Fostering Dialogic Teaching – The "Dialogic Video Cycle" as a video-based professional development programme to enhance classroom discourse

Maralena Pielmeier[1], Ricardo Böheim[1], Ann-Kathrin Schindler[1],
Alexander Gröschner[2], Maximilian Knogler[1], Martina Alles[1] & Tina Seidel[1].
[1] Technical University of Munich (TUM), School of Education, Germany
[2] Friedrich-Schiller-Universität Jena, Faculty of Social and Behavioral Science, Germany

ABSTRACT

Classroom discourse is often dominated by the Initiation-Response-Follow-up (IRF) interaction pattern, forcing students into the role of key-word providers. Changing the routine as well as students' learning perceptions is an imperative in the community of research on dialogic teaching (Mercer & Dawes, 2014). In the current paper, the project DIALOGUE is presented which aimed to conceptualize the Dialogic Video Cycle (DVC) as an effective evidence and video-based TPD program. One aim of the project was the investigation of its impact – in comparison to a control group – on the four columns of Desimone's TPD model (2009) showing the following findings: (1) teachers perceived the DVC as a satisfying learning environment with a professional facilitation, (2) watching both their own video and those of colleagues supported teachers in redefining their teaching practice regarding classroom discourse, (3) feedback – as a follow-up

move – was easier for teachers to change than questions as an initiation element, and (4) students benefited from their teachers' TPD participation with regard to their motivational and cognitive learning developments. Based on the given findings, indications for the second project phase were derived.

"TEACHER: WHAT'S THE SQUARE ROOT OF 25? STUDENT: 5. TEACHER: CORRECT."

This short piece of teacher/student interaction illustrates a wide-spread interaction pattern: *Initiation-Response-Follow-up* (I-R-F). The research strength of dialogic teaching – which reaches back to the 70s – (Howe & Abedin, 2013; Mercer & Dawes, 2014; Walshaw & Anthony, 2008) finds the pattern described to be dominant especially during whole-group discussions, which have been identified as the main interaction setting in classrooms (Hiebert et al., 2003; Seidel & Prenzel, 2006). According to the I-R-F, teachers initiate (I) classroom discourse typically by asking a question. This is followed by a student response (R), for which a concluding feedback (F) from the teacher is received. Kobarg and Seidel (2007) found that teacher questions are predominantly designed to obtain short student answers. In consequence, classroom discourse is often dominated by the teacher, and students commonly do not represent equal conversation partners. Thus, students' roles in classroom discourse are reduced to keyword givers (Seidel & Prenzel, 2006), who predominantly give short answers. Therefore, it is not surprising that students' verbal contribution in classroom discourse is much smaller compared to that of their teachers (Helmke et al., 2008; Mercer & Dawes, 2014). Based on the analysis of the frequency and duration of student statements Jurik, Gröschner, and Seidel (2013) additionally found that mostly students with high cognitive abilities and high motivation are the ones actively contributing in classroom discourse. Thus, these tight I-R-F patterns also favor a particular group of students and often fail to involve less-engaged students.

Even though this teaching mode described may be legitimized by its push for efficiency (e.g. Scott, Mortimer & Aguiar, 2006), it often fails to activate and challenge students sufficiently (Howe & Abedin, 2013). Therefore, it is important to rethink the potential of classroom discourse to foster student learning and support teachers in extending their repertoire of discursive interaction patterns (Alexander, 2005; Osborne, Simon, Christodoulou, Howell-Richardson

& Richardson, 2013). In this context, Scott, Mortimer, and Aguiar (2006) distinguished between authoritative discourse and dialogic discourse. In dialogic discourse, teachers aim to facilitate students' verbal engagement by encouraging different ways of thinking and by welcoming the ideas students bring to the conversation (Scott, et al., 2006). Thus, students' ideas and opinions are seen as a resource to be explored and expanded. In contrast, the main purpose of authoritative discourse is to focus students' attention on a specific meaning, instead of exploring different students' ideas (Scott et al., 2006). As a result, authoritative discourse leads towards a "closed" or rigid interaction pattern, where the teacher forces the students' attention to his/her intended direction (Scott, et al., 2006). As shown by previous research, (see Jurik et al., 2013; Kobarg & Seidel, 2007; Seidel & Prenzel, 2006), the I-R-F pattern is commonly found in such authoritative interactions. Even though authoritative approaches are often inevitable during classroom discourse, classroom discourse benefits highly from dialogic teaching, since it offers more opportunities for students' active engagement and more elaborate learning processes (Alexander, 2005; Lyle, 2008; Mercer & Littleton, 2007).

The level of interaction within the I-R-F differs clearly for dialogic teaching: Teachers' questions are designed to encourage students to share their ideas and discuss their views and opinions (Mercer & Littleton, 2007; Scott, et al., 2006). As opposed to the prevailing practice of posing closed questions (i.e., questions with only one specific answer), Oliveira (2010) highlighted the importance of questions being open-ended, since these allow students to give multiple answers. Challenging and connecting questions ensure that students carefully explore their ideas while embedding them in prior knowledge (Oliveira, 2010). Such questioning has the potential to initiate a dialogic conversation as it provides several opportunities for students to engage in classroom discourse and co-construct knowledge by exploring and justifying each other's ideas (Molinari, Mameli & Gnisci, 2013). In dialogic teaching, students' responses are understood as an important resource for learning opportunities (Mercer & Dawes, 2014). Teachers' subsequent feedback should therefore not solely include information about correctness. Instead, feedback is a powerful tool to facilitate students' thinking by helping students in restructuring ideas, pointing out alternative directions, or indicating relevant information needed in the process (Hattie & Timperley, 2007). Hattie and Timperley (2007) argued that this feedback about the processing of

the task has a much greater potential to enhance deep learning since it focuses on the underlying processes and applied strategies of students' thinking.

