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# Knowledge Transfer in Geography - Reconstructing implicit orientations of Teacher Trainers in exchange processes with researchers using the example of the subject Geography

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## Abstract

The transfer of research findings into teaching practice is often defined as a mutual exchange process between research and teaching practice. In the exchange and handling of new findings, the implicit-action-guiding orientations of teachers in particular are highly important. The present study is dedicated to reconstructing these orientations of teacher trainers of geography, who, as educators of trainee teachers in the second practical phase of the German teacher training system, occupy a unique position between research and teaching practice. Using the documentary method, different orientations of the teacher trainers were reconstructed through multiple group discussions. These were conducted in the context of a one-year training series on new insights into China's innovation-based economic development. These orientations move along a continuum between instruction and co-construction. From these findings, important insights for future transfer research and practice can be derived.

## Keywords

knowledge transfer, theory-practice Gap, documentary method, implicit orientations, Teacher Trainer of Geography

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## 1 Introduction

Academic discourses about the theory-practice problem frequently point out a large temporal gap between the generation of innovative findings and concepts and their widespread implementation in classroom practice for the educational system (Morel et al., 2019). Regarding the transfer of scientific knowledge into teaching practice, teachers as key actors in designing lessons play a decisive role (Elmore, 2016). In particular, the implicit action-guiding knowledge stocks are crucial in this context, as the reconstruction of these implicit cognitions can reveal the fractures between knowledge and skill (Neuweg, 2014). Despite their great importance, implicit cognitions are decisive for the way in which innovations are transferred and multiplied. So far, their reconstruction has been insufficient. The present study aims to reconstruct the implicit knowledge of teacher trainers of geography, who, as central actors in the second practical phase of the German teacher training system, have a wide range of experience in transfer contexts.

The basic framework is provided by a cooperation project between partners from economic geography, geography didactics and education administration. In this project, new teaching-relevant findings on China's economic development with a focus on independent innovations and the resulting new self-image of China (Liefner et al., 2019) were elaborated in an advanced training series with the teacher trainers and prepared in an innovative way for integration and scaling up in teaching practice.

## 2 Theoretical Approach - Transfer in the context of action guiding knowledge of actors in school practice

### 2.1 *Teachers as key actors in transfer processes*

Transfer is nowadays defined as a process of exchange between science and practice, in which the boundaries of the different reference systems are bridged dialogically and mutually-interactively (Froese et al., 2014). The aim of such processes is translating and developing compatible knowledge for both sides, which can be further integrated by the school practice into the teaching design and thus be used for the goal of “scaling up of scientifically based innovations in the education system” (Gräsel, 2010, p. 7; more detailed in Jakobs, 2021)<sup>1</sup>. According to Coburn (2003), successful transfer and scaling-up processes not only include the spread of an innovation, but also qualitative indicators of depth, sustainability and identification. At the center of these processes are actors from research as well as from teaching practice, who must do justice to multifaceted and often interacting influencing factors in order to ensure successful transfer. Thus, it can be assumed that transfer always involves an “adaptation to the conditions at hand” (Gräsel, 2019, p. 3) and that notions of an immediate transfer are not tenable, since “no direct and situation-sensitive instructions for action can be taken from scientific and

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<sup>1</sup> German quotes have been translated for better understanding

theoretical knowledge” (Helsper, 2021, p. 136). In addition to a wide range of external factors (e.g. the attractiveness of innovations or the design of a supportive and transfer-promoting environment), there are in particular internal characteristics of teachers that can either promote or counteract transfer processes (Jäger, 2004)<sup>2</sup>. In particular, motivational and cognitive dispositions of teachers prove to be virulent in this context, since they are partly subconscious to the actors and often function as frames, filters or barriers significantly influencing their actions (Reusser & Pauli, 2014). Against this background, a closer look at the central action-guiding knowledge of teachers seems essential in order to approach professional action in transfer contexts from a theoretical perspective.

