can be influenced only to a limited extent during the project period (e.g., sudden changes in political support, natural changes, new economic conditions, etc.).

3 Methodology: Formative competence development and reflexive evaluation in the InNoWest joint research project

As outlined in the introduction, the aim of this paper lies in examining how needs-based formats for building transdisciplinary competences can be formatively developed within an ongoing research project. Based on these experiences, the article further reflects on possibilities and limitations of institutionalising transdisciplinary competence building as well as transdisciplinary research as a research mode at German HEIs. To this end, the article draws on the German InNoWest joint research project as a single-case study, which, following a mixed-methods approach, is being informed by multiple sources of evidence (Yin, 2003). The InNoWest project is regarded here as a single case in the sense of a heuristically defined unit of analysis (Hering & Schmidt, 2014). Throughout the research process, which draws on various evaluation methods, the aim is to gain a comprehensive understanding of this specific case, particularly with regard to the factors relevant to the development of a needs-based portfolio of formats for formative competence development in transdisciplinary research. By placing the results within the context of the relevant academic literature, the findings are examined in terms of their relevance beyond the single case.

Accordingly, this section defines the boundaries of the InNoWest case and outlines the research design of the study as well as the data collection instruments and analysis methods underlying the iterative development and formative evaluation of the competence development formats within the subproject "Knowledge Transfer".

3.1 Case context: The InNoWest joint research project

The "Innovative University" programme, a funding initiative of the Federal Ministry of Research, Technology and Space, aims to raise awareness and provide support for the transfer of new research findings and application-oriented innovations as a third mission, particularly at small and medium-sized universities or universities of applied sciences, in order to promote the impact of universities as drivers of innovation in their regions (Bundesministerium für Forschung, Technologie und Raumfahrt, n.d.). The joint research project "InNoWest: Just do it! Working together for sustainability and digitalisation in north-west Brandenburg" (duration 01/2023 – 12/2027) is funded as part of this federal-state initiative. The aim of the project is to establish and consolidate transfer structures between science, municipal actors such as administrations, but also small and medium-sized enterprises (SMEs) and civil society in various communities in the north-west of the federal state of Brandenburg, Germany. Furthermore, the joint research project is also intended to have an impact on universities and to further develop and expand transdisciplinary research practices at the participating universities and HEIs (InNoWest, n.d.-a). InNoWest fosters reciprocal transfer between universities and society through transdisciplinary research: by convening actors from diverse scientific backgrounds (disciplines and universities) with actors from non-scientific practice, the project ensures the transfer of knowledge about relevant problems and working methods from practice to universities on the one hand, and promotes the transfer of jointly obtained results into the working practice of non-scientific actors on the other.

Structurally, InNoWest is a consortium with approximately forty employees and fifteen professors from three universities of applied sciences in Brandenburg – the Eberswalde University for Sustainable Development (HNEE), the Potsdam University of Applied Sciences (FHP), and the Brandenburg University of Applied Sciences (THB). The network comprises six teams, of which three teams are responsible for strategic and structural measures, as well as project coordination. The other three teams are so-called innovation teams that conduct research and work on topic-related projects. These pilot projects are located in the north-west Brandenburg region.

The objective of the InNoWest joint research project is, on the one hand, to provide impetus for sustainable development in and with the region in the areas of user-centred digitalisation, future-oriented restructuring, and education for sustainable development and participation. On the other hand, the project consortium aims to establish knowledge transfer between science and the various practical actors, create an exchange, initiate communication between universities and society, and implement this cooperation with practice in the university structure. The joint research project therefore does not rely on existing and established structures between science and society but aims

to do pioneering work – in establishing and, ideally, perpetuating such transfer structures between science and practice, in passing on knowledge about such successful projects to practitioners, and in establishing transdisciplinary research competences at universities.

The InNoWest sub-project "Knowledge transfer for regional learning processes" or team "Knowledge Transfer" is based in the strategic-structural teams and provides support to the innovation teams in their transdisciplinary research processes and transfer projects (Team Wissenstransfer, n.d.). The innovation teams in the InNoWest research network consist of researchers from various disciplines who contribute their disciplinary expertise to transdisciplinary research projects to help solve societal problems. Some of them already have experience in transdisciplinary or participatory projects, but this was not usually a key selection criterion when filling the positions. The task of the "Knowledge Transfer" team has been to develop and implement formats for transdisciplinary knowledge and competence development within the network, to stimulate reflection on research activities, and to promote the exchange of research at the participating universities of applied sciences.