In this context, Alexander (2005) establishes five principles that define dialogic teaching as being *collective, reciprocal, supportive, cumulative,* and *purposeful* (p. 26). In line with these principles dialogic teaching comprises the following: Teachers and students address tasks together rather than in isolation (*collective*), listen to each other, and are open to different opinions (*reciprocal*). Opportunities are provided for students to state ideas freely without being afraid of saying anything "wrong" (*supportive*). Moreover, students benefit from different viewpoints and chain these into coherent lines of thinking (*cumulative*), whereby they are facilitated by the teacher who has a particular educational goal in view (*purposeful*). As a result, students and teachers build a learning community in which they work together as well as share and follow-up on each other's ideas. In order to meet these criteria, the question emerges of how teachers can be facilitated to improve their discursive practices towards a more dialogic discourse.

In their review on effective classroom discourse, Walshaw and Anthony (2008) provide a comprehensive framework about how to introduce dialogic teaching in classroom discourse. In line with the I-R-F pattern, the authors identified two decisive activities. The first activity concentrates on a successful initiation of students' engagement in classroom discourse. Verbally engaged students have the opportunity to elaborate their cognitive processes and deepen their understanding. The second activity includes feedback as a meaningful tool to facilitate students' thinking and structure students' ideas (Walshaw & Anthony, 2008). Both activities provide relevant implications for the implementation of dialogic teaching in classroom contexts.

TEACHER PROFESSIONAL DEVELOPMENT (TPD) AS A MEANS FOR DIALOGIC CLASSROOMS

Teacher professional development (TPD) programs have an indispensable drive for changing classroom routines (Kazemi & Hubbard, 2008). As highlighted above, educational research has identified classroom discourse as being stuck behind its potential, and this bothers both the TPD facilitators and the affiliated research community. In the following, we provide an overview of selected TPD programs fostering dialogic teaching.

Existing approaches

There are two approaches from the University of Cambridge – Lesson Study and CamTalk.

In the programme "CamTalk" the role of dialogic teaching and learning in successful classrooms is explored in secondary education (age 11–18) based on Alexander's principles (van de Pol, Brindley & Higham, 2017). The applied TPD programme was based on Alexander's principles of effective TPD and embodied face-to-face meetings, as well as online modules including chat sessions with other teachers and a supervisor. For History teachers, the TPD was highly effective, while for Mathematics teachers, the TPD was only effective to some extent. For explaining differences in implementing dialogic teaching, focusing on teachers' understanding and practice of dialogic teaching were the most promising (van de Pol et al., 2017).

The "Lesson Study Project" examines how and what teachers learn in the context of the development of a self-sustained Lesson Study community that involved collaborative lesson planning and the evaluation of student learning (Vrikki, Warwick, Vermunt, Mercer & van Halem, 2017). The extent to which the TPD programme affected teachers' learning and regulation activities was investigated. Findings showed that teachers used practical resources for modeling more targeted concepts. Furthermore, there was a change in lesson structure, so students were given more time to articulate their thinking and reasoning. In addition, there was a strong focus on developing the language of mathematics and challenging students to use mathematical terms appropriately. The tasks were more often presented as problem-solving challenges (Vrikki et al., 2017).

Another approach called "Accountable Talk" was established at the Institute for Learning at the University of Pittsburgh by Michaels and her colleagues (2008). Accountable talk is characterized by three broad dimensions: (1) *accountability to the learning community*, in which participants listen to and build their contributions in response to those of others, (2) *accountability to accepted standards* of reasoning, talk that emphasizes logical connections and the drawing of reasonable conclusions, and (3) *accountability to knowledge*, talk that is based explicitly on facts, written texts, or other public information" (Michaels et al., 2008, p. 283). In the treatment conditions "academically productive talk" (APT) taught how to stimulate the described key assumptions by concrete *talk moves* (strategic teacher moves

for opening the conversation and supporting student participation, explication, and reasoning (Michaels & O'Connor, 2012). The APT condition was compared to a "direct instruction" condition. Students, whose teachers participated in the APT condition, showed a significantly stronger performance regarding mathematical knowledge at the end. Furthermore, students in the APT condition classes talked more than those in the "direct instruction" condition. In either condition, findings showed no relationship between the degree of *individual* students' verbal contributions (measured by word count) during the lesson and student mathematical performance. The authors interpret that somewhat puzzling finding as a result of "active listening" and "repeating in your own words" being one emphasis of the program. Silent students might have had the chance to improve their knowledge through active listening and their chance to listen to many student answers using differentiated wording (O'Connor, Michaels, Chapin & Harbaugh, 2017).

