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ABSTRACT

Classroom-based teacher leaders assume a variety of roles including being a model of effective instruction and supporting others to improve instruction. However, some teachers may be reluctant to engage in novel pedagogies. In working with 34 experienced teachers in their final year of a teacher leadership fellowship, we developed a rehearsal activity toward the co-creation of principles for supporting reticent colleagues. Using thematic content analysis, we analyzed rehearsal scripts and subsequent discussion. We examined what their rehearsals revealed about their perspectives on supporting reticent colleagues and how rehearsals can be used to build knowledge for leadership practice. We found evidence that considering realistic scenarios through scripting and rich discussion was a useful approach for supporting emerging leaders. Teacher leaders drew on their expertise to collectively develop three guiding principles for supporting reticent colleagues. We re-envisioned rehearsals to leverage the knowledge of experienced teachers and identified four components of effective rehearsal for building networked expertise.

Introduction

There has been a growing recognition of the importance of teachers as leaders over the last few decades (Wenner & Campbell, 2017; York-Barr & Duke, 2004). Teacher leadership has been positively related to increased student achievement, particularly in facilitating improvements in curriculum, instruction, and assessment (Shen et al., 2020). The role of classroom-based teacher leaders is crucial in supporting shifts in teaching practice; these shifts are driven in part by the most recent teaching Standards (National Governors Association Center for Best Practices, Council of Chief State School Officers [NGA & CCSSO], 2010; NGSS Lead States, 2013). For example, in the disciplines of mathematics and science these shifts in teaching practice are challenging, requiring teachers to make use of high-quality mathematical tasks and rich, relevant scientific phenomena to make students' thinking visible (Lampert et al., 2013; Windschitl et al., 2018). These fields refer to such teaching as *ambitious* teaching, wherein teachers purposefully elicit and build upon

student ideas (Kinser-Traut & Turner, 2020; Windschitl et al., 2018). Enacting these shifts in pedagogy and content requires a multi-pronged approach through ongoing professional learning opportunities and from teacher leaders.

Teachers recognize the need for leadership within their ranks, colleagues who recognize the issues and who have been working on these ideas in their own learning (Fairman & Mackenzie, 2015). However, relationships with colleagues who are reticent, resentful, or resistant can also inhibit the work of teacher leaders (Hunzicker, 2017; Wenner & Campbell, 2017). This particular challenge of working with reticent colleagues, was raised by a group of developing teacher leaders as an area in which they needed support. This study contributes to the knowledge base of those tasked with preparing future teacher leaders in this central activity.

These developing classroom-based teacher leaders (CBTLs) were part of a five-year fellowship, designed to support secondary mathematics and science teachers in both improving teaching practice and developing leadership skills. We characterized the role of CBTLs as a leader who could leverage their own teaching practice to support colleagues in improving their teaching. CBTLs, in this project, learned to support their colleagues through coaching, collegial conversation, and modeling effective mathematics and science instruction (Cheung et al., 2018; Teacher Leadership Exploratory Consortium, 2011; Wenner & Campbell, 2017). Margolis and Doring (2012) suggest that modeling practice may be better conceived as a process that encourages reflection on teaching rather than replication of best practice. Therefore, we designed rehearsals as a means to practice opening reflective conversations with their colleagues around teaching practice.

These rehearsals with practicing secondary CBTLs were similar to those of teacher educators (TEs) using rehearsals with preservice teachers to publicly and deliberately practice an activity in a bounded setting; we used that performance as a site for collaborative examination. In this use of rehearsals with CBTLs, we acknowledged and drew on their expertise. Working toward a shared professional vision of teacher leadership, we engaged CBTLs in rehearsals to co-construct knowledge that they might use for supporting reticent colleagues. We explore two questions:

(1) What did the rehearsals reveal about the CBTLs' perspectives on supporting colleagues in ambitious teaching?
(2) How can rehearsals be used to build communal knowledge for leadership practice?

Background on rehearsals with novice and experienced teachers

TEs and scholars organize the work of teacher education around core practices of K–12 teaching (Grossman, Hammerness, et al., 2009) to support novices' co-development of meaningful knowledge with enactment of ambitious teaching (Kazemi et al., 2009; McDonald et al., 2013). TEs have used rehearsals to help teachers deliberately practice how to teach rigorous content using particular instructional activities (Arbaugh et al., 2018; Davis et al., 2017; Lampert et al., 2013). During a rehearsal, a TE can guide the collaborative examination of appropriate teaching actions. In using this tool, TEs support novice teachers (NTs) in both enacting routine practices and learning to make judgments.

Grossman, Compton, et al. (2009) described rehearsals as beginning with representation of practice, such as seeing a teacher modeling a particular aspect of practice, which provides opportunities to develop ways of seeing and understanding practice. Novice teachers are afforded an opportunity to take on new roles, such as the role of the teacher. The TE acts as a coach and supports novices by pausing the rehearsal and engaging in in-the-moment feedback and facilitating reflective discussion. Through these approximations of practice, rehearsals simulate both routine and improvisational decisions (Kazemi et al., 2016), while also exposing novice teachers to the social and intellectual demands of teaching (Lampert et al., 2013). In this process, TEs *bound* the complexities that novice teachers will encounter, allowing them to practice as they prepare to teach ambitiously.

Most researchers have used rehearsals to examine preservice science and mathematics teachers (Arbaugh et al., 2018; Campbell & Elliott, 2015; Davis et al., 2017; Stroupe & Gotwals, 2018). Research on the role of rehearsals with experienced teachers is limited and the use of this pedagogy in professional development differs from rehearsals with novice teachers (Hawthorne & Gruver, 2018; Valenta & Waege, 2017). As with preservice teachers, the TEs used rehearsals and instructional activities targeting a content area but acknowledged the greater expertise and experience of the teachers. Rehearsals were characterized by more active involvement of the teachers and a connection between rehearsal and classroom teaching practice.

Rehearsals are a pedagogical practice used to assist teachers with the *problem of enactment* by providing a space for them to gain the skills needed to enact a practice with students (Arbaugh et al., 2018; Davis et al., 2017; Lampert et al., 2013). We deviated from their typical use, similar to Gutiérrez et al. (2017) who used rehearsals to prepare novice teachers for the politics of teaching. In this study, we explore the role of rehearsals as a means to facilitate the sharing of expertise among a group of experienced teachers in the final year of a teacher leader fellowship. They collectively built knowledge around a specific practice of leadership they identified: how to support colleagues that challenge the pedagogical shifts expected in ambitious teaching.

