"And Then We'll Just Check If It Suits Us" – Cognitive-Affective Maps of Social Innovation in Early Childhood Education

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The idea that a simple execution of an innovation invented by actors other than those who are expected to apply it is not likely to take place is a truism. We assume, however, in this paper the idea of a discursive production of knowledge on the application of an innovation across different levels of the education system. We aim to shed light on an innovation's 'journey' from educational policy over training providers to teams of professionals in early childhood education and care (ECEC). By investigating knowledge and emotions associated with the introduction of an intended innovation using the example of "stimulation interactions" in day care-centers, the paper contributes to research on the transfer of innovations in education. To better understand challenges occurring during the transfer of innovations, we triangulate methods from discourse theory (coding techniques based on GTM) and cognitive science, namely cognitive-affective mapping (according to the scholarly conventions). The data corpus includes educational plans ($N = 2$), in-service training programs ($N = 123$) and group discussions of pedagogical teams ($N = 6$) who participated in an in-service training on the subject, stimulating interaction. Findings underline that similar messages from the inventors on the educational policy level are received and processed heterogeneously by the teams of pedagogues as a result of their preexisting views, routine practices and experiences with intended innovations through in-service trainings. Besides, a diffuse mixture of competing and contradictory information is communicated to the professionals and, hence, collides with the in-service training providers' and educational policy actors' expectations on the processing of the intended innovation. Specific knowledge elements and their valences are diametrically opposed to each other. Dissonances like these are considered as obstacles to social innovation. The obstacles are caused by the lack of a 'common language' beyond all levels. Hence, policy-makers and in-service-training providers should anticipate the supportive as well as competing knowledge-emotional complexes of professionals and take these into account when communicating an intended innovation.

Keywords: social innovation, cognitive-affective mapping, sociology of knowledge approach to discourse (SKAD), early childhood education, education policy, stimulating interaction, in-service training, triangulation

INTRODUCTION

Although educational programs have been introduced as binding guidelines for educational work in Germany for almost 15 years (Diskowski, 2008) and although the educational staff of day-care centers participate in many educational initiatives and in-service training courses (von Hippel and Grimm, 2010; Baumeister and Grieser, 2011; Schneewind et al., 2012; Müller et al., 2016), the quality of the educational processes and in particular the interaction between pre-school teachers[1] and children still needs to be improved (Wertfein et al., 2017). 'Stimulating interactions' are linguistically stimulating interactions or dialog formats, e.g., sustained shared thinking (SST). SST is a didactic action pattern aiming to support the cognitive development of children and is regarded as a key variable of process quality in early childhood education (Siraj-Blatchford et al., 2002; König, 2009).

Recent studies show that process quality in German day-care centers is at best average (Wetzel et al., 1997; Tietze, 1998; Smidt, 2012; Tietze et al., 2013).

According to findings of recent studies, pre-school teachers are addressed to further develop their skills in order to enhance the quality of children's learning processes through stimulating interactions. Siraj-Blatchford et al. (2002) found that although 'sustained shared thinking' was most effective to encourage children's thinking, this promising interactional format is only scarcely put into practice. Based on their videographic study on the ability of pre-school teachers to promote learning processes of children through stimulating interactions during free play settings, Wadepohl and Mackowiak (2016) report that participating pre-school teachers only achieved very low scores on a valid rating scale for stimulating interactions. Correspondingly, they have to improve their respective competences (for an overview of studies with similar results see Wadepohl and Mackowiak, 2016). Years earlier König (2009) came to the same conclusions. She was able to show that pre-school teachers rather practice direct instructions which leave only limited opportunities for children to think independent, than introducing stimulating interactions which proved to contribute to children's enhanced learning. Accordingly, the introduction of 'stimulating interaction' is the aim of the intended education policy innovation. But even though the promotion of interaction between teachers and children is seen as the key to successful learning and development in early childhood (e.g., Sylva et al., 2004; Anders, 2013), it is still unclear to what extent such practices are realized as a result of intended educational policy innovations.

In addition to a lack of in-depth research concerning the effectiveness of in-service training for the educational staff of day-care centers (Müller et al., 2016), empirical insights on the implementation of educational plans in practice (Große and Roßbach, 2015; Anders, 2018) and on pedagogical beliefs and attitudes (Wertfein et al., 2015) are required. Due to the lack of

empirical evidence in the areas mentioned there is no definitive answer to the seemingly simple question of why initiated innovative interaction formats do not reach the practitioners and do not significantly change existing practice.

Against this background the paper examines the 'journey' of an intended social innovation in the multi-level system of education using the example of a selected innovation desired by education policy, i.e., 'stimulating interactions' in the field of early childhood education. So far, little is known about how an innovation intended by education policy is put into practice, in particular the influence of education policy on improving the quality of education in German day-care centers through educational plans (Meyer, 2018). It seems necessary to question the extent to which innovative pedagogical interactions are taken up, negotiated and put into practice on the level of the day-care centers and their teachers, i.e., those to whom the call for innovation is directly addressed.

The purpose of this paper is to develop a sound understanding of innovation processes in education. The subsequent sections will therefore explain the theoretical and methodical foundation of our empirical research approach, particularly discourse analysis and cognitive-affective mapping (see Bormann et al., 2018). Finally, the findings will be presented and discussed with regard to the implementation of social innovation in early education.

An Entangled Journey of Innovation in Early Education

Innovation promises change. This claim becomes particularly clear in the field of early education with regard to the large number of initiatives that have been launched, for example in order to improve the quality of educational organizations and pedagogical interaction in the last few decades (Edelmann and Roßbach, 2017; Jergus and Thompson, 2017). However, an innovation can neither be forced nor adopted *ad hoc*, because it is a complex, selective process of understanding and adding situated meaning to an intended innovation in education (Euler and Sloane, 1998; Fend, 2009; Bormann, 2013).

Nevertheless, some scholars argue that innovations should be understood as intentional processes. For example, Howaldt and Schwarz (2010) claim that social innovations are intentional, targeted re-combinations of social practices with the aim of better solving or satisfying problems or needs (ibid., p. 54). Even more striking than the assumption that innovations always aim at improvement is the fact that the authors assume that these changes were deliberately launched by assertive actors. This view neglects the specific reception and assessment of an intended innovation by the actors to whom it is addressed. In the eyes of its "inventors" an innovation can indeed aim at improvement. But whether the addressees of an innovation also assess the same need for improvement, is a different matter. Such an evaluation, however, determines how the addressees of an intended innovation perceive and assess the innovation itself. Thus a linear idea of the direct implementation of an innovation that is assumed to be successful as long as powerful actors take care of its implementation misses the complexity of processes of

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[1]In the following, the term 'teacher' is used for pre-school teacher, and refers to a synonym to all terms used in German for the educational professionals in day care-centers.

innovation transfer by neglecting the perspectives of the actors to whom the innovation is addressed.

With that said and in contrast to approaches that consider social innovations as intended social changes, we refer to innovations as emergent phenomena labeled 'discursive innovations' (Bormann, 2011). According to Foucault, Keller points out that discourses are "considered as historically situated 'real' social practices" that constitute the objects which the discourses 'talk' about (Keller, 2011, p. 46). Discourses can be understood as powerful in that they transport knowledge through space and time (ibid., p. 60) although they do not require the co-presence of the actors who participate in a discourse in the sense that they refer to the contents, positions etc. of that particular discourse. According to this understanding, an innovation is not implemented just because powerful actors think it is the right thing to do. Instead, innovations need a discourse that contributes to their being seen as relevant and effective. That is to say that a particular innovation and its underlying intention merge with other information and events relevant to an educational field. Together, innovation intentions and for example politics, policies, narrations on necessary changes, programs established to promote the transfer of an innovation etc., form a discursive event, which is in turn transported via discourses and changed in them (Bormann, 2011, p. 324).

In line with this approach, the innovation process is subdivided into two partial processes: the de-contextualization of an innovation and its subsequent re-contextualization (ibid.). Basically, this model assumes that a discursive event is followed by the process of de-contextualization as an interpretational act of the perceived event as influenced by the individual evaluation. Subsequently, re-contextualization takes place, in which the discursive event is actively appropriated in a given organizational context: from the perceived discursive event, requests are constructed (level of interpretation patterns), which guide action (level of practice) and lead to a result (level of position), so that at the end a new discursive event is formed (ibid., p. 316). However, it is not natural for the event to be perceived at all, since innovation is negotiable and subject to social practices of generating and acquiring knowledge (ibid., p. 317). In short, the innovation process within an organization is more than just replicating a simple idea intended by others (Bormann and Nikel, 2017, p. 796).

Thus, the focus of our investigation lies on the process of reception on the part of actors who come together situationally through a common theme, in our case: innovative pedagogical interaction formats (Bormann, 2011, p. 317). How do teachers perceive and evaluate the innovation? To what extent do they consider the whole intention of the innovation or do they only take into consideration some selected aspects which they think match their previous practices and routines?

Following the approach of discursive innovations, the analysis is not about evaluating implementation processes as right or wrong, but rather about recording the conditions and forms of the process of its joint appropriation on the part of the addressees in discourses (ibid., p. 325).

As a supplement we consider Rogers (1995, 2002) diffusion model. This supports the idea that innovation is processual, communicated through certain channels and negotiated between affected members of a social system. The condition to be negotiated is that the individuals or units involved perceive this innovation (idea, practice) as new. Rogers (2002, p. 990) proposes a characteristic of innovation that determines its rate of adoption as follows:

- Relative advantage: Is the new practice perceived as better by the addressees?
- Compatibility: Does the new format match existing values or personal needs?
- Complexity: Is the new format easy to understand?
- Trialability: Are there limits within an organization that prevent experimenting with and testing the format?
- Observability: Is the use of the new format visible to others, e.g., outside the organization?

Rogers claims that a great relative advantage, compatibility, trialability, and observability plus less complexity lead to a more rapid adoption of the perceived new practice. The decision within the organization on whether to adopt or reject a new idea also depends on how others think about the innovative format (ibid.). Diffusion is a social process –(people have to talk to each other to spread the new idea) and decision-making process based on the mental efforts the individuals or units have to make (ibid.). From this the hypothesis can be derived that the team processes and interchange routines which are applied within day-care centers are decisive in the implementation of the innovative interaction format.

Coburn (2001) provides insights into the collective sensemaking processes in a community of teachers, who mediate reading policy by constructing and reconstructing multiple calls to implement new pedagogical formats. The sensemaking process is selective in that different communities find different meaning within the same messages (Coburn, 2001). However, a high quality of conversation among the teachers leads to their deeper engagement with content, and thus abstract messages can be translated more easily into concrete action (ibid.). In order to determine the quality of an innovation more closely, Coburn proposes three success criteria: 'depth' (pertaining to norms, beliefs, pedagogical approaches), sustainability (as an expression of consistency of change and retention) and shift in reform ownership (i.e., a permanent adoption with impact on children) (Coburn, 2003, pp. 4–8).