Another dialogic teaching PD was developed by Reznitskaya and colleagues in New York and Ohio. The programme was designed to help elementary school teachers to support the development of students' argument literacy. Teachers were trained to use a specific type of talk, the so called "inquiry dialogue" (Wilkinson et al., 2016). Inquiry dialogue (Walton, 1998) aims to find the most reasonable answer to contestable, "big" questions (Wilkinson et al., 2016). The research group developed an observation tool (argumentation rating tool ART) to assess pre/post videotaped classroom discussions of participating teachers. ART rates the quality of teacher facilitation and student argumentation during group discussions on texts in elementary language arts classrooms (Reznitskaya, Wilkinson & Oyler, 2016; Reznitskaya, Wilkinson, Oyler, Bourdage-Reninger & Sykes, 2016). Findings showed fundamental improvement in teachers' facilitation of inquiry dialogue in line with students' enriched argumentation during classroom discussions (Wilkinson et al., 2016).

In this chapter, we introduce another TPD program, the "Dialogic Video Cycle" (DVC) developed in the project context "DIALOGUE" (Gröschner, Seidel, Kiemer & Pehmer, 2015). Concretely, the evidence-based conceptualization of the DVC is described since we consider sharing such knowledge can help both TPD facilitators und researchers to move the field of carefully designed TPD programs forward. Additionally, results of the first DIALOUGE phase regarding the impact and effectiveness of the DVC are presented in order to discuss the potential and

challenges of such a program. Finally, further development steps of the DVC and the affiliated research in the context of the second project phase are illuminated.

Effective TPD features

When conceptualizing an evidence-based programme such as the DVC – besides screening the research environment for other programs – the consideration of effective TPD key features identified is inevitable. In this regard, five core features have been identified including: content focus, active teacher learning, coherence, duration, and collective participation (Desimone, 2009; Wilson, 2013).

- *Content focus*: The TPD programme focuses on a specific subject or pedagogical content. In other words, teacher learning is directed towards a defined goal such as dialogic discourse that can be implemented in subject-specific teaching.
- *Active teacher learning*: Teachers engage actively in the learning process – e.g. reflecting on their own or other teachers' behavior – as opposed to being passive recipients.
- *Coherence*: Content topics of TPD programs are chosen and aligned with teachers' beliefs and previous knowledge.
- *Duration*: To achieve long-term and profound results, the training consists of multiple interventions spread out over a significant period of time.
- *Collective participation*: As teachers benefit from each other's professional experience, opportunities to interact, argue, and exchange opinions are provided for teacher learning.

Besides Desimone's (2009) highly acknowledged core features, *continuity* is of great importance to assure, maintain, and increase teachers' instructional quality throughout their professional career (Vermunt & Endedijk, 2011; Vigerske, 2017).

Besides the questions of: how long, in what kind of structure, and on which topic teachers should learn in a TPD setting, a challenge is the connection to teachers' daily routines. In this context, video excerpts of teaching have been introduced as an innovative supplement for effective TPD programs (Blomberg, Sherin, Renkl, Glogger & Seidel, 2014; Borko, Jacobs, Eiteljorg & Pittman, 2008; Seidel, Stürmer, Blomberg, Kobarg & Schwindt, 2011; Sherin & van Es, 2002). Video excerpts of teaching provide opportunities in TPD to illustrate content and daily classroom

routines in ways no other teaching artifact (student work, lesson plan, etc.) can currently do (Coles, 2013; Jacobs, Borko & Koellner, 2009). Furthermore, including video in teacher learning is powerful because it fosters active teacher reflection of their own teaching practices or those seen from colleagues (Borko et al., 2008; Kleinknecht & Schneider, 2013; Seidel et al., 2011; van Es & Sherin, 2006) and even activates teachers' modeling behavior (Moreno & Valdez, 2007). Using video for TPD allows capturing complex classroom discourse in an authentic, practice-oriented way for teacher learning (Gaudin & Chaliès, 2015; van Es, Tunney, Goldsmith & Seago, 2014; Zhang, Lundeberg, Koehler & Eberhardt, 2011). To ensure meaningful learning processes through video-based teacher reflection, the role of the facilitator is pivotal (Borko, Jacobs, Seago & Mangram, 2014; Gröschner, Seidel, Pehmer & Kiemer, 2014; van Es et al., 2014). The facilitator's task is the selection of video excerpts rich in content, focusing the reflection towards decisive goals, and supporting collective participation among the participants.

One TPD programme that integrates the potential of video in a teachers' "working cycle" (planning, teaching, reflecting) is the *Problem Solving Cycle (PSC)* from Borko and colleagues (Borko et al., 2008). The PSC is a series of three inter-related workshops (one planning workshop and two video-based reflection workshops) in which teachers' discussions are organized around a rich mathematical task. In the first workshop, teachers have to solve a mathematical problem and develop a lesson plan about how they could teach this problem to their students. The following workshops focus on the planned and videotaped lesson with regard to teachers' experience applying the problem in their classrooms. In the first reflection workshop, the focus is on the teachers' role, whereas the second reflection workshop centers on critical examination of students' mathematical reasoning.

