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Utilizing a scriptwriting task as a tool to examine facilitator practices in response to teacher orientations for at-risk students

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Teacher orientations influence instructional prioritizations and how teachers attend to students, particularly those at risk of being left behind. In PD programs, facilitators’ practices to recognize and respond to such teacher orientations for supporting at-risk students are thus an important aspect of content-related facilitator expertise. Extending the use of scriptwriting tasks to the PD facilitator level, we present two contrasting cases of how facilitators employ practices to respond to teachers’ orientations in a PD simulation. One facilitator avoids direct opposition with conflicting teacher orientations, while the second facilitator challenges the teachers’ orientations that do not contribute to supporting at-risk students’ learning. By discussing the contrasting practices in the facilitators’ written scripts, we demonstrate how the scriptwriting task can be used to investigate content-related facilitator expertise in terms of practices in response to teachers’ orientations.

Keywords: Scriptwriting tasks, facilitator practices, teacher orientations, professional development.

Introduction

Mathematics represents a cumulative content area with basic concepts laying the foundation for later understanding. It is crucial that students can be supported in gaining knowledge from previous years or units, so they can develop deeper conceptual understanding as they move forward in later grades. The orientations that teachers have in response to less-privileged students who are at risk of being left behind are important to understand and necessary for PD facilitators to be able to identify and respond to. Such facilitator practices are part of their content-related expertise as conceptualized by Prediger et al. (2021). In this study, we draw on the Prediger et al. (2021) framework and utilize a scriptwriting task to examine facilitators’ practices for responding to teachers’ orientations for supporting at-risk students’ learning processes. We examine these practices in the context of a PD for teachers to monitor and enhance at-risk students’ conceptual understanding of basic concepts. In the theory section, we first address teacher orientations as part of their teaching expertise. Particularly, we elaborate on four sets of orientations pertinent to the context of fostering at-risks students’ mathematics performance. Second, we describe the framework of facilitators’ content-related expertise, with a focus on the facets relevant for our study. Third, we expound upon the tool of a scriptwriting task, the instrument we applied. Thereafter, we present and discuss the data we gained in the context of the teacher PD project Mastering Math, which is built around supporting at-risk students’ mathematics learning. Especially, we report how two facilitators were immersed in a PD
simulation by the scriptwriting task and what practices they applied to deal with different teacher orientations.

Theoretical background

Teacher orientations as a part of teacher expertise

Various studies showed how teachers’ orientations, respectively beliefs, regarding the nature and meaning of mathematics are manifested in their teaching practices. Schoenfeld (2010) examined the components that impact how a teacher acts in the classroom and developed the theory of goal-oriented decision making, which considers resources, goals, and orientations as essential components. Such orientations and accompanying practices can have consequences for supporting students, especially those in need of additional assistance, if teachers prioritize, for example, procedural fluency over conceptual understanding. In expanding upon this conceptualization of orientations, Prediger (2019) created a framework of mathematics teacher expertise that includes orientations as one of five facets: “Orientations refer to content-related and more general beliefs that implicitly or explicitly guide the teachers’ perceptions and prioritizations of jobs (e.g. beliefs about the content or students’ learning processes)” (p. 370). Findings from empirical studies revealed four sets of contrasting orientations. First, teachers often focus on the development of procedural knowledge as opposed to conceptual knowledge (Wilhelm et al., 2017). Second, in terms of diagnosing individual student challenges, teachers often follow the school syllabus regardless if students fall behind, and, third, maintain short-term mastery in contrast to emphasizing long-term goal mastery (Prediger et al., 2016). Fourth, teachers concentrate on individual student issues (Krähenmann et al., 2019), instead of facilitating rich discourse with all students. These four sets of orientations are addressed in the PD course Mastering Math that constitutes the context of our study.