In conjunction with all previous ideas concerning perception, negotiation and implementation of innovations embedded into discourses, our approach goes one step further. We assume that not only knowledge circulates within innovational discourses and has to be de- and re-contextualized, but also that the emotions and affects associated with each knowledge element are part of the innovation process (Bormann et al., 2018). The term 'emotional cognition' derives from cognitive psychology and means that human thinking and the resulting actions are influenced by emotions, moods, or motivations (e.g., Thagard, 2000, 2006). During decision-making processes such as those involved in rejecting or adopting a new idea, mechanisms occur in our thinking that can be described with the concept of emotional

coherence that "serves to explain how people's inferences about what to believe are integrated with the production of feelings about people, things, and situations. On this theory, mental representations such as propositions and concepts have, in addition to the cognitive status of being accepted or rejected an emotional status called *valence,* which can be positive or negative depending on one's emotional attitude toward the representation" (Thagard, 2006, p. 147).

The point of this perspective is that information processing in human cognitive systems runs in parallel. In most cases, different information is simultaneously active in different modalities. While thinking that a person permanently constructs holistic, coherent interpretations, which in turn affect the representation, weighting, and evaluation of the individual information (ibid., p. 170). This means in particular that the information which is compatible with a person's individual motives is more easily perceived, considered as relevant and processed (ibid., p. 171). Knowledge and attributed emotions can be represented as networks in which the nodes stand for domain-specific terms that are related to each other. The connections form the semantic relations between the terms. Innovation from a coherence-theoretical perspective is a "conceptual revolution" (Thagard, 1992): the network is fundamentally reconfigured, i.e., new information is not just integrated or rejected (ibid., p. 162).

Following Intended 'Stimulating Interactions' on Their Way From Policy Into Practice

The use of the new interactional formats called 'stimulating interaction,' with which educational policy makers and training providers intend to innovate pedagogical interactions, is supported by bindingly introduced educational plans. Furthermore 'stimulating interactions' are an obligatory part of the contents of in-service training. Accordingly, this innovation is an example of an intended cross-level transfer from educational policy makers via training providers into early-education practices.

In response to societal changes and the resulting demands on the early childhood education system, a scientifically inspired educational policy publishes binding educational plans for the teachers within the organizations. New demands are made on teachers, which they should be able to meet because of their participation in in-service trainings. The training courses offered to them are considered to be of great importance for the effectiveness of pedagogical actions (Thompson, 2017, p. 60f), whereby most of the offers concentrate on accompanying and supporting children's educational processes (Baumeister and Grieser, 2011, p. 33). On their journey from educational plans to in-service training to practice, innovative pedagogical interactions are challenged by many fractures. It may turn out that the ideas of educational policy makers and in-service training providers of 'good' or 'better' pedagogical practice may collide with the ideas of the practitioners concerning the relevance or value of the envisaged new pedagogical approaches. However, because the principle of emotional coherence – initially at the level of the individual but also at the level of the group – ensures

that only the information that fits with an existing idea is likely to be taken up, it may not be possible to perceive or integrate innovations at all (e.g., Thagard, 2006; Homer-Dixon et al., 2014).

It is therefore necessary to examine and compare the perspectives of *all* the actors involved in social innovation in education in order to identify possible obstacles to innovation on its entangled journey. So far, no approaches that shed light equally on both circulating knowledge and associated emotions of different actors involved in an innovation seem to be in place. If we know which knowledge-emotional complexes are produced by them, to understand to what extent they differ from one another, and to realize how the addressees of an innovation react toward the expectation to support intended changes, we can deduce how the re-structuring of a social practice can be better promoted. Besides, this knowledge can then contribute to the field of ECEC, so that 'stimulating interactions' can be introduced, understood and implemented more reasonably. This is especially important for modern societies. If children are better supported to think independently, they will hopefully be better able to react to global demands and challenges in their future lives.

Against the backdrop of these theoretical explanations, the following research questions arise for an investigation of the intended transfer of the 'stimulating interaction' innovation in the field of early education:

(1) What prescriptive-normative specifications about the respective interaction can be reconstructed in the educational plans of two selected German federal states and the programs of regional in-service training providers on an emotional and cognitive level?

(2) In what respect do these specifications differ from the ideas of the teachers within different the day-care centers?

MATERIALS AND METHODS

According to the abovementioned notion of discursive innovations, the analysis of the transfer of social innovations constructed by different actors who are not necessarily co-present (Bormann, 2012) requires specific methodical approaches. After all, it is about the generation and circulation of knowledge and its effects on different levels: firstly, on the level of educational policy makers and in-service training providers, a discourse analysis of policy documents and training programs focuses on how and with what linguistic means the necessity of the innovation is made plausible. Incongruities could already appear here and provide important clues relating to the further journey of this innovation, because in-service training providers pass their interpretations of intended innovations by educational policy makers on to the individual organizations in early childhood education. Secondly, on the level of the respective educational organizations, the analysis of group discussions focuses on the meanings that are associated with the planned innovation of 'stimulating interaction,' how the innovation intentions transported from above or outside are replicated in teams, and what factors lead to indifference, approval or rejection on the part of the teams.

With the aim of the subsequent journey of the innovative interaction format, it seems indispensable to capture norms on 'stimulating interaction' on different levels, to visualize the actors' perspectives and to compare the actors' views. The central method of this investigation is an innovative form of the sociology of knowledge approach to discourse ('SKAD'; Keller, 2011), which triangulates the cognitive science-based approach of cognitive-affective mapping (Thagard, 2010) with discourse analytical methods (for triangulation see, Bormann et al., 2018). The triangulation, as a combination of methods, aims here to "examine a problem from as many different methodological perspectives as possible" (Denzin, 1978, p. 291). Denzin (1978) argues that "each method implies a different line of action toward reality – and hence each will reveal different aspects of it" (ibid., p. 292) and this in turn has the power to diminish the researchers' personal biases that can arise from the application of a single methodology (ibid., p. 294). Our approach of inter-methodological triangulation follows the idea "that the flaws of one method are often the strengths of another; and by combining methods, observers can achieve the best of each while overcoming their unique deficiencies" (ibid., p. 302). Leech and Onwuegbuzie (2007) even emphasize "the need for researchers to use more than one data analysis method" (Leech and Onwuegbuzie, 2007, p. 579) to contribute to trustworthiness.

SKAD is more a research program than a method "embedded in the sociology of knowledge tradition in order to examine the discursive construction of symbolic orders which occurs in the form of conflicting social knowledge relationships and competing politics of knowledge" (Keller, 2011, p. 48). SKAD aims at reconstructing the processes of the social construction of meaning and sense, assuming that the structures of interpretation and action at institutional and organizational levels and at the level of social (collective) actors are not singular events, but occur within structured contexts, i.e., discourses (Keller, 2008, p. 233). Discourses materialize in spoken and written language (ibid.). Language is linked to emotions. Thus, discourse analyses should also consider emotions. The innovative combination of SKAD with CAMs introduced here aims at reconstructing typical patterns of knowledge, practices and forms of subjectivation, supplemented by the affective dimension of a discourse and visualizes it in cognitive-affective maps. CAMs are already used in various fields of research to present the opposing perspectives of political actors, for example, and thus contribute to conflict resolution by visualizing dissonances (cf. Homer-Dixon et al., 2014). The research process is fundamentally oriented toward grounded theory methodology (GTM) and adapts its methods and strategies (Glaser and Strauss, 2010; Bormann and Truschkat, 2018). The process is circular, i.e., sampling, analysis, and interpretation are interwoven and interrelated (Lueger, 2010; Flick, 2016; Bormann and Truschkat, 2018).

The theoretical sensitivity of the researcher determines the initial focus for sampling and analysis and is to be reflected transparently and comprehensibly as a guiding component of the entire research process (e.g., Kelle, 1994; Strauss and Corbin, 1998). Because the analysis of innovation processes is not about evaluating and judging practices, but about identifying typical patterns of the processes, the researcher's position in relation to

the research subject as well as the research process needs to be reflected continuously. Parts of the data were therefore analyzed jointly in various collegial analysis groups and the results were also discussed (on the quality criteria of reconstructive research, in particular collegial validation see, for example, Przyborski and Wohlrab-Sahr, 2014).

Sampling: Localization and Sample Formation

The research is part of a cooperative practical research program EQUIP funded by Federal Ministry for Family Affairs, Senior Citizens, Women and Youth (Germany).

Ethical Considerations

The research program, the data collection and the data management follow the guidelines of ensuring good scientific practice and for the management of research data of Deutsche Forschungs gemeinschaft (Deutsche Forschungs Gemeinschaft [DFG], 2013, 2015) and the EU DGSVO (General Data Protection Regulation GDPR). Data in this paper derive from a qualitative group discussion study with pedagogical teams of 6 day-care centers in two German federal states on a voluntary basis during the entire research process. The participants were informed about data protection, that stipulates, f.e., that personal data must be kept separate from the interview material and in encrypted form (VeraCrypt: is a free open source disk encryption software). The participants signed an information sheet stating their informed consent to take part in the study. Informed consent addressed the purpose of the study, collection, storage, and assessment of data [in conjunction with the data protection and privacy manager in project EQUIP]. The participants have the right to withdraw their declaration at any time.

The audio-recorded group discussions were transcribed completely anonymously (names of persons, organizations, institutions, localities, etc.). The transcripts are stored in encrypted form as well. After the transcription, the audio recordings were deleted.

An ethical approval was not required as per applicable institutional and national guidelines and regulations. Such a request is expected on the institutional level, in particular, for studies in which the individuals under investigation are exposed to risks, or for studies in which the individuals under investigation are not fully informed about the objectives and procedures of the studies, or cannot understand the information due to their age, health status, etc. (Guidelines, 2017). As the participants did not belong to a particularly vulnerable group as stated above, the study did not affect personal rights, and there was no particular focus on the analysis of individual, subjective level an ethics committee was not involved.