THE DIALOGIC VIDEO CYCLE
Conceptualization of the "Dialogic Video Cycle" focusing on classroom discourse

The Dialogic Video Cycle (DVC) aims to fuse the described structure of the Problem Solving Cycle (Borko et al., 2008), Desimone's (2009) effective components of TPD, and the TPD content of dialogic teaching. Similar to the PSC, the DVC (see Figure 3.1) contains a lesson planning workshop, videotaping the planned lesson, and two reflection sessions. Just as Walshaw and Anthony's described activities,

(1) *student activation and clarifying discourse rights* and (2) *scaffolding student ideas and feedback* (Walshaw & Anthony, 2008) embed central quality features of classroom discourse in a concrete manner, these serve as the theoretical basis and structure of the DVC's reflection workshops. Throughout the whole cycle, teachers are monitored by a facilitator who moderates them and organizes the videotaping of the teachers' lessons and the selection of video clips, as seen in Figure 3.1 (Gröschner et al., 2015). In Workshop 1, teachers are introduced to Activities 1 and 2, are given ideas on the implementation of these activities in their classroom discourse, and how to support student learning processes. These activities aim to change the perspective of teachers towards engaging students in classroom discourse. Concretely, teachers are facilitated in planning the lesson to be videotaped. Together with the facilitator, and in collaborative practice, teachers adapt those plans by taking concrete activities of productive classroom discourse into account (Gröschner et al., 2014). In order to systemize the implementation options of productive classroom discourse, their knowledge on talk formats and talk moves become (or are) enriched and refreshed. Along with Michaels and O'Connor (2012), talk formats are understood as different student conversation settings such as whole-group or small-group discussions; talk moves are elements that teachers apply to open the conversation and to support student participation, explication, and reasoning.

After the first workshop, the lesson is taught and videotaped. For the second and third workshop, the facilitator systematically selects representative video clips (two or three minutes) from each teacher for reflection. Activities 1 and 2 serve as motivation for selection and reflection. Before watching, the facilitator establishes a policy on discussions about classroom videos. In line with the approved concept of teachers' professional vision (Stürmer & Seidel, 2015), teachers are asked to first *describe* their observations (without judging), *explain* their colleagues' decision making, and *predict* students' learning. Being familiar with the video-observation policy, the group watches the clip (of one of the group members) and the teacher on screen can give further explanations or contextual information. In the next step, the group watches the same clip again, this time with guiding questions regarding productive classroom discourse activities (e.g. "How does the teacher activate his/her students?"). The group exchange regarding the guiding question, give feedback (including solutions and alternatives), or ask more questions.
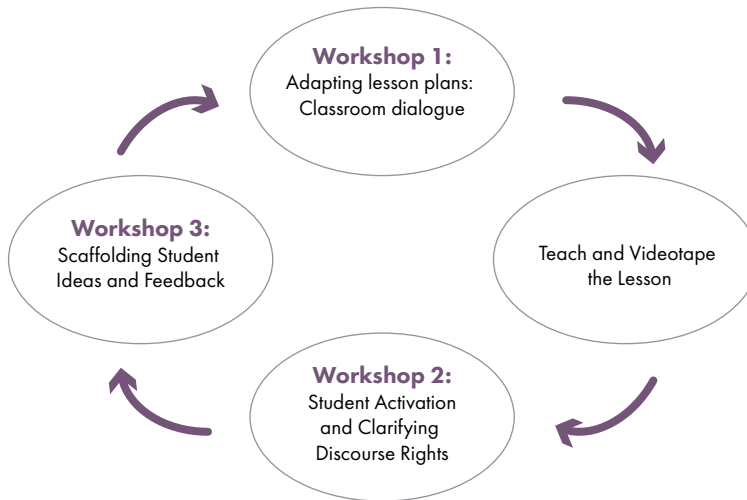
Figure 3.1   The Dialogic Video Cycle (Gröschner et al., 2015).

Implementation of the "Dialogic Video Cycle"

The teachers who participated in the first study implementing the DVC (IG: intervention group) took part in two iterations of the DVC including three workshops and one video recording each. With regard to effective components, the *duration* of the concept was 22 hours in total. Each workshop and the video recordings lasted two hours. The *content* was as described, classroom discourse by means of Activities 1 and 2. The aspect of *collective participation* was addressed by bringing teachers together in seven group meetings throughout the academic year and encouraging and facilitating them to exchange and discuss their own teaching experiences and develop new teaching strategies (transfer). Finally, *coherence* and *continuity* was implemented through regular meetings throughout one academic year, in a constant community working around teachers' routines regarding classroom discourse. A feasibility study approved all components to be successfully implemented in the programme (Gröschner et al., 2015).

Implementation of an advanced traditional programme serving as a control group

As research on TPD lacks systematic investigation of programs with regard to their effectiveness (Wayne, Yoon, Zhu, Cronen & Garet, 2008), the DVC was

systematically compared to a state-of-the art TPD in Germany. Teachers who participated in the so-called advanced traditional programme (ATP) chose a set of workshops in the area of classroom discourse and teacher/student inter-action (pedagogical focus) that were pre-selected by the research team and provided by the local Pedagogical Institute (Gröschner et al., 2015). Teachers had the opportunity to choose two to three of these courses, which in total added up to the same duration as the DVC (22h duration). They additionally met as a group (as an indicator of collective participation) three times dur-ing the academic year: in an *opening session* and in two *roundtables*. At these roundtables, Walshaw and Anthony's Activities 1 and 2 were also introduced. Teachers were then encouraged by the same facilitator as in the DVC work-shops to discuss their experience made at the local Pedagogical Institute. As these kinds of roundtables – as an option for reflecting TPD experience – are unusual in German TPD programs, we added the "advanced" term. The feasibility study showed that there were less options for active learn-ing since video did not serve as the tool to illustrate teachers' daily routines (Gröschner et al., 2015).