Facilitator practices as part of their content-related expertise

In terms of what PD facilitators need to know and do to be able to provide successful PD programs for mathematics teachers, researchers have increasingly examined what constitutes necessary PD facilitator knowledge and practices (Borko et al., 2021; Lesseig et al., 2017). In putting different knowledge domains in action, facilitators need to employ practices that are conducive to working productively with adult learners and construct environments in which teachers can collaborate about relevant topics and can feel safe and supported to share information (Borko et al., 2014). Accordingly, Prediger et al. (2021) provided a framework for content-related facilitator expertise. The framework consists of jobs, which are conceptualized as typical and often complex situational demands of facilitating a specific PD, and practices as recurrent patterns of facilitators’ utterances and actions for managing the jobs. These practices can be described and analyzed by revealing the underlying facilitator orientations and situative goals on which the facilitator implicitly or explicitly draws: 

Orientations: Generic or content-related beliefs and pedagogical attitudes (e.g., about teachers’ thinking or about the PD content) that implicitly or explicitly guide the facilitators’ perceptions and prioritization of jobs (e.g., participant orientation).

Situative goals: The goals that the facilitators pursue in a respective situation can directly refer to PD content learning goals (in brief, PD learning goals), can address process qualities (e.g.,
cognitive activation, briefly, process goals), or can be of an atmospheric nature (briefly atmospheric goals). (Prediger et al., 2021, p. 8)

Thus, goals and orientations determine how facilitators act in a specific situation, and it is important to make them visible in facilitators’ practices. For that purpose, scriptwriting tasks are a useful tool, which allow for creating a fictional context in which facilitators need to simulate their practice.

**Scriptwriting tasks as approximation of PD practices**

So far, scriptwriting tasks have been employed on the teacher level as a tool that functions as a bridge between planning and the actual course of action in the classroom by providing classroom situations for teachers to react to learners’ utterances and provide possible explanations (Zazkis & Sinclair, 2013). By using scriptwriting tasks, one can draw on a situated approach to enable the approximation of the actual act of supporting students, but instead in a fictionalized situation. Scriptwriting tasks have been accordingly implemented as a means of investigating pre-service teachers’ understanding of content and facilitating of learning (Lim et al., 2018); and with in-service teachers (Kontorovich & Zazkis, 2016) to assess how teachers deal with student alternate conceptions. Scriptwriting tasks, however, have not yet been utilized as a tool for assessing facilitators practices in response to teachers’ orientations in a situated fictional PD context.

**Aims and research questions**

To examine PD facilitators’ practices in response to teachers’ orientations for supporting at-risk students, we employed a scriptwriting task to first provide facilitators with a fictional situation in which teachers in a PD are provided with a student dialogue of three students working on a task and then with a discussion between three teachers concerning how they would continue the conversation with the students. The facilitators were then given the task to first complete the dialogue with the fictional teachers and guide them to in discussing how to support the fictional students and, second, to provide rationale as to why they ended the dialogue at the chosen moment. We pursued the following research question:

RQ: What practices do facilitators apply to respond to teachers’ orientations for supporting at-risk students in completing the scriptwriting task, and what situative goals are behind these practices?

**Methodology**

**Instrument: scriptwriting task**

The scriptwriting task was developed based on a classroom-level task concerning filling in the tens between 0 and 100 on a number line that contained the following prompt: How can you plot and label numbers on the number line? What can help you? The scriptwriting task included a fictional dialogue of three students with alternate conceptions of the task discussing their solutions followed by a fictional teacher dialogue of three teachers discussing how they could support the students in completing the task (Figure 1).
After reading the fictional dialogues of the three students and the three teachers, the facilitators were asked to complete the dialogue with the three teachers (Karin, Sabine and Jana), thereby demonstrating how they will address the teachers’ orientations for supporting at-risk students and help the teachers to foster student understanding of the basic concepts in the task. The four contrasting sets of teacher orientations for supporting at-risk students were embedded in the scriptwriting task.

Participants, data collection and data analysis

In total, a group of 14 PD facilitators from the federal state of Berlin were asked to participate in this study and were provided with the number line scriptwriting task described in the previous section. Six facilitators agreed to participate. All of the facilitators led PD courses in the program Mastering Math for primary school mathematics teachers, which focuses on means of supporting students at risk of being left behind. The Mastering Math PD program centers on the four sets of principles: (1) diagnostic vs. syllabus-bound orientation; (2) conceptual vs. procedural orientation; (3) long-term vs. short-term orientation; and (4) communicative vs. individualistic orientation. We selected these unique written scripts from two of the facilitators, in particular, as these two contrasting cases of facilitator practices illustrate how two facilitators react differently in the same fictive PD situation to enhance teachers’ learning processes.