## 2.2 Professional knowledge and skills of teachers in the context of transfer

Within the cognitive psychology concept of the expert approach (Krauss, 2011), teacher competence is seen as an interplay of professional knowledge, self-regulatory skills, motivational orientations, and beliefs and value attitudes (Baumert & Kunter, 2013). Based on a taxonomy by Shulman (1986), professional knowledge can be further differentiated into content knowledge (CK), pedagogical content knowledge (PCK) and pedagogical knowledge (PK). The importance of these knowledge stocks of teachers has been shown in many studies. For example, a deep professional understanding (CK) has high effects on student learning (Hattie, 2012). Pedagogical content knowledge (PCK) as “making content understandable” (Krauss et al., 2008, p. 227) promotes cognitively challenging lessons as well as adaptive support for learners (Neuweg, 2014). In addition to these mostly explicit knowledge resources, teachers’ implicit cognitions in particular play a significant role. According to Helsper (2021), in this context the “difference between scientific and *action knowledge or ability* is to be assumed” (p. 136). Scientific knowledge thus provides reasoning and reflecting knowledge that is distinct from teachers’ skills based on experiences. This ability, applied in concrete situations of action, has an inherent implicit knowledge, “which is not easily verbalized and which professional actors themselves are partly unaware of” (Helsper, 2021, p. 137). Neuweg (2014) takes up the differences between explicit and implicit knowledge in his conception of teacher knowledge and distinguishes between three different forms. While knowledge 1 refers to “knowledge in the book” (p. 584), representing aforementioned explicit professional knowledge of teachers acquired in education and further training, knowledge 2 refers to “knowledge in the head” (p. 584). In the sense of cognitive structures, including beliefs and subjective theories, knowledge 2 lies between an explicitly retrievable and an implicitly hidden level. Such overarching and profession-related beliefs are seen as a significant component of teachers’ professional action competence, as “they influence and control the selection of goals and action plans, the perception and interpretation of situations, as well as didactic and communicative action and problem solving in the classroom” (Reusser & Pauli, 2014, p. 642). In particular, biographically formed beliefs are often highly resistant to restructuring and

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<sup>2</sup> It should be considered that the internal motivational and cognitive characteristics of researchers can also have an impact on the transfer process.

change due to their function of stabilizing action and protecting against shocks. Transformative changes take place “as a rule only against resistance, pressure and crises” (p. 645). Connections to knowledge 3 according to Neuweg (2014), which resembles the previously described ability and manifests itself “in practical action” (Helsper, 2021, p. 137), are recognizable here. It is not accessible to the actors themselves, but can only be grasped through the observation and reconstruction of the logic of action by observers from the outside. As an implicit or incorporated form of knowledge, it is highly comparable with what Bourdieu (1976) or Bohnsack (2021) describe as *habitus* or *modus operandi* of action practice (see Chapter 5). It should be noted that between these forms of knowledge, there are multiple breaking points and transformations become possible. Accordingly, training knowledge (knowledge 1) already undergoes significant transformations in the process of acquisition, for example, by influencing deeper beliefs (knowledge 2). The relations or discrepancies between knowledge 1 and knowledge 3 are often described as a theory-practice problem, whereas the relations between knowledge 2 and 3 mark the tension between knowledge and skill (Neuweg, 2014). It should be emphasized that all forms of knowledge are of great importance for the successful transfer of innovations into practice. Subject-related qualification measures are needed to enable teachers to deal with new scientific findings (Prediger et al., 2019). At the same time, the implicit cognitions and orientations of teachers in such transfer processes must be considered, as the updating or changing of action routines, which is mostly genuine for successful transfer processes, always takes place against the background of these implicit knowledge stocks. In particular, the habitual patterns that are usually not reflexively accessible to teachers should be the focus of research.

### *2.3 Teacher Trainers of Geography - selected empirical findings on knowledge and practice in context of transfer*

The focus of the present study are teacher trainers of geography. They play a central role in the transfer of scientific knowledge into teaching practice. As the main actors in the second phase of the German teacher training system, they are responsible for the school practical training of trainee teachers (Fischer, 2021)<sup>3</sup>. In this position, they occupy a mediating function between theory and practice, especially from the educational policy side. Accordingly, the German Kultusministerkonferenz (KMK) requires them to have both “special scientific and practical school expertise” (KMK, 2012, p. 4). The German Society for Geography (DGfG) also assigns teacher trainers the task of testing didactic concepts and reporting back practice-relevant impulses to the universities. The DGfG considers the teacher trainers to have the duty to act as multipliers of didactic and pedagogical innovations in teacher training and further education (DGfG, 2010). In the specific case of geography, it must be considered that geography is different from other subjects, as it is the only subject claiming to be both a

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<sup>3</sup> The initial teacher training in Germany is generally divided into two phases that must be successfully completed. While the first phase takes place at universities and ends with a university degree, the second phase consists of a practical preparatory service and takes place in schools and special teacher training institutes (for more detailed, see Fischer, 2021).

social science and a natural science subject (DGFG, 2010). These different approaches to the subject and the demand for multi-perspective networking result in great challenges for teacher trainers, the transfer of knowledge, and the professionalization of geography teachers.

