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Learning in a Community : An Investigation of Mentor Inquiry into Formative Assessment Practices

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Learning in a Community:

An Investigation of Mentor Inquiry into Formative Assessment Practices

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Abstract

This qualitative, instrumental case study examined how a mentor inquiry community can serve as a space for mentors to articulate their knowledge and what about the inquiry community, its characteristics, might harm or help that development. Using Design-Based Research as the methodology, a mentor inquiry community, composed of three university-based mentors of pre-service teachers and I engaged inquiry. Mentors showed their knowledge through their storytelling and problematizing each other's work. The inquiry community was facilitated by shared symbolic language, and mentors' off-task talk hindered the current work of the community but may have opened up new avenues of inquiry for the mentors in the future. The study creates opportunities for future research into how storytelling and joint-problem solving may expose knowledge in inquiry communities, teacher education, and P-12 practice; and future research into how symbolic language, small talk, and the principals of design-based research may facilitate mentors showing their knowledge.

Keywords: Mentor professional development, collaborative inquiry, design-based research, formative assessment, mentor knowledge

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Chapter One: Introduction

I remember accepting my first teaching job, still in college in 1998. I was in a convention center in Buffalo, NY and The School District of Palm Beach County, Florida (FL) offered me a contract on the spot. I was overjoyed. A few weeks later, I flew to West Palm Beach, stayed in a hotel room overnight, and, the next day, put on a linen dress and heels. I took a cab to Lake Worth High School. The cab driver dropped me off in muddy dirt - the school was installing an outdoor pool - and I walked up a steep hill in what felt like 100-degree heat. By the time I arrived at the school office - sweaty and disheveled - I knew I was not in Buffalo anymore. Lake Worth High School was enormous compared to my small, Catholic, all girls high school. At the time, it enrolled about 3,000 students, had 18 buildings, and a whole parking lot full of portable classrooms, which were used while the school was under construction.

I began teaching four months later, in my assigned a classroom, with a schedule, and a full roster of students, but no assigned mentor. The state policy in FL at the time was that a teacher who graduated with a degree in education did not need a mentor. My first year as a teacher was a mess. There is no other word. The majority of the student population in Lake Worth was Hispanic, Black, and Haitian-Creole; my education classes had minimal lessons on multiculturalism (and none on anything like culturally and linguistically responsive teaching). I did not know my students. I did not speak the languages they spoke at home. I did not know their culture. And they did not know me. I had no idea where to start. So, I did the things I would do at any school. I taught the books I was taught. I provided lessons the way lessons were provided for me. And, guess what? Most days I was an abject failure. It became so bad that I can recall sitting

in an administrator's office and weeping openly about my struggles. More than once, I questioned if I should even continue to teach. To this day, I am shocked that they offered me a second year.

I have been teaching now for 23 years and, although I did not know it then, what I desperately needed that first year of my career was a mentor. Not just a colleague to offer me a shoulder to cry on at the end of a hard day, but a mentor who would induct me into the world of teaching. Someone who understood the context of the school and could help me develop practices that were relevant and useful to my students. Instead, I spent the first years of my career figuring it out for myself when I might have been honing my practice with a more-experienced teacher mentoring me.

Needless to say, I made it work and am still growing as an educator. I was shaped by many influential administrators and colleagues and am grateful for their mentoring and have also had the opportunity to mentor other teachers. I have found mentoring others to be rewarding in many ways: I am able to help novice teachers discover and enact research-based practices and to learn from novice teachers, some of whom have recently graduated from school and are excited to share all they have learned. Therefore, I firmly believe that novice teachers need knowledgeable mentors in their clinical internships and the early stages of their career, and I have spent much of my time in the Teacher Education and Teacher Development program devoted to the study of teacher mentoring. To this end, focused my dissertation on mentors and mentor knowledge.

Mentoring

Achinstein and Athanases (2006) defined *mentoring* as a strategy of teacher induction programs, where a veteran teacher is paired with a novice teacher to support the novice's

professional development. A *mentor* is a skilled or more experienced person who sponsors, encourages, counsels, and guides a less experienced person (Iancu-Haddad & Oplatka, 2009; Achinstein & Athanases, 2006), typically a novice teacher during the first three years of teaching (Feimen-Nemser, 2001a) or a preservice teacher (PST) who is engaging in their *clinical internship*, or their student teaching experience. Mentoring is mandated in more than 30 states (Goldrick, 2016) and there are many benefits to having a strong mentoring component in a teacher induction programs. Mentoring lowers novice attrition rates (Goldrick, 2016; Gray & Taie, 2015; Smith & Ingersoll, 2004), increases novice teacher capacity to teach (Goldrick, 2016; Moir et al., 2009), can introduce novices to best teaching practices (Achinstein & Barrett, 2004), can increase novices subject matter knowledge (Barnett & Friedrichsen, 2015), and may influence novice's beliefs (Achinstein & Barrett, 2004). Mentoring also benefits the mentor themselves. By engaging in mentoring, mentors may enhance their knowledge (Kwan-Lopez & Real, 2010), increase feelings of efficacy (Achinstein & Athanases, 2006), and increase feelings of job satisfaction (Whatman, 2016).

However, in order for mentors to sponsor, encourage, counsel, and guide novice teachers or PSTs, mentors need knowledge of teaching and mentoring Achinstein and Athanases (2006) proposed knowledge base for effective mentoring, that reflected what mentors "need to know and be able to do" to mentor novice teachers or PSTs (p. 11). This knowledge base began with Darling-Hammond et al.'s (1999) three domains of knowledge: learners and learning, curriculum and teaching, and contexts and purposes. To this knowledge base, Achinstein and Athanases (2005, 2006) added that mentors need a *bifocal perspective*; they must understand and be able to apply these domains for both novice teachers or PSTs and P-12 students.

Inquiry Community

According to social learning theory, individuals construct new knowledge by collaborating in activities and internalizing the effects of their collaboration (Cuddapah & Clayton, 2011; Putnam & Borko, 2000; Wenger, 1990).

One way mentors may collaborate is in an *inquiry community*, which is a community of teachers who study their own classroom practices in a systematic and intentional way (Cochran-Smith & Lytle, 1993; Yendol-Hoppey et al., 2008). The goals of a community are to critique common teaching practices, to examine underlying assumptions, and to question their current language and conceptions concerning teaching (Cochran-Smith & Lytle, 1992; Levine, 2010). Some benefits of such a community are they may facilitate co-construction of knowledge (Palincsar, 1998; Vygotsky, 1978), can provide structure for learning (Kasl & Yorks, 2002), can provide participant's context-specific choice of study (Reason, 1999), and can add teacher voices to the research (Cloonan, 2019).

Design-based research (DBR), which is a research approach that involves an iterative design is one way to study an inquiry community. The goal of DBR is to develop solutions to problems and to develop knowledge (Anderson & Shattuck, 2012; Barab & Squire, 2004). Common principals of DBR are that it is interventionalist (Bakker & van Eerde, 2014), open (Bakker & van Eerde, 2014; Cobb et al., 2003), holistic (Bakker & van Eerde, 2014; Barab & Squire, 2004), social and collaborative (Barab & Squire, 2004; Penuel et al., 2011), context-specific (Anderson & Shattuck, 2012; Barab & Squire, 2004), focused on theory (Bakker & van Eerde, 2015; Brown, 1992; Cobb et al., 2003; Penuel et al., 2011), and iterative (Anderson & Shattuck, 2012; Bakker & van Eerde, 2014; Cobb et al., 2003; Penuel et al., 2011).

Statement of the Problem

Achinstein and Athanases (2006) argued that mentors need knowledge of learners and learning, curriculum and teaching, and context and purposes. Theory in educational psychology supports the co-construction of knowledge through working with others (Palincsar, 1998; Vygotsky, 1978). One way teachers can co-construct knowledge is through a learning community, of which there are many varieties and purposes (Levine, 2010). For this study of mentors, I determined that an inquiry community was the appropriate descriptor for the group of mentors who came together in this study to investigate their mentoring practice.

There is a developing research base showing that inquiry communities have many benefits for mentors. However, less is known concerning how a mentor inquiry community engaged in DBR can serve as a space for mentors to articulate their knowledge and what principals of DBR might affect this work. For example, can the mentor inquiry community encourage the mentor to externalize or make public knowledge that would have otherwise remained internal? In doing so, this might that provide opportunities for a mentor to reorganize or synthesize their knowledge or learn from other mentors in the community from what they shared. Additionally, what principals of DBR might facilitate mentors externalizing their knowledge? Because the inquiry community can serve as a place to make internalized processes externalized, I forwarded the following research questions:

Research Questions

Research Question One: In what ways do mentors show their knowledge in an inquiry community engaged in design-based research?

Research Question Two: What conditions affected mentors' work in the inquiry community engaged in design-based research?

Overview

In this qualitative, instrumental case study of a mentor inquiry community, a group of three university-based mentors and I engaged in inquiry surrounding mentoring Clinical Interns (CIs) with a focus on formative assessment. I employed the methodology of DBR to examine how mentors show their knowledge and the conditions that affected their work in the inquiry community. This investigation into the case of a mentor inquiry community is composed of six chapters including this one. Here, I will provide a brief overview of the chapters.

Chapter Two: Review of the Literature

In this chapter, I present a framework for mentor knowledge and a framework to explain how knowledge develops. Then I review the literature relevant to the study: including literature on a knowledge base for mentors, research-based practices mentors enact, and characteristics of mentor inquiry communities.

Chapter Three: Research Methodology

In this chapter, I provide specific details about the context and participants in the study, and a statement of my positionality in the study. I also include a rationale for my study, specific details on what and how I collected data, and how I analyzed the data once it was collected. I conclude the chapter with an examination of how I established trustworthiness in the reporting of my findings.

Chapter Four: Design of the Inquiry Community

In this chapter, I provide more information surrounding DBR and its principals and background and context for the mentor inquiry community. This includes a detailed account of each mentoring session.

Chapter Five: Findings

In this chapter, I present the *case* of the mentor inquiry community. In it, I analyze the ways in which the three mentors showed their knowledge in the inquiry community and the conditions that affected their practice. I specifically addressed each research question in my findings. For research question one: In what ways do mentors show their knowledge in an inquiry community engaged in design-based research?, two themes emerged: mentors showed their knowledge through storytelling and mentors showed their knowledge through their solutions to joint problem solving. For research question two: What conditions affected mentors' work in the inquiry community engaged in design-based research?, two themes emerged: symbolic language facilitated the group's work and off-task talk hindered the group's work.

Chapter Six: Discussion, Significance, Implications, Future Directions

In this chapter, I investigate the underlying meaning of my research findings. This includes connections to the existing literature; significance and implications of my research findings to research, theory and practice, recognizing the study's limitations and how I see my work informing the direction of future research. I organize the discussion portion of this chapter by the research questions and subheadings I used in chapter five. Then, I do the same for the significance, implications, and future directions. I conclude the chapter by revisiting the study's purpose and significance.

Significance

The results of this study provide evidence of how mentors showed their knowledge when working collaboratively with other mentors and presents DBR as a research methodology that affected mentor's work in the inquiry community. That a mentor inquiry community composed of members with equal status might be a valuable context for mentors to show their knowledge is important to informing future work with mentors. Authentic examples of how mentors used

stories and solutions to joint problem-solving to show their knowledge, can be cataloged and used as teaching exemplars to prepare new mentors or improve the practice of established mentors. If an important aim is to also develop or further mentor's knowledge, then taking a constructivist approach means exposing mentors' existing knowledge as a necessary first step to continue the learning process. That teacher educators can use inquiry communities, and specifically the techniques of storytelling and joint problem solving, as ways to expose mentors' existing knowledge, is a promising application of this work to practice.

Characteristics of the community, such as symbolic language and off-task talk, may affect the community's work. Symbolic language may create a shared understanding that can facilitate the community's work. Future research into this topic is necessary to determine how and why mentors use symbolic language in an inquiry community. Another characteristic, off-task talk, often hindered the community's current work, but may have had other social benefits or introduced new areas of inquiry. Researchers may want to encourage small talk in appropriate situations to not only build camaraderie, but also to serve a larger purpose generating future topics for the group to discuss. Teacher educators can consider how to use symbolic language to facilitate PSTs knowledge of practice and to create a common language for their specific contexts and the ways that off task talk in their classroom may engender camaraderie among PSTs and inspire topics for future lessons.

Lastly, the design features of the inquiry community, such as the selection of highly-experienced mentors, a shared context, the social and collaborative nature of the community, the open and holistic design, the iterative nature of the inquiry must be carefully planned and implemented. This is important knowledge for those designing inquiry communities in their own contexts.

Definitions of Terms

Clinical intern (CI) - A PST engaging their clinical experience.

Clinical internship - The final course for PSTs which involves a student teaching experience.

Collaborative inquiry - A form of Action Research which involves a cyclical process of inquiry, reflection, and action (Black, 2019; Heron, 1996; Reason, 1999).

Cooperating teacher (CT) - The P-12 teacher who oversees the CIs student teaching experience. The CI will teach the CT's students during the clinical internship.

Context - A complex concept that addresses both physical environment and workplace culture (Salter & Kouthari, 2016). Context can encompass constructs as large as federal, state, and district policy and as specific as school community and student population (Achinstein & Athanases, 2006).

Inquiry community - A community of teachers who "talk about teaching" and "use tools to investigate and reflect on it" (Levine, 2010, p. 112). The goals of such a community are to critique common teaching practices, examine underlying assumptions, and to question their current language and conceptions concerning teaching (Cochran-Smith & Lytle, 1992; Levine, 2010).

Mentor - A mentor is a skilled or more experienced person who sponsors, encourages, counsels, and guides a less experienced person (Iancu-Haddad & Oplatka, 2009; Achinstein & Athanases, 2006).

Mentoring - When a novice teacher is paired with a veteran teacher who focuses on the novice's professional development (Achinstein & Athanases, 2006).

Mentor practices - The focus and process of teacher mentoring (Wang & Odell, 2002).

Pre-service teacher (PST) - A teacher who is participating in a clinical internship experience in order to earn certification.

Chapter Two: Theoretical Framework and Review of the Literature

Mentors need knowledge and practices to engage in effective mentoring (Achinstein & Athanases, 2006). Inquiry communities can be used as places for participants to make knowledge explicit (Levine, 2010). However, it is unclear how a mentor inquiry community can serve as a space for mentors to articulate their knowledge and what about the community's characteristics might deter or facilitate that work. In this chapter, I will first introduce my theoretical frameworks, a knowledge base for mentors and sociocultural learning theory. Second, I will review relevant literature on a mentor knowledge, practices, and mentors engaged in inquiry. Within this review of the literature, I will show the need for more research on how a mentor inquiry community can serve as a space for mentors to articulate their knowledge and what about the inquiry community, its characteristics, might harm or help that work.

The Process of Knowledge Development

My theoretical framework is based upon the conception that knowledge development in teachers is, as Cochran-Smith and Lytle (1999) asserted "a pedagogic act" (p. 272). It is context-specific, connected to the teacher, and is relevant in classrooms and in theory-building (Cochran-Smith & Lytle, 1999). The process of teachers' knowledge development is also social (Cochran-Smith & Lytle, 1999). Throughout their careers, teachers generate and refine knowledge by collaborating in activities and internalizing the effects of their collaboration. As teachers collaborate, they draw upon their varied experiences, collective memory, and the multiple and varied ways in which they structure their knowledge and practice; and this contributes to their own and each other's knowledge development (Cochran-Smith & Lytle, 1999).

To situate my research study, I present Achinstein and Athanases' (2006) framework of a knowledge base for mentors to define what mentors need to know to mentor novice teachers and

PSTs and the theory of social learning as one theory that explains how knowledge develops (Cuddapah & Clayton, 2011; Putnam & Borko, 2000; Wenger, 1990). These theories of conceptualizing knowledge and how knowledge develops serve as the underpinning of my research study.

A Knowledge Base for Mentors

In Achinstein and Athanases' (2006) book *Mentors in the making: Developing new leaders for new teachers*, the authors proposed a knowledge base for effective mentoring. This knowledge base begins with Darling-Hammond et al.'s (1999) three domains of knowledge: learners and learning, curriculum and teaching, and contexts and purposes. However, Achinstein and Athanases (2005, 2006) posited that, in addition to these domains, mentors need a bifocal perspective; they must understand and be able to apply these domains for both PSTs and students.

Mentors need knowledge of how novice teachers and PSTs learn (Achinstein & Athanases, 2006). This could encompass novice teachers or PSTs values or vision, and their development, needs, and concerns (Achinstein & Athanases, 2006). Additionally, mentors must know novice teachers and PSTs as "individuals, and as members of cultural groups with prior experiences that they bring to teaching" (Achinstein & Athanases, 2006, p.13). Mentors must also be aware of the demands on novices or PSTs as they learn to teach. For example, a PST is simultaneously completing their college coursework and engaging in a clinical internship. To do this, mentors must assess the novice or PST's knowledge base and catalogue of teaching strategies and must address the novice or PST's cultural competence, or their attitude, awareness of, and commitment to a diverse student population (Achinstein & Athanases, 2006).

The second knowledge base for mentors is the knowledge of curriculum and teaching, such as "knowledge of professional teaching standards novices are expected to master, how to teach deep content knowledge to novice teachers or PSTs, and how to provide formative assessment to teaching practice to tailor support and guide novice development" (Achinstein & Athanases, 2006, p. 14). To enact this knowledge base, mentors need to know not only how to inquire about and reflect on the novice teacher or PST's practice, but also how to help the novice or PST do the same (Achinstein & Athanases, 2006). In addition to a knowledge of standards, instruction, and assessment practices, mentors must also know how to build trust with a novice or PST, which may enable the mentor to develop the novice teacher or PST's knowledge of curriculum and teaching (Achinstein & Athanases, 2006).

The third knowledge base for mentors is the knowledge of context and purposes. Different contexts have varied "norms, practices, and expectations that inform mentors' work" (Achinstein & Athanases, 2006, p. 14). Achinstein and Athanases (2006) identified macro-level contexts (e.g., federal, state, and district policy) and micro-level contexts (e.g., administrators, teacher community, student population). Mentors must be aware of how these multiple, complex contexts interact. Another component of the context and purposes knowledge base is mentors must know the philosophies and tensions of induction and play a part in addressing them.

A Theory for Knowledge Development: Social Learning

In this section I use the theory of social learning to demonstrate how teacher knowledge can develop from social processes. I forward one way that teachers generate knowledge socially: through an inquiry community, in which they engage in joint inquiry of their own design.

According to the basic tenets that underlie all social learning theories, individuals form knowledge by engaging in joint activities and integrating the results of their collaboration

(Cuddapah & Clayton, 2011; Putnam & Borko, 2000; Wenger, 1990). This collaboration provides teachers with an opportunity to make their tacit knowledge explicit (Hennissen et al., 2017; Loughran, 2019). Teachers share this externalized tacit knowledge with the community (Salter-Kothari, 2016). In working with, through, and beyond what an individual has experienced and internalized through social interaction, the individual can construct new knowledge (John-Steiner & Mahn, 1996). From this perspective, cognition is a collaborative process (see Rogoff, 1997), thought is internalized discourse, and the purpose of inquiry regarding cognitive development is to examine the transformation of socially shared activities into internalized processes (see John-Steiner & Mahn, 1996). For example, when teachers of the same subject engage in inquiry surrounding data analysis, the teachers may share their thinking about their data. This social interaction may lead to new insights into how to interpret the data. These new insights will not just inform this one conversation or upcoming lesson, but a teacher may internalize this insight and use it when enacting future data analysis. Thus, teachers internalize a technique learned through joint work and then used in future practice.

