Conceptual and Epistemic Uncertainties in Collaborative Teacher Learning

Ido Gideon, Ben Gurion University, idogid@post.bgu.ac.il
Gideon Dishon, Ben Gurion University, gdishon@bgu.ac.il
Dana Vedder-Weiss, Ben Gurion University, vedderwe@bgu.ac.il

Abstract: Studies of collaborative teacher learning often focus on the way concepts of teaching are formed when teachers engage collaboratively with problems of practice. Through shared collaborative inquiry into teaching practice, teachers may build on their own knowledge and relate to formal concepts – concepts formulated by academics and policymakers *for* teachers. However, such studies have largely overlooked how teachers engage with formal concepts. By analyzing two contrasting discussions in one teacher meeting, which centered on the pedagogical concept of feedback, we explore how teachers manage uncertainty concerning such formal concepts. Specifically, we highlight the importance of paying more attention to epistemic moves in group discussions, as such moves represent a collective effort to integrate formal concepts with teachers' lived experiences.

Introduction: Conceptual inquiry in teacher collaborative learning

Recent decades have seen a paradigm shift in teacher professional development (PD), from a "transmission-oriented" approach to a "more constructivist approach" that situates teachers' learning within a process of inquiry into their own practice (Cochran-Smith & Lytle, 1999). Practice-based teacher PD emphasizes knowledge that is collaboratively created by teachers as they engage with and share their own practice (Ball & Cohen, 1999). This approach is marked by special attention to the way classroom practice is presented and used as a means for collaborative professional learning.

Cochran-Smith and Lytle (2001) differentiate between three notions of knowledge in teacher PD: (1) *knowledge-in-practice* – knowledge embedded in teachers' work of teachers or practical know-how; (2) *knowledge-for-practice* – formal knowledge, codified by academics or policymakers for teachers; and (3) *knowledge-of-practice* – generated through teacher inquiry into their own practice, as well as "the knowledge and theory produced by others as generative material for interrogation and interpretation" (p. 48). Cochran-Smith and Lytle note that beyond the conceptual uncertainty characteristic of such inquiries, engaging with knowledge-of-practice also entails epistemic uncertainty: "Basic questions about knowledge and teaching – what it means to generate knowledge, who generates it, what counts as knowledge and to whom, and how knowledge is used and evaluated in particular contexts – are always open to question" (p. 48).

Horn, Garner, Kane, and Brasel (2017) present a taxonomy of learning opportunities in teacher discourse, similarly emphasizing the importance of collaborative concept development that links between formal and lived concepts, allowing teachers to bridge between practice and theory. However, existing research focuses almost exclusively on inquiry stemming from practice. We suggest that conceptual inquiry might also lead to meaningful conceptual uncertainty and therefore pedagogical concept development (*knowledge-of-practice*). We therefore explore how teacher groups manage conceptual uncertainty.

Conceptual uncertainty in teacher collaborative learning

Following Schön's notion of "reflective practice" (1983), practice-based PD often emphasizes teachers' sharing and discussing their uncertainties concerning practice (Ball & Cohen, 1999; Cochran-Smith & Lytle, 2001; Horn & Little, 2010). Research into teacher development has found that this notion of productive pedagogic uncertainty is by no means the only kind of uncertainty teachers experience in professional development. Teachers may become uncertain concerning their personal efficacy (Helsing, 2007), their social face in group conversations (Vedder-Weiss, Segal, & lefstein, 2019), and their occupational future under neoliberal policy (Hall & McGinity, 2015).

Our study focuses on a PD meeting that attempted to engage with knowledge-for-practice (namely, the concept of feedback) in order to generate conceptual inquiry that would enrich their inquiry into practice. When engaging with *knowledge-for-practice*, teachers are prone to experience uncertainty about the meaning/s of theoretical concepts mean. We are particularly interested in the way uncertainty, or doubt, concerning concepts summons inquiry. We therefore analyze moments in teacher discourse that involve conceptual uncertainty in order to understand how teachers inquire into concepts and what implications, if any, this has for collaborative learning.

Context and participants

This study is part of a large-scale practice-based Israeli teacher PD program in which teams use discussion protocols to inquire into practice (Segal, lefstein, & Vedder-Weiss, 2018). The study analyzes one regional PD meeting of leading teachers, who facilitate teacher teams' professional discussions in the participating schools, and their district coaches (total of 25 participants). One major objective of these bi-weekly regional meetings throughout one year (2014-2015) was to develop facilitation skills and support the implementation of representation-based problems-of-practice discussion. The process was designed and led by our research team (including the third author) in collaboration with district personnel. In the focal meeting, participants split into two groups, which discussed the same concept, feedback, and viewed the same classroom video.