From an empirical point of view, research on the group of teacher trainers appears to be deficient so far (Gerlach, 2020). Looking at previous studies, however, the seemingly clear role attribution to be part of the innovation system in the perspective of educational policy proves to be evidently more confused in the empirical observation. Fischer (2022a) shows that the teacher trainers of geography often perceive incoherencies in the form of a distance between university research and school practice, responsibility differences and non-transparent objectives. Accordingly, it is often criticized that geography didactics is blind to the requirements of school practice. However, the teacher trainers themselves seem to be rather distant to research, since only very little cooperation was reported (Fischer, 2022a). Furthermore, subject-specific didactic theory is only attributed a low relevance in reflection interviews with teacher trainers (Fischer 2022b). With regard to the design of their own seminar and consulting practice, Fischer (2022b) refers to a distinction between more transmissive and more co-constructive practices. Similar results can be found in the study by Gerlach (2020), who reconstructed different types of teacher trainers in the context of foreign language didactic preparatory service. These differentiate themselves with regard to transmissive-instructivist and moderating-co-constructivist orientations in the design of their training practice as well as with regard to more distinctive and more identifying positioning towards the trainee teacher and the formal specifications of the training system. It seems particularly noticeable that the teacher trainers in both studies implicitly identify themselves rather as teachers than teacher trainer across all types. Thus, they also construct the teacher training in terms of power theory as a hierarchically shaped teacher-learner relationship including a strong knowledge gap. In international contexts, special attention is paid to identity research and the transformation from first-order teachers to second-order teachers that comes with specific practices in the new field of teacher education (Murray, 2002, Swennen et al. 2010)<sup>4</sup>. In this regard, Murray and Male (2005) show in an interview study that new teacher educators need up to three years to find their new professional identity despite a previous successful career as a school teacher. Van der Klink et al. (2017) point to professional biographical developments that shift from a mode of “survival in a new and complex context” (p. 174) that is formative at the beginning of the job to a mode of searching for one's identity as a teacher educator and a greater focus on the trainee as experience increases. As a result of a literature review, Swennen et al. (2010) were able to reconstruct four sub-identities of teacher educators. The teacher educators as school teachers (1) still identify very strongly with their previous work as teachers, whereas the teacher educators as teachers in higher education (2) increasingly refer to principles of

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<sup>4</sup> It is important to note that research in international contexts often refers to the term teacher educator. This is broader than the term teacher trainer and often includes the field of teacher education at universities. Nevertheless, there are many parallels between teacher educators and teacher trainers (for more details, Gerlach (2020))

adult education. The teacher educators as teachers of teachers (3) are much more aware of their change of identity from first- to second-order teacher and the teacher educators as researchers (4) are also becoming more active in research. It seems central to Swennen et al. that the transition between the different professions must become conscious and that this is mainly achieved by reflecting on one's own professional biography and disclosing the further sub-identities. Teacher educator professional development opportunities, which include for example guided induction or mentoring programs, can be divided into formal development (1), informal development (2), and communities of practice (3) (Livingston et al., 2009). According to Kosnik et al. (2015), informal development predominates in this regard, although it remains questionable whether this is sufficient for professionalization.

Another effort of international research is aimed at the development of standards for the work of teacher educators. In this regard, the Association of Teacher Educators (ATE) for example has formulated 9 standards under which the aspects scholarship (engage in inquiry - standard 3), commitment to continuous professional development (Standard 4), developing, implementing, and evaluating teacher education programs (Standard 5), and collaborating with relevant stakeholders (Standard 6) are carried out in the context of transfer (ATE, n.d.). According to Cochran-Smith (2003), all teacher educators in the U.S. should have a central role in implementing educational reforms. It becomes apparent that the inclusion of teacher educators in research-related contexts is demanded and researched especially in international contexts. However, also with regard to the findings of German studies, the transition from first-order to second-order teacher and thus the professionalization of teacher trainers seems to be a particular challenge for this group. Such professionalization should also include the fields of innovation and transfer in alignment with national and international standards (as can be seen in the Standards of DGFG and ATE). However, especially with regard to the innovation and transfer practice of teacher trainers, there is a great research desideratum.

### 3 Research interest

With the aim of the study to reconstruct the teacher trainers' implicit orientations, the focus is set on knowledge 2 and 3 according to Neuweg (2014). In this paper, attention will be paid particularly to the exchange processes between research and practice. Due to the abductive character of this study, the focus is first of all on capturing the field as well as on providing an insight into the teacher trainers' modes of action. Based on this, recommendations can be made for future transfer research and practice. The following research questions are central to this paper:

*With regard to which implicit orientations do geography teacher trainers of geography differ in exchange processes with actors of research?*

- Which understanding do geography teacher trainers have of exchange with research and regarding the goals within the exchange process?
- Which understanding of process and role is the basis for the explanations?
- What are the evaluation logics followed by the teacher trainers within the exchange processes?



## 4 Methodology

### 4.1 Study design

The basis for the study is a symbiotic training series, which consists of three consecutive meetings between the teacher trainers and researchers in economic geography and geography didactics (see Fig. 1). In accordance to the transfer idea, exchange processes are to be initiated in the context of these advanced training courses, in which new and practice-relevant findings about the innovation-driven economic development of China (Liefner et al., 2019) in combination with didactically innovative concepts are jointly processed for transfer into practice. The contents of the advanced training serve as an innovative and significant context for geography teaching, which implies the task of transfer and, together with the previous experiences and the experiences during the training series, has an effect on the group discussions. In the following analysis, the higher-level relevant orientations towards the transfer can be reconstructed from this.