Social Learning in an Inquiry Community

Cochran-Smith and Lytle (1999) called for teachers to construct knowledge by engaging in inquiry. Teacher inquiry is defined as "the systematic, intentional inquiry by teachers of their own school and classroom work" (Cochran-Smith & Lytle, 1993, p. 22-23). One way that individuals can develop knowledge socially is by engaging in inquiry in a group setting. Levine (2010) defined an inquiry community as "a teacher community [that] foregrounds the role of systemic inquiry conducted with the support of colleagues as a means of improving teaching and learning in schools" (p. 112). Inquiry communities can enable teachers to study things they may want to change and find ways to do things better (Reason, 1999). In an inquiry community,

teachers “talk about their teaching and use other tools to investigate or reflect on it [their teaching]” (Levine, 2010, p. 112). The objectives of an inquiry community are to: address gaps in current knowledge, expand teacher knowledge, test knowledge about teaching and apply it in new circumstances or with different participants, challenge school and classroom structures, uncover values served and not served by school structures, and add voices not yet heard to research knowledge (Cochran-Smith & Lytle, 1999). An important component of an inquiry community are its members, who may be teachers, researchers, and administrators, and all of whom are considered both learners and researchers (Cochran-Smith & Lytle, 1999). Another important component of an inquiry community is the inquiry itself; unlike other communities of practice, the inquiry process is essential to their knowledge development (Levine, 2010).

In an inquiry community, members select what to read, write, discuss, and research. Often, these communities use a “cycle of inquiry” model to facilitate their research which involves formulating their own research questions and then “collecting data, analyzing data, reporting results, and planning for action” (Levine, 2010, p. 112). The cycle nature of this interaction then facilitates teacher learning (Cochran-Smith & Lytle, 1999; Levine, 2010). By engaging in this cyclical, sustained inquiry, teachers may construct contextualized knowledge-in-practice (Levine, 2010).

One way that groups increase collective knowledge is by members explaining their thinking to other members as they engage in shared work (Salter & Kothari, 2016; Scardamalia & Bereiter, 1989). Daiute and Dalton (1993) explained that when group members work on a joint activity, they reflect on what they are doing. The presence of a peer gives the group member a reason to talk out loud, and therefore examine their thoughts more explicitly than might have been done alone (Daiute & Dalton, 1993; Salter & Kouthari, 2016). Additionally, by engaging in

a discussion, group members may activate their prior knowledge, consider and select an appropriate response, and present ideas in real time, which may require monitoring and adjusting what is being said (Windschitl et al., 2018). This type of discussion may help group members to give structure to loosely formed concepts (Windschitl et al., 2018), help the speaker to identify gaps in their logic (Windschitl et al., 2018), allow the speaker to question assumptions about common practice (Cochran-Smith & Lytle, 1992), and to help the group generate data to consider alternatives to common practice (Cochran-Smith & Lytle, 1992). Through this process, group members might provide possible solutions to problems in their schools and in education in general (Cochran-Smith & Lytle, 1992), gaining knowledge by talking and listening as they collaborative on a joint task (Daiute & Dalton, 1993; Scardamalia & Bereiter, 1989).

An inquiry community creates space for mentors to articulate the knowledge base created by Achinstein and Athanases (2006). Because mentors in the community determine the topic of their inquiry (Levine, 2010), they can choose to examine topics related to learners and learning, curriculum and teaching, and context and purposes. When mentors engage in inquiry with the support of other mentors (Levine, 2010), they may improve their understanding of learners and learning and curriculum and teaching. Additionally, because inquiry communities occur in the participants context (e.g. school, university-based mentoring program), members can develop their knowledge of context and purposes.

Literature Review: Mentor Knowledge and Practices

My study is informed by three literature bases: mentor knowledge, mentor practices, and mentor inquiry communities. Because the study is focused on how mentors show their knowledge, it is important to include literature on mentor knowledge and practices they enact that may show their knowledge. Additionally, because the mentors and I are engaging in an

inquiry community, it is important to review the literature on mentoring inquiry communities. Here, I provide a review of the literature on the mentor knowledge and practice strands of literature, and, in the next major section, I provide a review of the literature on mentor inquiry communities.

Search Process

I conducted a search of the following EBSCO Host databases available through Montclair State University's Harry A. Sprague Library: ERIC, PsychInfo, PsychArticles, Education Research Complete. The first search consisted of the following keywords: "mentor," "mentor knowledge," "education," and "teach*." After, I removed duplicate references, I applied specific criteria to 177 abstracts to determine each article's relevance to my research. Inclusion criteria included:

1. Focused on mentor teachers (not PSTs, cooperating teachers, students, administrators, etc.).
2. Focused on mentor knowledge or a knowledge base for mentoring.
3. Focused on research-based practices for mentoring, and not the effects on mentoring on PSTs (e.g., changes to novice knowledge).
4. Was published after 2006.
5. Was peer reviewed
6. Were empirical studies.

I made the decision to focus on studies published after 2006 based on the release of Achinstein and Athanases (2006) book *Mentors in the making: Developing new leaders for new teachers*. Given that this work synthesized the research base prior to 2006, I focused my review on subsequent publications.

After I applied the search criteria, 41 articles were eligible for full review. During full text review, I made a second elimination of articles that did not focus on mentor knowledge development, a knowledge base for mentoring, or research-based practices for mentoring. This resulted in 10 articles that were appropriate for this review. I also culled 14 articles from course readings, forward searches of articles pertaining to my study, and articles of interest mentioned in articles found in my first search. Altogether, I identified 24 studies from journals and book chapters.

Systematic Analysis

To synthesize the work across the identified studies I first reread each article and annotated them. Second, using those annotations, I created a table of studies that included the following information: author's name, purpose, participants, design methods, and findings (see Appendix A:Table of Studies). I applied the knowledge codes based on Achinstein and Athanases (2006) framework including mentor knowledge of learners and learning, mentor knowledge of curriculum and teaching, and mentor knowledge of contexts and purposes. I did not have a priori codes for mentor practices. Instead these themes: mentoring conversations, lesson planning, examining data, and reflection and modeling emerged from open coding processes.

Theme: Mentor Knowledge

To review the literature on mentor knowledge, I used the three tenets of the knowledge base for mentors: learners and learning, curriculum and teaching, and purposes and context (Achinstein & Athanases, 2006). From this literature emerged common mentoring practices mentors used to show their knowledge: mentoring conversations, lesson planning, examining data, and reflection and modeling.

Mentor Knowledge of Learners and Learning.

According to Achinstein and Athanases (2006), mentors need knowledge of how novices and PSTs learn. Seven studies addressed mentor knowledge of adult learners and learning (Achinstein & Davis, 2014; Achinstein & Fogo, 2015; Ambrosetti, 2014; da Graça Nicoletti Mizukami et al., 2015; Grimmett et al., 2014; Hudson & Hudson, 2011; Parker-Katz & Bay, 2007).

The knowledge that mentors need to address PSTs' needs varied among studies. Some reported that mentors need knowledge concerning how to develop the whole teacher, their Pedagogical Content Knowledge (PCK), a knowledge of both content and pedagogy, and their identity as educators (Achinstein & Fogo, 2015; Grimmett et al., 2018; Parker-Katz & Bay, 2007). To do this, mentors may need to provide emotional support to support PSTs (Achinstein & Davis, 2014; Ambrosetti, 2014; Grimmett et al., 2018). Mentors also must have knowledge of both theory and practice and how to convey these ideas to PSTs (da Graça Nicoletti Mizukamia et al., 2015). To enact this knowledge, mentors may need to seek professional development (Ambrosetti, 2014; Hudson & Hudson, 2011) and engage in self-reflection (da Graça Nicoletti Mizukamia et al., 2015; Grimmett et al., 2018). I will now describe each of the studies I reviewed for this section and the connection to my research study.

In a study situated in the United States, Parker-Katz and Bay (2007) explored what constituted mentor knowledge, how mentors used this knowledge to construct new knowledge, and what guided mentors' actions and how did that shape their use of mentoring knowledge. Seventeen mentors of PSTs were selected to participate by university field instructors and school principals. The authors divided mentors into two groups. Each group met with a university field instructor, who facilitated the discussion once a month for six months. Three themes emerged

from the discussions: not what, but who; focusing on pupils' learning as the means to learning about teaching; and changing the image: teacher learning as collective responsibility (Parker-Katz & Bay, 2007). The theme not what, but who focused on how the mentors described what PSTs need to know. The mentors reported that they were less interested in what PSTs need to know and more interested in who they want the PSTs to become as educators.

In the second theme, "focusing on pupils' learning as the means to learning about teaching," mentors emphasized that PSTs must have a student-centered stance; in other words, PSTs must understand and address the needs of their students. The mentors also noted that this was not just an understanding of students' academic needs, but instead an understanding of the whole student. The mentor knowledge here would be how to focus PSTs both on individual student needs and the whole student.

Parker-Katz and Bay (2007) described the final theme, "teacher learning as collective responsibility," as mentors viewing their role as part of collaborative work that they do with the PST. These mentors pushed against a model where a PST has increasing independence in the classroom and instead advocated for a model where mentor and PST collaborate in the classroom (e.g., co teaching) and beyond. The mentor's knowledge here would be how to help PSTs understand the importance of collective responsibility.

To conclude, Parker-Katz and Bay (2007) imagined an experience for PSTs that included both the theory expected in PST programs, but also an understanding of mentor teachers as learners.

da Graça Nicoletti Mizukamia et al.'s (2015) study addressed the importance of a knowledge of theory and practice to facilitate teacher learning. Situated in a Brazilian university the researchers created an Online Mentoring Programme (OMP) in which they paired

experienced mentors with novice teachers with the goal of building knowledge. Concerning mentor knowledge, the researchers found that mentors, among other dispositions, needed a knowledge of novice's formative processes and an ability to research and analyze their own mentoring practice and to communicate their findings to others (da Graça Nicoletti Mizukamia et. al., 2015).

To examine the importance of mentors' pedagogical knowledge, the University in Australia created a professional development program titled Mentoring for Effective Teaching (MET; Hudson & Hudson, 2011). To accomplish this, they assembled a "working party," which was a group of teachers, who were nominated by their principal, and 14 university-based academics who had previously mentored PSTs (Hudson & Hudson, 2011, p. 5). The group completed an initial questionnaire. The researchers shared the results with the group via email and the working party met three times to settle upon eleven strategies mentors could use to facilitate PSTs pedagogical knowledge development. The strategies were: "planning, implementation, timetabling, preparation, teaching strategies, content knowledge, questioning skills, problem solving, classroom management, assessment, and viewpoints" (Hudson & Hudson, 2011, p. 7). The group asserted that mentors need to know both these strategies and the education theory that supports them so that they can support PSTs pedagogical knowledge development. The authors concluded that mentors would benefit from professional development in these strategies, with an emphasis on how these practical strategies were associated with teaching theory that PSTs may learn in their undergraduate program.

In a study of 11 Australian mentors who engaged in a pilot mentoring preparation course, Ambrosetti (2014) focused on developing mentors and the "nature and process of mentoring," and the roles of mentors and PSTs. A university hosted four, 2-hour professional development

classes. After the four classes, the mentors completed an open-ended survey. For this study, Ambrosetti (2014) focused on four questions under the subheadings of Change Understandings of Mentoring and Changed Practices for Mentors. Questions related to changed understandings included: "(1) What have you achieved from the course? And (2) How did the course promote change how you mentor pre-service teachers?" (p. 34)

Ambrosetti (2014) found that the mentors recognized the complexities of mentoring. For example, one mentor responded: "I have a greater insight into the complexity of mentoring. Mentoring depends on the situation, environment, and individual person. You have to plan accordingly" (Ambrosetti, 2014, p. 36). This mentor recognized that mentoring changes based upon context and individuals. Mentors also reported that mentoring was holistic and that they must not only be task-oriented but must also take into consideration PSTs feelings. In other words, mentors must recognize their role as someone who is responsible for the education of PSTs, but who must also recognize when PSTs need emotional support.

The questions under the subheading of Changed Practices for Mentors, were "Briefly describe some of the processes you use when mentoring a pre-service teacher" and "What were the changes in your mentoring practices?" (Ambrosetti, 2014, p. 34). According to the mentors' responses, mentor knowledge must include an understanding of mentor roles, the complexity of mentoring, how to develop knowledge of the PST, and the ability to determine when to provide emotional support. The authors found that the nature and process of mentoring may help mentors develop their own knowledge of mentoring, which may result in them changing the way the mentor.

In an American two-year, university-based induction program, Achinstein and Davis (2014) examined the knowledge and practices of mentors of novice teachers. This study involved

16 mentors of varied subjects and 31 novice teachers. The mentors engaged in monthly PD that addressed content mentoring and met with novices weekly or bi-monthly. Six mentors participated in this study by completing open-ended questionnaires, participating in focus groups, and engaging in interviews. Achinstein and Davis (2014) divided the mentors' responses into four themes: mentoring strategies, content knowledge, assessment, and PCK.

The mentoring strategies addressed the socio-emotional role of mentors, which the authors defined as "awareness of novices' developmental needs, readiness, strengths and contexts, and how to appropriately support novices' growth" (Achinstein & Davis, 2014, p. 112); and the socialization role, which one of the mentors defined as "navigate school contexts and work within different systems to mentor effectively" (Achinstein & Davis, 2014, p. 112). Although Achinstein and Davis (2014) acknowledged that these roles are important, they outlined more content-specific findings as well, which will be acknowledged in the Mentor Knowledge of Curriculum and Teaching subheading.

To discern what mentors need to know and do to develop novice teachers PCK, Achinstein and Fogo (2015) studied a mentor and his two novice teachers from an American, university-based induction program. This program focused on subject-specific mentoring and the mentor was matched by subject with novices. The mentor met weekly with his novices and also engaged in monthly professional development provided by the university. The authors identified two themes of mentor knowledge: knowledge of novices' PCK and knowledge for developing novices' PCK. Knowledge of novices' PCK was defined by assessing novices' knowledge, beliefs, and needs regarding elements of PCK and using assessment of novices' PCK to adapt mentoring practices (Achinstein & Fogo, 2015). This was evidenced by conversations and observations of the novice, which I will describe in the Practices section of this review. I will

present the second theme, Knowledge for novices PCK, in the Mentor Knowledge of Curriculum and Teaching subhead.

One Australian study restructured the CT and PST model entirely (Grimmett et al., 2018). A school-university partnership initiative called Teaching Academies of Professional Practice (TAPP) brought schools and universities together with the goal of improving the "professional experience for all participants" (Grimmett et al., 2018, p. 342). This study focused on one university's partnership with nine schools. From these schools, five mentors were selected. They collaborated with the university staff and school-based teachers and gave and received PD. Grimmett et al. (2018) conducted semi-structured interviews near the end of the first year of the project to determine how mentors understand and enact their role and if those understandings and enactments have changed over the year. The authors found that mentors reported shifts in how mentors understood and enacted their role.

In addition to a shift in self-perception, mentors began to see themselves as supporters of PST learning, as opposed to assessors of PSTs. Grimmett et al. (2018) asserted that, because of the reconceptualized mentoring model, they increasingly saw their role as facilitating PSTs learning about teaching, as opposed to supervisors or assessors of PSTs. Ultimately, mentors in this study identified knowledge of how to facilitate PST learning and how to build affirming relationships with PSTs.

Mentor Knowledge of Curriculum and Teaching

Mentors also need knowledge of curriculum and teaching, such as "knowledge of professional teaching standards novices are expected to master, how to teach deep content knowledge to novices, and how to provide formative assessment to teaching practice to tailor support and guide novice development" (Achinstein & Athanases, 2006, p. 14). Six studies

explored mentors' knowledge of curriculum and teaching (Achinstein & Davis, 2014; Achinstein & Fogo, 2015; Ambrosetti, 2014; Hudson, 2013a, 2013b; Sempowicz and Hudson, 2018).

Mentors must have a knowledge of curriculum and teaching to develop PSTs teaching capacity. Three studies addressed the importance of knowledge of subject matter (Achinstein & Davis, 2014; Achinstein & Fogo, 2015; Hudson, 2013a). Additionally, mentors must have a knowledge of lesson planning and how to implement a lesson (Achinstein & Davis, 2014; Hudson, 2013a). Finally, mentors must have a knowledge of classroom procedures (Hudson, 2013; Sempowicz & Hudson, 2018).

The second theme of Achinstein and Davis' (2014) study of six mentors was content knowledge, which they defined with Achinstein and Athanases bifocal perspective (2006). That is, to address P-12 students' needs, mentors need knowledge of content and the corresponding state standards, policy, tests, and units. With regard to specific teaching practices, mentors reported that they needed knowledge of formative assessment. This involved knowing how to assess novices' knowledge and beliefs about teaching and learning content like an understanding of how students learn. It also involved knowing how to identify, collect, and analyze useful data for novices about their teaching and their students' understandings to use in reflective mentoring. Finally, mentors reported the need to know how to focus novices on assessing students' understandings and disciplinary reasoning. The final theme in this study is mentors' PCK. The authors divided the mentors' responses regarding PCK into four dimensions: knowledge of supporting diverse learners access to content, knowledge of supporting student understanding of content, knowledge of supporting novices in developing curriculum and resources, and knowledge of how to support novices' "representation of content and understanding of the nature of the discipline" (Achinstein & Davis, 2014, p. 115).

As mentioned above, Achinstein and Fogo's (2015) theme Knowledge for Developing Novices PCK was divided into three subheadings: novices' subject matter knowledge, novices knowledge of students and context, and novices pedagogical knowledge. The authors defined novices subject matter knowledge as focusing on subject-matter "content, concepts, and constructs that build upon a novices' knowledge and interests and promote growth...engaging novice in conceptual representations and decompositions of subject matter; providing resources to support novice growth…and modeling hope to learn content" (Achinstein & Fogo, 2015, p. 55). The mentors used subject-matter related resources to develop knowledge and discussing definitions and examples of subject matter concepts with the novice. I will provide more detail on these practices in the Practices subheading. I will address the novices knowledge of students and context (Achinstein & Fogo, 2015) in the subhead Mentors Knowledge of Context and Purposes. The authors asserted that mentors have a unique PCK which targets new teachers and students, which, in this case, was important for the mentor to have to support PSTs in subject-specific teaching for diverse groups of students (Achinstein & Fogo, 2015).

In Hudson's (2013b) study, Australian teacher mentors participated in a professional development program titled Mentoring for Effective Teaching (MET) in which they engaged in social discourse with university-based staff. To determine strategies that mentors can use to facilitate pedagogical knowledge in the mentee, teacher mentors identified knowledge related to curriculum and teaching including knowledge about syllabus requirements for allocated teaching durations, the theory behind timetabling, and the impacts of extra-curricular activities on weekly timetables as important (Hudson, 2013b). Another component of mentor knowledge identified was knowledge of content. Mentors needed content knowledge so they could, in turn, support PSTs in their own learning and so they could select varied and appropriate resources (e.g.,

Internet, curricular documents) to help PSTs learn. Additionally, mentors needed a knowledge of how to help PSTs problem solve, or think on one's feet, during a lesson. To do this, mentors should be able to explain their own problem-solving techniques and encourage PSTs to consider ways to solve potential problems before the lesson. Another consideration was classroom management. For this, mentors need to know how to help PSTs to be proactive in their planning and classroom procedures to enhance student engagement. Mentors should also be able to model these strategies in lesson plans and lesson delivery. Questioning skills were another consideration for mentor knowledge. Because there are a variety of questioning strategies, mentors must provide opportunities for PSTs to try varied strategies and be willing to discuss the strategies' effectiveness with the PST. Mentors must know how to help PSTs better understand physical context, lesson structure and timing, students' prior knowledge, and how implementing lessons is linked to other practices (e.g., planning, assessment). Mentors must also have knowledge of assessment for student learning. They must help PSTs understand how assessment connects to other teaching practices. Ultimately, mentors in this group identified not only what mentors need to know, but also strategies to convey this knowledge to PSTs.

Under the same MET professional development program, Hudson (2013a) gave a survey to 101 mentor teachers and interviewed 10 mentor teachers to gain insight into how mentors perceived their mentoring of pedagogical knowledge across the three learning areas (literacy, numeracy, and science). In the survey, most mentors reported that they had mentored in the three learning areas, but there were differences in their reporting. For example, the number of mentors who reported mentoring for content knowledge in literacy was 95% but was only 65% for numeracy and 69% for science. In the open-ended responses in the survey, mentors called for PD on subject-specific mentoring and "mentoring skills" (Hudson, 2013a, p. 776).