Teacher leadership

Teacher leadership is multidimensional and CBTLs may be '...uniquely positioned as collaborators with a capacity for modeling and refining content-specific instructional practice' (Wenner & Campbell, 2017, p. 140). Modeling reflection and collaboration with others to improve instruction is one of the central activities of teacher leaders (Cheung et al., 2018; Teacher Leadership Exploratory Consortium, 2011). While teacher leaders may take on formal roles in supporting colleagues, their position as a teacher leader at their school site might open additional opportunities for informal support of their colleagues (Fairman & Mackenzie, 2015; Von Dohlen & Karvonen, 2018; Wenner & Campbell, 2017). Peers' acceptance of this informal coaching may vary, and some teachers may be reluctant to accept support from CBTLs (Friedman, 2011; Hunzicker, 2017). Furthermore, the CBTL's work is situated in the larger school climate and culture that may either support or inhibit the work of the CBTL (Cansoy & Parlar, 2017). Therefore, the work of learning to support reticent colleagues, across a range of schools, requires CBTLs to access a variety of strategies and approaches. Given the range and diversity of experiences of CBTLs, we

constructed a rehearsal as a means to leverage their experiences to build communal knowledge to meet the significant challenge of working with challenging colleagues (CCs).

Theoretical framework

Sfard (1998) distinguished two metaphors of learning, the *acquisition metaphor* and the *participation metaphor*. Hakkarainen et al. (2004) discussed a third metaphor, a *knowledge creation metaphor* to address processes and practices related to the formation of new communal knowledge. Members of knowledge-building communities are experts trying not only to change their own mental states but also to originate new thoughts and advance communal knowledge.

Participants in knowledge-building communities create new conceptual artifacts (e.g. new theories, problem formulations, specifications of best practices) (Bereiter, 2002). They make conscious efforts to advance conceptual knowledge and develop the expertise needed to go beyond existing understanding (Hakkarainen et al., 2004). These participants recognize existing problems and collaboratively set out to solve them. In doing so, they leverage their expertise to transform practices or perspectives and explore possible avenues of solutions. Hakkarainen et al. (2004) described 'expertise that arises from social interaction, knowledge sharing, and collective problem solving' as *networked expertise* (p. 246). Focusing on the social foundations of knowledge creation does not lessen the importance of individual skills, competencies, and expertise. Individual expertise is also present.

One characteristic of this knowledge-building community is called the *ratchet effect*, wherein participants use previous intellectual achievements to reach new ones. Challenges and tension within the community allow individuals to think past current practices and knowledge. This process not only advances an individual's understanding but also contributes to the advancement of communal knowledge. Because the structure of rehearsals creates an interaction-rich, collaborative setting, we sought to capture how this pedagogical activity might bring about a knowledge-building community. Specifically, we explored the activities that contributed to communal knowledge building, including how differing perspectives and expertise were leveraged to establish guiding principles to consider in their interactions.

Methodology

In this study of emerging CBTLs, we examine what a rehearsal reveals about the CBTLs' perspectives on supporting colleagues in ambitious teaching. Data collected included both video and written artifacts (scripts) produced during a rehearsal. We utilize qualitative thematic content analysis and discourse analysis to analyze CBTL-generated scripts of the proposed conversations with reticent colleagues and video of their discussion of these scripts (Berelson, 1952; Braun & Clarke, 2012).

Context

The leadership fellowship goals were to (a) support strong mathematics and science teachers in enriching their practices through engaging with content and students' thinking

so they could grow as extraordinary teachers, and (b) support these teachers in becoming teacher leaders who could then support teachers at their school sites and beyond. The professional development activities included leadership sessions focused on such topics as supporting student teachers, coaching peers, leading professional development, and using artifacts (e.g. video clips or student work) in professional learning communities.

Participants

The data presented here come from 34 teacher leaders all from high-needs school districts in the Southwestern United States (see Table 1). They were familiar with the Common Core State Standards, Next Generation Science Standards, or both (NGA & CCSSO, 2010; NGSS Lead States, 2013) and were teaching curricula that addressed these standards.

At the inception of the project, we recruited 32 Fellows. These CBTLs were selected through a highly competitive application process that included analysis of student work, video of their teaching, and an interview (Nickerson et al., 2018). We sought, in addition to an understanding of ambitious teaching, a learner disposition in each teacher. A second cohort of CBTLs was selected in Year 4. Each year, we supported the CBTLs in one week of intensive summer work and five follow-up days throughout the academic year, along with extensive school-based work. All CBTLs consented to participate in the research under the oversight of our university's *Institutional Review Board*.

These teachers brought with them (and developed) not only deep understandings of content and pedagogy but also a wealth of leadership experiences, such as chairing a department, leading professional development, and supervising student teachers. The reach of these teachers grew throughout the fellowship. Being named a fellow led to leadership opportunities at the school, district, county, and state levels. For example, one CBTL in addition to regularly supervising student teachers, teaches a course for under-graduate science majors considering entering the teaching profession. Another was tasked with leading the rollout of new standards at the district and state level.

Context for data collection

As described in the literature on rehearsals, TEs decompose complex practice and engage teachers in approximations of practice. In the following, we describe how we, working with experienced teachers, reconceptualized this framework.

Table 1. Examples of sequencing of coding in scripts written by the CBTLs.

Stance	Sequence	Conversation
Peer	Rephrasing → Clarifying Question (x2) → Ask for Suggestions → Clarifying Question → Empathy → Clarifying Question → Rephrasing → Empathy → Describing Pedagogy → Offer to Share Rationale → Articulating Rationale → Empathy → Articulating Rationale → Offer to Follow-up (x2) → Invitation to Observe	1
Empathetic Expert	Empathy → Articulating Rationale (x3) → Invitation to Observe→ Describing Pedagogy → Invitation to Observe → Empathy → Articulating Rationale → Empathy → Articulating Rationale (x3)→ Offer to Follow-up	7
Expert	Articulating Rationale (x2) → Describing Pedagogy → Invitation to Observe → Follow-up	4

Recognizing the professional expertise of our teacher leaders, we designed experiences to support the development of an inquiry community. Bereiter (2002) emphasized that participants should be encouraged to focus on questions that emerge from their own experiences. Our professional development drew on the stories and experiences of the teachers; teacher narratives about teaching are one example of a *representation of practice* (Charalambous & Delaney, 2019). The selection of topics covered during the five-year project was largely driven by the challenges that the CBTLs noted, which included leading professional development workshops, supporting NTs, and working with reticent, or skeptical, colleagues. Peer teachers who resisted the changes the CBTLs strived to enact for ambitious teaching were described as *challenging colleagues* (CCs). Even though we use the term CC to refer to CBTLs' peers, we acknowledge that CBTLs could be seen by their peers as challenging.

In rehearsals with NTs, a teacher educator models or shares established principles for the practice. Because there is no one correct approach or strategy to meet the significant challenge of working with CCs, we constructed an activity to elicit the CBTLs' expertise. CBTLs were placed in groups of three or four, that were purposefully constructed to represent both disciplines and a range of teaching and leadership experiences. The groups were provided with four TE-authored scenarios that stemmed from previous discussions with the CBTLs. In learning about ambitious teaching, teachers are sometimes uncomfortable with the degree of student autonomy and the time spent on exploring students' solutions, including those with incorrect initial ideas (Coffey et al., 2011; Kinser-Traut & Turner, 2020). The 'teacher' in these scenarios refers to the CC:

(1) Teacher walks into your room and sees a student sharing incorrect strategies or initial math/science ideas they see as 'wrong'.
(2) Teacher does not come into your room but comments on the classroom being loud and looking unproductive.
(3) Teacher makes a comment that you (as the teacher) do not seem to be teaching them. 'You are never at the front of the room'.
(4) Teacher says, 'How can you still be on that topic? We've already moved on to . . . '.