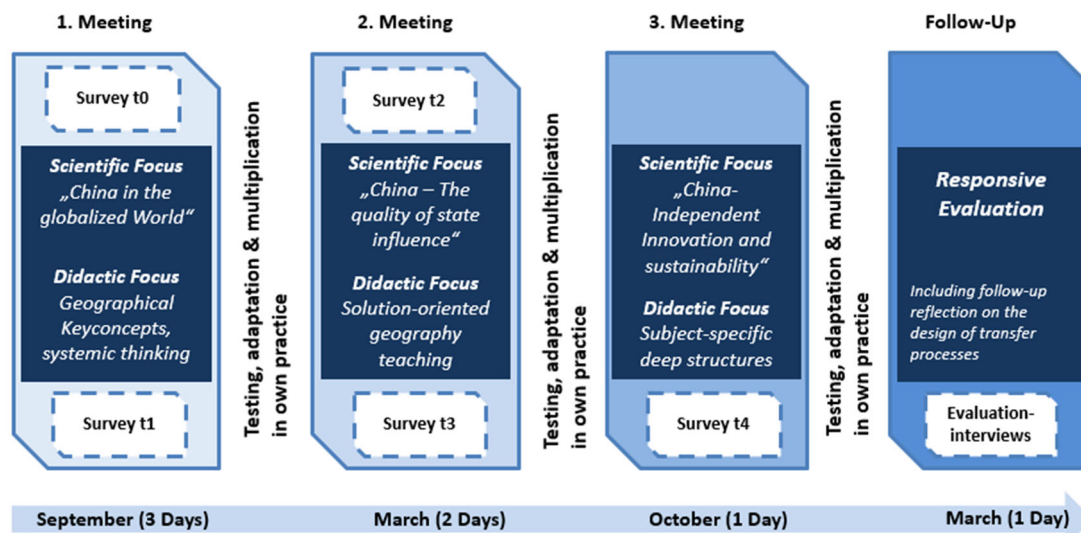


Fig. 1 Training programme & research design of the study (the follow-up session served the purpose of the responsive evaluation, but will not be addressed in this framework; Source: own representation)

### 4.2 Sample

Assuming that the habitus reveals itself in particular in self-directed and interactive community discourse about its own practice of action, the sampling requires a concentration on actors with common and comparable backgrounds of experience in the field of transfer (Przyborski & Wohlrab-Sahr, 2014). Geography teacher trainers prove to be a particularly fitting group in this context. In total, 24 geography teacher trainers participate in the study. Overall, the sample is evenly composed of 12 male and 12 female teacher trainers. Most participants have long-term experience in school teaching and in teacher training. Many of them continue to work as teachers with a certain number of hours in addition to their main function in the training of trainee teachers. In addition, this group of teacher trainers meets twice a year for joint exchange and further training. External experts are often invited to these meetings. Particularly due to their special role in the training of trainee teachers, they occupy an important position in the German teacher training system between research and practice. It is part

of their professional profile to engage in continuing education and to operationalize relevant new scientific findings for teaching practice (see Chapter 2.2). Through their work in the training seminar and in school, they also have access to a wide range of further object-related fields of experience and opportunities in the sense of integrating, deepening and multiplying new findings. Therefore, it can be assumed that the group has diverse and comparable experiences in both dealing with researchers and scientific knowledge and transferring knowledge into practical contexts.

### *4.3 Data collection*

As a basis for the aim of reconstruction of orientations, group discussions are conducted at a total of five points in time (see Fig. 1). Data collection took place during the COVID-19 pandemic between September 2020 and October 2021. Due to the tightened contact restrictions, the second training date and the surveys t2 and t3 had to take place digitally. All other surveys could be conducted in presence with all participants. In order to get through to teachers' orientations, the group discussions are surveyed in their own logic: they are openly structured, i.e. they promote the self-flowing nature of the discourses, and their content is only (pre-)structured by exmanent follow-up questions at the end (Bohnsack, 2010a). At the beginning of each group discussion, an open-ended question was asked, for example about the experiences with transfer processes. Due to the multiple survey points in time and the diverse experiences that were gathered with the contents, processual transformations or persistences of the orientations over time can also be reconstructed. The groups themselves are determined beforehand according to their school types, since homogeneous groups are presumed to have the largest common ground of experience or the largest basis for shared orientations. In total, 15 group discussions were conducted. The individual cases are then sequentially evaluated using the documentary method.