Investigation of the DVC's impact and effectiveness

As stated above, after conceptualizing the DVC, its investigation regarding impact and effectiveness was one of the major aims of the project DIALOGUE, which was funded as a research project by the German Research Foundation (DFG). The core features presented of TPD provide a solid basis to design and plan effective environments for teacher learning, which influences teachers' practice and thus meets the challenges revealed by educational reforms (Desimone, 2009). To understand the pathway between implementation of TPD core fea-tures, teacher learning, and its effects on teachers' classrooms, Desimone (2009) proposed a conceptual framework (see Figure 3.2), differentiating four steps relevant for studying TPD. According to this model, teachers: (1) participate in an effective TPD program, (2) acquire knowledge and skills and/or change their attitudes and beliefs, followed by (3) changes in their teaching practice, and (4) consequently improved student learning. Desimone's model serves as the basis for the research agenda (overview see Figure 3.2) derived in the first phase of the project (DIALOGUE I).
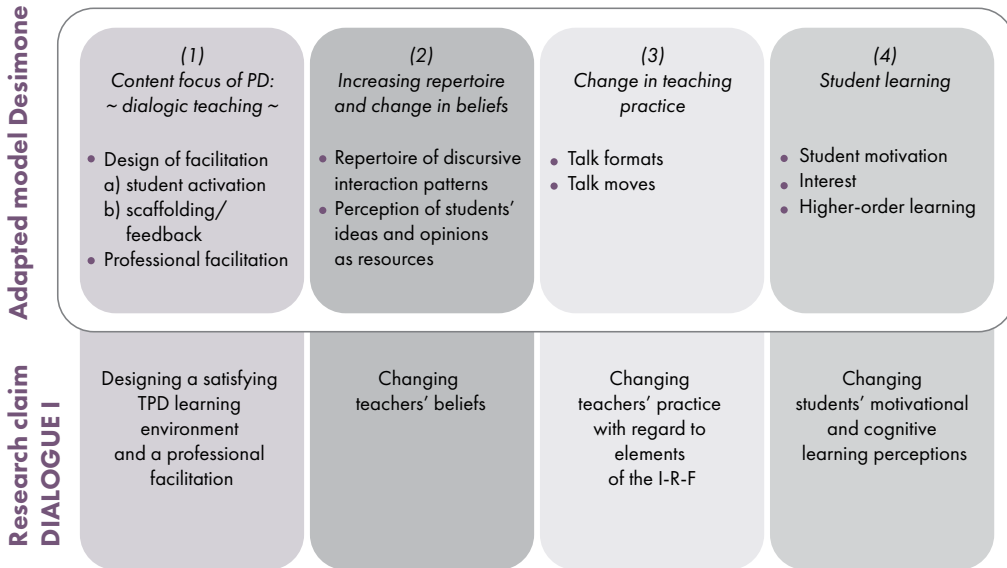
Figure 3.2   Study concept of the project Dialogue adapted model from Desimone (2009).

RESEARCH AGENDA DIALOGUE

As highlighted above, the project includes two phases. In the following, results are presented for the first phase concluded as well as "lessons learned" in the second phase are discussed.

First phase: DIALOGUE I

Design of the study

Data was obtained within a one-year longitudinal intervention design in the academic year 2011-2012 with two groups taking part either in the DVC or the ATP. A quasi-experimental design (DVC classes serving as the intervention group [IG], ATP classes serving as the control group [CG]) was chosen to investigate claims for the effectiveness of the TPD (Fishman, Marx, Best & Tal, 2003; Osborne et al., 2013). This systematic approach allowed direct comparison of a newly developed programme based on existing evidence on effective TPD (Desimone, 2009; Wilson, 2013) with the given state of the art protocol currently used in TPD in Germany.