The CBTLs were tasked with reviewing the four scenarios and selecting two to discuss in their groups. Each group selected one scenario for which to develop a full script describing how they would leverage the CC's comment to begin a conversation about teaching and learning. In doing so, we decompose the complex practice of teacher leaders working with peers. Scripts have previously been used as an effective pedagogical and research tool in mathematics education (Zazkis & Herbst, 2018; Zazkis et al., 2009). As Lim et al. (2018) suggest, 'scripting can serve as a way of approximating practice' (p. 298). Script writers can imagine different characters and possible interactions but also rethink and refine the interactions involved. Zazkis et al. (2009) argued that the act of scripting a lesson forces prospective teachers to anticipate exactly what language they would use to introduce a problem, possible student answers, and how they would respond to the various student solutions. The researchers in that study began the rehearsal with a *starter* or unfinished case study. Our script-writing task began with the scenarios described above. As moderators of this activity, we framed the script writing as an opportunity to share expertise. We were clear that there is no one correct way to respond to the scenarios.

The rehearsal described here goes beyond the script writing to include a rich discussion in which the CBTLs performed their scripts for the larger group. The role of the moderators shifted from providing directive or evaluative feedback to facilitating reflective discussion. Teachers received feedback from their peers which supported learning; the approximation became a representation of practice for others (Grossman, Compton, et al., 2009).

As Grossman, Compton, et al. (2009) note, approximations differ from actual practice in completeness and congruence. These scenarios were congruent as they were constructed based on scenarios teachers had previously described. This task was also authentic in the sense that CBTLs developed actual responses as they authored their scripts. However, the task was incongruent in the time that could be devoted to their responses and in that the responses were collectively developed.

Data and analysis

In examining what can be learned from rehearsals and how rehearsals can be used to build communal knowledge, we had two sources for qualitative analysis: (a) nine scripts written by small groups of CBTLs in response to prompts and (b) transcript of video recordings of the enactments and surrounding discussion. The rehearsal took 45 minutes for script development in small groups and 45 minutes for whole-group script enactments and discussion. In the whole group discussion only five of the nine scripts were enacted and discussed. Our analysis approach included discourse analysis (Gee, 1999) in concert with elements from thematic content analysis (Berelson, 1952; Braun & Clarke, 2012). We coded for emergent themes across the scripts (A – I) and transcript of the discussion. We used discourse analysis including a representation of talk turns to analyze the discussion (Gee, 1999; Koehler et al., 2005). A research assistant, independent of the project, double coded both scripts and conversations, equivalent to roughly 20% of the coding, with 85% agreement.

Scripts

We first coded the scripts by characterizing their content and then holistically. When coding for content, we noted that the scripts contained examples of CBTLs' articulating reasons for what they were doing, expressing empathy, or trying to understand the CC's reasoning. Some examples of the codes applied to the scripts follow:

Articulating Rationale for Pedagogy: '...to prepare my kids for these different, more authentic assessments, I had to change my instructional practice'.

Empathy: 'I've had that same apprehension when I first started'.

Codes for trying to understand the CC's reasoning came in different forms. Some examples include:

Rephrasing: 'Ok, I think I get where you are coming from. You are worried that I am letting kids walk out with misconceptions that haven't been addressed? Is that right?'

Clarifying Question: 'Tell me more about what you saw so that I can really understand'.

Table 2. Examples of script-coding sequences.

Stance	Sequence	Script
Peer	Rephrasing → Clarifying Question (x2) → Ask for Suggestions → Clarifying Question → Empathy → Clarifying Question → Rephrasing → Empathy → Describing Pedagogy → Offer to Share Rationale → Articulating Rationale → Empathy → Articulating Rationale → Offer to Follow-up (x2) → Invitation to Observe	A
Empathetic expert	Empathy → Articulating Rationale (x3) → Invitation to Observe→ Describing Pedagogy → Invitation to Observe → Empathy → Articulating Rationale → Empathy → Articulating Rationale (x3)→ Offer to Follow-up	E
Expert	Articulating Rationale (x2) → Describing Pedagogy → Invitation	C

One of our holistic lenses was related to *stance*. The stance a teacher leader takes has potential impact on the coaching relationship (Hu & Tuten, 2021). The sequence of codes in the individual scripts helped us attribute a stance to the script writers. Stance characterized the positioning of the CBTL in the script as peer, empathetic expert, or expert. Table 2 includes examples of the coding sequences for scripts that took particular stances.

Transcript of the enactment and discussion

Our analysis of the transcript of the enactment consisted of four phases employing discourse analysis and qualitative content analysis (Berelson, 1952; Gee, 1999). Qualitative content analysis has been previously used for analysis of transcripts of class-room discussions, interviews, and on-line discussions (e.g. Borko et al., 2008; Goktas et al., 2009; Hou et al., 2009). Our content analysis is a thematic analysis in which one looks for patterns that prevail in content. In contrast to critical discourse analysis, content analysis does not include consideration of the intersubjective space, how discourse serves other purposes.

In the first stage, using discourse analysis, we separated the transcript into segments we called *conversations* that indicated when new scripts were read or the topic shifted. In seven identified conversations, five scripts were read. Conversation #1 was about Script A. Conversation #2 was about Script B. Conversation #3 was about connections between Scripts A and B and included reflections on the process. Conversations #4 and #5 were about Scripts C & D, respectively. Conversation #6 was about department culture. Script E was discussed in Conversation #7.

In the second stage, consistent with thematic content analysis, we coded the transcript capturing key thoughts or concepts, starting with the coding scheme from the scripts (Hsieh & Shannon, 2005). We coded instances in which the CBTLs noted what the authors of the scripts had done explicitly or implicitly. For example, the CBTLs sometimes noted that the dialogue implicitly conveyed that the CBTL in the script was listening to the CC. We assigned codes when the CBTLs labeled a particular course of action in the dialogue.

Third, we linked these codes into clusters to describe themes (Berelson, 1952). Our analysis led to clusters of (a) guiding principles, (b) what teachers noted about the scripts, and (c) reflections on the process of rehearsing. The principles new conceptual artifacts recognized by the group. The guiding principles were collectively constructed through the CBTLs' knowledge sharing and problem solving. Codes referring to a CBTL's noticing an emotion or stance were grouped in a Noting category.