Level I – Educational Policy Makers and In-Service Training Providers

Firstly, the corpus contains the educational plans of both the abovementioned (see section "Sampling: Localization and Sample Formation") federal states. These provide an orientation framework for pedagogical work in day-care centers. Secondly,

the training programs of 12 regional in-service training providers were specifically selected (Patton, 1990). Because the in-service training sector in the field of early education is very heterogeneous and there is an almost unmanageable number of providers (Müller et al., 2016), the sample selection was based on a study by Baumeister and Grieser (2011) compiling the most important in-service training providers for all federal states and their program priorities. The corpus then contained 123 short programs of in-service training with a focus on pedagogical interactions. The programs explicitly address pedagogical staff in day-care centers as recipients and potential participants. The sampling strategy used corresponds as far as possible to the homogenous strategy (cf. Patton, 2002, pp. 235, 243). In order to identify programmatic models of innovation at Level I, the educational plans and the in-service training programs were examined in discourse-analytical terms, with the focus on linguistic means that underline the need for innovative interaction formats. However, the procedure and its results will not be the subject here, but rather the presentation of the merged results and their visualization with CAMs. The findings of the SKAD have to be considered as a base for the development of ideal-typical 'cognitive-affective maps' (CAMs).

Level II – Day-Care Centers in Two Federal States

Six day-care centers were selected from the project's internal database so that it would be subsequently possible to contrast the various cases. Both rural and urban day-care centers were selected, financed by independent or state bodies, with different team sizes and varying numbers of children aged from 0 to 6 years. All teams participated in a 1-day in-service training course on 'stimulating interaction' before the group discussions took place on a voluntary basis. The semi-structured group discussions were held in the organizations during the course of the day (children's sleep breaks) or during service counseling hours after closing time. The discussions focused on the perception and evaluation of the intended social innovation of 'stimulating interaction' in education and its meaning for educational practices. The discussions were recorded, then transcribed and finally added to the analytical corpus. They were analyzed with the help of GTM analytical strategies. The findings were transferred into CAMs on Level II.

Research Procedure – Coding and CAM-Visualization

The procedure of analytical steps from coding to visualization is shown in **Figure 1** and briefly described below:

*Box*I and II (**Figure 1**, left) illustrate the ongoing sampling process from a first material body including the educational plans in total, all the programs of the selected in-service training providers available in 2017/18 and the reduction of the transcribed group discussions into a smaller analytical body as a result of rough analysis. The selection of key sections was guided by predefined criteria. For the detailed analysis, those text passages within the documents were selected that had an interpreted connection with pedagogical interaction. The selection was supported by lexical word searches, which contained keywords like *interact*, *learn*, *apply*, *exchange* etc.

The detailed analysis (Box III and IV, **Figure 1**) is carried out in the sense of GTM (Strauss and Corbin, 1996), initially by open coding which alternates with axial coding in the ongoing analysis process and closes with a selective coding procedure. During coding memos were written on the codes obtained. The term 'code' corresponds to the term 'concept' in **Figure 1**. The coding process is closely related to the visualization of the concepts using the cognitive-affective mapping approach (e.g., Thagard, 2010; Findlay and Thagard, 2014) with its own conventions as follows: (1) finding main concepts on the topic, (2) determining the emotional value of the individual concept, (3) defining relations, (4) arranging concepts in such a way that the lines intersect at the least, and (5) validating and discussing; for the visualization of the concepts, their values and relations see Box IV, **Figure 1** (according to Thagard, 2010; Milkoreit, 2013). The detailed analysis can be described as a circular process of coding concepts and transforming the interpreted interrelations to the format of CAMs: within key section A two concepts can be reconstructed. They are interpreted as connected to each other, but have a different affective connotation. Concept 1 has a negative connotation (red hexagon), Concept 2 has positive connotations (green oval). The connection of differently connoted concepts is incoherent (dotted line). Within key section B another two concepts can be reconstructed: Concept 2, as found in key passage A and an additional Concept 3 – again with a positive value – are related to each other. Their connection is visualized in the CAM as coherent (solid line), because the affective connotation of both concepts is of equal valence. Since Concept 1 and Concept 3 are not linked to each other in any key section, there is no relation displayed. The core categories result from the selective coding processes. The arrangement of the concepts is the result of this coding step. First the material of Level I was coded and mapped. The results then influenced and contrasted the analysis of the group discussions (Level II) as sensitizing concepts. To support the analysis process, software for qualitative data analysis was used in addition to manual sketches and notes.

Guiding questions for the coding sessions were:

- What do we learn about 'stimulating interaction' at the educational policy maker, in-service training provider and organizational levels:

  ○ How is 'stimulating interaction' defined?
  ○ What norms of 'stimulating interaction' are produced by the actors?
  ○ What emotional connotations of central concepts can be reconstructed?

- How is the formal 'input' concerning 'stimulating interaction' by education policy and in-service training providers negotiated on the organizational level?

FIGURE 1 | Research process – grounded cognitive-affective mapping approach (gCAMA).
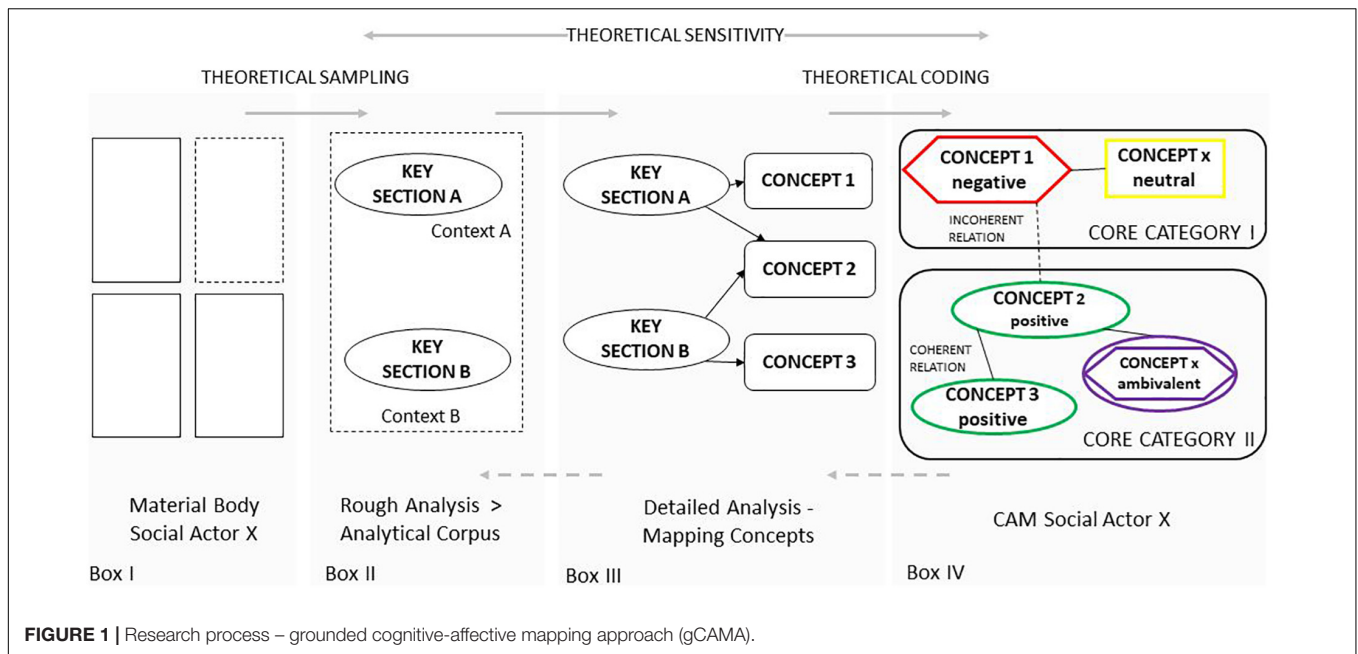
RESULTS

In general, the deliberated social innovation 'stimulating interaction' is perceived at the level of the organizations, with conditions that promote or prevent this interactional format being negotiated in specific ways as a result of shared values and perspectives on pedagogical practices within each team. The presentation of the results follows the premise of introducing the perspectives of the investigated actors, while focusing on their commonalities and dissonances, in order to deduce statements about the diffusion of the required innovation.

Different Perspectives on 'Stimulating Interaction' – Overview of Core Categories

Based on the analytical corpus (educational plans, in-service training programs on Level I, transcribed, guided group discussions with the teams of teachers on Level II), eight different CAMs were reconstructed. The CAMs consist of several interconnected concepts. These concepts, their emotional values and their associations are not only level-specific, but also actor-specific characteristics of the core categories found. Within the document on Level I 'stimulating interaction' is determined by three core categories embedded in the actors' call for innovation:

(1) 'assumed reality of practice': combines concepts that express the presumed reality of the teachers in practice; these concepts tend to be located on the left-hand side of the CAMs,
(2) 'demands on the teacher': combines concepts that express the call for further development; concepts are shown at the top, and
(3) 'principles of child learning and development': unites concepts that express general assumptions about the

learning child within a day-care center; concepts are mainly on the right-hand side of the CAMs.

Within the group discussions on Level II 'stimulating interaction' is determined by five core categories:

(1) 'demands on in-service training': summarizes concepts which describe the general expectations the teachers impose on in-service training courses, even independent of content; concepts are located at the top of the CAMs,
(2) 'perceived reality of practice': unites concepts that express the detected practical reality that constitutes pedagogical work on a daily basis; concepts are mainly located on the left-hand side of the CAMs,
(3) 'pedagogical approaches': unites concepts of pedagogical work to which the members of the organization collectively refer; concepts are mainly located on the right-hand of the CAMs,
(4) 'demands on children': summarizes concepts that children contribute to the success or failure of interactions; concepts are again mainly located on the right-hand side, and
(5) the transversal category of 'processing implementation': contains concepts that describe experiences and principles in the implementation of new pedagogical content in further detail; concepts are scattered within CAMs.