3.2 Research design and evaluative logic

In developing the portfolio of services of the "Knowledge Transfer" team within the InNoWest research network, an iterative-prototyping and needs-oriented approach was adopted: based on best-practice examples from existing competence development projects aimed at promoting transdisciplinary research skills (Barth et al., 2020; Studer & Pohl, 2024), basic formats for potential offerings were identified. This concept was further developed through needs assessments conducted within the entire InNoWest project team. The content focus was guided by articulated needs. Throughout the duration of the InNoWest project, this approach was intended to develop a portfolio of services that supports the formative skill enhancement of researchers in transdisciplinary projects. For the target group-specific, iterative improvement of the portfolio of services, the individual service formats and contents were formatively evaluated using a mixed-methods design (Döring, 2023). The objects of evaluation were thus both the service formats and the specific content of the individual events. The central target group of the evaluation consisted of the heterogeneous group of scientific project staff, who differed in prior knowledge, professional background, and role within the InNoWest project. The evaluation instruments were each developed to suit the object of evaluation and the requirements of the target groups. Since the members of the stakeholder groups are heavily involved professionally and the individual programme formats are brief in duration, the instruments are designed to be processed quickly and easily. The central function of the evaluation was to determine the extent to which the programme formats and content promoted the participants' learning processes (competence development processes). Since the team members of the "Knowledge Transfer for Regional Learning" team both developed and conducted competence development programmes and also evaluated them, the evaluation concept was an internal evaluation. The potentially lower degree of neutrality associated with internal evaluation compared to an external evaluation form was addressed through critical reflection on potential role conflicts in all phases of the research process, as well as by dividing implementation and evaluation tasks within the team as much as possible.

3.3 Data collection instruments for evaluating competence development formats

The formats presented in more detail in Chapter 4 for promoting transdisciplinary methodological competence and reflection on research practice are listed in Table 1 along with their respective objectives and target groups. The last column of the table lists the data collection instruments used to evaluate the formats with the aim of their formative further development. For each format, an appropriate evaluation instrument was developed by the team "Knowledge Transfer" and used in addition to participation statistics, which on the one hand reflected the design and implementation of the offering and on the other hand served to identify further needs.

In addition, after just over a year of project duration, qualitative guideline-based interviews were conducted by members of team "Knowledge Transfer" with project staff in all roles to reflect on

the onboarding phase in the project consortium. The guideline included explicit questions for reflecting on the competence development formats. It also addressed the institutional context of research activities within the complex consortium project.

Table 1. Overview of the formats developed by the "Knowledge Transfer" team in the InNoWest research network

<i>Format</i>	<i>Target</i>	<i>Participants</i>	<i>Evaluation tools</i>
Methodology workshop "ttt – testing transdisciplinary tools"	Competence expansion in transdisciplinary methods	Researchers and professors of the InNoWest research network and employees of all four universities of applied sciences in Brandenburg	1. List of participants with professional background (standardised) 2. Observation sheets during the workshop (partially standardised) 3. Participant feedback rounds at the end of the workshop (partially standardised) 4. Questionnaire to the participants six weeks later (partially standardised)
Reflection workshops & peer consultation	Reflection on research activities and collaboration, exchange of experiences	Researchers and professors of the InNoWest research network & practice partners	1. Group discussion (partially standardised) 2. Participant feed-back sessions at the end of the workshop (partially standardised) 3. Reflections on the enquiries received by the 'Knowledge Transfer' team regarding peer consultation
Doctoral Day & doctoral and research colloquium	Strengthening cooperation between the four universities of applied sciences in Brandenburg & promoting transdisciplinarity as a research mode	Employees of all four universities of applied sciences in Brandenburg, especially doctoral candidates and students interested in pursuing a doctorate	1. Needs assessment among InNoWest researchers (partially standardised questionnaire) 2. Feedback sessions from the participants at the end of the Doctoral Day and the doctoral and research colloquium
Qualitative semi-structured interviews with members of the InNoWest research network to reflect on the onboarding phase in the collaborative project			Qualitative content analysis

Since most evaluation tools were designed as parts of the individual competence development programmes, their response rate for data collection was 100%. Only the questionnaires administered after the ttt workshops had an average response rate of 60%.