Fourth, because building communal knowledge occurs through critiquing, extending, elaborating, and transforming knowledge objects (Hakkarainen et al., 2004), using discourse analysis, we then traced the thread of the conversation within these clusters or the sequence of ideas while they developed. Finally, for each conversation, we tracked the dynamics of discussion of the principles using a representation developed by Koehler et al. (2005). This representation (see Figures 1–3) illustrates talk turns, and the foci of the
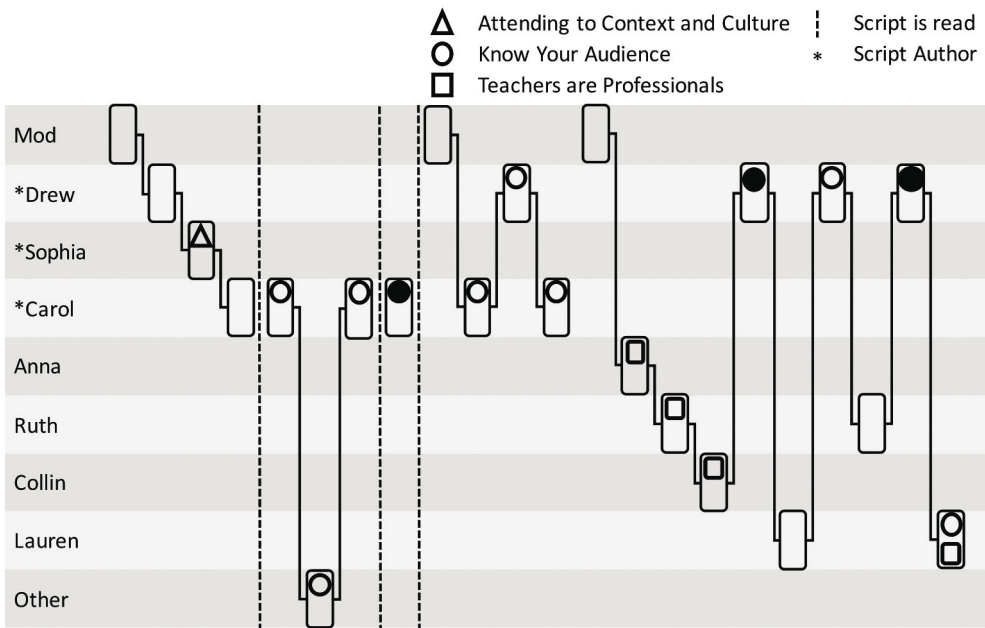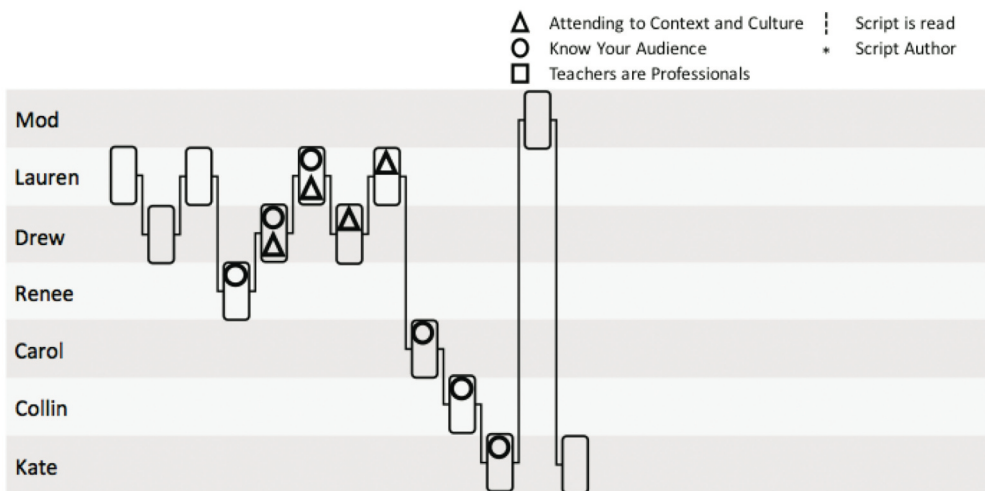

Figure 1. Talk turns in conversation 1.

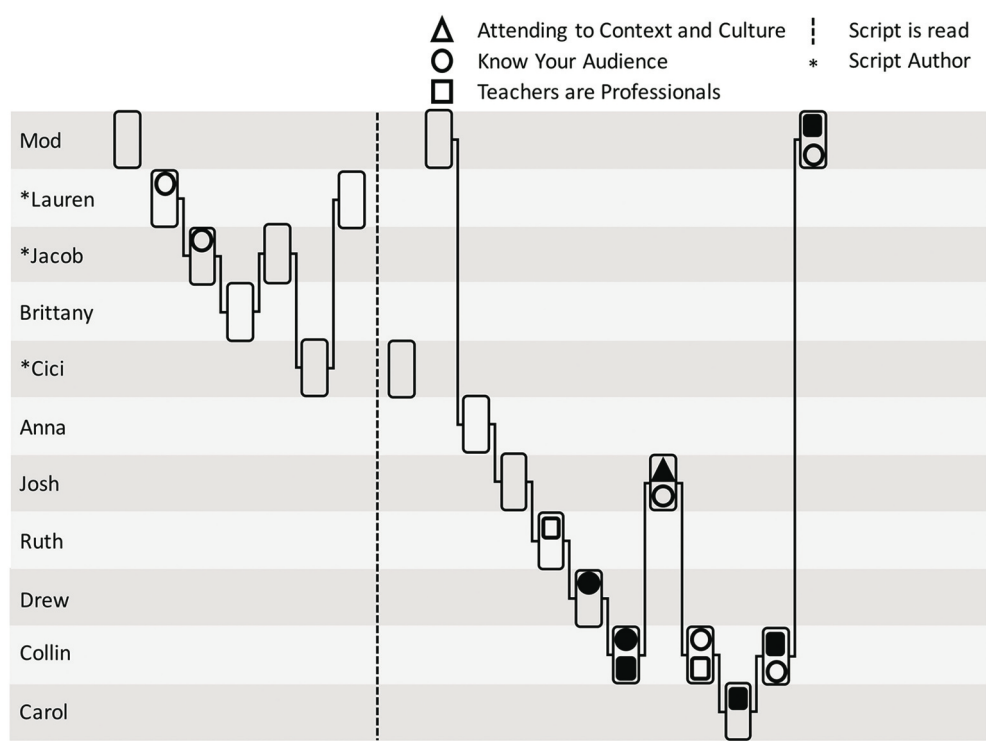Figure 2. Talk turns in conversation 3.

Figure 3. Talk turns in conversation 7.

talk turns are labeled. Although this will be elaborated in the results, note these figures show the progression of the discussion in three dimensions: who is contributing, when they are contributing and what they are contributing. We include representations of three of the seven conversations. The representations graphically illustrate both when ideas were introduced and the merging of ideas.

Results

In answering our research questions, we begin by describing what the rehearsals revealed about CBTLs' perspectives on supporting colleagues in ambitious teaching. The scripts they authored represented a range of stances toward their peers. The enactment and discussion of the scripts more richly revealed their perspective toward their colleagues as they collectively considered the foundations for working with reticent colleagues.