In an Australian qualitative study of a mentor and a PST, Sempowicz and Hudson (2018) suggested that the mentor's personal attributes and pedagogical knowledge aided the PSTs in the classroom management practices. The mentor illustrated her knowledge of classroom management strategies was especially evident when helping the mentee during planning, preparation, and implementation. An example of this was when the mentor provided information on how to explain to students an acceptable noise level for an activity. The authors observed the PSTs lesson, in which she effectively instructed students to use "level 3 noise." In an exit interview, the PST credited the mentor for the feedback on noise level and other parts of her lesson.

Mentor Knowledge of Contexts and Purposes

The third knowledge base for mentors is the knowledge of context and purposes. Different contexts have varied "norms, practices, and expectations that inform mentors' work" (Achinstein & Athanases, 2006, p. 14). Achinstein and Athanases (2006) identified macro-level contexts (e.g., federal, state, and district policy) and micro-level contexts (e.g., administrators, teacher community, student population). Mentors must be aware of how these multiple, complex contexts interact. The third part of the context and purposes knowledge base is mentors must know the philosophies and tensions of induction and play a part in addressing them. Three studies addressed mentors' knowledge of context and purposes (Achinstein & Fogo, 2015; Hudson, 2013a; Thomassen & Munthe, 2021).

Mentors must be knowledgeable about complex contexts and purposes of teacher education. In these three studies, context is interpreted through the lens of student needs. In other words, mentors must be aware of the context of a school in order to enact responsive practices to

meet diverse student needs (Achinstein & Fogo, 2015; Hudson, 2013; Thomassen & Munthe, 2021).

In the findings from Hudson's (2013a) MET study, he posited that mentor knowledge included knowledge of teaching strategies, such as understanding of a student's context and needs, modeling the strategies, and allowing PSTs to try a range of teaching strategies. For example, mentors must model how to research a teaching topic, how to develop flexible lesson plans, make PSTs aware of resources (e.g., photocopiers, ordering supplies) available to them, and how to plan for a PSTs own context (e.g., differentiation strategies). To address mentor knowledge of teaching strategies, mentors must know not only the logistical details of a school, but also details of the individualized students' needs. This was evidenced by practices which I will present in the Practices section of the literature review.

Similarly, in Achinstein and Fogo's (2015) research, mentors needed an understanding of how to support novices so that they are aware of diverse students' "skill levels, interests, beliefs, understanding and misunderstanding, and background" (Achinstein & Fogo, 2015, p. 55). Mentors must also know how to support novices in understanding their educational context.

One recent study focused on mentors and PSTs' knowledge of multicultural and multilingual student needs. To determine how mentors perceive their work in giving PSTs opportunities to learn and practice in multicultural and multilingual classrooms in Norway, Thomassen and Munthe (2021), distributed two surveys to 654 PSTs and 340 mentor teachers. The survey prompts for mentors focused on mentor knowledge (e.g., "I have knowledge about multilingualism, multilingual practice and about learning Norwegian as a Second Language") and about PST preparation (e.g., "Preservice teachers learn methods to organize teaching in multilingual classes"). It appeared mentors felt that knowledge regarding mentoring PSTs to

teach in multicultural and multilingual classrooms was a concern for mentors. When responding to the prompt: "I have knowledge about multilingualism, multilingual practice and about learning Norwegian as a Second Language," 55% of mentors selected the three lowest values on the item (Thomassen & Munthe, 2021). Based upon mentors' responses, they believed mentors must have knowledge of multicultural and multilingual practices. The authors called for teacher preparation programs to provide PSTs opportunities to develop knowledge of multicultural and multilingual teaching to aid in success in classrooms.

Summary

Researchers have affirmed Achinstein and Athanases (2006) knowledge base for mentors. Mentors need bifocal knowledge of learners and learning (Achinstein & Davis, 2014; Achinstein & Fogo, 2015; Ambrosetti, 2014; Hudson, 2013a; Grimmett et al., 2018; Parker-Katz & Bay, 2007), curriculum and teaching (Achinstein & Davis, 2014; Achinstein & Fogo, 2015; Hudson, 2013a, 2013b; Sempowicz & Hudson, 2018), and context and purposes (Achinstein & Fogo, 2015; Hudson, 2013; Thomassen & Munthe, 2021).

Although we know that mentors need specific kinds of knowledge to engage in effective mentoring, less is known about the ways in which mentors externalize this knowledge, and therefore make it accessible for self-reflection and sharing. Additionally, although many studies suggest that mentors engage in professional development (Achinstein & Davis, 2014; Ambrosetti, 2014; Hudson, 2013b) and self-reflection (da Graça Nicoletti Mizukamia et al., 2015; Grimmett et al., 2014), little is written about how to conceptualize this professional development and, therefore, how mentors will show their knowledge as a result of such development.

Theme: Research-based Mentoring Practices

Seven articles suggested examples of effective mentoring practices. Across all articles, the researchers discussed four mentoring practices: mentoring conversations, lesson planning, examining data, and reflection and modeling.

Conversations

Engaging in conversations with novice teachers, be it before a lesson or after, was a strategy that was reported as effective in nine of the articles reviewed (Abramo & Campbell, 2019; Achinstein & Athanases, 2005; Achinstein & Barrett, 2004; Achinstein & Fogo, 2015; Barnett & Friedrichsen, 2015; da Rocha, 2014; Michailidi & Stavrou, 2021; Schwille, 2008; and Stanulis & Floden, 2009).

Although it might seem self-evident that the practice of engaging in conversations is something all mentors should do, what is not self-evident is how and when to have these conversations and what might be discussed. In these studies, the authors reported that mentoring conversations can be educative in nature (Achinstein & Fogo, 2015; Michalilidi & Stavrou, 2021; Schwille, 2008), student-centered (Abramo & Campbell, 2019; Achinstein & Athanases, 2003; 2005; Achinstein & Barrett, 2004; Barnett & Friedrichsen, 2015; Stanulis & Floden, 2009), and equity-based (Achinstein & Athanases, 2005; Achinstein & Barrett, 2004). However, conversations about a novice teacher's practice can be challenging and the mentor must consider how to both build and maintain a relationship with the novice teacher and provide timely, meaningful, educative feedback for the novice (Achinstein & Athanases, 2005; Achinstein & Barrett, 2004; Achinstein & Fogo, 2015; da Rocha, 2014; and Schwille, 2008).

Educative Conversations. *Educative mentoring* is mentoring that "helps novices learn to teach and develop the skills and dispositions to continue learning in and from their practice" (Feiman-Nemser, 1998, p. 66). One practice that mentors engage in is educative conversations,

or conversations that support the development of knowledge in PST and in-service teachers. In a cross-national study of 26 mentors and novice or preservice teacher pairs from the United States, England, and China, Schwille (2008) identified 10 forms of mentoring practice. Underlying all 10 forms of practice was engaging in conversation with novice teachers. For example, *mentoring on the move* consisted of brief, informal mentoring conversations, such as between classes. *Mentoring* and *debriefing* conversations were more formal, scheduled, and longer than mentoring on the move. Overall, Schwille (2008) reported that professional conversations between mentors and novice teachers benefitted both the mentor and novice. Both participants grew professionally in their teaching practice; mentor teachers honed their craft by planning and enacting educative experiences for their novice teacher and novice teachers developed educative habits when they engage in conversation with their mentor.

Another study that examined both formal and informal mentoring conversations was da Rocha's (2014) mixed-methods study based in Austria. He studied a program titled *Supporting New Teachers at the Beginning of their Careers* organized by the University College of Teacher Education Styria. Novice teachers (n=42), mentors (n=35), and principals (n=32) participated in the study. Novice teachers and mentors and principals were provided with in-service preparation personalized to their needs. The author conducted surveys, group discussions with all stakeholders, and individual interviews to collect data. In the survey, the novice teachers identified "a combination of quick, situation-related queries and longer professional reflective talks" (da Rocha, 2014, p. 111). In other words, novices felt that mentors must be available for varied types of mentoring conversations.

In a study focused on improving novice teacher quality, Stanulis and Floden (2009) divided novices into two groups; twelve novices received intensive induction and district

induction and 12 received only district induction. The focus of the intensive induction was balanced instruction. This preparation involved release time for the mentors to mentor their novice teacher, participation in mentor study groups for six hours each month, and six full days of PD. University-based coaches observed mentors during conversations with their mentee. In addition to weekly mentoring meetings, the mentors observed and provided feedback for their mentee, co-planned, analyzed student work, demonstrated teaching practices, and led a monthly seminar with the group of novices. A researcher observed all mentees, using a pre-selected assessment tool, at the beginning and end of the school year and the novices completed a survey at the end of the school year.

Some novice teachers in Stanulis and Floden's (2009) study reported that they wanted more educative conversations, specifically conversations focused on content knowledge. One mentor reported that, "not much time was spent discussing content knowledge" (Stanulis & Floden, 2009, p. 119). Other mentees reported that working with a mentor enhanced their content knowledge especially when they had discussions about teaching, lesson planning, and student engagement.

As mentioned earlier, Achinstein and Fogo's (2015) study involving one mentor and two novice teachers examined how mentoring conversations may support novices professional content knowledge and teaching of historical reasoning. Although the mentor, John, used conversations with both of the novices, he adjusted the conversation to meet the needs of each novice. For example, John determined that one novice, David, lacked subject-matter content knowledge, in this case history content knowledge. To address this, John provided support in curriculum planning by suggesting resources (e.g., books and websites) where David could find more information about a topic. He engaged in lesson planning conversations where he

questioned components of David's lesson plans (e.g., asking him to consider plans that did not align with the unit's essential questions and made suggestions regarding content). John also attempted to go beyond content knowledge conversations and venture into historical reasoning (e.g., contextualization of a primary source).

In Achinstein and Fogo's (2015) study, John's mentorship with Brian, the second novice, was more complex. The two focused on subject-specific PCK skills, specifically historical reasoning skills. They did this by identifying and breaking down teaching practices, or decomposition, and determining how to incorporate those practices into the larger whole of teaching, or recomposition. Achinstein and Fogo (2015) used a play metaphor to describe the types of conversations that John engaged in with Brian. The mentor and mentee set the stage for a lesson, or examined the complexities of implementing a lesson, including examining specific student needs. They rehearsed the lesson or practiced the lesson using teacher language. They engaged in performance reviews, or feedback from the mentor. The authors stated that these authentic and timely conversations supported the novice teachers; however, the mentor may experience roadblocks outside of their control, such as a novice teacher's lack of content knowledge (Achinstein & Fogo, 2015). As in the case of John and David, the mentor must assess and then tailor their mentoring practices and conversations to meet the needs of the novice.

A study that focused on how a mentor engages in conversations with in-service novice teachers was Michailidi and Stavrou's (2021) study based in the European Union, of five communities of learning (CoLs), composed of one science-teacher mentor and thirty-two mentee-teachers with varied amounts of teaching experience (i.e., 3 to 26 years of experience, and divided by grade and school district. The authors found that mentors assumed four roles during mentoring conversations: imperator, initiator, encourager, and advisor. The broad topics

mentors discussed with novice teachers were subject-matter knowledge, general pedagogical knowledge, instructional knowledge, knowledge of students, knowledge of objectives, and organizational issues. Mentors engaged in mentoring conversations in different roles. However, most often mentors were directive (e.g., sharing knowledge, giving advice, and providing feedback) in their conversations with novice teachers. They also often initiated the topics in the conversation. Only one mentor acted as an advisor more often than an initiator in his conversations with novice teachers. The authors noted that, as the study progressed, mentors shifted their style towards non-directive skills. This might be attributed to the mentors attempting to address the evolving novice teacher's needs. Additionally, mentors assumed the imperative role when discussing science subject matter and assumed the advisory role when discussing general pedagogical issues and their specific student's backgrounds. Michalilidi and Stavrou (2021) indicated that mentors in this study were effective if they were able to adapt both their style of mentoring (e.g. directive, imperative), which involved varied types of conversations, to meet to their mentees' needs.

Equity-based conversations. Mentors who focus on issues of social justice and equity are sometimes called *agents of change* (Achinstein & Athanases, 2006). One way mentors can enact equity-based practices is through conversations surrounding issues of equity. Mentoring conversations also played a part in a larger study concerning mentor knowledge by Athanases and Achinstein (2003). Thirty-seven teacher induction leaders completed a questionnaire and examined two case studies of a mentor and novice pair. Data from the two case studies included audiotapes and transcripts of mentoring conversations and individual interviews over a year.

To provide evidence of the areas identified by the mentors, the Athanases and Achinstein (2003) reported specific examples of these skills from the two cases. Mentoring conversations

was one practice identified that helped novice teachers conceptualize students as individuals who have different learning needs and need additional supports. These conversations, or conferences were held before lessons and after lesson observations. For example, in a post-conference, the mentor discussed student involvement during a lesson and, using a student participation chart and a script of teacher-student exchanges, the mentor drew the mentee's attention to two English Language Learners who were not involved in the lesson. With these specific students in mind, the pair discussed strategies to increase equity in student participation. Important elements of the conversation included: the mentor acknowledged and respected the novice teacher's understanding of his own classroom, and the mentor asked questions and offered indirect suggestions, as opposed to telling the novice what to do.

Another study that found engaging in equity-based conversations with novices to be a productive mentoring practice was Achinstein and Barret's (2004) cross case study of three mentor and novice pairings. Because novice teachers may initially focus on managerial classroom concerns and may also experience a cultural mismatch with their students, the authors found conversations with mentors can help novice teachers reframe their understanding of their classroom and their students to be more equity focused (Achinstein & Barrett, 2004). Over two years the authors collected data from the pairs, such as transcripts, interviews, observations, and documents that illustrated mentor-novice collaborative work. The authors used three frames — managerial, human relations, and political—to determine what perspectives mentors and mentees used to view both diverse learners and challenges of practice, how those frames were used differently by mentors and mentees, and how mentors used the frames to support their mentees. The political frame included talk about diverse students' needs (e.g., differentiation, inequities of

student participation in classroom discourse). However, Achinstein and Barrett (2004) found that political frame talk only made up 16% of the conversations.

Achinstein and Barrett (2004) found that mentors could use equity-focused conversations to help novice teachers reframe their thinking, to consider their relationship with individual students, and to reengage overlooked student groups into the classroom context. The authors suggested that mentors should partake in professional development that helps mentors understand reframing novice teachers and provides support and opportunities to practice this reframing in challenging situations.

Similarly, Athanases and Achinstein's (2005) study explored how mentors used conversations with novice teachers as an opportunity for the novice to explore issues of equity and differentiation. The authors addressed what knowledge and skills mentors need to mentor novices who teach culturally and linguistically diverse students. They requested specific examples of such a knowledge base from 37 mentors via questionnaire. Then, the authors selected one case from a larger case study; this case was selected because it aligned with the knowledge base that the mentors described in their questionnaire responses and because the mentor was experienced and identified as an "expert on issues of diversity, equity, and ELLs" by the leaders of her specific induction program" (Athanases & Achinstein, 2005, p. 848).

Athanases and Achinstein (2005) examined one case in which the mentor used conversations (e.g., pre- and post-observation conferences, goal setting discussions) and other practices (e.g., share resources) to explore "nuances and tensions" of this mentoring for equity knowledge base in action (Athanases and Achinstein, 2005, p. 852). The mentoring pair had a positive relationship, but the mentor noticed the novice was not challenging her students and not differentiating to meet all students' needs. One example of how the mentor addressed this

occurred during a lesson planning conversation. In this lesson planning conversation, the novice presented a concern about students' ability to work independently, and the mentor used this opening to discuss what the mentee was doing to differentiate instruction and wondered if the mentee was "depriving" some students of access for learning. The mentor then used her knowledge of student learners to provide ways to differentiate for diverse learners, highlighting strategies for students of differing abilities (i.e., vocabulary for some and independent comprehension for others). While describing these strategies, she focused the conversation on equity by emphasizing students' strengths, such as that all students had the capability to read for themselves.

To summarize, the mentor in Athanases and Achinstein's (2005) study used organic opportunities during mentoring conversations to address the novice's equity-related beliefs and practices, including offering strategies for students of differing abilities and emphasizing students' strengths. Of note is how the mentor reported that she chose not to address issues of equity "head on" and instead looked for opportunities to converse about this concern. Athanases and Achinstein (2005) felt that the mentor had to push back on messages the novice received in her school context and acknowledged the complexities of challenging the status quo in schools.

Student-centered conversions are conversations mentors have about creating and implementing lessons that are focused on individual students' needs. A more recent study that focused on using conversations as a mentoring strategy was Barnett and Friedrichsen's (2015) case study of one science mentor teacher and preservice teacher pair. The authors were interested in how educative mentoring practices helped a mentee develop PCK, specifically the strategies an educative mentor used. The authors had the mentor and mentee audio record "daily planning, reflection, and teaching-related conversations" of two curriculum units (p. 654). The authors also

observed the pair, interviewed the pair, and collected individual journals concerning mentoring from each participant. Barnett and Friedrichsen (2015) found five educative mentoring strategies, all of which they identified as increasing the mentee's topic-specific knowledge of secondary school biology: comparing teacher-centered practices to student-centered practices, modeling instructional strategies and critical reflection of these strategies and then have the mentee critically reflect on his own instructional strategies, highlighting common student misconceptions, helping analyze and then revise assessments to better align with the curriculum, and helping develop topic-specific curriculum knowledge through collaboration (Barnett & Friedrichsen, 2015). The mentor used conversations to accomplish all of these strategies. The mentor reported at the end of the study that engaging in these conversations helped the preservice teacher shift towards a student-centered orientation, but she also reported that she would like to see a larger orientation shift in the preservice teacher.

One study that addressed both finding opportunities to engage pre-service teachers in conversations as a way to learn about equity is Abramo and Campbell's (2019) study. In a U.S. study of five mentors of pre-service teachers, mentors completed a survey about practices and characteristics of effective cooperating teachers. Then, they participated in a focus group and individual interviews. From this data, authors found four themes of mentoring practices: conceptions of mentoring, strategies of mentoring, learning to be a mentor, and refinements of their original conceptions of mentoring. Similar to Achinstein & Barrett (2004) and Achinstein and Athanases (2005), mentors would wait for a problem to arise and then initiate a conversation with their student teacher. However, these were not simple conversations offering a quick fix, instead the mentors elicited student teachers' perceptions and assumptions, and then helped the

pre-service teachers to focus on students' "behavior, thinking, or perceptions" (Achinstein & Barrett, 2004, p. 177).

Lesson Planning

Planning with novice teachers is a mentor practice that appeared in six studies (Barnett & Friedrichsen, 2015; Norman, 2011; Pylman, 2016; Schwille, 2008; Stanulis & Floden, 2009; Stanulis et al., 2019). This practice of planning went beyond simply examining and providing feedback on novice and PSTs lesson plans. Instead, mentors co-planned with novices and PSTs. This enhanced novice and PSTs understanding of how to build lesson plans (Stanulis et al., 2019) and unit plans (Barnett & Friedrichsen, 2015). Additionally, planning with novices and PSTs enabled mentors to make their thinking explicit, which potentially contributed to their own knowledge development (Pylman, 2016; Schwille, 2008).

Effective co-planning activities go beyond a mentor providing feedback on a lesson and involve the mentor making their lesson planning thinking explicit (Stanulis et al., 2019; Schwille, 2008) or the novice making their thinking explicit (Barnett & Friedrichsen, 2015). It may be important to note that, although these studies focused on co-planning, the way the mentors co-planned with their novice and PSTs varied, which supported Schwille's (2018) assertion that there is no research-based "right way" to mentor. However, regardless of the way a mentor co-plans, they must make sure their practices are well planned (Pylman, 2019), theory-based (Schwille, 2008), and conceptually understood by both mentor and novice or PST (Norman, 2011).