In Figure 3.3, data collection throughout the academic year is presented, highlighting the theoretical connection to the adapted model presented in Figure 3.2.
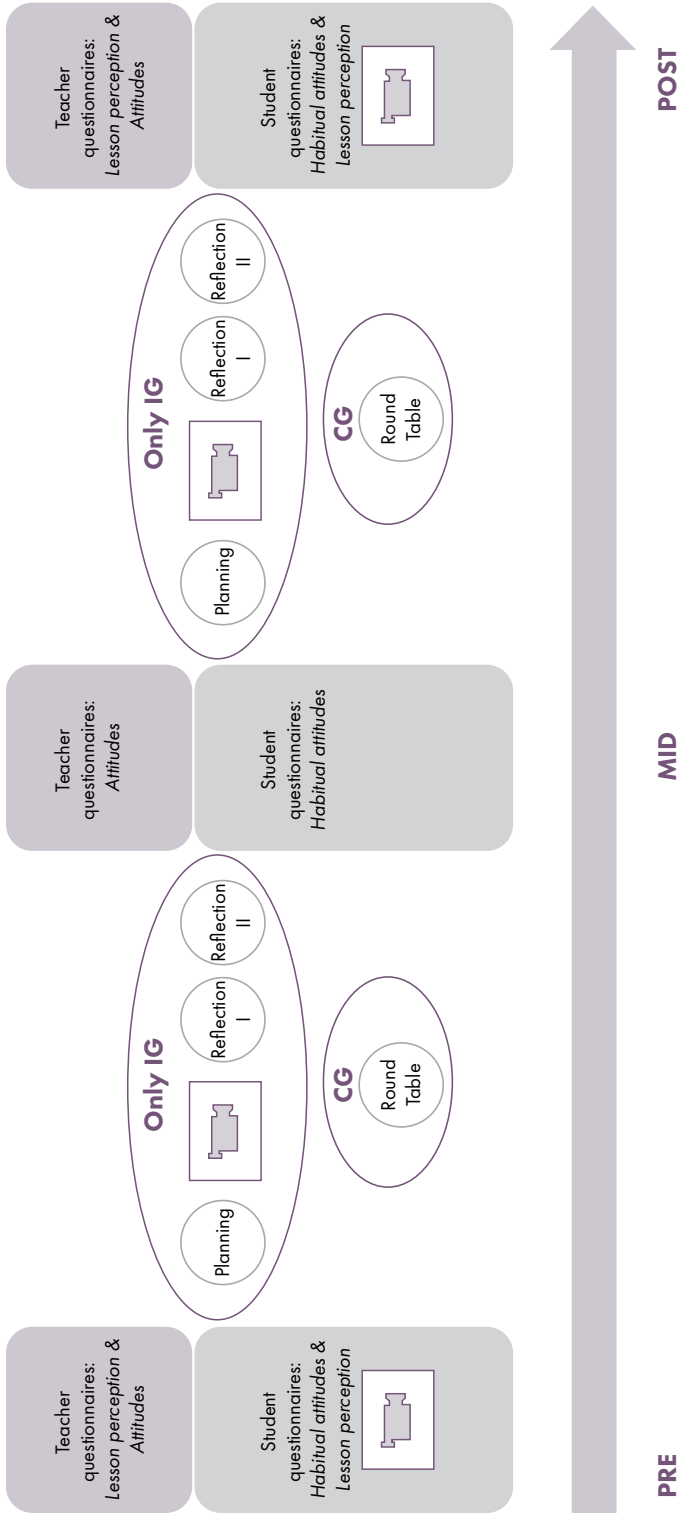
Figure 3.3 Date sources and instruments DIALOGUE I.

Sample

Full data sets from ten math and science teachers were analyzed within the first project phase. Teachers and their students (N = 226, 47.8% girls, 52.2% boys) were from German middle or high school tracks. Because of the high demand to train young people in STEM subjects, teachers were welcome to participate in either math or science lessons. Students had a mean age of 15.67 years (SD = .98) and were in 9th grade. To prevent any effects from systematic variation in teachers' characteristics, teachers in both the IG and CG were compared in the beginning. Teachers in both groups neither differed significantly in age (U = 7.50, z = −.97, p = .33), teaching experience (U = 6.00, z = −1.30, p = .20), gender (c = .08, df = 1, p = .78), nor subject (either math or science) (c = .63, df = 1, p = .43).

Results

Results are presented along the logic of the adapted Desimone model (Figure 3.2) and are outlined in the following table. For detailed information on instruments and statistical values of the presented results, see the primary published studies (sources see Table 1). Finally, Table 3.1 provides indications for the currently running second phase DIALOGUE II.

Summary of Main Results

(1) Designing a satisfying TPD learning environment and professional facilitation

The first task was designing a TPD programme that – in line with the implementation of effective TPD components – was perceived as satisfying for participating teachers. Results showed the DVC was perceived as highly satisfying throughout the program. Teachers participating in the ATP programme were slightly less satisfied regarding their participation in the middle of the academic year, but still on a high level. In comparison, their satisfaction dropped significantly for the post measurement point (for detailed findings, see Gröschner et al., 2015).

Besides satisfaction – a vital basis for a successful TPD programme – the examination of teachers' learning in the workshops was another research claim of the first project phase. High-inferent ratings of the videotaped TPD workshop revealed that learning processes could be encouraged by a productive learning support ("facilitation"). The facilitator created a positive learning environment and a loyal and valuable conversational culture, which follows discussion and

Table 3.1 Overview of instruments, results, publications of DIALOGUE I and indications for DIALOGUE II.

Research claim DIALOGUE I	Data sources	Instruments	Major findings DIALOGUE I	Publication	Indications DIALOGUE II
(1) Designing a satisfying TPD learning environment and professional facilitation	Teacher questionnaire	10-point Likert Scale on satisfaction	– DVC participants highly satisfied, ATP participants less satisfied	Gröschner et al., 2015	– Questionnaire for TPD satisfaction and perception – more comparability → both programs implemented by one institute
	Videotaped TPD sessions	High-inferent ratings of the TPD workshops	– positive learning environment important for successful learning, created by the facilitator	Alles, Seidel & Gröschner, in press	– Rating items for coding workshop contents
(2) Changing teachers' beliefs	Videotaped TPD sessions	Qualitative excerpts	– open questions were believed to be challenging – teachers' thinking and beliefs affected by the video excerpts	Pehmer, Gröschner & Seidel, 2015a; Alles, Seidel & Gröschner, submitted	– Questionnaire for teachers beliefs – Knowledge test on dialogic teaching
(3) Changing teachers' practice with regard to elements of the I-R-F	Videotaped classroom teaching	Coding scheme (Pehmer, Kiemer & Gröschner, 2015)	– IG: no change in quality of initiation – CG: drop regarding the I-R-F elements generally; positive changes regarding feedback and heterogeneous changes regarding questions from an individual perspective	Pehmer, Gröschner & Seidel, 2015a	– adapted video coding scheme for more efficient coding
(4) Changing students' motivational and cognitive learning perceptions	Student questionnaire	Scales on autonomy, competence and intrinsic learning motivation, interest, self-concept of ability	– IG: significantly increased perceived autonomy, competence and intrinsic learning motivation – especially students with a low self-concept of ability benefited from DVC	Kiemer, Gröschner, Pehmer & Seidel, 2014, 2015; Pehmer, et al., 2015b;	– Subject-specific knowledge test – Questionnaire on students' perception of the videotaped lessons – analyzing student groups separated by high or low shaping of characteristics, e.g. self-concept