Display, Description, and Comparison of CAMs – Level I: Educational Policy Makers and In-Service Training Providers

In this section, the perspectives of both actors, educational policy makers (see **Figure 2**) and in-service training providers (see **Figure 3**), are firstly visualized and described and secondly compared to each other.
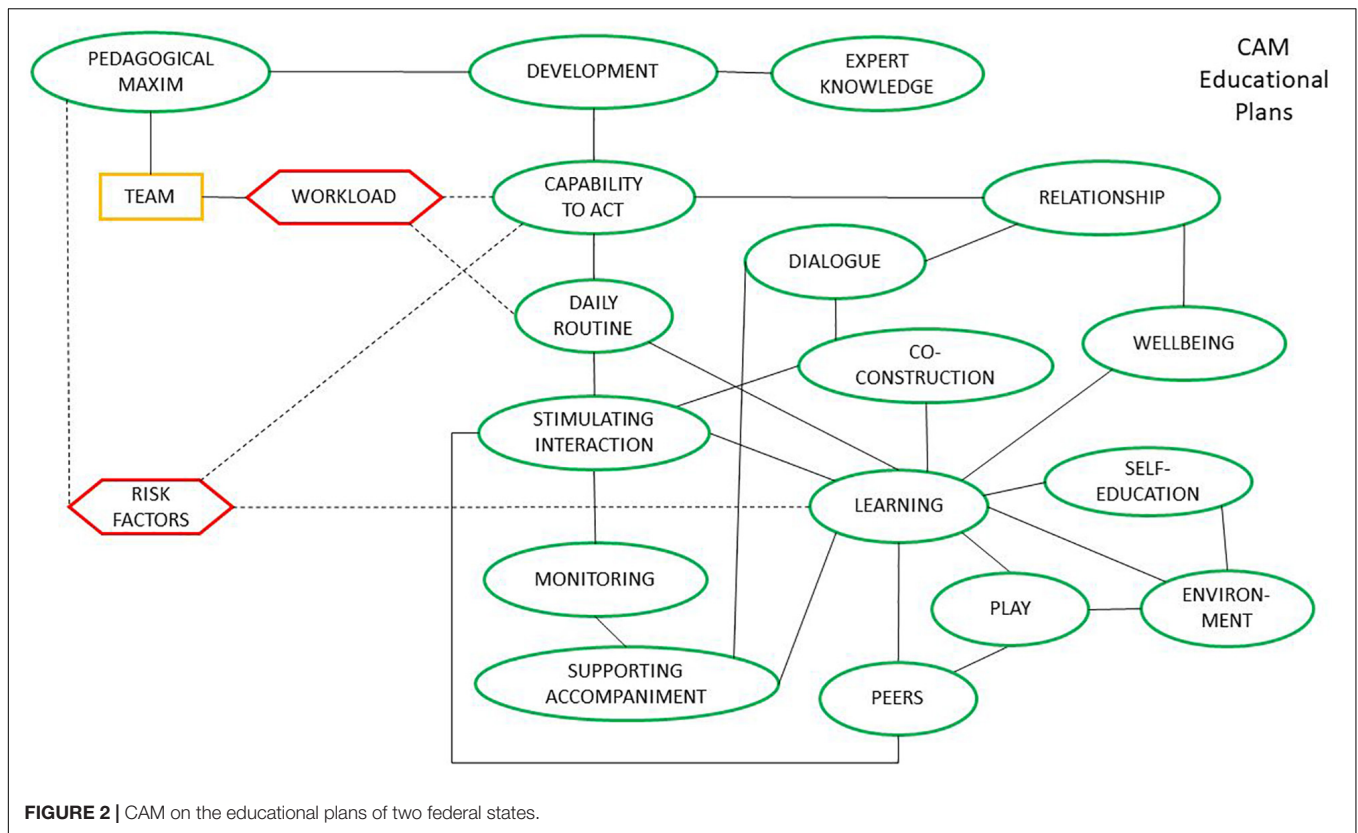
FIGURE 2 | CAM on the educational plans of two federal states.

Perspective of Educational Policy Makers – CAM on Educational Plans

Based on the educational plans of two federal states (Berlin and Brandenburg), 'stimulating interaction' can be reconstructed as a simple, easy-to-implement format of interaction between teachers and children. By assuming daily routines as resources, the pedagogical 'capability to act' as naturally given or a self-evident, intrinsic and promoted need to improve pedagogical skills, 'stimulating interaction' experiences a positive embedding. In addition, child learning and development are framed by only positively connoted concepts like 'dialog,' 'co-construction,' 'self-education,' or 'play.' 'Learning' emerges mainly from the child's inborn need to learn, so that the main pedagogical tasks are 'supporting accompaniment,' 'monitoring,' and guaranteeing access to an enriching 'environment.' Although the concept of 'workload' comes with a negative emotional value, the inherent acknowledgment that pedagogical practice can be very challenging and stressful tends to support the generally positive mood of practical reality in day-care centers. Further negatively connoted concepts can be reconstructed which either impair the child's development and learning or restrict the teachers' ability to respond to the social-economical or educational familial background or the heterogeneity of children. As a universal, idealized solution, pedagogical maxims of action are such as principles of democratic participation in practice or a holistic, individual educational approach are applied.

## Perspective of In-Service Training Providers – CAM on In-Service Training Programs

Based on the evaluation of 123 short in-service training programs, 'stimulating interaction' can be reconstructed as an ambivalent concept that on the one hand enables and supports child learning processes, but on the other hand is depicted as difficult to accomplish. The difficulties in applying formats of stimulating interaction are based on the assumed stressful and exhausting daily work of the teaching staff in day-care centers. 'Daily routines,' a heterogeneous child community and children that have behavioral problems or are disadvantaged in a variety of ways, prevent the teachers' 'capability to act.' As the key to the solution, the teachers are taught special techniques that can be easily and uncomplicatedly translated into everyday practice once they have been learned.

Comparing Educational Policy Makers and In-Service Training Providers

Although the core categories and most cognitive concepts are shared within the discourse on 'stimulating interactions' analyzed in the documents of educational policy makers and in-service training providers, a closer look also reveals some discrepancies on the level of individual concepts.

Similarities

In principle, the teachers and children are regarded as active subjects. A successful 'stimulating interaction,' meant

FIGURE 3 | CAM – Programs of in-service training providers.
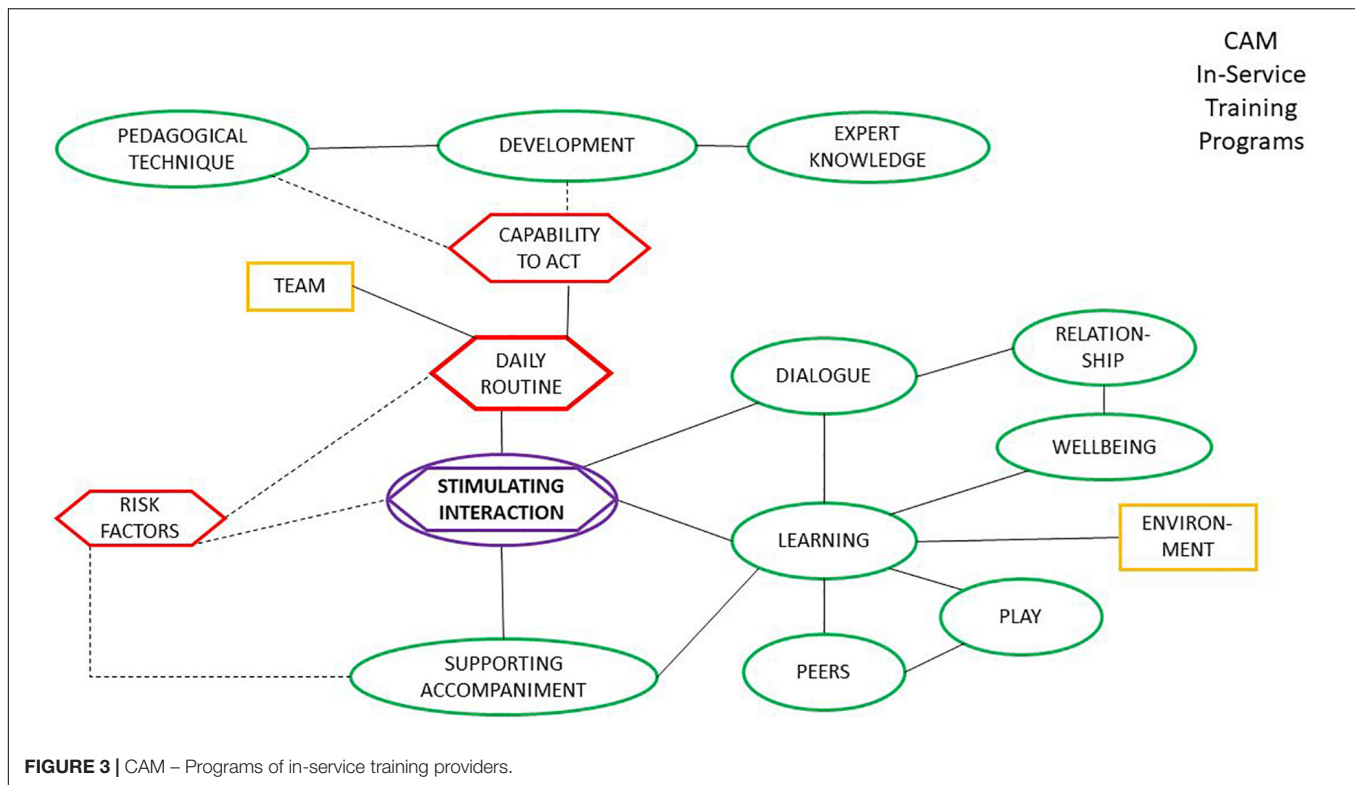
as execution in the intended sense, is influenced by various personal as well as external factors. They either support or prevent the performance of the activity attributed to the teacher and the children. Teachers have the task of supporting the children actively and empowering them to learn passively by designing the immediate or further social environment within and outside of the organization or by promoting peer-related play. In general, children's activities are fixed on learning and coming to terms with their environment, and are supported in this by the teachers. All concepts in the core category 'principles of child learning and development' have positive emotional connotations. The associative chains of concepts 'play,' 'peers,' 'well-being,' 'relationship,' 'dialog,' or 'supporting accompaniment' are almost identical and form the preconditions for children's developmental processes within those organizations which are labeled as a places of education. The concepts that are linked to the professional or even personal development of the teachers – including the requirement to develop constantly by participating in various in-service training courses and acquiring expertise in several fields – are rated positively. Development is necessary and can seemingly be implemented without effort.

Disparities

In regarding the views of both actors on how 'stimulating interaction' can and should be realized in practice strong contrasts become clear. For example, the concept of 'capability to act' is emotionally connotated in opposite ways. Within educational plans teachers are considered as competent subjects capable of acting against all odds, within in-service training programs they are characterized as deficient in competence and restricted in action. Another emotional contrast exists with regard to the concept of 'daily routine.' Within the educational plans it is understood as a resource that enables child learning even without interaction with the teachers. Within the in-service training programs 'daily routine' is connoted negatively. It limits the interactions seen as necessary for the child's development, the solution for which is to learn techniques at in-service training courses. Moreover, some concepts like the concept of 'risk factors' are linked in different ways. It belongs to the core category of 'reality of practice' and is negatively loaded. This concept includes potentially problematic features of children that challenge the teachers to interact: family and cultural background, poverty, disability etc. Within the educational plans it is regarded as a problem that these children are especially in danger of being disadvantaged. In order to reduce discrimination, pedagogical maxims for action are proposed, e.g., acting on the basis of democratic and participatory principles. Within the in-service training programs, however, it is declared that these risk factors prevent the pedagogical interaction itself that should in fact yield support. Countermeasures can be taken with various pedagogical techniques.