Stanulis et al.'s (2019) investigated elementary school mentors engaged in both planning and co-planning with novice teachers is. The authors launched a pilot program of a Mentor Study Groups (MSG), that partnered with the researcher's preservice teacher preparation program and

was facilitated by the research team in seven elementary schools. From this program, the authors selected 10 mentors who had exhibited characteristics of educative mentoring (e.g. educative conversations, reflection, collaboration) for data analysis. To understand what educative teaching practices look like through a mentor's eyes, the authors collected audio recordings of mentoring conversations with the preservice teacher, written reflections, video recordings of MSGs, and an interview with each mentor. The authors identified three common practices of any mentoring practice: co-planning, observing and debriefing, and analyzing student work. The mentors described three parts of co-planning: "thinking beyond the lesson plan, exploring what students walk in with to a lesson, and focusing on what teachers want students to walk out with from a lesson" (Stanulis et al., 2019, p. 572). Thinking beyond the lesson plan involved the mentor describing not only the lesson plan itself, but also the reasoning behind the lesson plan. Exploring what students walked into a lesson that involved discussing what knowledge or experience students may bring to a lesson. Finally, focusing on what teachers wanted students to walk out with from a lesson involved co-planning that focused on student learning goals. Ultimately, mentors found that these three parts of co-planning helped student teachers understand the complexities of lesson planning.

Similarly, Schwille (2008) identified co-planning as one of their 10 mentor practices. The authors defined co-planning as the mentor and novice working "together to design learning activities that lead to either the mentor or the novice or both teaching" (Schwille, 2008, p. 153). This is different from a mentor examining and commenting on a novice's lesson plans. Instead, in a co-planning session, the mentor makes their thoughts about planning explicit, which may encourage the novice plan in a similar fashion. Although Schwille (2008) reported that this type

of co-planning looked different in different contexts, she found that mentors engaging in co-planning helped novice teachers observe mentor's thinking and decision making.

The practice of co-planning can result in learning for both the mentor and novice or pre-service teacher. In an exploratory case study of a mentor focused on co-planning, which Pylman (2016) defined as the "mentor works to teach the intern how to engage in the thinking process necessary to plan for effective instruction, with the goal that the intern will be able to do this practice independently" (p. 52). The data collected were recordings of mentor/PST conversations, written reflections, debriefing sessions, and semi-structured interviews. The mentor and PST in this study engaged in co-planning for both the mentor and mentee's classes. They recorded their co-planning sessions and, after each, Pylman and the mentor would debrief, with Pylman acting as a coach for the mentor. In her analysis, Pylman identified types of mentor and PST talk, such as mentor telling, mentor transparent thinking, mentor questioning and providing feedback, which occurred during the co-planning sessions.

Pylman (2016) found that the practice of co-planning benefited the PST and mentor. The author reported that the targeted practice of intentional co-planning in which the mentor made clear learning goals, made her thinking transparent to the mentee, and gradually released responsibility of co-planning to the preservice teacher helped the PST make and explain her instructional choices. When reflecting on her mentoring practice by watching videos, the mentor determined that she should preplan her co-planning meetings and make sure she made purposeful instructional moves and had clear learning goals for her preservice teacher.

Engaging in co-planning with a PST may also help the PST understand how to appropriately sequence a unit plan. In Barnett and Friedrichsen's (2015) case study of a science mentor teacher and preservice teacher who co-planned a science curriculum unit, the mentor and

preservice teacher discussed topic-specific curricula 34 times during 14 planning sessions. For example, the two initially made a plan when to teach adaptations, but later as they reflected on the lesson the mentor asked the preservice teacher to reflect on the adaptation lesson asking, "Would you reorder them now?...Or do it the same way you did?" (Barnett & Friedrichsen, 2015, p. 663). These questions caused the preservice teacher to consider the way he taught the lesson. The mentor asked the preservice teacher to consider the order of the lessons again a week later. Barnett and Friedrichsen (2015) found that this ongoing planning on when to introduce the topic of adaptations helped the preservice teacher develop knowledge of sequencing in a unit.

Although planning and co-planning can be a meaningful practice for PSTs and novice teachers, mentors must enact the practice in a way that supports the PST or novice teacher. Norman (2011) established a six-person CT study group to "examine and strengthen how the CTs supported and assessed interns' learning to teach" (p. 51). For this study, the author selected planning as the targeted teaching practice on which the group would focus. The group clarified goals for their practice of mentoring by first identifying what veteran teachers knew about the core aspects of teaching and then studying their practice to determine how to help mentees "develop specific knowledge, skills, and dispositions" related to planning (p. 51). Norman (2011) collected recordings of teacher study groups, collected relevant documents, and interviewed mentors individually and as a group.

Some CTs in Norman's (2011) study also struggled to make explicit their planning practices because they had been teaching the same unit for years and did not need to plan extensively or because they collaborated with a co teacher for years and were able to discuss their plans quickly and without explanation of their thinking. In other words, Norman (2011) asserted that novice teachers and PSTs need more time and explicit planning to prepare for a

lesson than a veteran teacher and that CTs must be aware of these needs and willing to plan in a more explicit fashion. Interestingly, although the study group created a lesson plan format with clarifying questions (e.g., “What do you want the students to understand?” “How will you recap what happened?”) the mentors did not use the created plan with their PSTs as they had agreed upon in the study group. Norman (2011) speculated that the CTs understood the planning document and how to use it conceptually, but they did not use the questions in the planning document in their own practice and also did not support the PSTs while they planned for instruction using the document. So, although the mentors conceptually understood the targeted teaching practice of lesson planning, because she did not assert her vision of good teaching, the mentors did not enact the targeted practice as Norman (2011) had hoped.

Examining Data

Mentors also engaged in the practice of examining data with novice teachers in three studies; two common types of data were observations notes (Achinstein & Athanases, 2003; Achinstein and Barrett, 2004; Stanulis et al., 2019) and examining student work (Achinstein & Athanases, 2003; Achinstein & Barrett, 2004; Stanulis et al., 2019).

Examining data with novice teachers or PSTs, whether it be observation notes or student work samples, was complex work for mentors. This work did result in a focus on specific classroom practices (Achinstein & Barrett, 2004) and on individual student needs (Achinstein & Athanases, 2003; Stanulis et al., 2019). One of the complexities of this work might be the novice or PSTs’ resistance to examining and reflecting on their data (e.g., Achinstein & Barrett, 2004). Therefore, preparation for mentors on how to engage novice or PSTs in these tasks is needed (Achinstein & Barrett, 2004).

One study in which mentor practice included examining observation notes and student work was Achinstein and Athanases' (2003) case study of two mentor and novice teacher pairings, first mentioned in the Conversations subhead. One example of this practice was when a mentor used student work samples to encourage the mentee to focus on student learning needs and, ultimately, differentiate instruction. The authors described the process of dissecting student work as complex; the mentor did this by helping the mentee identify relevant standards, assess student work using a rubric and other samples of student group work that addressed the same standard, assess strengths and weaknesses of the student work, and then identify how to support the student's learning.

A second case study that used both observation data and student data was Achinstein and Barrett's (2004) cross case study of three mentor and novice pairings presented earlier. In it the authors used three frames— managerial, human relations, and political — to determine the perspectives of mentors and novices. They provided examples from three cases, two of which used observation and student data with some success. Although it may be successful in some cases, Achinstein and Barrett (2004) reported that observation data may not always move a novice away from a managerial frame and towards a human relations, or political frame.

A third study in which mentors engaged the novice teacher in the practice of using observation data and student work to inform their practice was Stanulis et al.'s (2019) study of a MSG of 10 mentors working with PSTs. Interestingly, one mentor reported collecting data on engagement during a lesson and discovered that the learning for the PST was more nuanced than just engagement. She noted that the students teacher's questions and expected responses were not specific enough. This collection of data helped the mentor better understand her PST's needs and how to help the novice to improve practice. Another mentor used observation data to help her

student teacher better understand student engagement. This mentor asked the PST to examine the beginning of a lesson "minute by minute" and then asked the student teacher to brainstorm different ways to involve her students at the beginning of a lesson. Using observation data in a focused way, as opposed to the "kitchen sink," enabled mentors to focus student teachers on specific practices.

In addition to using data from observations, mentors in Stanulis et al.'s (2019) study also analyzed student work with the student teacher. Mentors reported three parts of analysis of student work: "reflecting on instructional moves, figuring out what students do not understand, and planning what to do next" (Stanulis et al., 2019, p. 576). Similar to Achinstein and Barnett's (2004) novice teacher, one student teacher examining student work attributed student performance to their misbehavior. The mentor challenged this thinking by asking the student teacher: "So what are you going to do?" to consider what she should do to facilitate student learning. One mentor and student teacher pair examined a student's math work and both found new ways to analyze why the students did not understand a math concept. This led to a conversation on student learning. Finally, when a mentor and student teacher examined student work, they determined not only what students knew, but also what the student still needed to learn.

Modeling and Fostering Mentee Reflection

Encouraging novice teachers to reflect on their teaching was another mentor practice that appeared effective (Abramo & Campbell, 2019; Barnett & Friedrichsen, 2005; Tonna et. al., 2017). Mentors in these three studies modeled their own practices and then reflected on them to encourage novice and preservice teachers to do the same.

Reflection and modeling can occur in the moment (Abramo & Campbell, 2019) or it can be planned in advance (Abramo & Campbell, 2019; Barnett & Friedrichsen, 2015). It appeared to positively affect PSTs in all three studies; however, Tonna et al. (2017) emphasized the importance of a trusting relationship between mentor and novice teacher. Noticeably, in two studies mentors modeled the practice of reflection on their own work (Abramo & Campbell, 2019; Barnett & Friedrichsen, 2015).

Reflection and modeling both played an important part in one theme from Abramo and Campbell's (2019) study described in the Conversation subheading. One of their four themes into which they organized their findings, "strategies of mentoring," focused on what the mentors identified as the effective practices of reflecting and modeling (Abramo & Campbell, 2019). Mentors reported that modeling was an opportunity for PSTs to observe and evaluate a teaching practice, to help them develop their own practices, and to see mentor teachers' principles and values enacted. Mentors not only modeled practices, but also dispositions, such as modeling reflecting on a teaching practice. The mentors felt that reflection "allows student teachers to develop as an educator, including the ability to generate new practices, analyze and critique new and existing practices, and interpret and react to students' actions and perceptions" (Abramo & Campbell, 2019, p. 179). Mentors reported encouraging reflection in different ways. For example, one mentor took advantage of "emergent moments" when the situation was appropriate for reflection, while another mentor provided texts on which the novice could reflect.

A qualitative study involving three separate studies from Norway, Malta, and Ireland examined reflective practices of mentors across the studies (Tonna et al., 2017). The authors hoped to identify mentors' reflective practices across the three contexts and methods of each

country. Although the authors found that there are different models of reflective mentoring, they did identify the following themes across the studies:

> (1) preventing and alleviating a fear of evaluation through the dyad (mentor and mentee) and triad (mentor, mentee and university tutors) reflective process;
>
> (2) achieving a level of professional agency through mentoring; and
>
> (3) facilitating reflection (Tonna et al., 2017, p. 216).

In Tonna et al.'s (2017) study, mentors reported that reflective conversations reduced novices' fear of evaluation; however, mentors must ensure that the novice feels comfortable and safe during these conversations. Reflective mentoring practices also enabled the novice to gain confidence in their teaching, identify their learning needs, and develop their skills. Finally, novice teachers reported benefitting from this facilitated reflection. The authors attributed this to the mentors' focus on assisting and discussing ideas with novices, as opposed to judging or telling novices what to do (Tonna et al., 2017). To conclude, the authors reported that critical reflection benefits novice teachers and mentoring is one way to foster such reflection. However, mentors must be able to build a trusting relationship with their novices to facilitate such reflection.

In addition to teaching-related conversations and daily planning presented previously, Barnett and Friedrichsen's (2015) case study of a science mentor teacher and PSTs also focused on reflecting as a practice that can help to transform teacher-centered lessons to more student-centered lessons. To help the preservice teacher "develop his topic-specific knowledge of instructional strategies" (Barnett & Friedrichsen, 2015, p. 659), the mentor modeled her own critical reflection of a strategy and encouraged the PST to do the same. The mentor and PST discussed instructional strategies for science-based topics 74 times over 21 planning sessions.

One example of a mentor modeling and critically reflecting on her own strategies is when the mentor shared a strategy she used to introduce the topic of protein synthesis; she did this by describing an activity she has used and explaining the strengths of her activity. To engage the PST in reflection, in post-conferences, the mentor also asked the PST questions such as "What did you do well?" that encouraged his reflection on strengths and weaknesses in his lessons that developed his topic-specific knowledge.

Summary

Researchers have identified effective practices that mentors can engage in with novices or PSTs. These practices are engaging in conversations with novice teachers or PSTs (Abramo & Campbell, 2019; Achinstein & Athanases, 2005; Achinstein & Barrett, 2004; Achinstein & Fogo, 2015; Barnett & Friedrichsen, 2015; da Rocha, 2014; Michailidi & Stavrou, 2021; Schwille, 2008; and Stanulis & Floden, 2009), lesson planning with novice teachers or PSTs (Barnett & Friedrichsen, 2015; Norman, 2011; Pylman, 2016; Schwille, 2008; Stanulis & Floden, 2009; Stanulis et al., 2019), collecting and analyzing data with novice teachers or PSTs (Achinstein & Athanases, 2003; Achinstein & Barrett, 2004; Stanulis et al., 2019), and reflecting and modeling with novice teachers and preservice teachers (Abramo & Campbell, 2019; Barnett & Friedrichsen, 2015; Tonna et al., 2017).

Many researchers called for mentors to make their knowledge base explicit to novice teachers or PSTs when enacting research-based practices (Norman, 2011; Michailidi & Stavrou, 2021; Schwille, 2008). However, less is written about how mentors can do so. Achinstein and Barrett (2004) suggested that mentors engage in professional development, but do not provide the characteristics of this development that would benefit mentors in promoting research-based

practices. Therefore, more research is needed to clarify how mentors can show their knowledge to novice teachers or PSTs and what types of professional development can help mentors do so.

Literature Review: Mentor Inquiry Communities

The third research base that frames my research study is mentor inquiry communities. Inquiry based learning involves educators, in the present investigation: mentors, who conduct research in their own context to make changes within their own classrooms, schools, districts, and beyond (Cochran-Smith & Lytle, 1992). One way mentors engage in inquiry is through a mentor inquiry community, in which mentors and sometimes other stakeholders collaboratively research questions of their own design. Ideally, through talk, questioning their practice, and examining data, mentors deepen their knowledge and generate possible solutions to context specific problems (Cochran-Smith & Lytle, 1992). Such outcomes are possible because the community is conceptualized as an environment where members are encouraged to question everything, assume nothing, and to see their own knowledge as malleable and changing (Langdon & Ward, 2015).

For example, a group of mentors is interested in learning how to better help their mentees analyze K-12 students' standardized testing data. To do this, they form a mentoring inquiry community where they meet weekly to discuss this particular goal. In these meetings, they may engage in reading and discussing studies or books regarding analyzing testing data in an effort to deepen their knowledge on the subject. Then they will apply this knowledge to their context by generating and testing a solution to the question they created. This testing will result in the generation of data which the mentors will examine together in their weekly meetings. Because this inquiry is iterative, they may revise their solution, test, and collect data again until they are satisfied with their solution.

Search Process

A third search focused specifically on mentors engaged in inquiry consisted of the following keywords: "mentor," "professional development," and "inquiry community." After I removed duplicate results, I reviewed 24 abstracts. I applied the following criteria to 24 abstracts to determine each article's relevance to my research: Inclusion criteria included:

1. Focused on mentor teachers (not pre-service teachers (PSTs) or in-service teachers, university faculty, students, administrators, etc.).
2. Focused on inquiry communities that involved mentors.
3. Was peer reviewed.
4. Were empirical studies.

I eliminated 14 studies that focused on unrelated topics, such as a summary of a conference and an internship inquiry community. I selected 10 for full review based upon the criteria above and used eight in this dissertation. Again, I also culled 2 articles from course readings, forward searches of articles pertaining to my study, and articles of interest mentioned in articles found in my first search.

I reread each article and annotated them. Using those annotations, I created a table of studies that included the following information: author's name(s), purpose, participants, design methods, and findings (see Appendix A: Table of Studies). Codes such as cyclical, contextual inquiry, and diversified inquiry were applied to organize the findings into themes for mentor inquiry community.

Six articles suggested examples of mentors engaging in inquiry communities. Across all articles three characteristics related to these inquiry communities were forwarded as contributing

positively to their effectiveness. These included cyclical inquiry, contextual inquiry, and diversified inquiry perspectives.

Theme: Sustained Participation in Inquiry Cycles

In four studies, mentor inquiry communities that engaged in sustained, cyclical episodes of inquiry were better able to master the desired goal of the inquiry community (Betlem et al., 2019; Langdon, 2017; Langdon, 2014; Langdon & Ward, 2015). Cyclical inquiry included: identifying a problem of practices, setting inquiry goals, acting on those goals and collecting data, reflecting on their data, revising their goals as necessary, and then repeating the cycle of action and reflection. Sustained meant that these cycles of inquiry happened over an extended period of time.

Although sustained, inquiry cycles appeared to help mentors define their role (Langdon & Ward, 2015) and engage in educative mentoring practices (Langdon, 2014; Langdon & Ward, 2015), sustained cycles of inquiry was sometimes not enough to transform mentors' beliefs and practices (Langdon, 2017; Langdon & Ward, 2015). Some mentors struggled to move beyond a transmission model and adopt educative mentoring practices (Langdon, 2017) and others were hesitant to reflect on their practices (Betlem et al., 2019).

Three of the four studies that examined the outcomes associated with sustained, cyclical inquiry were conducted by Frances J. Langdon. Her earliest study was situated in a two-year, national New Zealand mentoring and induction project funded by the New Zealand Teachers Council (NZTC). Langdon's (2014) goal was to investigate the conversations between 13 mentors and their novice teachers to determine if and how mentors learned and developed through these conversations, if the substance of those conversations reflected the goals established by the inquiry community, and if mentors' practice reflected the intent of those goals.

As part of the program, mentors participated in sustained inquiry cycles; the number of cycles depended on how long the mentor was in the program and how long each inquiry cycle lasted. The aim of each inquiry cycle was to build mentor knowledge and skills regarding conversations with novice teachers on educative mentoring practices (e.g., how to assess student learning, how to foster self-regulatory learning). Mentors reported on their progress toward their goals during each cycle and created an annual poster documenting their research cycles. In order for mentors to reflect upon and articulate their learning from the inquiry cycles, they also participated in a focus group at the end of each school year.

After year one, Langdon (2014) observed the conversations between mentors and their novice teachers. Unfortunately she noted that the content of those conversations did not consistently reflect the educative goals that were the aim of inquiry communities. For example, even though only 3% of mentors' inquiry goals focused on affective support and transmission of knowledge and practices (e.g., providing advice and guidance), those topics encompassed 27% of mentors' conversations with novices (Langdon, 2014).

Interestingly, Langdon (2014) reported that mentors who committed to two or more years of engaging in the inquiry cycles were more likely to engage in conversations with their mentors that reflected the goals they set in their inquiry communities.

Using data from the NZTC funded study mentioned above, Langdon and Ward (2015) studied how 22 mentors in primary and intermediate grades' knowledge, attitudes, and skills developed from participating in sustained PD as they engaged in sustained inquiry cycles as part of an university-based intervention program. The authors collected recordings of mentor and novice teacher conversations, had the mentors self-assess their mentoring practice in a survey, and engaged the mentors in a focus group.

Langdon and Ward (2015) found that the mentors credited engaging in the sustained inquiry cycles as changing their mentoring practices. Specifically, they reported greater clarity of their mentoring role, using evidence to reflect on their practice, gaining confidence in their use of strategies (e.g., goal setting, observations, professional learning conversations) to mentor, and effectively using evidence in their mentoring (Langdon & Ward, 2015). Even so, during focus groups, the mentors also noted that they struggled to reconceptualize their role from problem-solver for a novice teacher to a mentor who would develop autonomy and agency in novice teachers. These reported shifts in practice were evidenced in the mentors' recorded conversations with novice teachers. In the second year of the inquiry cycle PD, the mentors occasionally dominated the conversations with novice teachers, but more often they gave novices more opportunities to discuss their beliefs and make decisions about their teaching practice.

Similar to Langdon's (2014) study, Langdon and Ward (2015) posited that inquiry cycles did help mentors to see themselves as learners and to practice educative mentoring but warned that these shifts were not easy or guaranteed and the "sustained" element of the inquiry cycle was needed to change mentor beliefs, experiences, ingrained practices. Langdon explored these ideas more in her 2017 study.