Scripts

Eight groups created scripts in response to the four prompts and a ninth group created their own prompt (Script E) inspired by the provided prompts and personal experiences. Of these nine scripts, only one was coded as a CBTL positioning as a peer, three as empathetic experts, and the remaining five were found to have taken expert stances in their interactions with colleagues (see Table 2). All nine scripts include instances of the

CBTLs articulating their rationales. One key difference between the *empathetic experts* and more directive *experts* was the timing of when they chose to articulate their pedagogical rationales.

Further analysis of the five *expert* stance scripts showed that in three the CBTLs responded initially with *articulating the rationale*. For example, in Script C, the CBTL's response to the CC's prompt in Scenario 3, 'You don't seem to be teaching. You're never in the front of the room', began with a rationale:

> I am not in the front all the time because there are parts of lessons where I want students to grapple with the information or work through an inquiry process where students are finding the answers.

The other two such scripts each began with a *clarifying question* followed by a description of the pedagogy on the CBTL's next talk turn. For example, response to the same prompt in Script F follows:

> CBTL: What did you see me doing in class?
>
> CC: I saw you walking around.
>
> CBTL: Right, I was working with my students in smaller groups and one-on-one to better meet their needs in regards to the lesson.

Here we see the CBTL used the question to quickly direct the conversation toward an rationale of their practice.

In contrast, in the scripts in which the CBTLs were coded as empathetic experts, *articulating the rationale* appeared early as well but was embedded with the clear message that the CBTL was listening and empathetic to the colleague's concerns. For example, in response to Scenario 2, regarding noise levels in the classroom, the conversation begins:

> CBTL: Oh, I'm sorry. My kids get really excited sometimes about the work they're doing. They're exploring the phenomena of *xyz*.
>
> CC: But how are they learning? I can't even hear myself think. Students need focus to complete a task.
>
> CBTL: Yeah, I used to manage students to make sure they're focusing. I understand how loud might look unproductive, but I invite you to come into our classroom to see what the loud is about.

Here we see that the CBTL's initial response included describing the pedagogy, but quickly pivoted to a stance of *empathy*. In the more directive *expert* scripts, we saw no inclusion of empathy or authentic attempts to listen to colleagues.

In Script A, characterized as taking the stance of CC as *peer*, the CC stepped into the CBTL's classroom, overheard a small-group discussion, and informed the CBTL that that group 'had no idea about the reality behind the content' (Scenario 1). The conversation continued:

> CBTL: So, are you referring to when you saw that group say, 'Blah Blah?' Can you explain more about the issue you see?
>
> CC: Exactly. The students were wrong. How are you going to fix their misconceptions? You cannot let them continue down this wrong road.

> CBTL: Is it the process you saw or the product the kids are making that has you concerned? What would you do? Tell me more about what you saw so that I can really understand.

In contrast to CBTLs with *expert* and *empathetic expert* stances, this CBTL began with a series of *clarifying questions*, attempting to truly understand the concern expressed by the CC (see Table 2). Another request for information revealed the CC's real concern: A misconception was not corrected in the moment. The conversation continued:

> CBTL: Ohhh. Ok I think I get where you are coming from. You are worried that I am letting kids walk out with misconceptions that haven't been addressed? Is that right?

> CC: Yes. Exactly. We cannot confirm student misconceptions. We have to challenge them.

Only after the CBTL understood the true concern of the CC did the CBTL offer a description of the pedagogical approach being used, in this case eliciting students' initial ideas, and the rationale for that approach.

We characterized how CBTLs were positioned in working with their reticent colleagues. One group's script positioned themselves as *peers*, attempting to understand the concerns expressed by their colleague. The rest of the scripts showed CBTLs positioned as *experts* or *empathic experts*, primarily directive and explaining actions.

Discussion of the scripts

Of the nine scripts written, four were reenacted and then discussed. This reenactment and discussion was separated into seven conversations. As noted, in coding the transcript of the seven conversations, we characterized the clusters in terms of (a) guiding principles, (b) noting category, and (c) reflections on the process of rehearsing.

We identified three CBTL-constructed guiding principles: (1) *Know Your Audience*, (2) *Attending to Context and Culture*, and (3) *Teachers Are Professionals*. Some of these principles were stated almost immediately, whereas others developed over time. In the following overview, we describe the thread of the conversation leading to the three guiding principles.

Representation of talk turns and principles

We used a diagrammatic representation of talk turns to represent the flow and order of the discussions surrounding the rehearsal and scripts (Koehler et al., 2005). See Figures 1–3. The vertical axes list those who spoke during the specific conversation. The moderator is denoted by Mod, and names with asterisks denote individuals who were authors of the script being discussed. Each box in the figure represents a person talking, and the dotted vertical line denotes the time when a script was being read. The figure inside a box (triangle, circle, or square) indicates the discussion of one of the three identified principles. A shaded figure denotes when the principle was established or explicitly expanded. The blank boxes illustrate talk turns where principles were not discussed. Lines connect threads of ideas; an unconnected box reflects a new or unrelated topic within the conversation.

Details of the development of each principle follow. We found additional aspects of interest regarding participation.

Role of moderator.   The extent to which the moderator discussed the three principles was minimal. Before Conversation 7, the moderator served as a facilitator, as Figures 1 and 2 show. For example in Conversation 1, the moderator invited others to join the conversation, saying, 'So what did others notice in that script?' Conversation 7 reflects the only explicit statement of principles by the moderator, who, at the end of the conversation, summarized the *Teachers Are Professionals* principle and supported the *Know Your Audience* principle (as depicted by the closed square for *Teachers Are Professionals* and the open circle for *Know Your Audience* in Figure 3). However, most moderator boxes through all seven Talk Turn representations are blank, which can be attributed to the moderator's facilitation of group discussion. This is illustrated in the three representations here.

Broad participation.   Another aspect to note, in each conversation about scripts, non-authors and authors supported, established, and elaborated the principles. The communal knowledge was co-constructed, and the networked expertise of the group was leveraged to formulate these principles.

Know your audience principle

In Conversation 1, *Know Your Audience* emerges as an explicit first guiding principle (Figure 1). The first group to volunteer to share was the group that developed the *peer* stance script for Scenario 1 described above. When enacting the script, CBTL Carol stepped out of the scene to add that one has to 'kind of judge, like, do you have colleagues that really like to hear research, or do you have colleagues that are like, "Oh, you are so self-important"?' Someone outside the authoring group said, 'Read your audience'. Carol then explicitly labeled the suggestion as 'Know your audience' and received affirmation from others within and outside the authoring group. This conversation thread can be followed in Figure 1 by noting Carol first talked about *Know Your Audience*, as depicted by an open circle, and solidified the principle, as depicted by a closed circle.