Display, Description, and Comparison of CAMs – Level II: Organization – Group Discussions

The CAMs of the organizations clearly differ from each other in detail. Each of the 6 day-care centers shows an individual picture of the reconstructed core categories.

FIGURE 4 | CAM Day-care center A.
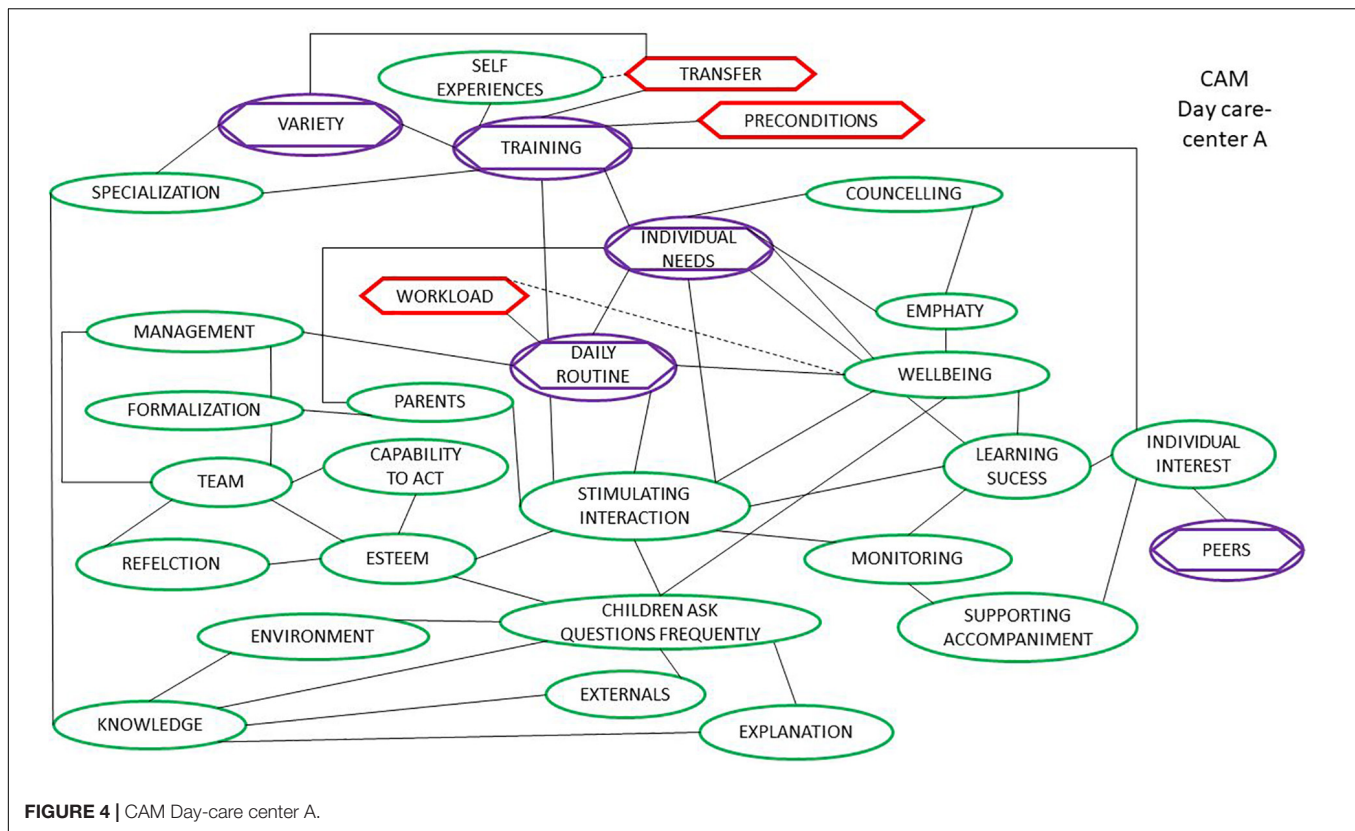
Day-Care Center A

In day-care center A 'stimulating interaction' is positively valued (see **Figure 4**). It is associated with a group of positively valued concepts like 'children ask questions frequently': children show their curiosity and thus initiate interactions with the teachers, which is somehow expected and seen as mark of 'well-being.' In addition, the teachers are enabled to satisfy the children by giving 'explanations.' Because 'knowledge' is rated as highly positive and as the basis for 'explanation,' it serves the positive self-perception on the part of the organizations interactional formats. Their positive attitude toward 'specialization' (e.g., qualifying language or natural science experts) within the team by in-service training selected by interest is coherently integrated into the chain of associations. The team has a positive attitude toward its 'environment' or 'parents,' not least because they sense the opening of the organization as an enrichment for the children's acquisition of knowledge ('learning success'). Working as a 'team' is perceived as pleasant through mutual 'esteem,' good informal and formal moments of 'reflection' and the importance the management attaches to the mental and physical health of the employees. All these concepts contribute to stress reduction ('workload') in their observed 'reality of practice.' However, in-service training itself is sometimes viewed with skepticism. This is because the 'variety' of the offered in-service training courses and their perceived demands to develop come with emotional negative values. Beyond that the willingness to implement something new is determined by the equipment and tangible comfort of the in-service training environment.

Day-Care Center B

At day-care center B (see **Figure 5**) 'stimulating interaction' is defined by the 'pedagogical approaches' to philosophizing with children and being able to wait in order to give them space to find their own problem-solving strategies or to follow their interests. These positively evaluated concepts are, among others, linked to the desire of the educators to personally benefit from the perceptible 'learning successes' of the children and to regard this as a motivator for the interaction methods they use. They are supported in the application of their 'stimulating interactions' by a perceived inspiring 'docent' who has a positive influence on the 'team' culture and 'daily routines' through 'videography.' They value their own way of interaction very highly and also defend it against 'externals' like colleges or other familiar day-care centers and 'parents,' because they feel misunderstood and condemned. Their way of interaction is not seen as accepted at all. Their 'own standards' may lead to a negative perspective toward 'material' provided in in-service training, because such material is regarded as imposed on them.

Day-Care Center C

The teachers of day-care center C (see **Figure 6**) have ambivalent feelings about 'stimulating interaction.' On the one hand they blame the children themselves for the failure of this new form of interaction in everyday life. They regard them as not old or capable enough, so that for the teachers but also seen from outside any 'visible success' fails to appear as motivator for the constant application of the method. 'Stimulating interaction'
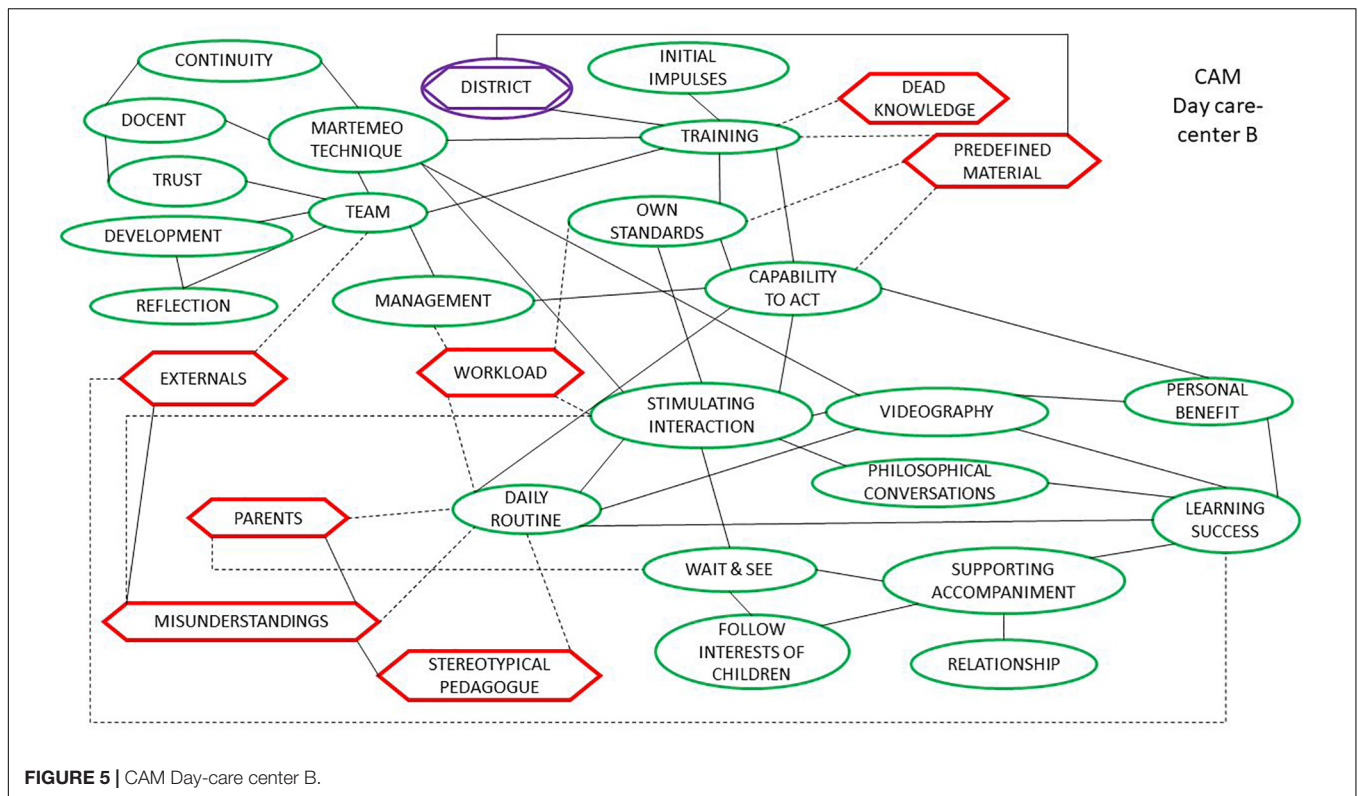
FIGURE 5 | CAM Day-care center B.

is nevertheless connected to positively valued concepts like 'relationship,' 'conversation,' or to 'arouse and show interest.' All of these contribute to the 'learning' processes of children. Parents are held primarily responsible for the educational success of their children. The assumed claim of parents that the day-care center is solely responsible is rejected at the same time. Changes that have taken place in the organization so far are experienced as sluggish and compulsory processes. This leads to a devaluation of continuous 'in-service training' unless the in-service training itself offers entertainment, good 'material' or an authentic 'docent.' Moreover, the informational content offered by in-service training courses is rated in a negative way. The emotionally positive concepts of 'restart' and 'ideal' conditions are mentioned as a self-proclaimed solution to the unenforceability of new interaction formats.