In her 2017 study, she used a comparative case study model to investigate the development of mentoring expertise of two New Zealand elementary-school teachers, both of whom were part of a PD intervention program, over two years (Langdon, 2017). One mentor, Kate, felt less confident in her ability to mentor and struggled to change her ingrained mentoring practices. The other mentor, Susan, felt more confident in her practice and challenged her assumptions and beliefs about her role. Mentors engaged in 11 inquiry cycles, six in their first year and five in their second, in which they identified a problem, engaged in collaborative

discourse about the problem, set goals, took action, collected data, reflected, and revised when necessary.

Based on data collected from mentor reflections, material artifacts, field notes, interviews, focus groups, and mentor-mentee conversations, Langdon (2017) found that by the eleventh cycle mentors used the language, understandings, and processes of the program more often. For example, in Kate's reflection during the last inquiry cycle, she used the language, understandings, and processes that were introduced during the intervention in her reflection. This is evidenced in Kate's 11 educative mentoring goals, one for each inquiry cycle, which focused on facilitating critical thinking and reflection surrounding beliefs about teaching and children. That said, in her mentoring practice, Kate occasionally reverted to transmission-based practices, like providing support, which the author attributed to Kate's concern for the novice teacher and anxiety about her mentoring ability. Langdon (2017) provided examples of Kate's conversations with her novice teacher from years one and two of the mentor's inquiry cycles in which Kate gave directions or advice before asking questions. Even in the last cycle of the second year, Kate said the following to her novice teacher: "You need to push yourself a little harder. Have you any thoughts on this? (Langdon, 2017, p. 538). This sort of statement followed by a question stymied conversations about the novice teacher's beliefs because the novice felt inclined to agree with Kate. So, although Kate used the language of the program and identified educative goals for her inquiry cycles, the way she enacted the cycles were sometimes more aligned with a transmission model of mentoring. As evidenced in Langdon (2014) and Langdon and Ward's (2015) earlier studies, shifts in mentoring practices were not always guaranteed through inquiry.

Conversely, Susan, who also engaged in 11 inquiry cycles, wanted to facilitate discussion and reflection as her educative mentoring goal. Her practice appeared to better reflect her inquiry

cycle goals. For example, in a discussion with a novice that occurred in the second year of the study, Susan asked, “What do you think is the rationale behind the think, peer, share strategy you are using?” (Langdon, 2017, p. 539). Unlike Kate’s statement and question, Susan’s question allowed room for her novice teacher to reflect on their choices. Langdon (2017) asserted that Susan’s practice transformed to collaborate and build knowledge with her novice teacher. Her inquiry led her to consider novice teacher’s beliefs, agency, and the use of theory to inform practice (Langdon, 2017).

Langdon (2017) reported that, despite her growth in many areas, Susan occasionally struggled to examine their mentoring practices with a critical gaze and that this struggle was not resolved until the second year of inquiry cycles. Although, the nature of sustained cyclical inquiry helped Susan to examine and change her practice, but these changes occurred slowly and over the course of two years. Therefore, in this study, the sustained nature of the study combined with its cyclical nature helped Susan better understand her role. Given that both teachers engaged in sustained inquiry cycles, Kate did not show the same progress as Susan. As I will address in the following subhead, Inquiry Situated in Practice, in more detail, Langdon (2017) also felt that it was not solely inquiry, but also context that affected the mentors’ practice.

In another two-year study of a university-school partnership that occurred in a rural school district in Australia, Betlem et. al. (2019) engaged in sustained inquiry cycles with two groups: one from a secondary school and one from a primary school. These groups collaborated with academic partners from the university and were composed of mentors and, in one instance, other stakeholders. The aim of each inquiry group was “to investigate an evidence-based contextualized professional development model for the practice of mentoring” (Betlem et al.,

2019, p. 330). Mentors' inquiry involved cycles of "plan, act, observe, reflect and re-plan" (p. 332). The authors collected data from focus groups and individual interviews.

Betlem et. al. (2019) reported that the sustained, cyclical nature of the inquiry positively impacted all participants. One mentor described the inquiry as such: "it kept going, round and round . . . because we do, build on something, we gain the skill, . . . practice . . ., reflect on that skill" (Betlem et al., 2019, p. 337-338). In other words, the mentor's practice was developed iteratively.

Theme: Inquiry Situated in Practice

Four studies examined the effect of mentor inquiry that occurred within the mentors' teaching context (Betlem et al. 2019, Gilles et al., 2009; Langdon, 2017; Yendol-Hoppey et al., 2008). This is not to say other mentor inquiry groups did not take place in the mentors' context (e.g., Langdon & Ward, 2015); however, in this section I focus on studies in which the authors suggest that the situated nature of the inquiry contributed to positive mentor outcomes.

Although inquiry-based, contextualized professional development varied in structure and participants, it supported mentor learning (Betlem et al., 2019; Yendol-Hoppey et al., 2008) and was well-received by schools (Yendol-Hoppey et al., 2008). However, teachers reported that engaging in this work was challenging and time-consuming (Betlem et al., 2019).

Context became a focus of Langdon's (2017) study of two mentors who engaged in inquiry — Kate and Susan—in two different schools, or contexts. Susan's school held high expectations of their teachers, and her building principal was serious about induction and mentoring practices and her colleagues were supportive. Conversely, Kate's school district had high professional expectations of teachers, but she did not experience similar support for mentoring. For example, where Susan's school had explicit policy, guidelines, and resources set

aside for mentoring, Kate's school only had minimal policy and resources (Langdon, 2017). Because the two mentors in this comparative case study taught in different schools, the author found that school context and the support of coworkers and principal matter in the development of mentoring expertise.

In a study that examined the development of mentors' skills and knowledge and focused participant learning regarding context-specific concerns and mentor needs, Betlem et al. (2019) were interested in how mentors developed professionally in contextualized inquiry communities. The inquiry communities were "site-based," in other words, the mentors met with researchers either online or at the site (school) where they mentored. From the first phase of the inquiry community, the academic partners encouraged mentors to explore their context, question their understandings of their practice, and discover the conditions that affected their practice (Betlem et. al., 2019). The authors also found that contextualized inquiry communities allowed mentors to "contest issues relevant to their teaching lives" (Betlem et al., 2019, p. 342). One example of this is a group of teachers from a primary school were required to synthesize the roles of mentor, coach and supervisor: a context-specific concern. The mentors reported that their inquiry helped them to "merge" and "clearly define" their roles, which resulted in "personal growth" (Betlem et al., 2019, p. 336).

Not all mentoring inquiry communities in Betlem et al.'s (2019) study were successful. In one high school, three of the four group members left the community and created their own inquiry community to reflect on their practice, which they reported was easier to "ask more questions" and to "dig deeply" (Betlem et al., 2019). The authors determined that these teachers needed a more structured inquiry community.

Another study that prioritized context as an important part of inquiry was the University of Florida's Professional Development Schools (PDS), in which K-12 mentor teachers, PSTs, university-based faculty, and other stakeholders engaged in contextualized inquiry communities with university-based faculty. In these communities, members defined a shared goal, articulated a shared pedagogical approach to teaching, and enacted a culture of teacher inquiry. The university-based faculty working in the PDS used the school context, and not a teacher education curriculum, to craft the PSTs student teaching experience. Yendol-Hoppey et al. (2008) wanted to use the school context and specific needs to explore problems of practice and study instructional changes as a way to prepare their PSTs. To do this, they enlisted teacher mentors and other stakeholders in the school to engage in inquiry communities to address a school improvement in a contextualized nature.

For this study, Yendol-Hoppey et al. (2008) provided four examples of contextualized PDS in four different contexts. One example focused on an inquiry community that consisted of a mentor teacher, two PSTs, and a university-based faculty member. The mentor identified student writing as an area in which she would like to grow. The PSTs suggested trying a Writer's Workshop model. students reported enjoying the workshop and their writing improved. Both the PSTs and mentors agreed that they would continue using this model. Yendol-Hoppey et al. (2008) felt that this example of context-embedded inquiry showed how both PSTs and in-service teachers can learn from inquiry, which can, in turn, support student learning as well.

Theme: Diversified Perspectives Engaging in Inquiry

As evidenced above, some inquiry communities involved mentors and other stakeholders from their schools or district (e.g., administrators, novice teachers). Three of these studies involved mentors engaging in inquiry communities with other stakeholders (Betlem et al., 2019;

Gilles et al., 2009; Yendol-Hoppey et al., 2008). This is not to say that these studies were the only ones containing diverse perspectives, but these studies reported findings they attributed directly to the diverse perspectives in the inquiry community. By engaging in diversified inquiry, mentors and other stakeholders may help mentors make their tacit knowledge explicit (Athanases & Achinstein, 2003), may encourage growth and confidence (Betlem et al., 2019), and may introduce mentors to new practices (Yendol-Hoppey et al., 2008). It may also encourage teachers to act as mentors to each other (Betlem et al., 2019). However, not all diversified communities will, due to time or other circumstances, find success (Betlem et al., 2019).

A study that involved diverse inquiry communities was Betlem et al.'s (2019) in which groups engaged in PAR. First, the authors positioned themselves as both participants and researchers (Betlem et al., 2019). They worked with three context-specific inquiry groups: a group of three mentors in leadership roles (who later withdrew from the project); a diverse group consisting of four mentors, two classroom teachers, and two middle management administrators; and a group of five mentors who held leadership roles in their schools. The three groups felt that the researchers were a support that served as a resource (e.g., providing notes of meetings, resources, questions) who "helped them [teacher-mentors] to move forward" (Betlem et al., 2019, p. 340). Therefore, the researchers appeared to play an important role in structuring and guiding the communities. In the inquiry group composed of diverse participants, group members struggled with the time commitment of PAR, as noted above. The teacher-mentors, mentioned above, who formed their own group were from this diversified inquiry community. The authors attributed the breaking off of the diversified group to the teachers' schedules, stating that they may have needed a "tighter structure" than the inquiry community provided. Through inquiry the teachers in the middle management roles, which was a combination of supervisor, coach, and

mentor were able to better synthesize their many roles. They attributed this to the meetings and reported that the tools they received at the meetings engendered "personal growth" together with "feel[ing] stronger in [their roles] and more capable of doing them" (Betlem et. al., 2019, p. 36). So, ultimately, the diversified community in this context did not complete their inquiry as a whole group, which the authors noted that engaging in inquiry with a diversified group was beneficial to some but was not a positive experience for all inquiry communities.

The PDS in Yendol-Hoppey et al.'s (2008) study also involved diversified perspectives. For each school, there were 12 to 24 participants; they included a site coordinator, mentor teachers, school leadership, and a university faculty liaison. The groups at each site created a shared, contextualized goal involving school improvement. As stated earlier, the author provided four examples of PDS in action. To conclude each of the examples, they provided instances of how each member of the community was a catalyst for the group's success. For example, in the Writer's Workshop inquiry community, the mentors traits were willingness to problematize writing practice, and willingness to engage in collaborative inquiry with site coordinator and prospective (Yendol-Hoppey et al., 2008, p. 30).

Summary

Researchers have identified characteristics of inquiry communities involving mentors, such as engaging in sustained, cyclical episodes of inquiry to attempt to achieve the desired goal of the inquiry community (Betlem et.al., 2019; Langdon, 2017; Langdon, 2014; Langdon & Ward, 2105); engaging in inquiry with a community of mentors and other stakeholders (Betlem et al., 2019; Gilles et al., 2009; Yendol-Hoppey et al., 2008), and engaging in context-specific inquiry (Betlem et al. 2019, Gilles et al., 2009; Langdon, 2017; Yendol-Hoppey et al., 2008).

Although we know these characteristics of a mentor inquiry community, less is known concerning how a mentor inquiry community can serve as a space for mentors to articulate their knowledge and what characteristics of an inquiry community might facilitate or hinder that articulation of knowledge. Therefore, more research is needed to determine the characteristics of a mentor inquiry community that might facilitate or hinder mentors showing their knowledge.

Chapter Three: Research Methodology

The purpose of this study is to gain insight into how mentors show their knowledge as a result of participating in an inquiry community engaged in DBR. I will also explore how the conditions of an inquiry community engaged in DBR affected the mentors' work.

Because the focus of my study was to examine how mentors show their knowledge while engaging in an inquiry community, which involved discussion, I chose a qualitative case study as my method of inquiry. A case study is a bounded system that allows the researcher to provide an in-depth explanatory analysis of the phenomenon (Merriam & Tisdell, 2016; Stake, 1994; Yin, 2017). The case was the inquiry community (Stake, 1994). It was in instrumental case study, intended to provide insight into how mentors expressed their knowledge and the characteristics of an inquiry community that facilitated this knowledge (Stake, 1994). The case was bounded by the following: it was located in a public university in New Jersey, more specifically in the Department of Teaching and Learning which is located in the College of Education and Human Services. Three mentors of clinical interns joined me in an inquiry community. I bounded the case from January 2021 to December 2021 because we were able to engage in one full cycle of inquiry during this time. I did not include the mentor's clinical interns in the case, as my focus was on the mentors' knowledge and the specific characteristics of the community engaged in DBR. To analyze my case, I employed thematic analysis (Braun & Clark, 2006) to identify themes related to my research questions focused on mentor knowledge and the characteristics within the community that affected mentors' practice (Stake, 2006).

The questions that guided my inquiry were:

Research Question One: In what ways do mentors show their knowledge in an inquiry community engaged in design-based research?

Research Question Two: What conditions affected mentors' work in the inquiry community engaged in design-based research?

Study Context

A Public University and the College of Education and Human Services

The context of the study is a public research university located in the northeast, USA. There are over 21,000 graduate and undergraduate students enrolled (CAEP, 2020). I situated the study situated the College of Education and Human Services, whose mission is "to provide quality undergraduate and graduate programs that will prepare professionals in education to achieve the [University's] academic goals and meet [state] requisite professional standards" (CAEP, 2020). The teacher certification programs are accredited by the Council for the Accreditation of Educator Preparation and have partnerships with 34 [state] schools or districts (CAEP, 2020).

Preservice Teacher Preparation

After PSTs have completed all course requirements in their discipline specific content major, they begin what is called the professional semester, which includes two clinical internships: Clinical I and Clinical II (CAEP, 2020). Clinical I is taken concurrently with Seminar I. In Seminar I, PSTs are given the "opportunity to develop a foundational understanding of classroom and school culture; observe teachers and students; and engage with others about instructional practice" (CAEP, 2020, p. 12). Clinical I, in which PSTs complete 175 hours of professional practice, "provides candidates experiences to foster skills and dispositions necessary to become effective and nurturing teachers" (CAEP, 2020, p. 12). Clinical II is taken concurrently with Seminar II. In Seminar II, candidates are provided with "additional opportunities to foster their development in teaching and learning as well as engage in

meaningful discourse with peers and university mentors about their teaching practice" (CAEP, 2020, p. 12) Clinical II provides PSTs with the opportunity to "plan deeper inquiry-based lesson plans that include quality formative and summative assessments as evidence of student learning to strengthen their competencies in providing intentional feedback with directed supports and strategies to improve student learning" (CAEP, 2020, p. 13).

During these experiences, the PSTs are assigned a mentor who is employed by the university but does not serve as a professor or a CT to the PST. The university defined this mentor as a "professional colleagues/advisors who provide(s) practical advice and assist(s) with challenges that may arise regarding instruction, professionalism, and any other matters related to the clinical internship" (Clinical Practice II Fall 2020 Handbook, 2020, p. 4). They were expected:

> to ensure that a positive, productive relationship is developed and maintained between the teacher intern and the CT. Mentors provide guidance for conflict resolution and help ensure that the "4 Cs" of cooperation, clarity, communication, and collaboration are happening effectively. (Clinical Practice II Fall 2020 Handbook, 2020, p.4)

The university mentor holds pre-conferences, observes the CI, and holds post-conferences throughout the semester. The mentor completes both formal (four times/semester) and informal progress reports (two times/semester) (CAEP, 2020). Both the mentor and the CT submit progress reports online so that the entire field team could share all feedback on CI's progress (CAEP, 2020). In the final assessment both the CT and university mentor provide the CI a letter grade, which is averaged together as a final grade (CAEP, 2020).

Participant Recruitment and Selection

My dissertation chair connected me with the coordinator of the teacher education pre-clinical year fieldwork and clinical year mentor program. On December 4, 2021, I began communicating with her. On Tuesday, December 22, 2020, the program associate of the Department of Teaching and Learning and CEHS Facilities Services sent an email on my behalf to all mentors of clinical interns inviting them to participate in an inquiry community. Three mentors expressed interest in early January 2021 and one joined in February 2021, after a second recruitment email was to the mentoring community on January 21, 2021. The final mentor expressed interest in March 2021. Mentors who were interested in participating completed a short application via Survey Monkey (see Appendix B: Application to Join Mentoring Inquiry Community). The application included sections on years of mentoring experience, if they were assigned a clinical intern for the 2020-2021 school year, and what they hoped to gain from participating in the mentor inquiry community.

Participants who met the following criteria were eligible to participate in the study:

- assigned a CI for the 2020-21 school year,
- previous experience mentoring,
- interest in participating in the mentor program.

It was important that mentors were assigned to mentor a CI so that they would be able to conduct inquiry of the selected targeted practice with the CI. Previous experience mentoring helped them to identify a targeted practice that CIs struggled with and one that was worthy of inquiry. Finally, participating in inquiry would require more effort than traditional mentoring, and so I wanted mentors who were interested in participating in my research. Of the five mentors that completed the online application, one mentor had to recuse himself from the study because he was not assigned a CI for the semester and another mentor had to recuse herself after one

meeting due to personal reasons. The remaining three participants voluntarily participated in an inquiry community that met remotely and/or in-person once a month for eight months (see Chapter Four for details on the Mentor Inquiry Community experience).

The Inquiry Community Plan

Rationale

Educative mentoring is context specific, goal-oriented, standards-based, and student-centered (Feiman-Nemser & Carver, 2012). To engage in educative mentoring, mentors formed a cooperative, inquiry community. An inquiry community is a group in which teachers talk about their teaching and create tools to investigate and reflect on their practice (Levine, 2010). Unlike researchers, an inquiry community yields "a rich and unique source of knowledge" because of the teachers' specific knowledge of their own context, in this case a university-based mentoring program (Cochran-Smith & Lytle, 1992, p. 301). This community was cooperative because the mentors worked together to explore the selected targeted practice of formative assessment. Unlike other communities, an inquiry community is focused on cycles of inquiry in which teachers, in this case mentors, are "asking generative questions, engaging in relevant data collection and analysis, and participating in the kinds of dialogue and critical colleagueship essential to this enterprise" (Levine, 2010, p.114).

Participants

During the 2020-2021 school year, each university mentor involved in my study had six CIs. Below I describe each participant based upon their demographic survey responses and their initial interview. All participants selected "over 50" in regards to age on the demographic questionnaire. All participant names are pseudonyms.

Abby

Abby, a retired, White woman, taught for 14 years as a special education teacher in a large, suburban school district in New Jersey. After her tenure as a teacher, she became a learning consultant for a Child Study Team for 22 years in the same district. She served as the university's test preparation coordinator. For the last 15 years, Abby worked as an adjunct professor who teaches special education classes to prospective teachers on the college level at a university in which my study was situated.

At the time of my study Abby was a mentor of CIs for 15 years in the same program as the study. Although her area of expertise is special education, Abby mentored CI's teaching in pre-kindergarten to high school settings across varied subjects - such as physical education and science.

Beth

Beth, a retired, White woman, got her first elementary education teaching job as a bilingual teacher (English and Spanish) at a suburban New Jersey school district in the 1970s. She taught for five years. She went back to school for her Master of Arts and became an elementary school bilingual curriculum supervisor for a different district in New Jersey. From there, she worked for the New Jersey Department of Education's Office of Equal Education Opportunity (OEEO) as a technical assistant who collaborated with districts to provide services to second language learners. There, she worked on the state's desegregation plan and linguistically responsive teaching plan. Eventually, she made her way back to a suburban school district as an elementary education supervisor, then as an elementary school principal, then as an assistant superintendent, and finally as a superintendent, a job from which she retired. Altogether, her K-12 public education career spanned 42 years.