Having framed this principle, the CBTLs continued reading the script and the moderator invited the authoring group to share next steps. Carol responded that it depended on the teacher. This theme was elaborated by several CBTLs; they suggested they might share the research, student-work examples, or set a time to meet. Drew raised the need to understand the type of resistor the CC is in order to vary the responses accordingly. Drew said resistors differ and named one the *parking-lot sniper*, who is friendly to your face but whispers behind your back. Lauren, a CBTL outside the authoring group, acknowledged the similarities rather than the differences among the resistors: 'I think that [it] is really important to, like, make it known in these conflicts that we all have the same concerns and we all have the same worries about change'.

In Conversation 3, the CBTLs reflected upon the connections between Script A and Script B (see Figure 2). The *Know Your Audience* thread was picked up again when Renee elaborated:

> If it's the fear of the unknown or being uncomfortable, then it is a different approach than if it's a philosophical difference, which is a different approach than . . . . Really get[ting] to the underlying cause of the resistance is really important because that's going to deal with it.

Carol discussed the difference in the response depending upon whether the CC is someone with whom one has a great relationship or someone who *thinks* they know them and approaches with preconceived thoughts and entrenched positions. Collin suggested an approach to someone who has an entrenched position: 'I just try to throw in new evidence. [Pretending to hold up a paper] "Hey, look what my kids did! Right, look at what they can do. Look at what they said in my class", and then "How did that happen?"' Kate elaborated that for the entrenched resistor, one could ask the CC's opinion of what the teacher should do.

The CBTLs in the first three conversations reflected on the different kinds of resistors and how responses hinge upon the differences in resistors. At the beginning of Conversation 4, they took up motivation. Anna offered a metareflection: 'So we are recognizing that there is a different belief system and that we have to present some evidence for them to see that what we are doing works'. Collin said that after hearing the conversation, he would revise his group's script to have the teacher first clarify the CC's specific concern about what teaching should entail: 'How is this different than what you were expecting?' After the discussion in Conversations 5 and 6, the CBTLs discussed similarities between teachers and department culture.

In Conversation 7, as seen by the closed circle in Figure 3, they elaborated on *Know Your Audience* in terms of the motivation for the teacher's concerns. Drew said,

> I think that's part of the, the knowing your audience, I think that somebody said earlier. And people respond to what's in it for them, so this person might be motivated by 'Oh, the assessment, right; this might help my kids do better on the assessment', or, 'Oh, I might get to go home before it's dark', or. . .. So just knowing, I think, . . . that people respond to what's in it for them. And people don't make rational decisions based on logic. [Or] nobody would smoke, and we'd all be in shape.

Collin added that resistance comes from fear and people respond to fear of change differently:

> Sometimes it's very aggressive and confrontational, so they're talking to you just to poke holes in what you're doing. It's not like I'm going to say something that will convince you. Other times, it's like, 'No, I want to; I want to learn about that'.

He also acknowledged that every teacher, '. . .as resistant as they are to that style of teaching or lesson . . . ' would still recognize student understanding.

Early on, CBTLs established *Know Your Audience* as a guiding principle: A CBTL's response to a CC depends upon understanding the CC as teacher and learner, the underlying reasons for the resistance, and the relationship between CBTL and CC. Periodically, they acknowledged the similarities among the resistors and ultimately recognized the similarities to themselves. Their understanding of their colleagues supported the emergence of two other guiding principles, *Attending to the Context and Culture* in which the CCs worked and recognizing that *Teachers Are Professionals* who ultimately want the best for their students.

Attending to context and culture principle

A second guiding principle, the need to attend to the larger context of the CC interactions, emerged in Conversation 1 with Sophia's suggestion that *administrators can be resistors* (depicted by Sophia's open triangle in Figure 1). Drew raised the idea again in

Conversation 3 (see Figure 2), noting, 'I have seen it [resistance] with admin', and that idea was affirmed by two other CBTLs. Then in Conversation 6, Ruth introduced the principle that culture and context are significant: 'Maybe we could have those conversations with the administrators about how the administrators, like, what they need to do on their end to help support change in the classroom'. Here Ruth elevated the need to connect with administrators beyond thinking of them *as* challenging colleagues to recruiting them to support the work *with* challenging colleagues. The moderator connected this idea to a previous meeting focused on explaining changes in teaching practice to administrators. Expanding on the principle, Ruth added, 'But they'd see, like, "It's great what you're doing in your classroom", but then seeing then how they need to help, help us to foster it in other classrooms so other students are also . . . getting access, right?'

Finally, in Conversation 7 (see Figure 3), Josh connected the *Know Your Audience* guiding principle with *Attending to Context and Culture* by revisiting the idea of fear:

> And I think what you said about the fear is really important for all of us, as well as to think about how we can make our departments safe places to try new things and experiences and get to know each other so that level of fear drops. And then everyone is sharing, and it's okay to make mistakes, and it's okay to try new things.

Josh had built upon the idea introduced by Sophia and Drew and formalized by Ruth regarding the administrators' roles. He connected understanding the root of resistance to the context and culture of the school, emphasizing the importance of the context and culture of the administration and school site. Josh drew on the established *Know Your Audience* principle, along with Drew's and Ruth's ideas about recruiting administrators as allies, to advance the group's existing understanding and transform the shared knowledge into a common understanding.

Teachers are professionals principle

Although the *Teachers Are Professionals* principle was formally introduced in Conversation 2, we saw in the *Noting Category* codes revealed from the beginning the implicit recognition of this guiding principle. It was present in what CBTLs recognized and highlighted in their peers' scripts. For example, in Conversation 1 about the first script (with a *peer* stance), Anna noticed that her peers attended carefully to a CC, saying, 'And then they weren't like challenging or attacking. It was really like trying to understand, you know, get common understanding' (See Figure 1). Building on Anna's remarks, Collin noted the importance of initially listening and being empathetic:

> And before, you went into, like, 'This is how—why I'm doing what I'm doing', you re-voiced what you heard them say: 'So, this is your specific concern, that [students are] going home [with misconceptions]'. I thought that was a very crucial step. Like, 'Hey, I hear you. This is what you're saying. I get that. I had that same concern'.

In Script B, the CBTLs asked their CC to meet and share strategies, but when reading Script B in Conversation 2, the authors stepped out of character to indicate that this 'sharing' may really have been 'manipulating the teacher . . . to think' that they found the CC's contribution valuable. Reconsidering, one author added, 'Actually, I bet they do have skills to bring to the table. [We are] assuming positive intention'. Although the

original script seemed to counter the idea of teachers as professionals, in the discussion Drew elevated their statement about 'assuming positive intention' in stating a guiding principle:

> I think they said, 'Assume positive intention', which is kind of a big deal. You know, even though a person just may not understand or whatever – hey're resistant, they still want kids to know things. ... It's just they're scared.

Drew, holding these ideas of being empathetic and listening to the teacher, assumed implicitly that the other person was of value both as a person and a professional.