Data were collected by the third author through participant observation, including audio-recordings (total of 60 hours) and field notes. In both groups, the facilitators opened the discussion by presenting a broad definition of feedback, referring to academic literature that constructs feedback as including any interactional response between teachers and students (e.g. Wells, 1993). The field notes indicate that the third author was left with the impression that this discussion uniquely gave rise to uncertainty in one of the groups due to one participant's consistent resistance to the definition of feedback offered by the facilitators. The field notes emphasize the emotional reaction that the disagreement elicited from participants. In the second group, the conception was challenged as well, but the discussion was not as volatile as in the first group. Thus, we selected this case for detailed analysis, serving as an "information-rich case which manifests the phenomenon of interest intensely" (Patton, 2002, p. 234). Analysis of the data first identified episodes in the discussion in which the proposed conception of feedback was problematized or challenged. These segments were then micro-analyzed to determine whether and how participants responded to conceptual uncertainty. In the next section, we present findings from three excerpts from the discussions in the two groups and their analysis.

Findings

Amira's group: Mitigated conceptual uncertainty

In the first excerpt, the district facilitator, Amira (pseudonym, as are all names in this paper), is in the midst of presenting a long list of activities that fall under the definition of teacher feedback, when she is interrupted by a leading teacher, Yasmin, who says: "*I don't see it as feedback, I see it as activities of [classroom discourse] yes, of classroom discourse, of keeping a respectful relationship, of reflecting to the student, asking questions, feedback is to advance the student from one place, like to reflect for him everything he did, to describe what I liked about his work, what he did, I related to that and it's correct, the things that he can improve, but asking follow-up questions or being silent or listening I don't see it as feedback*".

Yasmin is problematizing the definition of feedback that Amira presented. She is addressing conceptual uncertainty regarding what teaching practices should be included in feedback as a concept. Her understanding of the concept is narrower than Amira's and includes a motivational aspect that should be a part of actions defined as feedback. To support her argument, Yasmin does not refer to any lived example or problem from classroom practice (either her own or anyone else's) but, rather, presents her own definition of the concept. Her claim does not address the question "How should I give feedback?" but, rather, "What is feedback?"

Amira's initial response to Yasmin's conceptual challenge indicates that she detects uncertainty and has decided to open the floor rather than respond herself ("*reactions?*"). Another participant, Rachel, then responds to the conceptual uncertainty by refining the kind of feedback Amira was describing: "*This is spoken feedback, it's continuous feedback, actually continuous feedback is the classroom discourse, it's my reactions that cause me to*". Rachel's response directly addresses Amira's description of feedback and concludes with an affirmation of Amira's definition ("*you're right*"). She works through the conceptual problem by first relating feedback and discourse, two formal concepts, and then turning to her own lived experience, emphasizing the continuous aspect of a broad definition of feedback.

Taly's and Miri's group: Heightened conceptual and epistemic uncertainty

The discussion in the second group was heated, and the group spent considerable time engaging with the definition of feedback. One participant, Noa, constantly challenged the broad definition of feedback presented by Taly, the district facilitator, asserting (similarly to Yasmin in Amira's group) that not all teacher-student interactions should be defined as feedback. After several minutes of back-and-forth retorts between Noa and the facilitators, Noa refers to a source of her definition of the concept: "*because I attended a course on feedback before coming here, and the lecturer was someone who has written books*". This is then responded to by Dorit, the researcher-developer accompanying the regional PD meetings: "*OK, and others have written other books, so I am saying that this is a*

matter of definition, we can define feedback as only a rational and directive response, and we can define it as any response. So, now, for the purpose of the discussion, we are presenting it as a definition that you can argue with and say 'I don't accept this. I want to narrow the definition of feedback.' But for the sake of the discussion at this point, we are presenting a very broad definition. I think the discussion will be more informative if we hold it after we watch the video and then we can consider whether feedback for us is every response or, like you say, only something that is directive. It is a matter of definition".