3.4 Analysis methods

The quantitative elements of the evaluation instruments (participant statistics, standardised elements of the observation sheets, and documentation of discussion rounds) were analysed using descriptive statistics. The qualitative elements (observation sheets, interviews, open responses, group discussions and reflections on the enquiries received by the "Knowledge Transfer" team) were analysed using qualitative content analysis according to Kuckartz (2018). The category system was initially developed deductively from the objectives of the programme portfolio and additionally

inductively from the data material during the coding process. To enhance analytical reliability, inter-coding was carried out by two members of the "Knowledge Transfer" team in each case.

3.5 Synthesis of the evaluation data

The findings presented in the results chapter are based on a triangulation of quantitative and qualitative evaluation data. The aim was to make visible the needs of the scientific staff of the InNoWest project as well as organisational and structural factors that influence the effectiveness of the competence development offerings. The triangulation took place in workshops of the entire "Knowledge Transfer" team, in which each member presented the results of the survey they had primarily conducted. The insights were then compiled and interpreted in relation to the common research questions. Explicitly, the possibility of bias in the results due to role conflicts of team members as both programme developers and evaluators was always reflected upon.

3.6 Ethical considerations

Ethical considerations were considered throughout all phases of the research process. Participation in all evaluation activities was voluntary. Participants were informed about the purpose of the study, the use of the collected data, and their right to withdraw at any time without any negative consequences. Data collection and processing were conducted in accordance with applicable data protection regulations, in particular the General Data Protection Regulation (GDPR). Personal data were minimised and, where collected, handled confidentially, pseudonymised where necessary, and stored separately. No personally identifiable information was included in the analysis or reporting of results. To further ensure the protection of participants' identities within the research consortium, results were reported in aggregated form, and potentially identifiable elements – such as the use of anchor quotations in the presentation of results – were deliberately omitted.

4 Results and discussion: Presentation and evaluative reflection of the formats for formative competence development

This section presents the individual formats for formative competence development in transdisciplinary research, which were developed by the "Knowledge Transfer" team. In addition, based on the synthesis of the evaluation results, the challenges and potential of the formats are discussed in terms of their contribution to the project objectives of InNoWest and to the fundamental promotion of transdisciplinary research competences.

4.1 Methodology workshop "ttt – testing transdisciplinary tools"

For transdisciplinary knowledge and competence expansion in InNoWest, a series of workshops entitled "ttt – testing transdisciplinary tools" was developed at the beginning of the joint research project (Kühn & Schmidt, n.d.). The format was designed based on experience gained from existing competence development projects, primarily from the BMFTR-funded "tdAcademy" project network and the td-net toolbox based at the Swiss Academies of Arts and Sciences (SCNAT). After the first workshop was held, detailed feedback on the format was collected and a survey was conducted to determine the need for further content. The aim of the workshop series is to provide innovation teams with process methods for the various phases of transdisciplinary and participatory project work and research. A workshop lasts 1.5 hours and usually takes place once a quarter. Initially, it was held in person, but an online workshop is now being designed and offered so that more employees from all three universities of applied sciences can participate. The workshop is structured in such a way that the respective tool is first briefly presented and then tried out together with the participants in a practical and application-oriented manner using a fictitious scenario. At the end of the workshop, attention is drawn to potential obstacles and moderation tips for using the tool. The idea behind this is that participants will then be able to use the tool themselves in their respective research projects. The tools have so far either come from the td-net toolbox of the Swiss Academy

of Arts and Sciences (schat, n.d.) or a separate workshop has been designed with the presentation of secondary literature on a specific question and a subsequent exchange of experiences on the respective topic.

When selecting topics, the aim is to choose the respective tool or topic in accordance with the needs-based approach to developing offerings in such a way that it also fits in with the respective stage of the innovation teams' project work. However, reflection on the project activities in the various innovation teams has shown that this is only possible to a limited extent due to the asynchronous nature of the projects in the different teams. For instance, some teams were already in close contact with partners in the field, while others were initially busy developing prototypes for practical applications and only approached potential partners in the field at a later stage of the project. Participation in the workshops was voluntary, with an average of five to seven participants per InNoWest workshop, corresponding to 10 to 20 per cent of project employees.