feedback rules. Additionally, the TPD setting offered opportunities for participants to reflect upon their own teaching routines and solutions transferable to the classroom (Alles, Seidel & Gröschner, in press).

(2) Changing teachers' beliefs

Qualitative excerpts extracted from the workshop videos illuminated teachers' beliefs. The illustrations chosen provided a hint that teachers identified open teacher questions – one criteria for productive classroom discourse – as partly difficult to control the teaching process (Pehmer, Gröschner & Seidel, 2015a).

Furthermore, our findings indicate that a change in teachers' thinking and beliefs were affected by the video excerpts of their own and other teachers' teaching, which encouraged teachers' reflection on teaching. Teachers saw their own teaching from a new perspective and could redefine their teaching practice. In addition, the video showed teachers' modeling behavior and fostered their intention to transfer, albeit to a lower extent. Especially, video excerpts of their own teaching supported teachers in redefining their teaching practice, whereas video of other teachers fostered teachers' intention of transfering strategies into their teaching practice (Alles, Seidel & Gröschner, submitted).

(3) Changing teachers' practice with regard to elements of the I-R-F

For examining teachers' changed practice, classroom videos were segmented in talking turns (teacher, student). Along the theoretical rational of the I-R-F, teacher talking turns were coded regarding the quality of questions and feedback and student talking turns regarding quality of responses. Results revealed that the IG teachers were able to change the follow-up element by giving more learning process-oriented feedback (Pehmer et al., 2015a) – meaning that instead of just evaluating their students' answers, they were providing hints for guiding them through the learning process.

Against the hypothesis, teachers in the IG group had trouble changing the quality of initiation and did not ask more questions that encouraged more student elaborations. As a consequence, student responses did not change significantly. CG teachers showed a drop regarding the I-R-F elements. Additional individual teacher analysis showed a homogeneous picture for feedback changes, where teachers' questions changed in a heterogeneous manner.

(4) Changing students' motivational and cognitive learning perceptions

Moving along Desimone's model, and pre/post-tests comparison of students' situational learning revealed that students in the IG significantly increased their perceived autonomy, competence, and intrinsic learning motivation as compared with those in the CG. Concerning the habitual motivational learning characteristics, IG students benefited regarding their subject interest, ability self-concept, and self-efficacy compared to CG students (Kiemer, Gröschner, Pehmer & Seidel, 2014). A similar picture could be shown for students' higher-order learning perceptions. In this context, additional differential analysis highlighted the DVC as especially beneficial for students with a low self-concept of ability (detailed findings see Pehmer, Gröschner & Seidel, 2015b).

Second phase: Summary of indications for DIALOGUE II

(1) Designing a satisfying TPD learning environment and professional facilitation

Regarding the first column of the adapted Desimone model, DIALOGUE I showed the DVC to be a satisfying learning environment including professional facilitation. Since the ATP was facilitated at the local Pedagogical Institute and provided an additional experience exchange (round tables), the question of causes for teachers' drop in satisfaction in this programme remains open. For reasons of stronger controllability, both programs are currently run by the same project team during DIALOGUE II. Additionally, teachers' perception of the TPD programme as a professional learning opportunity will be measured via questionnaire (Gröschner et al., 2016).

(2) Changing teachers' beliefs

The qualitative excerpts gathered during the first project phase served as a first fruitful approach to investigate teachers changing beliefs during the workshop sessions. In the second project phase, the feasibility study will be enriched by rating items investigating to what extent teachers and facilitators discuss concrete elements such as open teacher questions during the workshop sessions and in what way these discussions change throughout the TPD program. This allows for a more detailed picture on Desimone's causal TPD assumptions. Additionally, teacher beliefs regarding dialogic teaching will be measured via questionnaire (Gröschner et al., 2016). As Desimone (2009) claimed that not