Day-Care Center D

The CAM of day-care center D (see **Figure 7**) is characterized by a particularly high number of negatively evaluated concepts compared to the other organizations. These concepts represent the core category of 'reality of practice.' 'Stimulating interaction' is a poorly rated interaction format. Its emergence is linked to various conditions. The format is for one thing prevented by perceived 'structural conditions' within the organization, and it is limited by 'standard procedures' during daily life and a recognized high 'workload' that lead to a feeling of heteronomy. The political decisions that lead to this unfortunate situation are called into question. As another factor, child conditions like age, cognitive skills, origin are used to predict the failure of the

format. However, the assumed impact of the format on child development is assessed as positive in itself, because it can be a stimulus to child imagination ('fancy') and lead to more intensive 'relationships.' A good emotional basis ultimately supports the self-attributed main pedagogical tasks: doing 'conversation' and satisfying the basic needs of the children for sheltered care. The pedagogical approach of 'open work' serves the inherent idea that children are able to 'develop naturally' if they can follow their personal interests. The basic attitude toward in-service training is positive and linked to the concepts of 'knowledge,' 'personal interest,' 'input,' and 'material,' which are also positively regarded.

Day-Care Center E

In day-care center E (see **Figure 8**) 'stimulating interaction' is associated with highly positively valued concepts that represent the pedagogical approach practiced there: 'in-depth conversations,' 'active listening,' interacting with 'all children' are the daily business. All these concepts are linked to a number of other positively rated concepts that enable the teachers to 'get involved in children's topics' to 'share thinking' and trigger children's 'cognitive processes.' This factors lead to an 'intense relationship.' The 'team' work is characterized by a high level of mutual trust and standardized reflection processes, which have led the team to self-developed 'pedagogical standards and interests.' The perceived self-efficacy and the mutual appreciation of the work done in the organization contribute to skepticism about 'formal obligations' imposed by others, e.g., associated facilities. In-service training courses are
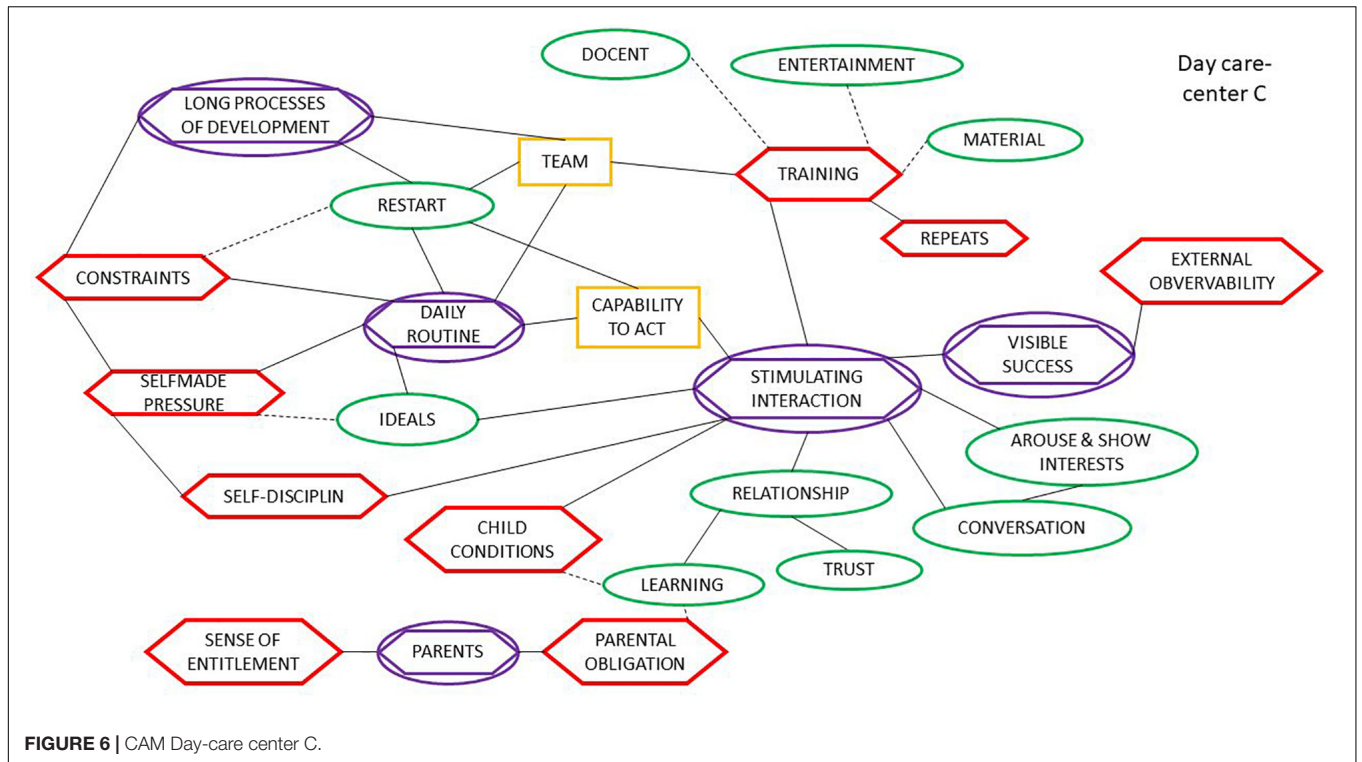
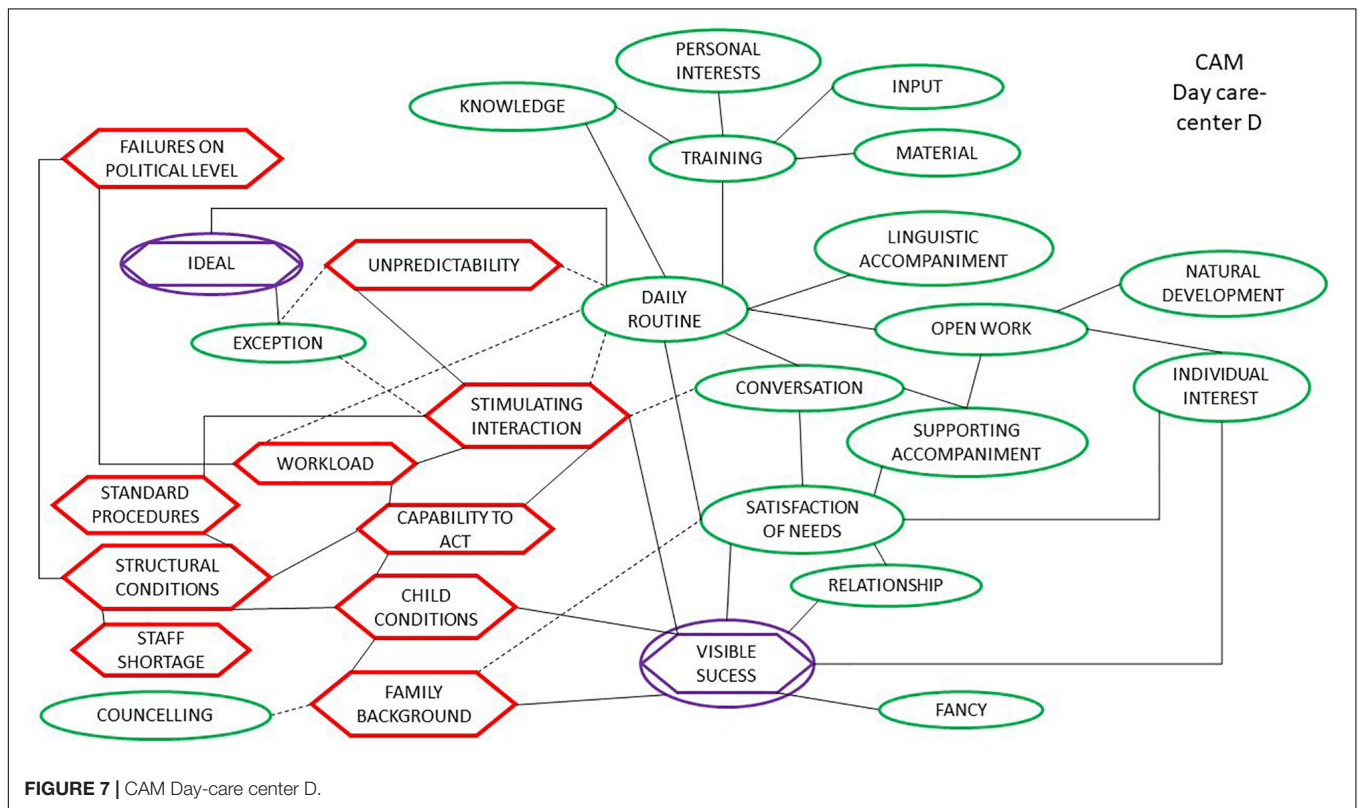**FIGURE 6 |** CAM Day-care center C.

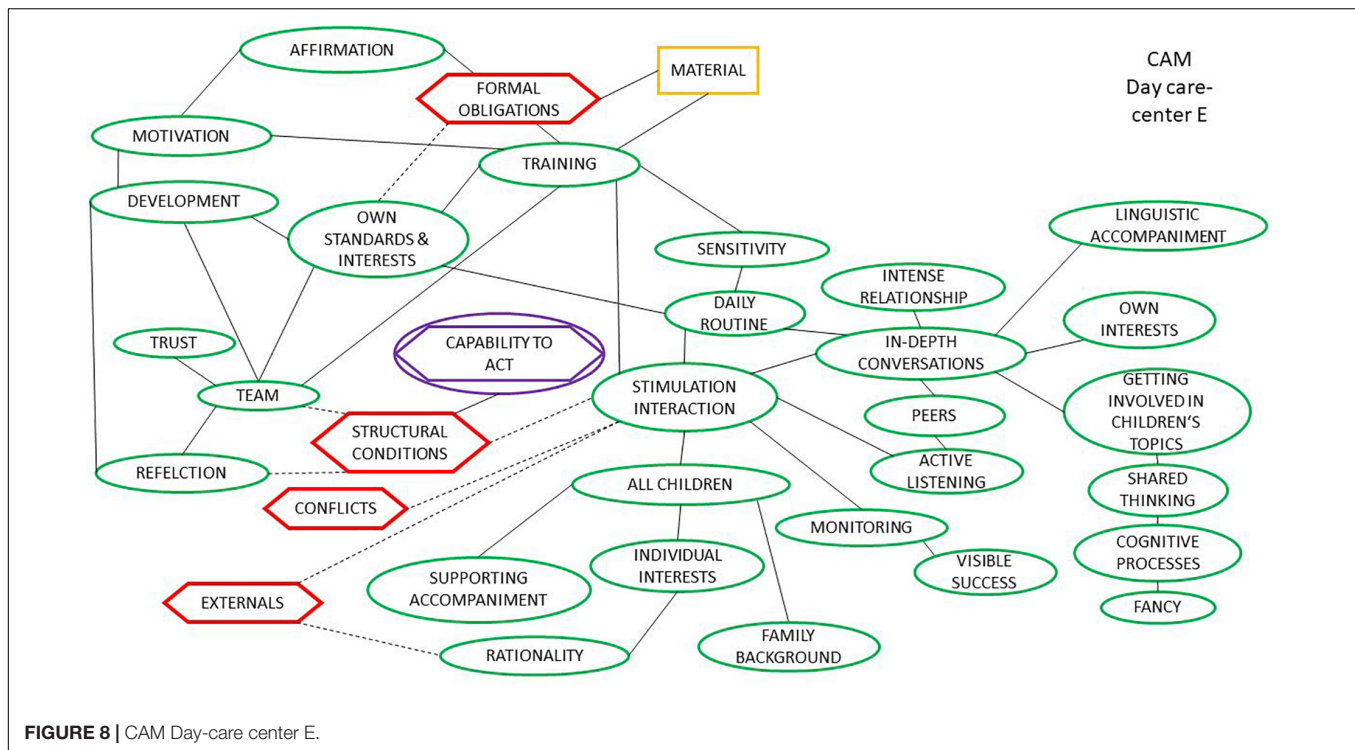**FIGURE 7 |** CAM Day-care center D.