With regard to the participants of the workshops, an analysis of the list of participants showed that so far they have so far come almost exclusively from a specific professional culture and a specific area of work within the network: They were primarily humanities, cultural, and social scientists who already had experience with perspective shifts and reflexivity and whose areas of work within the InNoWest network were compatible with transdisciplinary areas of knowledge and competences, such as project management, stakeholder management, network expansion, or the development of a citizen science project. Based on the analysis of the various evaluation formats, it was determined that participation in the workshops was encouraged by this awareness among employees and depended on whether supervisors and the innovation team considered participation to be relevant to the project work.

Since one of InNoWest's tasks is to promote regional learning processes beyond the project period, the workshop series was opened to members of all four Brandenburg universities of applied sciences from December 2024 onwards. Since then, the workshop has also been used by various employees from all four universities who belong to different disciplines and status groups – from students in higher semesters and research assistants in the doctoral and postdoctoral phases to people in research support positions and professors. The fact that a disproportionate number of participants came from a university with an explicitly transdisciplinary orientation is seen as an indication that, even for those outside the project, familiarity with transdisciplinary working methods and the university's agenda setting in this regard are factors in the decision to participate. Participation in the workshops, which are open to all employees of Brandenburg's universities of applied sciences, has so far ranged between five and ten people. A particular challenge is to establish university-specific formats for promoting the programme.

Based on the findings from the feedback sessions and questionnaires, the formative support of transdisciplinary research activities through needs-oriented competence development offerings has the potential to support the research activities of those who participate in the offers. However, participation depends on specific framework conditions that influence the relevance attributed to transdisciplinary competences. In complex teams or organisations, needs orientation is limited by the asynchrony of the individual research processes.

4.2 Reflection workshops and peer consultation

Specific formats were developed for the researchers in the InNoWest research network to reflect on research activities in the innovation teams and in the network. Twice a year, a retreat or network meeting was held as part of the joint research project, to which all scientific staff and professors and, in some cases, practitioners or intermediaries were invited. To promote cooperation and mutual learning processes within the network and with practitioners, workshops and exchanges of experience were held at these meetings, which were organised or co-organised by the "Knowledge Transfer" team (Hobelsberger, n.d.). In addition, coaching sessions on team building and science communication, collegial advice for individual research projects, and further training on moderation methods for large groups were provided by external experts. In addition, the team working on the "Knowledge Transfer" sub-project was available to facilitate discussions and design workshops within the individual innovation teams. The innovation teams were supported in developing joint milestone plans for their projects, operationalising their goals, and addressing broad

questions about collaboration. The externally facilitated activities were designed directly within the teams and were evaluated positively. The involvement of the "Knowledge Transfer" team in internal team meetings was also initiated and announced by team coordinators, but was not always equally accepted by all, as it gave rise to concerns regarding confidentiality and the internal hierarchy of the teams.

The workshops were documented and the results were fed back into the research network or the relevant team. In response to feedback from the network meetings, in which orientation within the terminology and associated disciplinary discourse was repeatedly articulated as a challenge, a moderated terminology workshop for the entire InNoWest team was offered. In addition, the workshop was used as an impetus to clarify further terminology in the respective teams (InNoWest, n.d.-b). As a further development, the results of the terminology workshop were used to compile a glossary of terms commonly used within the InNoWest network, such as "transdisciplinarity", "transfer", but also "digitalisation" and "sustainability". The glossary was subsequently made available to the teams and the practice partners and was considered helpful for project work in feedback sessions and was further developed within the teams.

Another effect of these workshops was that the work of the "Knowledge Transfer" team became more visible to the innovation teams, who subsequently approached the "Knowledge Transfer" team with a request to design and conduct workshops at their own internal team meetings and in-person attendance days. The topics covered also included clarifying roles and responsibilities within the team.

Formative opportunities for reflecting on research practices and the quality of processes thus provide opportunities for the further development of needs-based initiatives, as illustrated by the example mentioned above of developing a shared glossary within the teams. When designing programmes, consideration should be given not only to thematic priorities but also to staff configurations and project- or institution-specific power structures, as demonstrated by the requests for mediation in team conflicts received by the "Knowledge Transfer" team.