They continued to take up the idea of teacher professionalism in Conversation 4. Although Anna and Collin were involved in writing the script with an *expert* stance, they both shifted their thinking toward teacher professionalism after hearing and discussing two other scripts and sharing their own. Anna suggested a more collaborative approach of co-planning a lesson and trying to 'mold our styles together and see if we can increase student learning'. Collin added, 'But I think, after hearing what you guys said, I would sort of, like, add in some stuff on .... . let them have voice, ... what they think teaching should look like'. By recognizing that their colleagues have ideas of value, the CBTLs continued to build the argument of teacher professionalism.

In Conversation 5, Renee supported these ideas by highlighting that although the CBTL and CC may use different pedagogical practices, they have the same goals: 'I totally have that same goal – that [students] are going to know this'. Although she may not agree with the CC's pedagogical practice, she recognized the inherent professionalism in the shared goal of children's learning. In Conversation 7, Collin further refined this idea:

> And I have never met a teacher who was incapable of recognizing learning. Right? Like, I've never met a teacher who would've come at the end of the lesson, see my kids in a productive conversation or presenting something, and go, 'Uh, they don't really know it'.

Here he acknowledged the inherent ability of teachers as professionals to recognize student learning. Carol continued to build the argument:

> Sometimes it's what we do with kids that we need to do with our colleagues. Right? Like, you just need to remember those things. If a kid makes a mistake ... I'm like, 'Hell, yeah', whereas sometimes when the adults make one and you're like [scoffing]. Right?

Collin continued:

> Like, recognize that in a certain scenario, or a certain lesson, this might be someone running at 90% capacity of their ability to change, or what they're comfortable with and it might be another person's 50%. It might be another person's 10%. Depending on what you're doing, those percentages change. So just give each other grace and be patient.

In the closing of the conversation, we see the earlier implicit ideas emerge into an explicit guiding principle that *Teachers Are Professionals* (see Figure 3).

Summary of guiding principles

The *Know Your Audience* principle was the first to be established and was deeply woven throughout all conversations. In developing *Know Your Audience*, the CBTLs recognized the need to understand the motivations of the resistor in order to tailor a response. It also

entailed understanding of the CCs' concerns and goals. With this early establishment, the *Know Your Audience* principle laid a foundation for the group to start recognizing the *Attending to Context and Culture* and *Teachers Are Professionals* principles. In Conversation 3, the elaboration on the *Know Your Audience* principle motivated discussion of *Attending to Context and Culture*. *Attending to Context and Culture* was focused on making departments safe places to experiment with ambitious teaching and on valuing the in recruitment of administrators as allies in the work. Teachers were acknowledged as professionals with shared concerns for student learning, but change is difficult and CBTLs need to 'give each other grace'.

In Conversation 7, both the restatement of *Know Your Audience* and the establishment of *Teachers Are Professionals* principles occurred in a single talk turn that was followed by the elaboration of the *Attending to Context and Culture* principle coupled with *Know Your Audience* (see Figure 3). The coupling of guiding principles in a single box in Conversation 1 indicated that *Know Your Audience* was initially identified as an approach to deal with the individual CC, but then it was built upon and used by the group to recognize *Teachers Are Professionals*. Ultimately, it led to the broader perspective of *Attending to Context and Culture* in the department or school.

Realistic nature of the scenarios

After two scripts had been discussed, one CBTL asked and the group pondered whether the scripts were realistic. CBTLs noted that they do encounter CCs, though some are 'parking-lot snipers'. They added that administrators can be CCs. They discussed the scenarios we had presented. In considering Scenario 4, they agreed that their colleagues had raised concerns about time on topic. Reflecting on the script, one CBTL said,

> But I think you've nailed, like, a very common teacher thing. Like, we—that's [a mathematical formula] really easy to memorize, like, some of them in like five minutes, 'It's easy', right? . . . I hear that a lot [from colleagues], and I think that a lot sometimes like, 'Why is this taking so long?'

The teachers of both science and mathematics shared these feelings. The conversation that followed reflected the self-struggles and doubt that some CBTLs feel when trying ambitious teaching.

The scenarios seemed especially realistic when CBTLs remembered their own initial ventures into ambitious teaching. In a discussion of a script addressing a CC's concern that 'this is too much work', a CBTL said,

> I mean that struck a chord with me because, when I first started teaching, I remember dreading the days that I didn't have time to plan an activity. . . . But when I had time to plan an interactive lesson where the kids were in teams, I was so much less stressed out at the end of the day, and that's what motivated me to keep doing it.

The CBTL directly connected a script comment with her experience, stating she found reason to pursue ambitious teaching in spite of the time commitment because she felt less stressed when enacting ambitious teaching. Clearly the scenarios from which the scripts were developed stem from shared experiences.

Discussion

Learning from rehearsals

We see evidence that this knowledge-building community collectively constructed guiding principles as a conceptual tool for their work with challenging colleagues. The analysis illustrates how CBTLs' ideas built on one another as in the *Teachers are Professionals* principle. Like novice teachers who learn from their mistakes in a low-stakes environment, CBTLs (such as Anna and Collin in Conversation 4) sometimes explicitly acknowledged they would like to revise their script from an *expert* to a *peer* stance.

The CBTLs agreed that an appropriate beginning was to understand the CC's concerns, the importance of expressing empathy, conveying that they were listening, and sharing concerns before sharing a rationale for pedagogical decisions. This collective intellectual achievement of establishing *Know Your Audience* allowed for the building of the *Attending to Context and Culture* guiding principle. The discussion of scripts began with concerns about how to relate to a CC in a dyad and quickly expanded to include the administrator. Ultimately, the CBTLs acknowledged the importance of their awareness of the context and culture in which their colleagues are embedded and the effects of this culture on one's efforts to shift toward ambitious teaching.

Prior research suggests relationships with colleagues can inhibit the work of teacher leaders when CCs are resistant to the proposed changes (Friedman, 2011; Hunzicker, 2017; Wenner & Campbell, 2017). Throughout their discussion, the CBTLs constructed a shared understanding of the importance of attending to the motivations and perspectives of CCs, as they would to those of their students. They recognized that the CCs' reticence might stem from emotions familiar in their own journeys. They also acknowledged that the CCs shared their desires for supporting students to learn and recognition of students' learning. The rehearsals provided an opportunity to rehearse informal reflective conversations with CCs, further developing their leadership skills of coaching and collegial conversation (Cheung et al., 2018; Teacher Leadership Exploratory Consortium, 2011). Ultimately, they saw that teachers are professionals and wanted to 'give each other grace and be patient'.

Components of effective rehearsal for building networked expertise

We found that the scripts composed in small groups from realistic scenarios, the subsequent enactment and discussion, and the role of the moderator as facilitator all served to build communal knowledge within the group. We see the guiding principles derived from these experiences as tools that could be used to advance their work with colleagues reluctant to adopt ambitious teaching (Hakkarainen et al., 2004).

Component 1. Developing scripts of realistic scenarios

The script writing provided the CBTLs opportunities to imagine (or recall and compare) interactions with colleagues who challenged or were skeptical of ambitious teaching. We, like Zazkis et al. (2009), found affordances for the teachers' learning when they considered the dialogs in the development of their scenarios. In script writing, CBTLs carefully considered the individuals involved and alternative responses. We see the

evidence for this in their discussion of realistic scenarios and their offering of explanations for their choices when scripts were enacted.