FIGURE 8 | CAM Day-care center E.

perceived as positive and enriching, because they help create awareness of certain topics or as intrinsic 'motivation' for an ongoing team development process.

Day-Care Center F

At day-care center F (see **Figure 9**) 'stimulation interaction' is interpreted as 'linguistic and supporting accompaniment.' Because language is daily life, 'conversation' is also a highly positively valued element of their pedagogical approach. 'Conversation' moreover serves the aim of being able to 'raise awareness on specific issues' for protecting children against environmental hazards, it contains the opportunity to ask children questions and to encourage them to share their thoughts and needs. The 'child is seen as expert' in relation to its own development and the pedagogical idea to 'serve children's interests' logically follows. The concept of 'capability to act,' in other words to empower stimulating interactional formats, is tied to ambivalent feelings. This is because the 'team' is dissatisfied with the current work situation, which was caused by a change in personnel that currently prevents backing each other up and pulling together, which are seen as essential elements of good practice. The basic attitude toward in-service training could be reconstructed as rather ambivalent. 'In-service training courses' have to promote their 'own standards' or 'own interests,' and need to be comprehensible and easy-to-implement.

Practices of Adopting and Rejecting 'Stimulating Interaction' on the Organizational Level

To answer the question of to what extent the innovative messages concerning 'stimulating interaction' are taken up, negotiated and put into practice, this section presents a summarizing

classification of the reconstructed organizational mechanisms and practices. Firstly, we describe the different interpretations of what 'stimulating interaction' appears to be in practice across various organizations. Secondly we describe how the teams accept, process or delegate their assigned responsibilities to implement innovational interaction formats, and thirdly we focus on how the teams evaluate their implementation attempts.

Variations of Interpretation as Performed Re-contextualization

As the results reported above show, the intended social innovation of 'stimulating interaction' is interpreted in different ways, i.e., within each organization the teachers make sense of this concept in heterogeneous ways. Apart from the fact that the emotional connotation of the concept 'stimulating interaction' can be positive (day-care center A, B, E, and F) and negative (day-care center D) as well as ambivalent (day-care center C), the concept is linked differently within the CAMs (e.g., day-care center B vs. D). The previously discovered incongruities at Level I continue at Level II. 'Stimulating interaction' is defined as:

– daily conversation that occurs naturally in everyday life, because language is the medium of human interaction. Teachers are able to show interest, to build a relationship and thus contribute to the well-being of the child,
– explanations given to share knowledge,
– a linguistic approach to concretely support language development, and/or
– in-depth or philosophical conversation to think together and make children think.

FIGURE 9 | CAM Day-care center F.
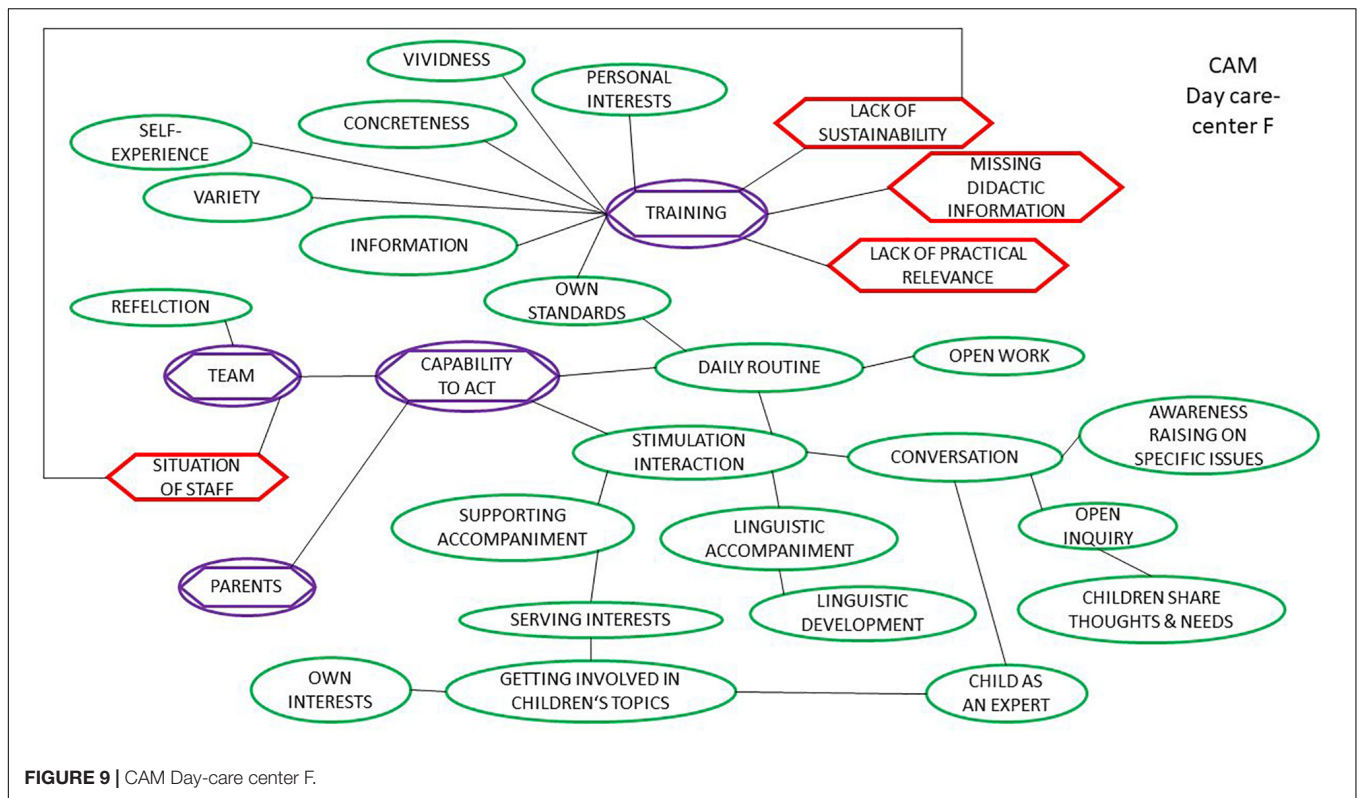
The characteristics and abilities as well as external qualities of children and their familial backgrounds are invoked as indicators of successful or failed 'stimulation interactions,' however interpreted. This leads to the implicit, ambivalent normalization of children. If 'stimulating interactions' do not succeed in the daily routines, the age of the children, their cognitive performance and their parental homes with references to origin and social class are listed as barriers and come with a negative emotional value. If 'stimulation interactions' can be realized in the daily routines, the child's image is the exact opposite and independent of social background. All children have rationality, are naturally interested, are active, communicative, open-minded, with positive attitudes, able to be equal partners in the dialog. However, the expectations of the children are ultimately the same and on a high level; they are only embedded in contrasting cognitive-affective ways.

Variations of Accepting and Delegating Responsibilities

In addition to the role of children in 'stimulating interaction,' other mechanisms within the organizations can be reconstructed which are in some way held responsible for the successful implementation of the innovative interaction format. Firstly, structural conditions such as the child-care ratio determined by educational policy makers are listed as negatively connoted obstacles (see day-care center D, E, or F). Here links are set to the negatively framed concept of 'workload' and the heterogeneously connoted concepts of 'capability to act' or 'daily routines.' Secondly, in addition to the perceived

educational mission expected by society and educational policy, in a broader sense by referring to the perceived task of family accompaniment teachers also return responsibility for the children's education to the parents (see day-care centers B, C, or D). Thirdly, a successful implementation of new interaction formats is linked to the in-service training courses participated in by the teachers and the defined roles of in-service training with regard to the development process of the organization (concepts at the top of each CAM). The reconstructed different functions of in-service training courses can coexist within an organization and are defined as:

- a short-term, superficial entertainment program, as a place of self-experience and source of concretely applicable, didactically prepared materials and ideas for everyday life, interest-related.
- a place of dialog with docents or teachers from other organizations for the purpose of confirming current practices.
- part of a long-term, self-initiated team development processes to evolve or enlarge their own standards alongside subjectively perceived 'state of the art' pedagogical approaches.

Self-Evaluation Mechanisms During Re-contextualization

It has been possible to reconstruct some concepts that provide an insight into the evaluation of the new interaction format if it was applied within the organization in individually interpreted

ways. For example, the concept of 'learning success' varies emotionally between the day-care centers as a result of the way the children reacted to the applied interactional format. If the teachers monitored a child reaction – interpreted and to some extent expected as positive such as imaginative narration, asking more questions, continuing with their subject further, deepening their interest etc. – they deduced a great benefit, or in Rogers (2002) terminology "a high relative advantage," and used the positive experience as an external motivator for continuing with the format (see day-care center A, B, or E). In contrast, other teachers reported a disappointing reaction by the children to the applied interactional format: the children kept quiet or turned around so that the teachers were negatively affected, deduced no benefit and stopped this way of interaction (see day-care center C or D). Another concept that needs to be taken into account is 'external parties,' who are either valued positively (see day-care center A) or negatively (see day-care center B or E) by different teams. Either way the concept is linked directly or indirectly to the applied pedagogical approaches and the way teachers evaluate the reaction of these external parties. The attributed emotional value is negative if they are regarded as critics of the pedagogical performance. In such cases the external parties are simultaneously downgraded as misinformed or old fashioned, with the teachers thus continuing to entrench their established practices.