### *4.4 Data analysis - The documentary method*

The great potential of the documentary method for the present study lies in the possibility of bringing "the implicit knowledge stocks ... to the surface..." (Applis et al., 2015, p. 246). The method of qualitative social research (Bohnsack, 2010b) distinguishes between conjunctive knowledge, which as atheoretical knowledge is mostly subconsciously anchored in the common experience and production of reality by individuals and groups, and communicative knowledge, which as institutionalized knowledge "is usually available to us in conceptually explicit form" (Przyborski & Wohlrab-Sahr, 2014, p. 281). In the methodological analysis of the empirical data, a change in the analytic stance, from the immanent meaning content (communicative knowledge) of an interaction, i.e. what is said or done within the group discussions, to the documentary meaning content (conjunctive knowledge), i.e. how topics are talked about and how the researched interact with each other, is subsequently focused on via the steps of formulating and reflective interpretation (Gresch & Martens, 2019). The goal of the interpretations is the reconstruction of frameworks of a group's orientation, which contain the conjunctive knowledge and span between aspired positive horizons, rejected negative counter-horizons and the enactment potential, i.e. the assessed chance of realizing the orientation (Kleemann et al., 2009). These frameworks of

orientation are equated by Bohnsack et al. (2018) in a narrower sense with the *habitus* or *modus operandi* of action practice and at the same time distinguished from the *orientation schemata* that comprise communicative knowledge. The tension between the framework of orientation in a narrower sense and the schema of orientation, in turn, constitutes a framework of orientation in a broader sense, which Bohnsack et al. (2018) also refer to as the tension between “habitus and norm” (p. 16). Within the framework of an ongoing comparison of the empirical cases, comparative horizons (*tertium comparationis*) crystallize in the course of the interpretation, on the basis of which homologous ways of dealing with different situations but also different ways of dealing with the same situations become recognizable. Via the recurrent reconstruction, the frameworks of orientation “can be elaborated as generative structures or as *modus operandi* of action practice and object-theoretical insights [can be generated]” (Asbrand & Martens, 2018, p. 33). From the insights generalizable types of dealing with the challenge of transfer can be reconstructed within the framework of a sense-genetic type formation (Luber et al., 2020).

## 5 Selected results

### 5.1 Systemic obstacles – first *tertium comparationis*

The basic typology, “from which the construction of an entire typology takes its starting point” (Bohnsack, 2013, p. 253), is given by the epistemological interest and mostly comprises a commonly shared orientation problem or an orientation dilemma (Przyborski & Wohlrab-Sahr, 2014). Within the framework of the present study, this basic type is revealed in the *design of transfer practice in the context of the fields of action of teacher trainers of geography*. During the initial processing and analysis of the data, it already became apparent that the teacher trainers worked very hard on normative guidelines across the cases and that these were often marked as obstacles for a successful transfer. In this context, for example, low teaching loads, lack of support for transfer activities and the weak position of the subject geography in the subject canon of the school system are pointed out on an explicit level. Exemplary for this are quotes like “my time is not enough anyway” (GD Sonne|t0|109), or “these are windmills we are going against”(GD Meer|t1|802-803). In the cross-case comparison, the systemic obstacles revealed themselves as the first *tertium comparationis*, in which, on the one hand, part of the orientation problem of the design of a transfer practice is reflected and, on the other hand, the tension between habitus and norm emerges in particular (see Chapter 4.4). Without going in depth at this stage, the comparison revealed different modes of dealing with these systemic obstacles, which range between evasive-defensive modes, which perceive the recognized and problematized norms often as too strong obstacles for the enactment of a transfer, and which attribute the responsibility for the transfer to the educational institutions, which “from the top... just have to hang on longer” (GD Sonne|t0|250-264), and self-assertion-seeking modes, which are more solution-oriented and look for possibilities in their own environment to circumvent the recognized “windmills” of the system and to “look within the structures and see what kind of freedom I have”(GD Meer|t2|737-738).

This first *tertium comparationis* offered a starting point from which a better understanding of the orientation problems could be developed from the researcher's perspective as well. In the following, the focus was directed more towards the sequences in which exchange processes with research were thematized, due to the research interest.

### 5.2 The orientations of the teacher trainers of geography in transfer-related exchange processes

The exchange processes in transfer contexts prove to be a further *tertium comparationis* along which different orientations could be reconstructed. In this context, it was initially conspicuous that the teacher trainers repeatedly and across several cases refer to experienced distances and asymmetries between research and practice. Exemplary are quotes like „I would like to have this huge gap a bit smaller (to) geography, which as a discipline likes to hover way up high“(GDSonne|t0|1159-1165) and with an ironic undertone, “and the stupid practitioners just don't understand that (they) just have to do what science has found out ...”(GD Meer|t3|190-193). Both quotes reflect further differentiations of the orientation problem raised at the beginning. The difficult usability of scientific findings in practice and also the critically perceived expectation by science that practitioners “just have to do” the concepts of science reveal themselves as conjunctive experiences, which in turn stand diametrically opposed to the enactment of a transfer into one's own practice. Against the background of these problems, different types can be reconstructed, which differ from each other in terms of their orientations in the context of these exchange processes.

As shown in Fig. 2, these orientations move in a continuum between the poles instruction and co-construction. This continuum follows a more-or-less logic, so that the types cannot be completely assigned to one of the poles.