Component 2. Script enactment and discussion

The enactment of the scripts provided a rich context for discussion. We note comments like Lauren's, referencing the power of hearing a script enacted: 'Now I'm really listening to you right after you said that. . .' We also note that within the discussion we saw the CBTLs construct a theory of practice around this central activity of teacher leaders (Cheung et al., 2018; Teacher Leadership Exploratory Consortium, 2011; Wenner & Campbell, 2017). They worked intentionally to construct communal knowledge.

We see evidence that CBTLs' work to advance communal knowledge led to evolution of individual expertise. Bereiter (2002) saw communal and individual knowledge as reciprocally dependent. In the scripts developed by the CBTLs, we found that only four of the nine groups held a perspective congruent with the *Know Your Audience* or *Teachers Are Professionals*. The remainder of the scripts portrayed an expert stance in which the CBTL neither leveraged the opportunity to understand the challenging colleague nor showed clear respect for the CC as a professional, but instead provided what the CBTL perceived was the correct pedagogical answer. This finding is in contrast to the participants' early adoption of the *Know Your Audience* principle during the discussion. This then developed into the principle of colleague as a peer who is a professional, adopted not only by those who were in groups that developed peer and empathetic-expert scripts but also by those whose scripts were positioned as expert. This result was most clear at the beginning of Conversation 4 when Anna, Ruth, and Collin were preparing to share their script with its explicit expert stance. Prior to script reading, Anna reframed her expert script, noting that CBTLs need to recognize that CCs might have 'a different belief system', a recognition that though not reflected in her script seems to have emerged from prior discussions.

The tension allowed for all three CBTLs to transform their initial perspectives on how to address a CC by exploring other solutions. This tension also contributed to advancement of communal knowledge because Ruth is the person who suggested that administrators should be recruited as allies, contributing to the *Attending to Context and Culture* principle in Conversation 6. Had the CBTLs only developed their scripts without accompanying group discussions, they would not have reached the same level of networked expertise or converged on the three guiding principles.

Component 3. Sequencing scripts in discussion

Also notable here was the sequence in which the scripts were shared. We, as moderators, realized that we had insufficient time for sharing and discussing nine scripts so we had the CBTLs share one example from each scenario; five scripts were shared. The order of the script stances as presented was Peer, Empathic Expert, Expert, Expert, Empathetic Expert. The first two scripts set a clear tone for the conversation. Our analysis indicates that the sequencing of the scripts may have shaped the trajectory of the conversations. Although we did not explicitly sequence the stances of the scripts (and only had surface-level knowledge of the scripts gleaned from observing groups during script writing), we recommend that others consider the sequencing of the scripts in discussion to the extent possible.

Component 4. Moderator as facilitator

As noted in the representation of Talk Turns, the moderator held a role as facilitator of the discussion rather than as provider of evaluative feedback, in contrast to the role described in the use of rehearsals with novice teachers (Arbaugh et al., 2018; Davis et al., 2017; Lampert et al., 2013). Like Hawthorne and Gruver (2018), the moderators recognized the extensive experience of the CBTLs; however, the role of content area was diminished in our adaptation of rehearsals. The CBTLs were from mathematics and science education backgrounds, yet their expertise as educators contributed to their shared goal of teaching ambitiously. The moderators' framing of the activity was not content specific and emphasized no single, correct answer. In the environment created by moderators, CBTLs shared their expertise in discussion after script readings and rephrased what was previously said, directly addressing and building on one another's ideas. This stance as moderator can serve as a resource for teacher educators and administrators to create a collaborative environment and engage teachers of all disciplines.

Community culture

We suggest that one attend to not only the structure of an activity such as we outlined here but also to the environment and norms. The majority of our community had been together for four and a half years, with a smaller cohort joining a year and half prior to the rehearsals. The CBTLs were regularly tasked with observing and critiquing one another's practices. The CBTLs had shared understandings of ambitious teaching and trust within the community. The ability to learn from colleagues requires the ability to critique, press for clarification, and challenge competing views and can be inhibited by avoidance of disagreements (Grossman et al., 2001; Vedder-Weiss et al., 2019). The CBTLs willingly expressed ideas and disagreements within the discussions, which, along with their dispositions to learn, we consider important to the community's knowledge building.

Conclusions and recommendations

In this study, we illustrate an additional productive way in which rehearsals can be used, in this case with emerging teacher leaders. We used rehearsals in a novel context with teacher leaders, a shift in their use historically from a directive and evaluative model to one in which expertise is networked. Specifically, this study suggests rehearsals, where emerging leaders are provided an opportunity to practice difficult conversations, is an effective approach in building leadership skill. Moderators need not convey specific best practices but instead elicit expertise from the community. Moderators provided representations that required emerging leaders to draw upon their extensive and diverse experiences to write and enact scripts as an approximation of practice.

We recommend teacher educators and administrators consider rehearsals as one way to support emerging teacher leaders. Specifically, this study highlights both the importance of acknowledging the expertise participants bring and building an environment of trust. CBTLs need a safe space to construct arguments and engage in critical discussion. School-based administrators can work as allies with teachers and teacher leaders, recognizing the importance of context and culture in facilitating change. Those moderating rehearsals should design scenarios grounded in the CBTLs' experiences. The results

highlight the potential benefit of sequencing the enactment of scripts. Therefore, the moderator would want to be intentional in sequencing based on the scripts produced. In discussion, moderators, acknowledging the participants' expertise, ought to avoid an evaluative role; rather they should serve to summarize and encourage elaboration and critique among the participants.

One limitation of this study is that it did not afford an examination of the consequences of these rehearsals on subsequent interactions with their reticent colleagues. However, we note the guiding principles constructed by the CBTLs are consistent with creating the conditions of productive pedagogical discourse. Leaders seeking to understand their colleagues' concerns and context, coupled with respect for teachers as professionals, could encourage 'rooting teacher learning in peer collaborative practice' (Margolis & Doring, 2012, p. 865). While these guiding principles emerged from the collective experiences of the CBTLs, they echo similar findings in the teacher leadership literature (Cansoy & Parlar, 2017; Fairman & Mackenzie, 2015). While these guiding principles were not new to researchers, we believe the CBTLs' opportunity to co-construct these by building on and connecting to their everyday experiences is central to their learning to lead. A second limitation is that we have a limited window into individual CBTL's learning. Further research might investigate both individual teachers' learning and subsequent practice following the rehearsal.

We believe rehearsals are a productive approach for supporting emerging leaders in practicing difficult conversations. This work illustrates how experienced teachers can propose not only what leadership practice could and should be but also under what circumstances it would be applied. We value teachers' expertise and encourage our colleagues to seek opportunities to nourish networked expertise in support of teacher leaders.

Disclosure statement

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