4.3 Doctoral Day and doctoral and research colloquium

The development of the doctoral and research colloquium provides a particularly vivid illustration of the iterative and needs-oriented format development process: Since promoting and strengthening cooperation and exchange on research and transfer among Brandenburg's universities of applied sciences is one of InNoWest's project goals, the "Knowledge Transfer" team developed a concept for a doctoral and research colloquium. As a result of the concept presentation to the project's professorial staff, it was recommended that a needs assessment be carried out among the project staff. The needs assessment showed broad interest in offers to promote doctoral projects, but with a focus on organisational issues. Therefore, the colloquium concept was put on hold and an information day on the topic of doctoral studies was designed first. To establish the programme across all four universities of applied sciences in Brandenburg from the outset, it was developed and implemented in close cooperation with the doctoral programme coordinators of all four universities. In this way, the Doctoral Day also served as a pilot project for the planned Brandenburg doctoral programme for the implementation of the newly created right to award doctorates at universities of applied sciences and was initiated and implemented in autumn 2024 at the Potsdam University of Applied Sciences (Schmidt, n.d.). The Doctoral Day was very well attended for a premiere, with approximately sixty participants. It was continued in autumn 2025 at the Eberswalde University for Sustainable Development (InNoWest, n.d.-c).

The Doctoral Day created a format for strengthening cooperation between the four Brandenburg universities of applied sciences and establishing their practical and application-oriented nature as a "trademark". One piece of emphatic feedback from the Promotion Day was that there was a desire for an exchange of content with examples of research at universities of applied sciences and the opportunities for doctoral studies. The formal offer thus paved the way for initiating a needs-oriented professional exchange, which had been considered less relevant in the initial needs assessment in the project context. The Doctoral Day was the start of a doctoral and research colloquium at Brandenburg's universities of applied sciences, which was held as an online event in the summer semester of 2025 under the title "Application-oriented – problem-solving –

transdisciplinary: Research at universities of applied sciences" (InNoWest, n.d.-d). The number of participants in the colloquium in the summer semester was approximately twenty per session. The doctoral and research colloquium was also continued in the winter semester 2025/26. Since the summer semester of 2026, both tasks have been taken over by the newly established service centre for the doctoral programme at Brandenburg's universities of applied sciences. This meant that both the Doctoral Day and the doctoral and research colloquium were well established and institutionally anchored in such a way that they can continue to take place even after the InNoWest funding has expired.

As the case of the divergent responses at different points in time regarding the need for a research colloquium shows, a consistent focus on needs when developing capacity building programmes may require questioning formulated goals and adjusting them in response to identified needs. It may become apparent that ambitious goals can be accepted through intermediate steps. Linking these formats to institutional structures also appears to be helpful for integrating project structures into university operations.

5 Summary of results and conclusion: Transdisciplinary research between societal application orientation and disciplinary career paths

At the outset, the following research question was formulated:

How can needs-based formats for developing competences in transdisciplinary research be formatively developed within an ongoing research project?

The results of the iterative offer development and its formative evaluation presented in Chapter 4 clearly show, within the framework defined by the project constellation and study design, that a needs-oriented competence development concept for transdisciplinary research can fundamentally be designed effectively, but its impact depends largely on organisational conditions.

The analysis highlighted that formats such as methodology workshops, reflection spaces, or cross-university doctoral programmes can be successfully developed prototypically and adapted based on the results of their formative evaluation. Their benefits – particularly in terms of expanding methodological and reflective competences – are demonstrable through the generally positive feedback from participants as well as through their respective role in the research activities of the actors in the project, provided that they are utilised.

The InNoWest project case study highlights the following key findings: Overall, the concept of competence development accompanying the research process was well received. However, it was not possible to reach all researchers, as their willingness to participate depended on their awareness of the topic and was influenced by the commitment of their supervisors or the university's agenda-setting. In particular, researchers from the humanities, cultural studies and social sciences took part, as well as academics who were generally familiar with transdisciplinary working methods due to their university's agenda. Formative reflection on research practice supported the further development of the InNoWest consortium. Programmes were sometimes more readily accepted when developed incrementally. Moreover, assessing needs involved not only identifying content-related requirements but also considering personnel and hierarchical structures within the consortium.