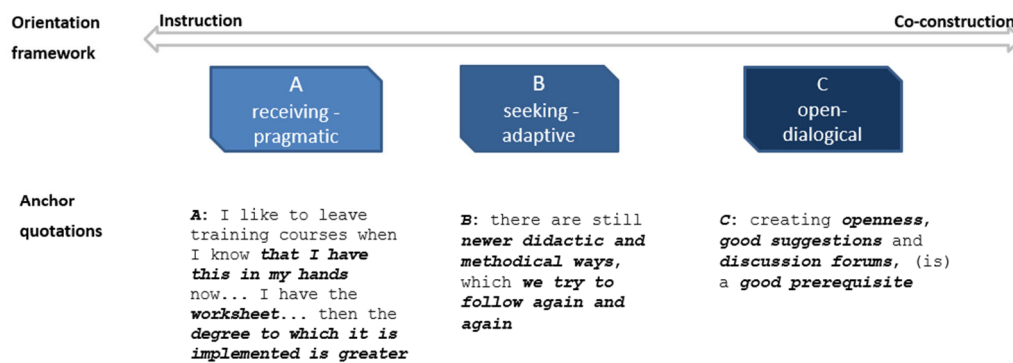


Fig. 2 Orientations of Teacher Trainers in exchange processes with research (Source: own representation)

### 5.2.1 Type A: receiving-pragmatic

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441 MaW: The ideal situation, that I really start, would be one
442 hour [...] and some competent person says, so and I explain to
443 you today three terms that are important in geography. And
444 they are explained. And then an example is made. And I get
445 another sheet.
446 Row:          hm (affirmative)
447 MaW:          with
448 Row:          hm (affirmative)
449 MaW:          on China, eighth grade, where these three
450               concepts are well implemented
    
```

Fig.3 Anchor example type A: receiving-pragmatic (slightly shortened and modified; Source: GD Sonne | t0 | 441-450)

Type A is located on the continuum of Fig. 2 more on the left pole, since for this type the paradigm of instruction in the context of exchange processes with researchers is strongly influential. In this context, this type identifies itself as a learner in exchange processes, which, in turn, following a hierarchical orientation, are characterized by a strong knowledge gradient. In the example above, this is revealed in the desire for an expert in the form of a “competent person”, who explains central aspects of geography (see Fig. 3). As a result of this perceived knowledge gap, the one-way direction of the transfer of research into practice intended by this type is implied on the one hand and, as it were, also the role ascribed to research as a pioneering instructor who explains what is “important in geography”. The hierarchical orientation revealed is thereby fundamental to this type, as it is repeatedly demonstrated in other contexts too, as in the example of educational institutions mentioned above, which must assume transfer responsibilities “from above”. In other sequences it is said specifically regarding the relationship between researchers and practitioners: “that you know more than I do, we can't get rid of that”(GD Sonne|t3|1040-1041).

Following the instructive orientation, it shows up as a characteristic of this type that it is always anxious to receive tangible and preferably immediate applicable material for testing and for the integration of central findings in one's own practice. Also, in such a material, which as in the above example is at best exactly adapted to the own contexts (“China eighth grade”), a form of instruction is implied, since the sheet shows how the concepts are “well implemented”. This material, designed by experts, thus represents a positive horizon, which is countered by the negative counter-horizon implied in the following quotation: “The purely theoretical input and see for yourself how you implement it ... that is often already lost in everyday life” (GD Sonne|t1|496-499). Accordingly, a too high degree of theory without suitable instructions for action reveals itself as a strong obstacle that ultimately prevents the enactment of transfer. Overall, the present modus operandi can be described as receiving-pragmatic, since the attitude of this type in exchange processes is a receiving one, out of which there is definitely an openness to new things. The prerequisite for this openness, however, is the personally perceived usability of the contents, which are conveyed in the context of instructive processes and mostly in the form of materials in the most pragmatic, i.e. efficient, way possible in one's own practice in such a way that it is “practicable, as simple as possible, with few materials”(GD Sonne|t0|1215-1216).

## 5.2.2 Type B: seeking-adaptive

869 CaW: In this respect, I think that teacher training (the  
 870 second phase) is the decisive interface, and for us then it is  
 871 just necessary, but from my point of view, this is what these  
 872 forums offer, to keep up with the research in order to be able  
 873 to pass it on.  
 874 HeW: I see it exactly the same way  
 875 BiW: mh, yes, me too, just keeping up to date and reading a  
 876 lot, and then quasi passing on research results to the trainee  
 877 teachers in this way.

Fig. 4 Anchor example type B: seeking-adaptive (slightly shortened and modified; Source: GD Strand | t3 | 869-877)

Type B is an intermediate type on the continuum between instruction and co-construction. In this context, this type also identifies itself as a learner in exchange processes with research, although its focus is less on receiving specific instructions or materials but more on updating its own knowledge. As can be seen in the example above, the effort to update and expand one's own knowledge along research developments is in the foreground, as this is perceived as a central component of one's own profession and role as a teacher trainer in order to be able to serve the "Interface" between research and practice (see Fig. 4). This implies a leaning attitude towards the movements and advances of research, which in turn is realized in a mode of continuous search for new developments. It is therefore necessary to "keep up with research". The "forums" mentioned in which the recurring exchange meetings with teacher trainers and researchers take place, therefore offer the possibility of updating one's own knowledge. In addition, this type is also characterized by a personal commitment in the form of further education in order to "keep up to date and simply read a lot" (876-877). As a positive aspired horizon, the findings of the research itself show up, which, as can be seen in other sequences, help to stabilize and legitimize the personal professional action, "to consolidate myself once again, also didactically" (GD Strand|t2|98-99). The concept of stabilization also implies the negative horizon of a destabilization, which could occur through the loss of connection to the developments of research. The accentuated importance of keeping up with the developments of research is then also transferred to the own training practice, by passing on the research results also to the trainee teachers.

The role of research is located in further sequences in "sending someone" (GD Strand|t1|938-939), who gives a specialist and subject-specific didactic "input" (939). In this sense, it is for this type as a "huge added value if someone can give us a compressed version of it" (GD Strand|t1|1292-1293). Knowledge transfer and exchange is thus revealed for this type as a unidirectional process, whereby the constructive acquisition and expansion of knowledge is prioritized in particular and the opportunity to "talk about it again in a broader way" (GD Strand|t2|596-597) in the recurring meetings, is also important for this type.

Altogether, as taken up in the anchor quotation Fig. 2, the attempt is in the foreground "to follow newer didactic and methodical ways ... again and again ..." (GD Strand|t0|1497-1503). In this attempt to integrate and to adapt these ways into one's

own action practice, however, limits become apparent for this type and it often bumps up against the question “what can I still integrate now without letting something slip out” (GD Strand|t0|1645-1646).

### 5.2.3 Type C: open-dialogical

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160 MaM: I also experienced very very positive further trainings
161 and according to my perceptions they were particularly
162 positive because they were directly related to learning needs
163 of the teaching staff [...] the concept of co-creation and co-
164 responsibility took place at all times during the training.
165 ElW: I think you said something very important again MaM. You
166 said, "Tie in with the learning needs".
167 MaM:         yes
168 ElW:         and not from the top down that means taking this
169 self-responsibility for my learning what do I need where do
170 I tune in what um what do I personally need to develop [...]
171 then I have the greatest satisfaction in the further trainings
    
```