Results

The two written scripts demonstrate the facilitators’ contrasting approaches in the extent to which they attempt to convince the teachers of the guiding principles of the PD program for supporting at-risk students. While the first facilitator poses questions and encourages the three teachers in the fictional PD situation to discuss the student misconceptions from the task without visibly advancing the guiding principles of the PD, the second facilitator more directly challenges the teachers who are not convinced by the guiding principles and engages them in a discussion surrounding long-term mastery achievement and diagnosing individual student capabilities in order to help move students forward. The two transcripts of the written scripts and the contrasting practices are presented in the following sections.
Case one: A hands-off approach to conveying PD guiding ideas

The facilitator in the first transcript encourages the teachers to provide their opinions concerning the challenges the students in the fictional dialogue encountered by posing questions as to the students’ different approaches and different problems they faced. The facilitator responds to the teachers either by demonstrating agreement with the comments concerning Martin’s problem that interferes with his understanding of the task and adding to the teachers’ ideas with a short commentary that reflects the guiding ideas of the PD, or by remaining neutral by closing the discussion without further comment.

1 Facilitator: The three students have different bases of understanding. What is the difference between Noah’s and Martin’s solutions?
2 Jana: Noah has a strategy. He knows that he first has to look for the middle and then has to record the remaining numbers at equal intervals.
3 Facilitator: And Martin? […] And what is Jonas’ problem?
7 Karin: Jonas obviously doesn’t know what is meant by tens. That is why I would first quickly explain it to him.
8 Jana: I don’t think explaining will help. He could discover it for himself by showing him the work of the other two children. The children could then make comparisons themselves.
9 Facilitator: Exactly. Martin has a fundamental problem. He may not yet have an understanding of place value. According to MSK, sustainable learning especially for at-risk students should be oriented towards building understanding. One of the guiding ideas of MSK is to promote communication. So what would have to happen for me to catch Martin up?
11 Karin: Well, with some students it’s really hopeless. I wouldn’t waste so much time, but rather concentrate on the better-performing students.
12 Jana: I believe that children have only really understood a subject when they can explain it in their own words.
13 Facilitator: Thank you very much for your contributions and your assessment. At this point I would like to end the discussion for now and show you a short film.

The facilitator continues the dialogue in such a manner echoing the main elements of the dialogue beginning such that Karin expresses a distinct opinion concerning how to support at-risk students, reiterating that short-term, quick approaches are necessary, especially for such “hopeless” students when support can instead be focused on “better-performing students.” It is evident that the facilitator identified the teacher orientations from the scriptwriting task dialogue and extended these to the continuation of the dialogue. The facilitator does not respond to Karin’s comments, however, but makes it clear that such orientations can be expressed in the PD. In response to the follow-up question regarding why the facilitator ended the dialogue at that specific moment, the facilitator explained:

Facilitator 1: Karin is obviously still of the old school, according to the motto: Explain quickly and then continue with the material, don't waste any time. It is more important for her to support the better-performing students. The other two participants are more oriented towards the principles of MSK. In the first round of discussion, I would not try to persuade them. It is not about persuasion, but especially such teachers like Karin should be able to make their own discoveries and not be discouraged […]

Thus, the facilitator reiterates her strategy of first assessing the orientations of the participating teachers, before engaging them or encouraging them to think about their viewpoints and their actions in the classroom. The facilitator creates an atmosphere in which the teachers are encouraged to express their opinions, at this stage, however, the facilitator does not push the teachers to reflect on
their positions and reasoning behind such viewpoints or have the teachers focus more deeply on the mathematics behind the students’ different representations from the student dialogue.

**Case two: A direct approach to conveying PD guiding ideas**

The second facilitator takes a different approach in the continuation of the dialogue with the three teachers in the written script and provides evaluative comments (see turn 24) of one of the teacher’s comments concerning spending too much time on the process of remediation for students considered not capable of doing math.

7 Karin: But that can take a long time until Martin understands it. What if he doesn't realize that 50 has to be in the middle...then we'll still be sitting together the day after tomorrow.

8 Facilitator: You're really making an important point here. There are children for whom MSK is ultimately not suitable either. And this would be a good time to find out what Martin's situation is like. If it's not clear to him that 50 is half of 100, and if he's not able to think in tens, then he needs a different kind of support. We would have to take a closer look at that in any case [...]