Furthermore, based on our experience with formative competence development in the case study of the InNoWest joint research project, it can be concluded that a needs-based approach reaches its limits in heterogeneous and asynchronous project constellations: As has been shown, the development of tailor-made programmes within larger consortia or even across an entire organisation is scarcely feasible due to differing project phases, roles and dynamics. This suggests that, whilst iterative format development in transdisciplinary research is a central component of successful competence development, it does not constitute a sufficient or generalisable condition. Additionally, scientists themselves perceive a clear distinction between discipline-specific competences and those transdisciplinary skills that target the social, communicative, and process-related dimensions of knowledge integration (Jahn et al., 2012; Barth et al., 2020). However, in transdisciplinary projects, these two areas of expertise are not only distinct but are often arranged in

a hierarchical order: From a systemic perspective, specialist skills are traditionally valued more highly within the academic system, whilst skills relating to knowledge integration or process management receive less institutional support. As long as disciplinary excellence criteria – such as “originality of research, international competitiveness, and academic reputation” (Verwaltungsvereinbarung, 2022) – remain dominant and the corresponding assessment criteria are primarily focused on disciplinary theories and methods as well as on discipline-specific publication cultures, transdisciplinary skills appear to many researchers to be an “add-on” with little institutional value. Studies also show that doctoral projects in transdisciplinary contexts are often viewed, in the short term, as disadvantageous for career progression (Rogga & Zscheischler, 2021). This reveals a clear discrepancy between the socially demanded transdisciplinary practice and the still discipline-oriented evaluation and incentive structures of the scientific system.

Against this backdrop, it is clear that needs-based initiatives for skills development and networking can indeed help to reduce this perceived gap, but only to a limited extent. As observed in our workshops, opportunities for transdisciplinary skills development are often viewed as supplementary to core disciplinary tasks and are only taken up when time is available, when there is an explicit expectation from line managers, or when the task is embedded in the individual’s job description. The findings from the evaluations also show that while many employees are highly interested in the societal impact of their research, further training in transdisciplinary methods is not always seen as a priority task. At times, even the high application orientation and the associated slowing down of work processes are perceived as a risk to their own professional development. This impression can be reinforced when researchers in transdisciplinary project contexts feel that they are not adequately prepared for the associated demands. The fact that some research staff have left the InNoWest consortium to pursue discipline-oriented doctoral projects also points to structural tensions.

At the same time, the new forms of cooperation and exchange developed within the InNoWest project – such as cross-university retreats, a joint glossary of key terms, or the established doctoral and research colloquium – make visible the potential of structured, institutionally supported learning spaces to anchor transdisciplinary research in the long term. The demands formulated in the tdAcademy position paper for capacity-building initiatives, reliable career paths, and stronger institutionalisation of transdisciplinary and transformative research (Partner:innenkreis tdAcademy, 2023) therefore align directly with the experiences gained in the InNoWest project. Establishing corresponding structural conditions – both in the funding landscape and within academic institutions – would be a central component in addressing the currently visible challenges.

Several limitations of the study should be acknowledged. First, by drawing on the InNoWest project as a single case study, the specific institutional and regional context of the InNoWest project may limit the transferability of the results to other settings. Second, the internal nature of the evaluation entails potential biases related to the dual role of the members of team “Knowledge Transfer” as both programme developers and evaluators. Although efforts were made to mitigate these effects through reflexive practices and a partial separation of roles, the possibility of bias cannot be fully excluded. Third, self-selection effects may have influenced the findings, as participation in the competence development formats was voluntary. It is therefore likely that individuals with a prior interest in transdisciplinary research were overrepresented in the evaluation. Finally, the study focuses primarily on short- to medium-term competence development processes. Long-term effects on research practices, institutional change, or career trajectories could not be assessed within the scope of this study.

Nevertheless, based on the experience of the „Knowledge Transfer” team with the formats offered for developing transdisciplinary research competences, it can be demonstrated that familiarity with the specific characteristics, challenges and conditions for success of transdisciplinary research is key to the acceptance and prioritisation of transdisciplinary tasks. Greater structural recognition of transdisciplinary competences within the academic system could therefore provide crucial incentives for a broader anchoring of this research approach. With the expansion of appropriate institutional structures and recognition systems, the identified challenges could likely be further reduced in the future, and the societal application orientation of HEIs could be sustainably strengthened.

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