Fig. 5 Anchor example type C: open-dialogical (slightly shortened and modified; Source: GD Meer | t3 | 160-171)

Type C is located furthest to the co-constructive pole, since for it, orientations to co-constructive transfer processes are more influential. Within the framework of exchange processes, this type is more strongly oriented toward personal learning needs and perceives training that is directly related to these learning needs as “very very positive” (see Fig. 5). In this respect, this type identifies itself as an equal actor in the exchange process with its own goals and demands active involvement in the process of exchange more strongly. For this type, “co-creation and co-responsibility” reveal themselves as positive horizons in the exchange process, while the “top-down” design of such processes in the sense of a withdrawal of responsibility represents the negative counter-horizon. This implies a more heterarchical orientation that intends a democratic process at eye level and accentuates mutual expertise. In other sequences, an “appreciative space” (GD Meer|t3|417) and “a culture ... of exchange as a way of professionalization” (419-420) is demanded both for the exchange of teacher trainers among themselves and for the exchange with research.

In the context of these exchange processes with research, Type C is open to new impulses. According to this, the role of research as a source of impulses in the present training is perceived positively, since “quite a lot of impulses (could) be set, which have stimulated reflection ... (There) are also some things to be rethought” (GD Meer|t3|489-494). As a result of these initiated reflexive processes, this type also shows itself to be open to change and revision of existing schemata, so that “now something new...where one could dock on well...can become a fixed component of the orientation” (GD Meer|t0|219-223).

Personally, the challenge in dealing with the research findings is then perceived in the question “what does this ultimately mean for school, for teaching, for training” (GD Meer|t3|779-780), which in turn reveals the perception and location of one's own expertise.

Overall, this type is characterized by an open-dialogical *modus operandi*, which shows an openness for new theoretical and research contents, and is willing to make them usable for their own practice in reflexive and dialogical processes with other practitioners and research actors. Problems of orientation become apparent for this type of researcher especially when the exchange between research and practice “is not so symmetrical” (GD Meer|t3|199).