Up to this excerpt, Noa had framed her problem with the way in which feedback was being defined as conceptual (What is feedback?). Here, however, her problem is presented as epistemic (Who decides what feedback is?), as she draws on the authority of her lecturer to support her conflicting definition. Dorit responds to this epistemic uncertainty by engaging with the question "How do we decide what feedback is?" She does not provide an answer to the question, but, rather, directs focus to the discussion itself and postpones addressing the conceptual uncertainty until after the group has watched the classroom video.

After watching the video of a seventh-grade geometry lesson on parallel lines, Noa remains resistant to the broad definition of feedback. She presents her own understanding of the concept, emphasizing her belief that feedback should be defined solely as actions that serve the teacher's objective:

21	Noa:	My objective means I direct feedback according to my goals.
22	Taly:	The objective is that the students arrive at the definition of parallel lines by thinking
23		and using their previous knowledge and mathematical formulation, that's her goal.
24	Noa:	I'm not talking about this now, I'm talking about feedback in general.
25	Taly:	I realize something now…I'm looking now at our inquiry of this video, the teacher has a
26		learning objective, not regarding the classroom climate, that the students arrive at the definition
27		of parallel lines using mathematical discourse. To achieve this objective she uses a task, she
28		asks them for the definition of parallel lines, using her feedback, they define it, and then she
29		asks, "How do you know?" "Prove it." "In math we need to prove things." [to Noa] You see,
30		the feedback serves the learning objective the teacher defined.

Noa's insistence on her definition of feedback as an objective-oriented activity (line 18) creates uncertainty in the group regarding the meaning of the concept. In response, Taly expresses a new realization concerning the actions of the teacher in the video representation. Taly demonstrates how Noa's definition of feedback as objective-oriented helps her make sense of the actions of the teacher in the video representation (lines 22-27).

Discussion

In all three excerpts, the uncertainty expressed in the discussion did not stem from pedagogical uncertainty or a problem of practice. The question to which participants related was not "How do I give feedback?" but "What is feedback?" In both groups, the facilitators' presentation of the concept as an almost all-inclusive description of teacher-student interaction was challenged, leading to *conceptual* uncertainty about the meaning of the concept. In Taly's and Miri's group, this uncertainty raised the question "How do we decide what feedback is?" Cochran-Smith and Lytle (2001) suggest that creation of knowledge-of-practice involves uncertainty regarding "both knowledge and knowledge use" (p.48). To describe the way knowledge and knowledge use are problematized, we term this kind of uncertainty *epistemic.* Accordingly, we identify three kinds of uncertainty in teacher discourse:

1. Pedagogical uncertainty, which focuses on teaching practices, addresses questions such as "how do I give feedback?", and stems from engagement with classroom practice.
2. Conceptual uncertainty, which focuses on teaching practices or teacher discussion, addresses questions such as "What is feedback?", and stems from engagement with formal concepts.
3. Epistemic uncertainty, which focuses on teacher discussion, addresses questions such as "how do we decide what feedback is?", and stems from positioning and evaluation of sources of information.

By analyzing how participants addressed these types of uncertainty in the discussions, we identified two kinds of responses to conceptual uncertainty:

Conceptual inquiry moves are moves in which the speaker relates to the concept by offering a definition, comparing it to other concepts, and/or applying the concept to practical circumstances. Conceptual inquiry stems from engagement with a formal concept. Although participants do not engage directly with lived experiences in

their reasoning, conceptual engagement may lead to new insights, which, in turn, might lead participants "to think differently about learning and teaching" (Schön, 1983, p. 67). *Epistemic moves* are moves that address conceptual uncertainty by positioning and evaluating sources of knowledge. Conceptual uncertainty can lead participants to make claims regarding the validity of and epistemic value of the discussion itself. While initially, such moves might seem counterproductive, we suggest that they represent a collective effort to integrate *knowledge-in-practice*, or teachers' practical know-how, with *knowledge-for-practice* – concepts derived from research and policy – and thereby facilitate collaborative creation of *knowledge-of-practice* – an integrated understanding of teaching derived from different sources of knowledge.

Contribution

As the above case illustrates, conceptual uncertainty can lead to both conceptual inquiry moves and epistemic moves. To date, research has focused primarily on the importance of conceptual inquiry moves. We argue that epistemic moves can make important contributions to collaborative teacher inquiry. Through epistemic moves, groups may open up more space for in-depth conceptual inquiry that includes inquiry into how knowledge-in-practice and knowledge-of-practice can be integrated. Moreover, we speculate that epistemic moves play a crucial role in regulating and self-correcting group discussions and thus ultimately facilitate the creation of knowledge-of-practice.

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