She became affiliated with the university in which I am enacting my study when, as a superintendent, she partnered with them in a collaborative program that offered three classes for cooperating teachers in her district. Beth took the classes with her teachers and, when she retired from K-12 education, she became a CI mentor for the university's program. She has been working as a mentor since 2015. Beth also teaches and mentors at another local university.

Caroline

Caroline, a retired, White woman, taught for 25 years in a large suburban district. She began her career in kindergarten but spent the majority of her career teaching grades one to five. Later in her career, she taught a gifted and talented program in elementary classrooms. Caroline also served as a supervisor of elementary education in her district. She and a colleague developed a mentoring program in the district, which included two strands: one for elementary school mentors and one for middle and high school mentors. When she created the mentoring program for her district, she reported that it had an application, interview process, and professional development. After five years in the program, each mentor had to reapply to be a mentor.

Caroline retired in 2016, but soon regretted her decision. Through a supervisor colleague who worked at the university, she applied to and began working for the university as a mentor. Caroline is certified in K -8 education and has mentored CIs in both elementary and middle schools.

Procedures

To ensure the rights and welfare of my participants were respected, I applied for Institutional Review Board (IRB), a group that monitors research on human subjects and received approval on December 16, 2020.

I contacted all interested mentors via email to let them know if they were selected to be part of the study and explained the next steps. In January 2021, mentors completed the consent form the demographic information survey. I distributed these documents via Survey Monkey as a single link. I then engaged in one, semi-structured interview with each mentor (M-time = 46). Then, from February 2021 to December 2021 (excluding the months of July, August, and September), mentors participated in monthly, hour-long virtual meetings. In late June and early July, I met with each mentor for a reflection interview (M-time = 49).

Data Sources

I collected data throughout the study (see Appendix C: Data Collection and Analysis Timeline). I used questionnaires, meeting observations, semi-structured interviews, and mentoring artifacts and documents to aid in reaching saturation. I video recorded all mentor meetings and interviews using the record function of Zoom and transcribed the recordings. I downloaded the transcripts provided by Zoom and then listened to and edited them for clarity and correctness.

Demographic Questionnaire

The purpose of the demographic questionnaire was to gather background information on the mentors, using a mentor Demographic Questionnaire (see Appendix D: Demographic Questionnaire Items). I posted this five-item questionnaire on Survey Monkey that participants completed prior to our first meeting. The purpose of the demographic questionnaire was to collect information about the mentors' race, gender, age group, education, years teaching and years mentoring.

Initial Questionnaire

The purpose of the initial questionnaire was to collect initial information on mentor's beliefs and conceptions of mentoring prior to our first meeting by using an Initial Questionnaire (see Appendix E: Initial Questionnaire Items) posted on an online survey platform. The six prompts included were on teaching approach, professional development and lesson planning. I used this information to determine a baseline of mentors' conceptions of mentoring and to develop questions for the first semi-structured interview.

Transcripts of Mentor Meetings

I participated in the mentor inquiry community to gather data as it occurred in context (Merriam & Tisdell, 2016). Our inquiry community meetings served as a context for mentors to demonstrate their knowledge on the practice of formative assessment and to engage in the stages of inquiry to plan how to develop their CIs' knowledge and enact research-based practices. Because the meetings took place via Zoom, they were video recorded. The Zoom platform provided an initial transcript, which I transcribed again as I listened to the mentor meetings. I included all eight mentor meetings that ran for approximately an hour each (M= 64 minutes) that spanned from February 2021 to December 2021 (excluding July, August, and September) in this study.

Semi-structured Interviews

An interview is a process of gathering data through a conversation focused on the research topic (Merriam & Tisdell, 2016). It occurs between the researcher and the participant or participants and centers on questions related to the research study (deMarrais, 2004). Researchers use interviews to collect data on something that is not observable, to encourage participants to elaborate on their feelings, or to determine participant's worldview (Merriam & Tisdell, 2016).

Mentors engaged in two semi-structured interviews throughout the study including the initial and reflection interview (described next).

Initial Interview

Mentors completed one semi-structured initial interview (M=46 minutes) in January 2021 (see Appendix F: Initial Interview: Mentors). During this semi-structured interview, mentors were asked 13 questions about mentoring and collaborative practices. Interviews occurred over Zoom, used the same transcription process as the mentor meetings. The purpose of the interview was to learn more about mentors' approaches to mentoring and how they typically engaged in collaborative practice. In February, mentors met for the first time as an inquiry community.

Reflection Interview

Mentors completed one semi-structured reflection interview (M=49 minutes), composed of 17 questions, in June or July 2021 in person (see Appendix G: Reflection Interview: Mentors). During the interview, I asked each mentor to reflect on their experiences in our inquiry community and about their current beliefs on mentoring and collaborative practices. Interviews occurred in person and were recorded using Otter.ai. The platform Otter.ai provided a recording and initial transcript of each interview, which I then revised while listening to the interview recording. The purpose of the reflection interview was to dig deeper and have mentors reflect on a specific example, thought, artifact, or experience that they discussed during our inquiry. In this interview, mentors reflected on their experiences in our inquiry community and about their current beliefs on mentoring and collaborative practices.

Material Artifacts and Documents

To supplement other collected data, a researcher can also use documents or artifacts (Schraw & Olafson, 2015). Therefore, I collected mentors' artifacts to support my understanding

of each mentor's case in context and to help me develop rich descriptions of each case context. Artifacts and documents are data sources, other than transcripts and interviews, which address the research question (Merriam & Tisdell, 2016). I used these to triangulate with my transcripts and interviews to ensure internal validity (Merriam & Tisdell, 2016). Appendix C: Data Sources contains a list of artifacts I collected during my study.

Mentor artifacts. Materials artifacts included digital copies of mentor reflections, mentor emails, mentor log of meetings. Mentors shared artifacts with me via email or Google Drive. I made sure that any CI, CT, or school identification was removed.

Researcher artifacts. These are artifacts that I created, which included meeting agenda and slides, meeting notes, and a researcher's journal.

Analysis

Data analysis was iterative and relied on the constant comparative method of analysis to generate conjectures and test them on the data sources (Miles & Huberman, 1994). To analyze the data, I employed Braun and Clarke's (2006) six-phase process of thematic analysis: familiarize yourself with the data, generate initial codes, search for themes, review themes, define and name themes, and produce the report, to identify, map, analyze, tell the story, and produce a final report of the data. To do so, I analyzed my data as I collected it, but also moved among Braun and Clarke's (2006) phases as I analyzed, coded, and created themes. For example, as I transcribed dialogue from inquiry meetings, I made notes in my researcher's journal about possible questions to ask during mentor interviews or possible codes to add to my codebook. Here, I moved from familiarizing myself with my data to generating initial codes.

Phases of Analysis

Braun and Clarke's six-phase process guided how I conducted data analysis guided by my research questions. In the following paragraphs, I provide a description of how I used Braun and Clarke's (2006) six-phase process of thematic analysis to analyze my data.

Phase One: Familiarize Self with Data. To complete phase 1, I immersed myself in my data as I collected it by repeated and active analysis (Braun & Clarke, 2006). I transcribed recordings, read the data, made initial analytic memos (Saldana, 2009), and kept notes of my emerging analysis in a research journal (Ortlipp, 2008). Additionally, I organized my data into Google folders. For example, in a folder titled "Study Data," I included sub-folders labeled: email interactions, written reflections, interviews, and monthly meetings.

Phase Two: Initial Coding. Codes which identify features of the data that are relevant to the researcher is the second phase in data analysis (Braun & Clarke, 2006). A code is a word or phrase that "symbolically assigns a summative, salient, essence-capturing, and or evocative attribute for a portion of language-based or visual data" (Saldaña, 2016, p. 4). The aspects of my data that I coded were any word, phrase, sentence, or paragraph that was relevant to my theoretical framework or research questions (DeCuir-Gunby et al., 2011). Based upon my review of the literature, I began with a priori codes. Then, I produced initial codes based upon my notes and memos from phase one. I coded my data four times in phase two to reach saturation (Merriam & Tisdell, 2016).

During this phase, I created a codebook (see Appendix H: Codebook), which contained my codes with a definition and example of each (Saldaña, 2016). As I coded and recoded, I applied the existing codes from this codebook; however, I also added new codes when necessary to describe new features of the data that I had not identified previously. Therefore, even though I considered a priori categories from the relevant literature in my analysis, I was also open to

emergent findings. As such, I used both inductive and deductive strategies in my analysis (Merriam & Tisdell, 2016). For example, some a priori codes I included were the research-based mentoring practices (e.g. conversations, planning, examining data, reflecting and modeling) as deductive codes which I applied to instances when the mentors discussed enacting these practices with their CIs. An example of an inductive code that emerged was standardized testing, which the mentors discussed often. I also removed codes that were not evidence in the data, such as knowledge of context, because, unlike curriculum and teaching, the mentors did not describe the context of their CIs schools as a way to show knowledge.

Coding Demographic Questionnaires. The purpose of the demographic questionnaires was to collect initial demographic data on each mentor. The codes in the codebook were not applicable to these documents as they were to collect demographic data.

Coding Interviews and Meetings. The purpose of the individual interviews was to understand how mentors viewed their mentoring practice, how they engaged in collaborative practices, and, in the reflection interview, to understand how they perceived our inquiry community. The purpose of the mentor meetings was to determine how mentors showed their knowledge in an inquiry community and the characteristics of the inquiry community that facilitated or hindered that knowledge. I used the a priori codes in the codebook for these two data sources. After transcription, I first coded these deductively, using the codes in the codebooks then inductively, looking for codes that emerged from the data.

Coding Artifacts and Documents. I coded the artifacts and documents similarly to the mentor meetings as the purpose of these documents was to ensure internal validity through triangulation (Merriam & Tisdell, 2016). These documents provided insight into how mentors' showed their knowledge. The codes I used for these documents were: mentoring role, mentor

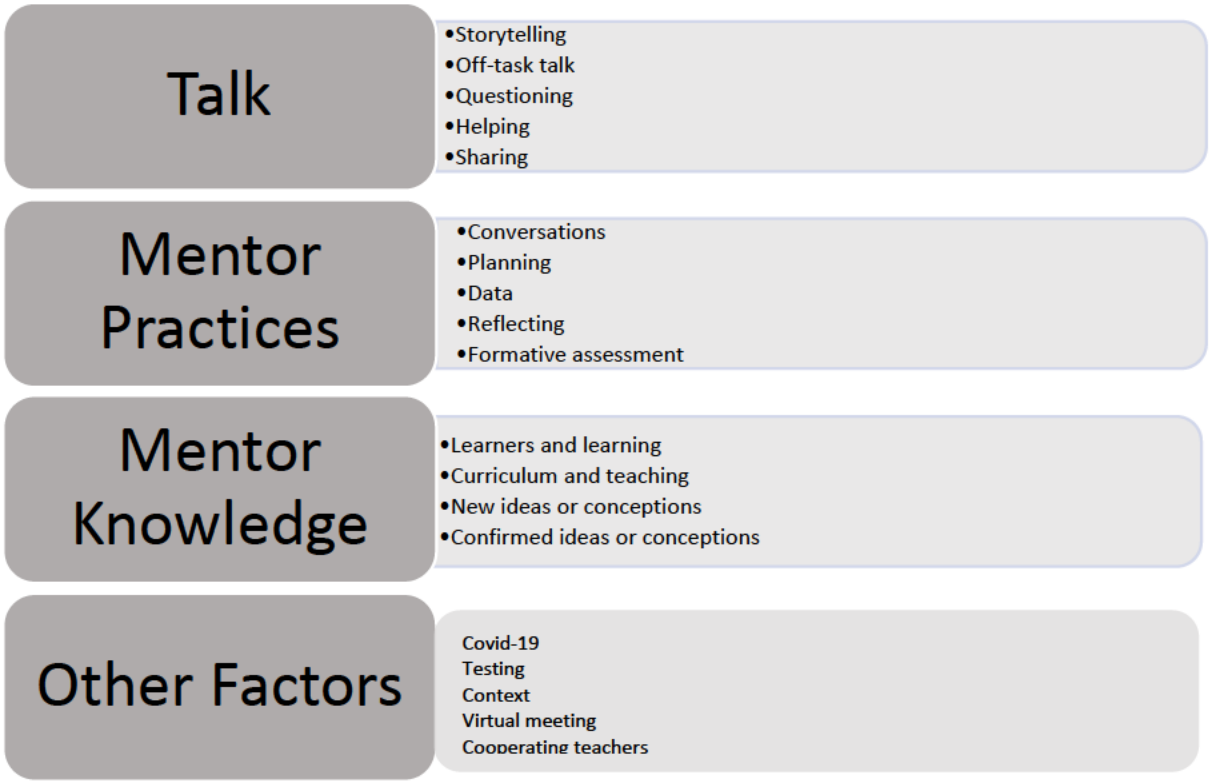
knowledge, practices, and sharing. Other codes, such as context or inquiry community, were not evident in these documents.

Phase Three: Searching for Themes. After I finished initial coding of all of my data, I sorted my codes using the literature in my review with the goal of finding initial themes (Braun & Clarke, 2006). For example, one theme that emerged was "My role as a researcher-participant," which aligned with the literature on DBR (Cobb et al., 2003). An example of a theme that was not in the literature was "Lead the discussion off topic." At the end of this stage, I had an expanded understanding of my research, but I did not abandon my miscellaneous codes and remained open to themes that emerged as I continued to examine my data (Braun & Clarke, 2006).

Phase Four: Reviewing Themes. I reviewed and refined my themes twice. First, I reviewed my codes in each initial theme to determine if they were coherent and meaningful to the study (Braun & Clark, 2006). For example, in the "Other factors," I included codes such as "testing" and "Cooperating Teacher" because both codes were topics that led the mentors away from the focus of our study. Second, I reviewed my initial themes to determine if they were relevant and accurately represented my data (Braun & Clarke, 2006). I also considered if there was a need to review and code my data to add to my themes. I searched for disconfirming evidence within the data set. For example, in the "Symbolic Language" theme, I only had one symbol - thumbs up, thumbs down; I searched for more symbols used in similar ways but was unable to find any. I attempted to do this until "refinements are not adding anything substantial" to my themes (Braun & Clark, 2006, p. 92).

Figure 1

Themes and Codes



Phase Five: Defining and Naming Themes. Here, I defined and further refined my themes with my theoretical framework and research questions in mind. To do this, I considered each theme as an independent idea and in relation to the other themes (Braun & Clarke, 2006). For example, I examined and refined the descriptions of the themes to accurately represent my data. For example, "Lead the discussion off topic" became "Off-task talk."

Phase 6: Produce Report. After I made a thorough preliminary analysis within and across my themes, I wrote my case of the mentor inquiry community. My goal was to convey to the reader the merit and legitimacy of my analysis through the telling of a convincing and coherent story of my data both within and across my themes (Braun & Clarke, 2006). In this telling, I organized my findings by the research questions. To provide evidence of the prevalence

of my themes, I selected rich, concrete examples of data extracts to embed within my analytic narrative.

Trustworthiness

To address trustworthiness, it was important to verify findings by using multiple sources of evidence (Merriam & Tisdell, 2016). These sources aided reaching saturation, or enough data to produce robust categories, themes, and findings (Merriam & Tisdell, 2016). To this end, I collected data from multiple sources and produced categories, themes, and findings using all sources.

To attempt to establish rigor and confidence in the research process, a researcher strives for credibility, transferability, dependability, confirmability, and positionality (Shenton, 2004). In this section, I will detail how I worked to establish trustworthiness in my study design and data analysis. Because there are multiple realities that are interconnected and inseparable from each other within a qualitative study, I did not attempt to determine truths, but instead focused my findings on the time and context of this specific study (Lincoln & Guba, 1986).

Credibility

Credibility concerns confidence in transparency of the research process and subsequent genuineness of the findings (Guba, 1981; Lincoln & Guba, 1986). I established credibility in multiple ways. Prolonged engagement and multiple points of contact were important features which added breadth and depth to my data (Lincoln & Guba, 1985). I addressed breadth in my data by using different data sources (i.e., semi-structured interviews, mentor meeting recordings, and artifacts). Another way in which I established credibility was through "lengthy and intensive" contact in the field to understand what was salient in the context (Lincoln & Guba, 1985, p. 77). Although meetings with the mentors were virtual, I was in contact with them often

in between meetings via emails, texts, and interviews. The interactive nature of qualitative research meant that I could not maintain a subjective distance from my participants (Lincoln & Guba, 1985). Instead, I aimed for a relationship built upon "respectful negotiation, joint control, and reciprocal learning" (Lincoln & Guba, 1985). In the meetings and interviews mentioned above, I continuously checked my behaviors to ensure I was acting as a co-researcher with mentors.

Transferability

To make this research study relevant to other settings, or transferrable, it was my job to provide sufficient descriptive data so that my reader could understand my findings and consider their application elsewhere (Lincoln & Guba, 1985; Merriam & Tisdell, 1996).

To do this, I provided participant background data, such as rich descriptions of participants, their lived experiences as educators and teacher leaders, and the study design. Throughout my investigation, I considered what details would help the reader better understand my participants such as adding direct quotations from each participant to support my interpretations. I also included detailed information about the clinical internship program and larger university context. Finally, I composed a detailed methods section in which I described the study design.

Dependability

Dependability is the responsibility of the researcher. The results of the study must make sense, be consistent, and dependable (Merriam & Tisdell, 1996). To establish dependability in this study, I included a clear description of research methods and engaged in triangulation. Triangulation, or collecting data from multiple sources, reduces the risk of inaccurate analysis (Maxwell, 1996).

I triangulated my findings by collecting rich data from multiple sources, such as questionnaires, interviews, meeting recordings, artifacts, and documents (Maxwell, 1996).While coding and naming themes, I made sure to search for disconfirming evidence and, if found, to include this in my final analysis. I did not identify any disconfirming evidence for my themes.

Confirmability

Confirmability is the "degree to which the findings of the research study are confirmed by other researchers" (Korstjens & Moser, 2018, p. 121). To achieve confirmability, it is important for the researcher to clearly establish the data and provide evidence that interpretations are unbiased and grounded in that data (Korstjens & Moser, 2018). This reduces researcher's bias and reinforces theoretical verification (Korstjens & Moser, 2018).

To ensure I was accurately analyzing my data, I employed member checking, or soliciting feedback from my participants to ensure I was representing them accurately (Maxwell, 1996). I did this by bringing my notes about our research to our monthly meetings to discuss with the participants and asking follow-up questions to statements made in meetings to better understand participants' statements. Also, I employed member checking in emails and at the closing interview. However, I did not ask members to check the entire case after completion.

To enact this study, I engaged in partial form co-operative inquiry with the participants (Heron, 1996). In other words, I introduced the practices of an inquiry group to the mentors and also participated in the research group, but, because I am not a mentor of CIs at the university, I was not able to participate fully in inquiry process (Heron, 1996) and instead took an interventionist approach in which I aided the participants in understanding inquiry-based research (Bakker & van Eerde, 2014).

Ethical Considerations

To ensure my participants' rights and welfare were protected, I submitted my research to the Montclair State University Institutional Review Board (IRB). After IRB approval, I garnered consent to participate in the study from my mentor participants. Within this document, I informed the participants of the purpose, methods, time constraints, risks, and benefits of the study. Additionally, I informed them that I would keep their identity confidential in any publication of my research.

Researcher Positionality

I identify as a White, middle-income, female doctoral candidate, middle school program supervisor, and high school English Language Arts teacher. In addition to my professional career, I am also a mother, wife, and friend. I recognize that my identities influence my work as a scholar. I have served as a mentor and teacher leader throughout my 23-year career. I believe that mentoring is an important opportunity for both the novice teacher and the mentor teacher. While serving as a team leader, I developed my knowledge by planning collectivity and discussing problems of practice with my team. As a mentor, I learned new theory and practices from my novice mentees.