## 6 Discussion and prospects

In view of the results, it is shown that in the context of exchange processes with research actors, the teacher trainers often reveal a *habitus* as recipients of transfer. This appears to be particularly significant because these habitual patterns pre-structure the teacher trainers' actions in transfer processes, but they themselves are not fully aware of them. In this context, a unidirectional understanding of transfer is implied, especially in the reconstruction of types A and B, contradicting the reciprocal concept underlying the theoretical definition (see Chapter 2.1). For these types, research fulfills a more service-oriented function and is located in the role of an instructor or knowledge mediator. Their own efforts to actively participate in exchange processes and to enter into dialogue are less evident for these types. One possible reason for this can be found in the attribution of dominating knowledge that research or science assumes in the perception of these types. Especially for type A, from the perception of this knowledge gap results, in turn, the expectation of research to prepare information and material in advance in such a way that it is immediately accessible and usable by the practitioners. The change of own schemata in favor of the new concepts or the engagement to develop own material is less focused than the concrete usefulness. With regard to the national and international empirical findings presented in chapter 2.3, it becomes evident that the transformation to second-order teachers or to teacher trainers who actively participate in research has only taken place rudimentarily (Murray, 2002; Swennen et al., 2010; Gerlach, 2020 or Fischer, 2022b). It seems alarming that in the field of teacher trainers of geography, the distance between research and practice is often perceived as massive and that this also manifests itself in habitualized unconscious practices. Such nonreflective orientations of the teacher trainers potentially influences the training of trainee teachers. More pragmatic-instructive or transmissive orientations can affect the development of trainee teachers and thus also future teaching as well as the further development of teaching. It cannot be ruled out that such orientations tend to widen the gaps between research and practice. A conscious or incorporated transfer practice in the sense of actively dealing with new research findings or striving for networking with research and the formation of a researching *habitus* for the further development of existing practices is not found in all reconstructed cases. Particularly for type C, this desire for exchange and to be part of the transfer process is more apparent, whereby this type often perceives a lack of prerequisites and, in part, a lack of will on the part of research and educational institutions for networking and cooperating dialogue at eye level.

For a professionalization of all actors (including researchers) in the transfer process, structures and processes are thus needed that sustainably promote transfer and create space for exchange. For example, processes could already be initiated during the recruitment and preparation of the teacher trainers for their profession, which from the



beginning aim at (further) training of the professional orientations in the direction of a stronger networking and more acceptance for the respective systems and expertise (Livingston et al., 2009). For instance, the reconstructed transfer types of this study could be used to initiate reflection processes on role understanding together with the teacher trainers in the context of further training. A transformation of habitual practices can occur, for example, through the establishment of professional learning communities between researchers and practitioners. Such have shown to be effective transfer catalysts in many national and international projects (Farrell et al., 2022). Involving partners from education policy and education administration is also beneficial in order to identify and jointly remove the systemic barriers that have been mentioned by many cases (Manitius & Bremm, 2021). In such partnerships, the observed lack of clarity about competencies and responsibilities in exchange processes could be counteracted in particular by defining the expectations of the respective actors as well as clear criteria and tasks in intensive discussions with all partners and recording them in a joint position paper. Such a position paper could then also include joint transfer strategies that are designed for the long term, call for and encourage collaboration, create incentives such as recognition of transfer activities when applying for new positions, and establish an infrastructure for the scaling up of content<sup>5</sup>. The German and Austrian societies for subject didactics (GFD & ÖGFD) are already taking an important step in this context by holding thematic conferences on transfer (in Vienna in 2022) and developing their own position paper on transfer. This can and should have positive effects for networking with actors in the second and third phase of teacher education. Since such long-term partnerships have so far often been implemented in subjects with higher educational acceptance<sup>6</sup>, it is also important to reduce aggravating conditions (e.g., no relief hours, limited financial resources), especially in subjects like geography that have so far been less focused. It is important to emphasize that although geography has to deal with many specific problems (e.g. dualistic nature of geography as a social and natural science, see Chapter 2.3), the reconstructed orientations are supra-disciplinary and thus quite transferable to other contexts or subject didactics.

Furthermore, a focus should also be placed on the development of transfer and teaching materials that are as low-threshold as possible to be able to do justice to all types<sup>7</sup>.

Due to the abductive character of the present study, it seems to make sense to confront teacher trainers with the typology in follow-up studies and to evaluate the personal meanings of the typologies as well as the significance for the further development and future acquisition of teacher trainers in reflexive processes.

In a further part of this study, the orientations of the teacher trainers in the context of multiplication will be addressed, posing another important component of transfer (see

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<sup>5</sup> Further valuable suggestions for such a position paper can be found, for example, in the discussion paper by Froese et al. (2014)

<sup>6</sup> Exemplary is the project BISS-Transfer (German, [biss-sprachbildung.de](http://biss-sprachbildung.de)) or the DZLM (Mathematics, [dzlm.de](http://dzlm.de))

<sup>7</sup> Exemplary is the digital Geobox-Project from the university of Gießen (<https://www.youtube.com/channel/UCKgFPzr61eDkEuwCEGUKNkQ>)

Chapter 2.1). It is to be shown how the reconstructed orientations can be put together to an overall typology and which transformations or persistences can be reconstructed in the course of the training series.

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