Counteractions Between Level I and Level II

In a sense, the core categories which have been found and are presented in Section "Different Perspectives on 'Stimulating Interaction' – Overview of Core Categories" can be understood as mutual counteractions between the actors on the two levels. Whereas, for example, education policy and in-service training providers determine the way of pedagogical development, the organizations make decisive demands on the in-service training providers. The 'principles of child learning and development' which have been found on Level I are reflected at the level of the organizations as subjectively possible pedagogical routines and approaches which, beyond that, manifest demands on the interacting child.

The core concept of 'reality of practice' is shared by all actors – in concrete terms as 'daily routines,' 'workload,' or 'capability to act,' for example – but its character is shaped by different emotional values and several different associated concepts. Even if the actors at Level I do not actively shape pedagogical practice within the organizations like the teachers do, educational policy makers and in-service training providers claim sovereignty of meaning and feeling, though in opposite ways. However, every organization has its own view of its feasible practice, its own experience of what it feels like and generates different concepts and associations to deal with it. Particularly in those organizations where the core category of 'reality of practice' combines rather ambivalent or negative concepts (e.g., day-care center D, E, or F), fractures between the organization and education policy become apparent. Either the view of the practice

is reflected on the level of the in-service training providers, or the organizations utilize the rhetoric of the in-service training providers. In either case, however, the positive view of the daily work assumed by educational policy makers is contradicted here.

Furthermore, there is also a differentiation from educational policy makers and training providers, especially if the organizations work according to the pedagogical standards they have themselves developed (see day-care center B and E), which *per se* prevent or complicate unwanted interference from the outside and equally allow only self-targeted interventions as a further developmental step.

The transversal core category of 'processing implementation' can be used to show how the innovation request is negotiated very differently within the pedagogical teams, or in other words, which stage of the diffusion process has already been passed, which ultimately leads to whether the innovative interaction format is individually adapted and implemented or rejected. It should be noted that the call for innovation itself finds its way into practice but is interpreted in very different ways.

Summary

This section shortly summarizes the findings by selecting the particularities on the two levels and between the levels.

Incoherences on Level I – Educational Policy Makers and In-Service Training Providers

The three core categories – 'assumed reality of practice,' 'demands on the teachers,' and 'principles of child learning and development' can be found within both educational plans and in-service training programs. However, the concepts assigned to the core category 'assumed reality of practice' differ greatly in their emotional values. On the side of the educational policy makers the assumed practical reality of a teacher is valued positively. By holding on to pedagogical ideals, the teachers within the organizations can endure any adversity and implement their educational mission for each child. The key to this lies in the hands of every teacher and is linked to further in-service training. On the side of the in-service training providers, the assumed practical reality of a teacher is valued negatively. Facing a lot of obstacles in practice, the teachers need an incredibly large repertoire of pedagogical action techniques in order to be able to implement their educational mission for each child. Because the circumstances within the organizations cannot be changed, the teachers themselves are the key to successful pedagogical work, at least if they keep learning.

Similarities and Differences Between the Day-Care Centers on Level II – Organization

The perspectives of the organizations on 'stimulating interaction' are very heterogeneous, no organization is like the other. While some teams find their perceived everyday life and structural conditions within the organization restrictive in providing the children with the support they actually need, others emphasize the feasibility of the partly new pedagogical approaches, some of them developed in-house, despite perceived difficulties in terms of the welfare and

education of the children. These differences become apparent in the contrary emotional connotations of some concepts, e.g., 'capability to act,' 'daily routine,' 'team,' or by accentuating the perceived reality with different concepts like 'workload,' 'child conditions,' 'structural conditions,' or 'self-made pressure' in an emotionally negative way (see day-care center C, D, E), or in an emotionally positive way with concepts such as 'own standards,' 'reflection,' 'esteem,' or 'trust' (see day-care center A, B, F).

Similarities and Non-conformities in Relation to Selected Concepts Between Level I and II

The perspectives on practice on the part of the actors at Level I to some extent represent extremes with regard to the assumed practical reality, while the organizations move individually between these poles and react to the partial statements of the in-service training providers if there is a need to underline difficulties by implementing innovative interactional formats – illustrated for instance with the emotionally negative concepts of 'risk factors' and 'child conditions.' Furthermore, if effective implementation is not perceived as successful, some organizations comment on the positively connoted concept of 'demands on the teacher' on Level I and their assigned task to develop continuously by targeting educational policy makers as responsible for 'structural conditions' that prevent the embedding of new pedagogical formats into practice, or by criticizing in-service training providers and their programs indirectly via concepts like 'repeats,' 'predefined material,' or 'lack of practical relevance.'

DISCUSSION AND CONCLUSION

The aim of this study was to trace the path of a social innovation using the example of 'stimulation interaction' in the field of early childhood education and to show both the cognitive and affective dimensions of meaning within the innovation discourse. The positions of the actors involved in the discursive innovation – educational policy makers and in-service training providers as senders of the educational innovation (Level I) and 6 day-care centers and their pedagogical teams (Level II) as receivers of the innovational messages – have been examined and visualized by CAMs.

Although educational policy and in-service training providers wish to establish innovative interactional practice, their prescriptive-normative specifications differ greatly from one another: the affective association of some concepts is even of opposite value. Thus a diffuse mixture of competing and contradictory information is communicated to the professionals and collides with their established practices. On the one hand, contradictory information concerning educational innovation makes it difficult to identify clear instructions for the implementation of the according actions. On the other hand, contradictory information cause implausibilities that affect the perception and evaluation of the intended educational innovation on the level of organizations: incoherent

messages from decision-makers in education policy seem to miss their effect at the level of educational organizations and, furthermore, at the level of educational practice. Possibly, these inconsistencies complicate collective sense-making which is an essential part of the implementation of an innovative idea, because an in-depth examination of the topic by the practitioners is hampered from the very beginning (Coburn, 2001). In terms of Rogers' characteristics of the diffusion of innovation (2002), content of the intended innovation may also be too difficult to understand or too difficult to achieve in the given context of application for the adaptation of the new ideas without further ado.

These inconsistencies not only inhibit innovation because they make it possible to evade demands, they also generate stagnation: controversial messages unsettle and strengthen the tendency to adhere to familiar rituals, methods and didactics in everyday practice and thus hamper innovation. In practice the professionals dissolve these tensions in different ways, e.g., by rejecting innovation requests as unrealistic and incompatible with their current situation, or by claiming they have already been fulfilled. At this point, we can tie in again with Rogers (2002), because apparently neither the preconditions for adaptation 'relative advantage' nor 'compatibility' seem to be fulfilled and, thus, do not lead to the requested change in the interaction.

If a social innovation cannot be seen as intended or feasible, the apparent insistence on established practice is ultimately a logical consequence.

In order to make a positive contribution to the change of interactions in practice, it might be useful:

– to establish a discursive agreement on central concepts of the topic at the policy level and to connect them with the actual working realities of practice in order to implement social innovations in education and
– to define 'stimulating interaction' more clearly as distinct from conversation and to link it more closely to existing ideas in practice. This will not be universally possible, but requires organization-specific support measures and time.

What also becomes clear is that in addition to the development pressure on teachers, there is also enormous pressure on in-service training providers, who have to translate the ideals of educational policy into the language of practice, while at the same time satisfying the needs and interests of practitioners. The problematization of everyday life as an obstacle to new interaction formats for instance seems logical, because it may be easy to tie in with the perspectives of practitioners, but it also points to an odd dependency relationship which spans a certified need for further in-service training, the options which are available and the interest-led participation.

Thompson (2017) shows how difficult and challenging it is to establish common sense and joint language between the in-service trainer and the participants. She points out that there are translational difficulties because of which the participants and their daily routines remain in a 'lost position' (Thompson, 2017,

p. 248) and reflections are only partially possible. For in-service training providers, it is therefore necessary to respond more individually to the participants' experiences, emotions, knowledge concerning an intended innovation in the training courses. It is questionable whether this is easily possible, because they actually have to deal with subjective narratives and can hardly refer to a common ground of experience within the specific organizations. Education policy actors could also react here by investing more financial capital in individual in-service training courses that are provided for local organizations rather than across different organizations that have to deal with various challenges (f.e., to enable permanent, process-accompanying coaching with the teams according to their needs and to support the development of a 'common language' beyond all levels). What probably seems most helpful in preventing reservations about innovation is providing educational professionals with consistent information. Policy-makers and in-service-training providers should anticipate the supportive as well as competing knowledge-emotional complexes of professionals and take these into account when communicating an intended innovation. Further research is needed to clarify whether it is more useful to use a rather positive-normative discourse on stimulation interaction rather than to clearly reveal deficits.

In this paper an innovative inter-methodological triangulation approach was presented which made it possible to reconstruct the perspectives of various actors representing different levels of the multi-level education system who are involved in a social innovation. The study uses the example of an intended new interaction format of 'stimulating interaction' in the field of early education based on various sources such as public documents and group discussions. This cross-layer approach made it possible to understand more comprehensively how innovations travel through space and time, and why it is often so difficult to implement innovations as planned. The visualization with the help of CAMs depicts the perceptions and values of different actors as crucial for a coherent process of innovation transfer.

It has to be mentioned, of course, that the CAMs are a result of an interpretational process of narratives within different documents. Moreover, the process of purposeful sampling which was applied led to a limited choice of materials. These focused primarily on large regional providers, leaving out smaller suppliers or training courses conducted by the bodies of the different organizations. Another limitation is certainly the design of the study itself, because only two federal states and one single survey were focused on, instead of longitudinal studies that might enlighten the follow-up process subsequent to the first interaction with an intended innovation. Such a method could make it possible not only to examine collective knowledge and values, but also to focus on the individual teacher involved in implementing an innovation in practice and to trace perceived obstacles to implementation at a subjective level. It can be assumed that pedagogical action and work are influenced not only by colleagues or the organizational culture, but that biographical experiences and the personal environment can also contribute to a change.

DATA AVAILABILITY STATEMENT

The datasets for this manuscript are not publicly available because of strict data protection regulations (EU DGSVO; data protection regulations). Requests to access the datasets should be directed to: Jasmin Luthardt, j.luthardt@fu-berlin.de.

AUTHOR CONTRIBUTIONS

JL: theory, methods, results, and discussion. TS: methods. FH: discussion. IB: idea, methods, and discussion.

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