For this study, I selected cooperative inquiry community because I do not believe that researchers should have a monopoly on knowledge (Reason, 1999) and that teachers' knowledge of teaching is seminal in understanding teaching and learning (Cochran-Smith & Lytle, 1992). Because of my strong positive opinions concerning teacher knowledge and mentoring, I took steps to examine my bias to ensure the validity of my research findings. Although it is not possible to eliminate my bias (Maxwell, 1996), to address it, I used my researcher's journal as a way to examine my bias (Ortlipp, 2008). Another way to address my personal bias was to solicit

feedback on what I observed from the mentor participants which I did by engaging in member checking (Maxwell, 1996).

Chapter Four: Design of the Inquiry Community

In this chapter, I will describe the design of the community. This will include a description of the principals DBR and a detailed account of the stages of the community's inquiry.

Design Based Research (DBR)

I selected design-based research (DBR) to guide the work of the mentor inquiry community. As mentioned in chapter one, DBR is a research approach that involves an iterative design. However, DBR is a not a rigid approach, rather it is "a series of approaches, with the intent of producing new theories, artifacts, and practices that account for and potentially impact learning and teaching in naturalistic settings" (Barab & Squire, 2004, p.2). An important benefit of DBR is that it has an impact not only on theory, but on learning in the context in which it is situated as well (Anderson & Shattuck, 2012; Bakker & van Eerde, 2014; Barab & Squire, 2004; Cobb et al., 2003; Penuel et al., 2011). In the following section, I will describe the principals of DBR and explain how they are evident in my inquiry community.

Interventionalist

DBR requires an intervention (or design) to take place (Bakker & van Eerde, 2014). In other words, the phenomena the researcher wants to study does not naturally occur and, therefore, the researcher must intervene (Bakker & van Eerde, 2014). The phenomena that I wanted to study was mentor knowledge as it is shown in an inquiry community and the characteristics that may facilitate or hinder this knowledge. In this inquiry community, I served as a research-participant who intervened in the design of the study. In other words, although all members in the community collaborated in their inquiry, I made decisions as to how the group

would engage in inquiry. Examples of this would be the readings and framework I selected for the group.

Open

The interventionalist in DBR has little control of the situation or data in the study (Bakker & van Eerde, 2014; Cobb et al., 2003). This can, in part, be due to the location of the research, which, in DBR, is a real-life setting (Anderson & Shattuck, 2013; Barab & Squire, 2004). My study is open because I had little control of the setting of the study. The university-based mentoring program was already in place when I formed the community. Also, I encouraged the mentors to select the focus of their inquiry and to collect data for their inquiry in the way that best suited them.

Social and Collaborative

DBR involves complex social interactions with participants (Barab & Squire, 2004; Penuel et al., 2011). Anderson and Shattuck (2012) described the relationship among researcher and participants as a partnership in which the group develops and negotiates the study. My participants were knowledgeable and opinionated; they wanted to share their knowledge with each other. They were an important part of the decision-making process. For example, they selected the mentoring practice, formative assessment, that we studied. The social interactions were also made more complex by the virtual nature of the study.

Context Specific

DBR occurs in, as Barab and Squire (2004) wrote, the "buzzing, blooming confusion" of real-world settings. This may ensure that the results can be used to "assess, inform, and improve practice" in the context in which the study is enacted, if not other contexts (Anderson & Shattuck, 2012). My real-world setting was the university mentoring program. Although my

research questions focused on mentor knowledge and the characteristics of an inquiry community, the mentors themselves were interested in studying formative assessment and how to mentor CIs in research-based FA practices. Therefore, the results of the mentor's study could inform and improve their practice.

Focused on Theory

The purpose of DBR is to give theoretical insights into ways that teaching and learning are facilitated (Bakker & van Eerde, 2014; Brown, 1992; Cobb et al., 2003; Penuel et al., 2011). In other words, through engaging in context-specific research, participants in DBR may improve their practice and produce new theory (Barab & Squire, 2004). Through my inquiry community, I hoped to glean theoretical insights into mentor knowledge and sociocultural learning.

Iterative inquiry

There are cycles of invention and revision in DBR (Cobb et al., 2003; Penuel et al., 2011). As participants develop hypothesis, create an intervention, and examine data from this intervention, they may revise the design of their inquiry (Anderson & Shattuck, 2012; Bakker & van Eerde, 2014; Cobb et al., 2003). Anderson and Shattuck (2012) stated that DBR interventions are rarely designed and implemented perfectly and, therefore, there are opportunities to revise. My inquiry community engaged in iterative inquiry in with we researched, developed a protocol, and tested it.

Holistic approach

DBR has many variables at play, which is why a holistic approach is necessary (Bakker & van Eerde, 2014; Barab & Squire, 2004). In my study, there were variable such as the pandemic changing the landscape of mentoring CIs, the university's policy on mentoring CIs, the state policy on mentoring CIs, and the varied personalities of the mentors themselves.

Constraints of DBR

Although DBR may inform theory and benefit participants' practice, this does not mean it is without challenges or constraints (Anderson & Shattuck, 2012; Barab & Squire, 2004; Brown, 1992). Because DBR is context-specific, one challenge of this work is showing external validity, or generalizability (Bakker & van Eerde, 2014). Another challenge is knowing when the research is complete, as DBR's iterative nature may make it difficult to determine when a study is at its end (Anderson & Shattuck, 2012). A constraint of DBR is, because of the iterative design of DBR, studies are often lengthy, which leads to large data sets (Cobb et al., 2003; Dede, 2004). Another constraint of DBR is the potential for researcher bias because the research is involved the design and implementation of the intervention (Anderson & Shattuck, 2012; Barab & Squire, 2004; Brown, 1992). To address this concern, I will detail my role as researcher-participant in this inquiry community.

Researcher-Participant

DBR calls for "strong involvement" of the researcher in the design and implementation of the study (Cobb et al, 2003, p. 12). As both a teacher and a teacher educator, I positioned myself as a researcher-participant in this study (Bakker & van Eerde, 2014). As a researcher-participant, I had three roles: (1) member of the inquiry community, (2) designer and a facilitator of learning for the community, and an (3) observer and analyzer of the mentors' practices. I will discuss how I enacted each of these roles in the inquiry community in the sections that follow:

Member of the Mentor Community

In DBR, the researcher is a participant and the community works as a team to conduct their inquiry (Cobb et al., 2003). Therefore, as a member of the mentor inquiry community, I actively participated in the mentor meetings. It was important to me to be a collaborative

member of the community at all times (Anderson & Shattuck, 2012). Because I have been both a teacher and a novice-teacher mentor myself, I felt a kinship with the mentors and it influenced my behavior in the meetings. Of course, my experience as a mentor differed from my participants' experiences and I acknowledge that mentoring a PST has unique challenges. However, similar to the mentors, during meetings and interviews, I told stories, offered advice and support, and shared my struggles as an educator.

As a teacher leader, I am comfortable collaborating in a learning community and also coaching individual teachers. I found myself participating in meeting conversations as a participant (e.g. empathizing with the mentor's problems of practice or adding examples of my own to the conversation) and as a researcher (e.g. asking questions to elicit more information from the mentors or guiding the discussion back to formative assessment).

Designer and Facilitator of the Mentor Community

In addition to being a member, I was also the designer and a facilitator of learning for the community. In DBR, the researcher's role is both a participant in the inquiry and as an observer of the inquiry (Bakker & van Eerde, 2014). My intent was to study how mentors built knowledge or evolved their practices, but I was continuously cognizant that these meetings should be useful for them on a practical level. It was important to me that participants could use what we were discussing almost immediately with their clinical interns. Or, as Barab and Squire (2004) asserted, I wanted to "directly impact practice while advancing theory" (p. 8).

Some of the roles I undertook as designer of the research were arranging the meetings, creating meeting objectives, creating meetings agendas, facilitating the meetings, assigning relevant materials to review before meetings, sharing meetings materials (e.g., brainstorms that we created together, notes from the meetings), and following up or clarifying any mentor

questions via email. As an educator myself, I did not struggle to think of activities that I could use in my meetings, but I also strove to select activities informed by the principals of DBR and the literature on mentoring and social learning theory. Because participants in DBR are not subjects, but rather co-designers and co-analysts of the inquiry (Barab & Squire, 2004), I created meeting agendas and activities that would honor and draw upon the mentors' years of experience as teachers and teacher leaders.

As a participant, I was cognizant that these meetings needed to be useful for mentors on a practical level; as previously stated, I wanted to be sure that they could use what we were discussing almost immediately with their clinical interns. As an observer, I was interested in how mentors showed knowledge within the inquiry community. In other words, I wanted to impact the mentors' practice while also advancing theories of mentor knowledge (Barab & Squire, 2004). Another differentiation between my role as a designer and the mentors' role in the community was that I was not a mentor to clinical interns at the university; therefore, I did not have the understanding of the local context, the university's teacher education program, that the mentors had. However, as a designer of the research, I guided the study from the selection of a teaching practice to the creation of a learning tool (Anderson & Shattuck, 2012).

I felt that these dual roles of team member and researcher were important because DBR brings all members of the community together, researcher-participant included, to provide their expertise in creating, implementing and analyzing the intervention (Barab & Squire, 2004). In design-based research, the researcher-participant works to value the participants of the community as experts who bring expertise to the community that will forward the research (Barab & Squire, 2004).

Observer and Analyzer of Mentors' Practices

DBR requires an intervention in which the researcher-participant guides the research and manipulates the inquiry according to specific theory (Bakker & van Eerde, 2014). As stated earlier, I was not a mentor to CIs, which meant I was at the same time a participant and an observer in the inquiry community. For example, because I was interested in mentors' knowledge, I really pushed mentors to make their thinking visible, and I paid close attention to instances in which they did so. I am aware that my presence directly impacted the direction of the inquiry community; however, in DBR, researchers must intervene to explore theory and learning (Barab & Squire, 2004). In other words, my guidance, reading selections, and my role in the direction of the group's work was purposeful, but also important to recognize.

Outside of the mentor inquiry community, I analyzed the transcripts of interviews and mentor meetings with my research questions in mind. The lens I took to the data, of course, impacted what data was selected and how that data was analyzed and interpreted. To ensure that I was accurately representing the mentors in my study, I engaged in member checking via email and interviews. I also took notes during our meetings and shared them with the mentors to refer back to between our monthly meetings; I encouraged them to email me questions about the notes if necessary. When engaging in analysis of transcripts, I examined other documents shared with me by the mentors (e.g. lists of questions for CIs, videos on formative assessment, written reflections) in an effort to triangulate my analysis. Even though I engaged in these procedures, my role in the study was still significant. For example, I was the researcher-participant who took notes during the meetings; therefore, I decided what was written down during the discussion. Also, when mentors shared information with me, I decided what information to bring to the meetings to discuss with the group. This again refers back to my role as a researcher-participant who guided and participated in the research (Bakker & van Eerde, 2014).

A Detailed Summary of the Stages of Inquiry

In this section of chapter four, I provide background and context for the mentor inquiry community. Although I had initially intended to establish the community in September and collaborate until June, the COVID-19 pandemic stymied these plans. Therefore, the mentors and I engaged in our inquiry beginning in January 2021. The portion of the study used in this dissertation is the nine-month period ending (excluding the months of July, August, and September) in December 2021. During this period, the community met on Zoom on a monthly basis for approximately one hour each meeting (n = 8, M = 64 minutes). I bounded the study from January 21, 2021 to December 21, 2021 (excluding the months of July, August and September, 2021) because the mentors and I had engaged in a full cycle of inquiry at that time. This meant that we selected a problem of practice, researched the problem, created a protocol to address the problem, and collected and analyzed data regarding the efficacy of the protocol. For each meeting, I created an agenda and slideshow, which I shared with the community members. We opened each meeting with greetings and check-ins. Then, we moved into the items listed on the agenda. At the end of each meeting, the mentors and I discussed tasks to accomplish for the next meeting[1].

Again, due to the pandemic, our community met virtually for all but one meeting, which affected both how and what activities the mentors and I engaged in. In this inquiry community, members engaged in what Levine (2010) called the "mechanisms of learning" (p. 122). This meant we drew on their own contexts to form clear problems of practice, questions, or dilemmas (Levine, 2010; Reason, 1999; Sagor, 1992). Then they research the identified problems,

[1] The inquiry community continued to collaborate beyond the collection of data, and at the time of this writing was still active.

questions, or dilemmas with readings, reflections, and discussion (Fairbanks & LaGrone, 2006). They also collected and analyzed data to gain a better understanding of the problem of practice (Levine, 2010; Reason, 1999).

I will describe the details of each mentor meeting. In these descriptions, I will include the objectives of the meetings and the activities in which we engaged. I have divided the meetings into the three steps listed above for clarity.

Step One: Identifying Problems of Practice, Questions, Dilemmas (January - February 2021)

After January's initial interviews, we met for the first time as a community in February. To address the contextual (Anderson & Shattuck, 2012; Barab & Squire, 2004) and collaborative nature of DBR (Anderson & Shattuck, 2012; Barab & Squire, 2004; Penuel et al., 2011), the overarching goal of meeting one (February) was for the mentors to be active in the identification of the problem of practice so that we could select a context-specific, research-based practice (Levine, 2010). The initial meeting's objectives were to (1) introduce themselves, as relationships are an important part of a design-based research (Cobb et al., 2003) and (2) introduce the concept of cooperative inquiry (see Appendix I: February Mentor Meeting Slides). As we did this, the mentors began to make explicit their problems, questions, and dilemmas of mentoring clinical interns, as is an initial mechanism of learning in an inquiry community (Levine, 2010). During our meeting in February, we introduced ourselves and discussed the problems of practice, questions, and dilemmas mentors experienced, the concept of an inquiry community, and the parameters of my study (Heron, 1996; Reason, 1999). Based upon the topics the mentors generated during their initial interviews and the initial mentor meeting, I created a list of practices on which the mentors might want to focus based on topics mentors offered

during their initial interviews and the initial mentor meeting. From there, I created a Google Form from which mentors could anonymously vote on the practice on which they would like to focus (see Appendix J: Inquiry Topic Survey). The survey contained a list of research-based practices culled from both the initial interviews of the mentors and the discussions from the February meeting: eliciting student feedback, lesson planning, and differentiation. From this list, I encouraged the mentors to anonymously select their first and second choices from the list. Two mentors selected eliciting P-12 student feedback as their first choice and the third selected eliciting student feedback as their second choice.

I shared the results of the survey with the mentors in an email and all mentors expressed interest during the March meeting in conducting inquiry into this practice. All mentors selected formative assessment practices as an inquiry topic to investigate and, during the March meeting, we brainstormed possible research questions on this practice to guide their inquiry (Kasl & Yorks, 2002).

Step Two: Research the Problem of Practice (March 2021 - October 2021)

This research stage began with mentors learning about ways to assess student understanding and provide feedback. They did this by reading articles I selected and shared (see Appendix K: Bibliography of Shared Readings), sharing their own materials with each other, and discussing the materials in our meetings. In addition, they generated data in the form of written reflections on their CIs; these written reflections were included in my study data as artifacts. At meetings, mentors brought examples and wrote reflections of CIs enacting the targeted practice to discuss with the group. They also collaboratively problem solved challenges that CIs faced developing the targeted practice.

March Mentor Meeting

For the March mentor meeting, my objectives were to clarify information about clinical interns (e.g., the number of interns per mentor, the grade level and subject areas taught by the interns) and to discuss our targeted practice - eliciting student understanding and providing feedback. I shared an agenda and slideshow with the mentors, with the explicit purpose of structuring our discussion and providing them an opportunity to revisit the slides for reference after the meeting (see Appendix L: March Mentor Meeting Slides). I wanted to emphasize the social and collaborative nature of our inquiry (Anderson & Shattuck, 2012; Barab & Squire, 2004; Penuel et al., 2011) so, after a brief welcome, I asked the mentors to participate in a "quick write" to the following prompt:

> Think of an interaction between a clinical intern and a K-12 student in which the intern was trying to figure out students' understanding related to a lesson objective.

- How did the clinical intern elicit the student's understanding? What questions or techniques did he/she use? Try to be as specific as possible; that is, if you can remember the actual question (whether it was written or asked verbally) etc.
- How did the student respond? Did the clinical intern push for clarification or elaboration? What kinds of feedback did the clinical intern offer? How did the student respond? Did other students participate in the interaction? Was there anything else that was noteworthy about the interaction?

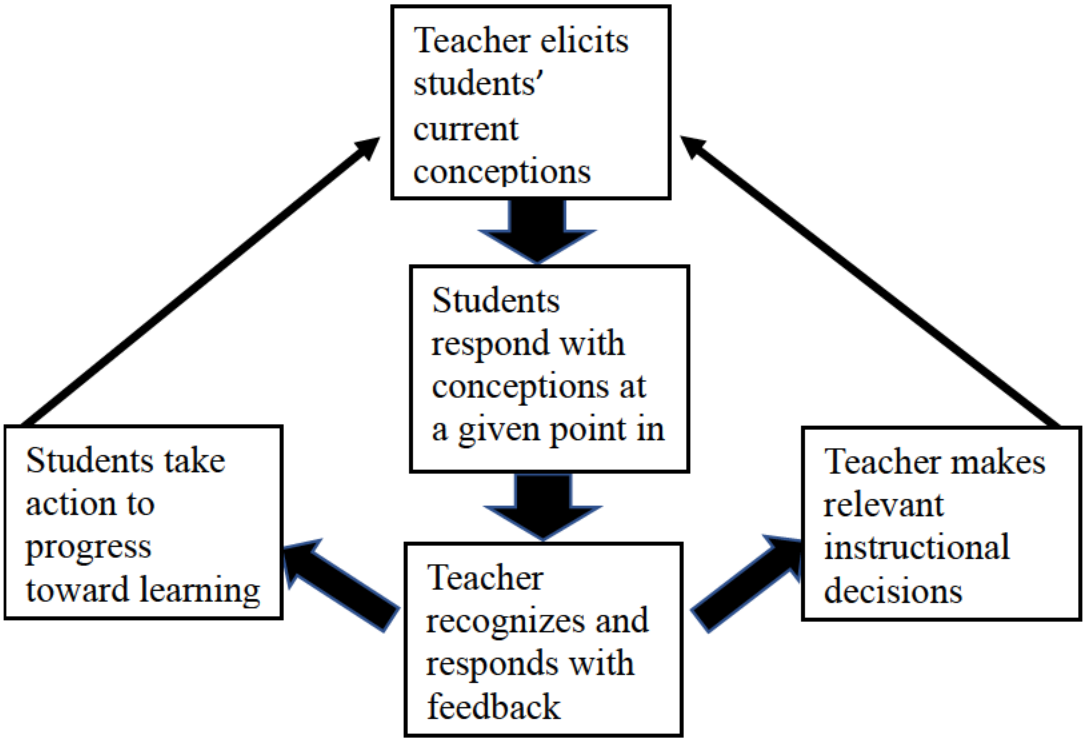
The purpose of the quick write was an opportunity for the mentors to make their knowledge explicit (Hennissen et al., 2017; Loughran, 2019) and to share that externalized knowledge with the community (Salter-Kothari, 2016). After the quick write, the mentors each shared their writing and I took notes in the shared slideshow; the goal of the notes was to look across the quick writes and develop a research question. By the end of the meeting, we

developed a research question: How do clinical interns solicit and assess student understanding and provide appropriate feedback?

To close the meeting, I introduced the formative assessment framework (Figure 2), selected based upon the mentors' responses on the Google Form, as a way for the group to have common language around the sub-processes involved in FA. I selected and adapted a model of FA originally developed by Sadler (1989) and then revised by Otero and Nathan (2008). I chose this specific model because it (a) addressed elements of FA that mentors discussed in their initial interviews and the first mentor meeting, (b) used language that would be familiar to mentors, and (c) was widely cited in the research literature.

Figure 2

Formative Assessment Framework



An iterative model of formative classroom assessment adapted from Sadler (1989), Otero and Nathan (2008).

As a researcher-participant, it was my role to guide the inquiry community (Bakker & van Eerde, 2014); therefore, at the end of the meeting, I assigned a task for myself and for the mentors to accomplish before our next meeting. Because researching a problem of practice is a necessary part of an inquiry community (Fairbanks & LaGrone, 2006), my task was to select and share relevant readings on formative assessment; specifically, techniques to elicit student understanding to help them reflect upon the selected problem of practice in their specific contexts (Levine, 2010; Reason, 1999). I tasked the mentors with writing about an interaction between a clinical intern and a K-12 student in which the intern was trying to figure out their student's understanding related to a lesson objective. We closed the meeting by reviewing the date and time of our next interaction. I shared three readings with the mentors by March 23, 2021 and asked them to read them in preparation for our next meeting. A list of the readings can be found in Appendix I: Bibliography of Shared Readings.