21 Facilitator: …But why (looking at Karin) is that so important anyway, that we take so much time for this whole process? […]

23 Karin: But that takes an infinitely long time. And there are simply children where I don't know if that really helps. Math is also a bit like that - either you can do it or you can't.

24 Facilitator: Yes, that's still a widespread belief. And there really are kids for whom it's very difficult to achieve. But there are also many who just need a little more time and visualization and action. And time for visualization...so...they need to be able to link what they see to their thinking. And when they get that, it clicks pretty quickly. Then they replace their misconceptions with more appropriate ones. If you have experienced this yourself a few times, then you can comprehend it better. You just have to do a few remedial lessons, and then you realize that. But it also takes a bit of time to develop a feeling for which children they really make a difference and for which ones you still have to look for other forms of support. But when you get the children further along, it's totally satisfying for everyone. Can you live with that for now, Karin?

25 Karin: [nods]

26 Jana: And luckily we don't have any time pressure in remedial lessons. It just doesn't make sense to keep going if the kids haven't understood it yet.

27 Facilitator: Exactly, that's the great thing about remedial lessons! But unfortunately we do have a bit of time pressure...we're going to get on with our program now. Anyway, I'm really looking forward to your reports from your first remedial lessons.

The second facilitator responds directly to Karin and even states that the idea that some children cannot do mathematics is “still a widespread belief,” and then explains how to support children who struggle with more time and visualizations. While the facilitator does provide an evaluative response to Karin’s statements, the facilitator asks Karin if she can try “to live with” the principle of long-term mastery for the time being, and moreover, the facilitator suggests that once Karin has completed a few remedial lessons, she will better understand the process of remediation. Thereby, the facilitator creates an atmosphere in which teachers with opposing orientations to the guiding principles of the PD are not completely discounted. In response to ending the continuation of the dialogue, the PD facilitator explains that such beliefs or orientations cannot be changed in one discussion as they are deeply rooted and will hopefully change with experience and observation:
Facilitator 2: Jana and Sabine are on the right track already and the essentials for conducting support discussions have been said. Karin still has doubts. But they can't be dispelled with a single conversation. These are deeply anchored beliefs about learning that - hopefully - will gradually disappear once Karin has gained her own experience and realizes that her colleagues are more convinced.

The facilitator thus acknowledges that changing a teacher’s orientation to reflect the PD principles will not happen immediately and notes the role of the other members of the PD as relevant for influencing orientations. While the facilitator did respond to Karin’s comments concerning some children who just cannot do mathematics, the facilitator does not press Karin further and instead provides an opportunity for another teacher in the PD to express support for long-term mastery.

**Discussion and conclusion**

The exemplifying cases show how facilitators could react differently in a PD in response to teachers’ orientations. Facilitator 1 creates a situation when completing the scriptwriting task in which the facilitator pursues the *content goal* by directing the teachers’ focus to students’ thinking and challenges in solving the task, to then diagnosing students’ learning processes in light of PD guiding principles. Facilitator 1 therefore pursues the *content goal* by analyzing the students’ potential and challenges. The assertion of one of the teachers that it is important to avoid wasting time on students who are not able to understand is left uncommented. The facilitator thus seems to demonstrate the need to show *esteem for participants* and therefore, especially at the beginning of the PD, purses *atmospheric goals* instead of the *content goal*. In contrast, facilitator 2 discusses and confronts the orientation the teacher shows who insists on avoiding wasting time. Moreover, the facilitator consequently defends the PD guiding principles, thus focusing on the *content goal*, despite repeated objections of the teacher. Moreover, the facilitator seems to try to provoke the teacher to reinterpret or invalidate her own orientation. At the same time, the facilitator engages the teacher in the discussion process and shows esteem for her, presumably to maintain a good atmosphere. The practices of facilitator 1 match facilitator 2 practices to some respect, as both seem to recognize and take teachers’ orientations into account. Furthermore, both facilitators refer to the PD guiding principles, with a focus on the *content goal*, albeit to different extents. In addition, both facilitators are anxious to maintain a good atmosphere.

As there have been calls for ways to expand research on expanding the professional growth of facilitators (Borko et al., 2014; Lesseig et al., 2017), this research responds with a research tool that can be utilized to fill this gap. The scriptwriting task as a tool for facilitator educators to examine facilitator practices in responding to teachers’ orientations, and second, as a means of discussing such responses to help facilitators continue on their path of professional growth.

**References**