only changing teacher beliefs but also teacher knowledge is a prerequisite for a changed teaching practice, the second project phase will employ a teacher knowledge test on dialogic teaching.
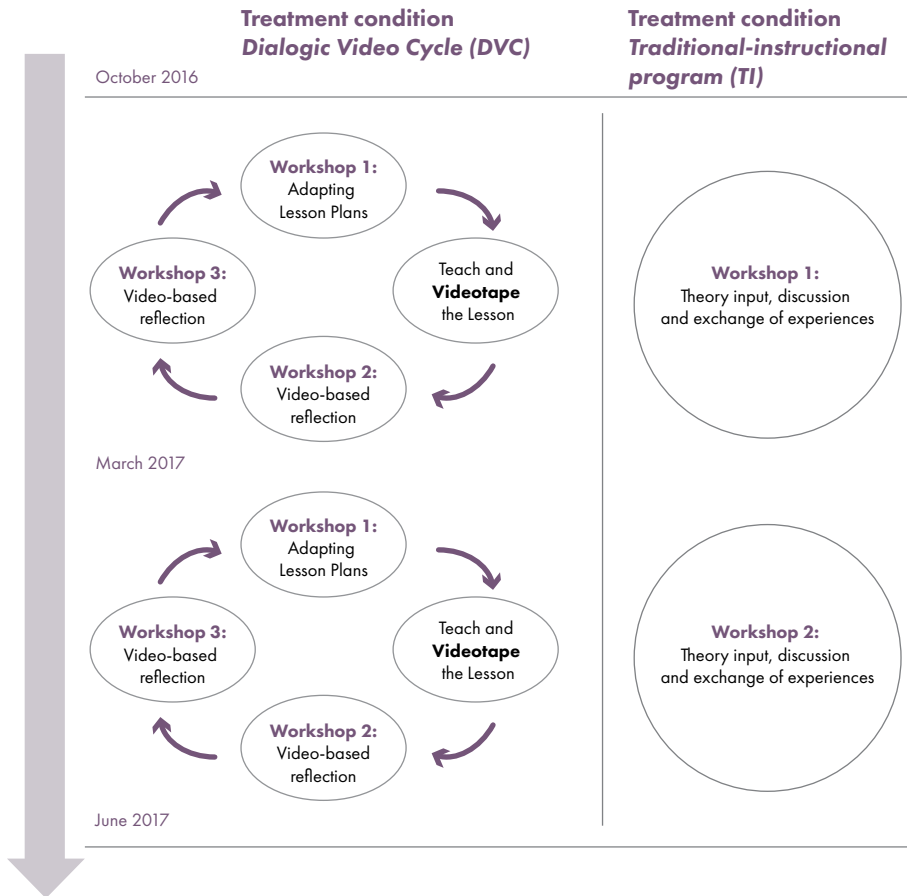

Figure 3.4   General Study design DIALOGUE II.

(3) Changing teachers' practice with regard to elements of the I-R-F
During the first project phase, teacher questions were especially part of the first reflection workshop, focusing on Walshaw & Anthony's Activity 1, and feedback included in the second reflection workshop, focusing on Activity 2. As presented, changing teacher questions seemed to be more challenging than

teacher feedback. In this context, one central question for DIALOGUE II is which of Walshaw and Anthony's activities are easier to implement into teachers' classroom discourse routines, where the DVC will be offered in different treatment conditions. Both DVC options share "dialogic teaching" as the common topic but focus on either Activity 1 or 2.

Measurement of changes in videotaped teaching routines will focus on changes in talking formats and moves – as the shared "toolbox" for teachers to implement ACTIVITIES 1 and 2. Rating procedures instead of segmenting talking turn will be applied based on the current understanding that classroom discourse is to be measured in an interconnected manner (Osborne et al., 2016; Reznitskaya, Wilkinson & Oyler, 2016; Wilkinson et al., 2016).

(4) Changing students' motivational and cognitive learning perceptions
Based on findings from the first phase, DIALOGUE II aims to replicate results on students' situational and habitual motivational learning with a bigger sample. Instruments regarding students' cognitive learning aspects will be expanded by a student knowledge test. As the differential investigation of the DVC's impact on student subgroups (e.g. either higher or lower-order learning) was identified as valuable, this research strength will be followed.

SUMMARY AND OUTLOOK
Teachers' professional development is one of the major leverages for changing classroom culture. Current research demonstrates that successful TPD programs have the power to initiate "chain reactions" put forward by recent models of effectiveness. These programs manage to facilitate change on different levels beginning with teachers' knowledge and beliefs, their classroom practices, and ultimately changing student behavior and learning. They are focused in content and revolve around a core theme such as classroom discourse with the goal of fostering a more interactive dialogic classroom discourse culture. In order to engage students more actively in verbal interactions, programs must effectively manage to stimulate and support teachers in overcoming rigid patterns of communication and adopting more open and engaging ways of talking *with* rather than merely *to* their students. Different tools and their combinations

have shown how teachers can learn and benefit from video-based and carefully facilitated discussions (e.g. Dialogic Video Cycle) or from using well-designed rating schemes (Argumentation Rating Tool) that help them diagnose and improve their students' argumentation skills. Research in the Dialogue project also has been able to further trace these changes in teaching practices and identify their relations to specific student outcomes. Critical outcomes such as student interest and self-concept seemed to benefit in relation to teachers more actively engaging students in classroom discourse.

Currently, more systematic and rigorous TPD research is underway. Dialogue II advances the agenda of Dialogue I and tackles the issue of experimental control by implementing a well-described traditional programme for comparison and random assignment to groups. It further adopts a more fine-grained test of effective features with interventions that focus on specific contents (student activation vs. scaffolding student ideas and feedback) and a more inclusive measurement of outcomes (teacher and student knowledge). Dialogue II will thus help to clarify more precisely which elements of the programme are effective. And it will highlight the challenges and show which outcomes are more or less difficult for TPD facilitators or teachers to change. Thus, this research will contribute to a growing knowledge base that more precisely models all the mediating process between facilitator moves on the one end, and student outcomes on the other, which can be harnessed to design effective programs.

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