April Mentor Meeting

The objective of the April mentor meeting (see Appendix M: April Mentor Meeting Slides) was to share and discuss each mentor's interaction writing and to make connections among the interactions, the readings, and the feedback framework. I selected this objective with the goal of helping the mentors clarify what types of feedback they would like to examine, which would help them in the design of our inquiry (Barab & Squire, 2004). My objective also specifically involving sharing and discussion encourage collaboration, which may help the mentors externalize their tacit knowledge (Salter-Kothari, 2016). To begin the meeting, I encouraged mentors to work in pairs to share their writing about an interaction between CI and student. I prompted them to consider the following questions as they discussed their writing:

- Where does your analysis "fall" on the framework?

- Can you make any connections among the analyses and your readings?
- Did you find commonalities between you and your partner's analyses? Differences?

I used the breakout room functionality of Zoom to provide the mentors the opportunity to discuss their writings. After 20 minutes, we reconvened to engage in a whole group reflection. In addition to these activities, I planned for a discussion of the articles, but the scheduled hour had elapsed. Although we began a brief discussion of the texts I selected and shared with the mentors, we decided as a group to discuss the readings at the May meeting.

At the close of the meeting, I introduced our tasks. I decided not to enact my task of assigning more formative assessment readings; however, I did share two videos about formative assessment that Beth had sent to me individually via email. One titled "Formative Assessments: When, Why, & Top 5 Examples" (Teachings in Education, 2016). The other was titled "What is Formative Assessment?" (Education Week, 2017). I encouraged the mentors to watch them before the next meeting. As another task, I asked the mentors to write on the following prompt:

> Consider what part of the framework on which you would like to focus. When you write about an interaction between a clinical intern and a K-12 student, analyze the interaction according to the selected part of the framework and/or connections to our readings.

My goal in selecting and assigning this prompt was to have the mentors collect data (their writings) which we could analyze and discuss at our next meeting (Levine, 2010; Reason, 1999).

May Mentor Meeting

The objective of the May mentor meeting was to consider in what ways the framework, readings, and videos related to mentors' experiences with clinical interns' formative assessment practices. As the researcher-participant, I selected this objective to aid mentors in connecting the formative assessment theory included in the framework, readings, and videos with their

mentoring practice. Based upon the mentors' brief discussion about "Enriching Classroom Discourse" (Moss & Brookhart, 2019) at the April meeting, I decided to revisit the chapter to engage in a longer discussion. After initial greetings, the mentors and I engaged in an activity called "sentence, phrase, word," (Project Zero, 2019) in which we individually selected a word that captured our attention or struck us as powerful; a phrase that moved, engaged, or provoked us; and a sentence that was meaningful to us (Project Zero, 2019), that we felt captured the core idea of the "Enriching Classroom Discourse" found in Moss and Brookhart's (2019), book *Advancing Formative Assessment in Every Classroom*. I selected this activity as a way to encourage the mentors to make explicit their thinking concerning the reading and on formative assessment in general. As a researcher-participant I also strove to select activities informed by the principals of DBR. Because I was unsure if the mentors had ever engaged in this type of text analysis, I decided to participate in the activity so I could model if necessary, so, during this activity, I acted as a collaborative member of the community (Anderson & Shattuck, 2012). As a group we shared our selections in the Zoom chat. We discussed word selection first, followed by phrases, and finally, sentences. To facilitate discussion, I used the following questions: *What themes emerge? What implications or predictions can be drawn? Were there aspects of the text not captured in your choices?* (Project Zero, 2019). As each member of the group explained their word, phrase, and sentence selections, I recorded their answers on our meeting slides (see Appendix N: May Mentor Meeting Slides). At the conclusion of our discussion, we discussed our tasks for the next meeting. To enable the mentors' inquiry into the problem of practice, my task was to select and share the new readings, which was another chapter from Moss and Brookhart's (2019) book titled "Shifting from correcting to informing: Feedback that feeds forward." To help mentors reflect upon the selected problem of practice in their specific contexts

(Levine, 2010; Reason, 1999), I tasked the mentors with considering the framework and the group's discussion and encouraged them to write down the questions the CI asked their P-12 students.

June Mentor Meeting

The objective of the June mentor meeting was to reconsider in what ways the framework, readings, and video might influence how mentors prepared CIs for the practice of FA. I asked the same question as the May meeting because I wanted to provide another opportunity for the mentors to articulate what element of formative assessment that they wanted to address with future CIs (Levine, 2010). In DBR, all members will co-create and use any intervention (e.g. a protocol or tool) (Barab & Squire, 2004). Therefore, my other reasoning for this objective was that I wanted to begin the next stage of inquiry in the fall of 2021, which would include the creation of a protocol that the mentors could use with CIs, and I wanted to further discuss how the theories addressed in the framework, readings, and videos might inform the protocol. To this end, I selected the chapter *Advancing Formative Assessment in Every Classroom* "Shifting from Correcting to Informing: Feedback that Feeds Forward" (2019). I asked questions, which I designed before the meeting, that were inspired by the chapter itself which identifies methods and content of feedback. I created these specific questions to elicit the sharing of problems of practice, which may help the mentors create an intervention in future meetings (Barab & Squire, 2004). I also wanted mentors to reflect on their own professional histories and, if possible, make connections between the theory in the readings and their own experiences. I encouraged this reflection and connections because, by engaging in discussion, the mentors give structure to loosely formed concepts (Windschitl et al., 2018) and help the, to identify gaps in their logic

(Windschitl et al., 2018). We put in the chat responses to the following questions with were on the meeting slides (see Appendix O: June Mentor Meeting Slides):

> My clinical interns always do…., but they really should….
>
> OR
>
> My clinical interns never do …, but I wish they would… (Meeting, 6-21).

I encouraged the mentors to answer more than once and to be prepared to provide specific examples during our discussion. Although these mentors are in the same context of the university setting, they are working with CIs in many different contexts. Therefore, I wanted them to give specific examples to make their experiences and frames of reference clear for the rest of the group (Cochran-Smith & Lytle, 1992). After we shared and discussed our responses, we moved on to scenarios, inspired by the same chapter, I created to help mentors make their knowledge of CIs as learners explicit (Achinstein & Athanases, 2006). One example of the scenario was:

> Your CI has a pattern of asking students closed questions, such as "What is the formula for the area of a triangle?" or "In what year did World War II begin?" You have coached the CI on asking open-ended questions, but, at your next observation, you counted 2 open-ended questions and 7 closed questions in one lesson (Meeting, 6-21).

For each scenario, I asked the following two questions:

1. Where might this interaction fall on the Formative Assessment Framework? Why?
2. What steps would you take to mentor this CI?

My intention was to invite mentors to make their knowledge explicit for the group and to examine if the mentors could contextualize the scenarios using the framework, which could potentially highlight the mentors' reasoning for decisions made during their mentoring

(Loughran, 2019). Unfortunately, we were only able to discuss the scenario detailed here before our hour had come to an end. Because the year was ending, my task was to contact each mentor individually to schedule a reflection interview and to determine if they wanted to continue with our inquiry in the fall of 2021. The mentors' task was to respond to my email.

Step Three: Formulating the Protocol (October 2021)

October Meeting

Because of scheduling problems, the mentors and I did not meet in September of 2021. Our first meeting of the new school year was on October 18, 2021. At the behest of the mentors, we met in person. In anticipation of starting to enact the next cycle of our research and to help the mentors reflect on their practice (Levine, 2010), in an email sent on October 6, 2021, I asked mentors to consider the following prompt and write down a response before the meeting:

> Brainstorm criteria or questions for clinical interns to use to evaluate their own formative assessment practices. To do this, I would ask yourself what clinical interns need to think about while creating a lesson plan, while teaching, and while reflecting on a lesson after it is taught. I put the formative assessment framework below to remind us of the stages of FA. Some examples that I was considering were the following:
>
> -Before the lesson - Where in my lesson might students become confused?
>
> -During the lesson - How am I eliciting feedback from my students in this lesson?
>
> -After the lesson - How might I change my lessons based on what I just taught?
>
> While brainstorming, don't worry about "good" or "bad" ideas, just get it all on paper. We can narrow down our thinking at our meeting" (Email, 10-21).

Because DBR involved a cycle of inquiry in which participants may create and test a tool (Cobb et al., 2003; Penuel et al., 2011), my objective for the meeting was to collaboratively

develop a questioning protocol with which to help CIs evaluate their formative assessment practices. I did not create slides as we were meeting in person and I did not plan to use my computer. I did, however, create an agenda, which I printed and distributed to the mentors (see Appendix P: October Mentor Meeting Agenda). Unfortunately, two mentors arrived to the meeting late because of traffic, so we did not accomplish all that I had planned on the agenda. We did, however, discuss our criteria and questions. Caroline was the only mentor brought a physical list. To help the mentors create a protocol that they could use to improve their practice (Levine, 2010; Goodwin, 1994) and to ensure that mentors provided their expertise in creating the intervention (Barab & Squire, 2004), I encouraged them to share their ideas and potential questions with the group. While they brainstormed, I took notes.

At the end of the meeting, my task was to synthesize the brainstorm into a list of questions to ask CIs before an observation, in a preconference in which the mentors discussed the lesson plan with the CIs, and after an observation, when CIs and discussing and possibly reflecting on the lesson (see Appendix Q: Formative Assessment Protocol). The mentors agreed to ask the questions of the CIs and collect data to share with the group. In my email, in which I shared my notes, I included the list of questions and suggested possible data that they might want to collect: “This can be notes from a meeting or observation, a copy of an annotated lesson plan (or a photo), an email, etc.” (Email, 10-21).

Step 4: Collect and Analyze the Data

November Meeting

As a group, we decided that, because of the mentors’ busy schedules and the distance from each other, it would be prudent to continue to hold our meetings online; therefore, both the November and December meetings occurred online. One mentor had a last-minute dental

emergency and was unable to attend. The objectives of the November meeting were to discuss and refine the protocol questions and to share any data that was collected. I selected this objective with the iterative nature of DBR in mind (Anderson & Shattuck, 2012; Bakker & van Eerde, 2014; Cobb et al., 2003); as the mentors may have wanted to make revisions to the protocol based upon their experiences using it with their CIs. Unfortunately, neither mentor had met with their CIs between the two meetings, so there was no data. I had also planned an activity to give the mentors an opportunity to explain their thinking about their first experiences using the protocol to each other. This activity involved having the mentors examine the protocol questions and sort them using the steps in the Formative Assessment Framework. Again, because the mentors had not yet used the questions, we did not engage in this activity. At the end of the meeting, my task was to reshare the protocol questions with the mentors, so they would be able to locate it easily and not have to search through their emails. Because I wanted the mentors not only implement, but also analyze the protocol (Barab & Squire, 2004), I tasked the mentors with collecting data and considering the following questions located on the meeting slides (see Appendix R: November Mentor Meeting Slides):

> Pre-observation: Use the questions and, after the meeting, write down notes on how they were received.
>
> Post-observation: Write down notes concerning feedback in the lesson? Did the CI change behavior or questions based on the pre-observation questions?" (Meeting, 11-21).

December Meeting

A week before the December meeting, I sent a reminder email to share with me any data collected from using the protocol. I did this so that I could include it in our meeting slides (see Appendix S: December Mentor Meeting Slides). All three mentors shared data with me before

the meeting. Caroline shared a reflection from a preconference with a CI and notes from an observation with a different CI. Beth shared notes on what she did with her CIs and what she observed her CIs doing during observations. Abby shared notes from three CIs observations.

The objectives of the December meeting were to share and discuss the data collected and to revise our questioning protocol, if necessary. The reasoning behind this is again to address the iterative nature of DBR (Anderson & Shattuck, 2012; Bakker & van Eerde, 2014; Cobb et al., 2003). As the mentors share and discuss their data they may want to make changes to the protocol based upon their experiences using it with their CIs. I had initially planned a quick write to begin the meeting. The mentors expressed that they would prefer to share their experiences aloud. Before the mentors shared, I introduced the following questions:

What data did you collect?

What did you notice and note?

Based on your data, where do you feel CIs need support?

- eliciting student responses
- responding to students' conceptions, providing feedback
- making instructional decision based on providing feedback. (Meeting, 12-21)

Each member shared and discussed their experiences. After all three had shared, we discussed commonalities among the experiences and, to make refinements to the protocol, if necessary. My task was to send an email with the refined questions. The mentors' task was to continue to collect and share data from using the protocol.

Chapter Five: Findings

In this chapter I present the case of the mentor inquiry community. Using thematic analysis, I analyzed the ways in which the three mentor participants showed their knowledge in the bounded system of the inquiry community and the conditions that affected their practice. I organized the findings by my research questions:

Research question one: In what ways do mentors show their knowledge in an inquiry community engaged in design-based research?

Research question two: What conditions affected mentors' work in the inquiry community engaged in design-based research?

Two themes emerged to answer research question one: when engaged in DBR, mentors showed their knowledge through storytelling and mentors showed their knowledge through their solutions to joint problem solving. In response to research question two, two themes emerged: when engaged in DBR, symbolic language facilitated the group's work and off-task talk hindered the group's work.

Research Question One: In What Ways do Mentors Show their Knowledge in an Inquiry Community Engaged in Design-based Research?

Mentors Showed their Knowledge through Storytelling

From the initial interviews in January 2021 to the meeting in December 2021, mentors used story as a way to show their knowledge. According to Clandinin and Connelly (1989) a story is an account of related events or experiences in someone's life. Stories embody knowledge that develops through experience and for teachers, it may play a part in how they come to understand the complex practices of teaching (Salter & Kouthari, 2016). In this inquiry community, one way mentors showed their knowledge was through the stories they told, which

were accounts of events that had happened to them and were often focused on their own teaching and mentoring practice. In them, the mentors often positioned themselves as the protagonist of the story and described a specific conflict or problem of practice. These stories were used in varied ways (e.g., to provide examples of their experiences, to describe an encounter with a CI, to ask for advice concerning their mentoring practice). Here I present three examples of stories that mentors told that showed their knowledge.

"I Never Thought of That"

An example of how mentors used storytelling as a way to show their knowledge comes from Beth's initial interview. You may recall that I created these interview questions with the purpose of learning more about mentors' approaches to mentoring and how they typically engaged in collaborative practice. In this portion of the interview, I prompted Beth to "tell me how you came to mentor clinical interns" (Interview, 2-21). After providing career details, she spoke of her experiences as a mentor of CIs and said, "…I'm saying, you're learning something new every day" (Interview, 2-21). To illustrate this statement, Beth spoke about her experience including mentoring a variety of CIs in the Spring of 2021. This led to Beth telling a story regarding a lesson plan that a CI presented to her that included the game Hangman. She described the setting and characters of the story – a pre-conference telephone call between herself and a CI. Then, she described their interaction:

> Beth: I'm looking at the lesson plan (as she is meeting with her CI). And she says (in the lesson), that for her culminating exercise or culminating activity she's gonna play, in second grade, Hangman. I go [to CI], 'Oh?' She [the CI] says [to Beth], 'I got that from Teachers Pay Teachers.' I've been doing this for 47 years plus so I said [to CI], 'I don't think that is appropriate in today's setting, today's world.' She [the CI] goes [to Beth],

> ‘Really?’ I said [to CI], ‘Think about it. I know some of the students in your class are…it's a very racially diverse…’She [the CI] says [to Beth], ‘Oh my God.’ I said [to CI], ‘Yeah so let's make it less negative. Can you make it a positive? If you get these right, we're going to grow a garden, or flowers, or something to make it [imitating a student’s reaction]: ‘Wow I've got my own garden!’ Not, ‘Yeah I hung the guy.’ You know what I mean?
>
> …She [the CI] goes [to Beth], ‘Oh my God, I never thought about it.’
>
> …That, to me, was such a teachable moment for she and I. I said to her [to CI], ‘You can talk to your cooperating teacher [about using Hangman as a culminating activity], but I personally, will not advise you to do that. She knows the kids better than you, but I think you need to be a little bit more forward thinking and not suggest that.’ (Interview, 1-21)

In this example, Beth told a story regarding a pre-conference with a CI. Because she prefaced the story with the statement “You’re learning something new every day,” it appeared that Beth told this story to illustrate that statement. To accomplish this, Beth used dialogue between her and the CI to illustrate both her concern about the use of Hangman as an activity and the CIs revelation that the game was not appropriate. The story concluded with Beth recommending that the CI discussing changing the activity with their CT.

Beth showed her knowledge of culturally responsive and age-appropriate practices by identifying Hangman as a game that was potentially offensive to students of color and alarming to all students. She expressed concern that her CI did not consider the cultural capital of the students in the class, and also identified that the CI, who should have had experience considering how to make lessons culturally responsive, was not aware of the inappropriateness of the game. Therefore, Beth took advantage of the teachable moment to help her CI develop their own

knowledge of the learners in the classroom, specifically an understanding of activities that are culturally responsive and age appropriate for a diverse group of second-grade students.

"I'm a Little Data Driven"

At the June mentor meeting, Abby used storytelling as a way to show her knowledge. To begin a discussion regarding the Moss and Brookhart (2019) chapter, "Shifting from correcting to informing: Feedback that feeds forward," I prompted the mentors to write a response to the following questions: "My clinical interns always do…., but they really should…." and "My clinical interns never do …, but I wish they would…" (Meeting, 6-21). You may recall that this prompt was inspired by the Moss and Brookhart chapter (2019). The quick write generated an ongoing conversation about collecting pre-assessment data and using it formatively, when Abby, who expressed a concern that CIs do not use the data they collect, told a story about the importance of documenting student learning with data:

> Abby: And so I talked [to a CI] about documentation and how this is great, and no one could ever argue with data and how important data is. Just like a lot of them use exit tickets, which is fine, but if you don't do anything after you look at those exit tickets, what do you do with them? So if you just do it to find it and then you don't address it, then what's the sense of doing it? So I'm a little data driven. And I know that teachers don't always have the time to do it, but being the learning consultant on a child study team, I say to these teachers: 'What happens if a parent comes to you and the kid has a C?' And you [the teacher say [to the parent], 'They are weak in this [skill…' And they [the parent] say, 'Oh not at home. He can do all of this. You're wrong.' What are you [the teacher] going to show them? If you're doing it in your head, you can't show it. So

> keeping data may be a step more. But when it comes to addressing needs, people are going to say they don't see the same thing you do. You have [to have] proof of it. (Meeting, 6-21)

Abby showed her knowledge concerning assessment in her story about a conflict regarding grades between a teacher and parent. In the story, she recreated the interaction between a parent and a teacher to illustrate that, if there is no documentation (i.e., evidence) to show parents, then it is difficult to defend the grade that the student earned. This exchange showed that the mentors knew of the teaching practice of collecting and using evidence, as a way to add credibility to their assessment decisions.

By telling this story, Abby drew from her rich experiences to illustrate her specific concern about how CIs collect data, but do not use it. The purpose of the story was to provide a specific example of her concern, which generated agreement from some mentors and furthered the discussion as well. Because the story originated from a response to a quick write that I assigned, it facilitated our inquiry goals in that it furthered our discussion and understanding of the concerns surrounding CIs use of formative assessment data, which the community wanted to address.

"I Feel Like I Failed"

Caroline used storytelling during her July reflection interview. You may recall one of my purposes for the reflection interview was to encourage mentors to reflect on their current beliefs on mentoring. During a portion of the interview that addressed coaching CIs, Caroline referenced using mentoring techniques that included both praise and critique. Then, she indicated that not all CIs are similarly prepared for their internship, I asked her: "How do you coach someone when

you see that you're starting at square one?" Caroline responded by telling a story of an experience with a CI:

> Caroline: Coaching an adult is very different formatively, seeing what they can and cannot do, versus elementary school. So that learning process for me too. And in the very beginning, there were a couple of students that I came on a little bit too strong and I had to read those personalities. So you really have to do that…One time, one [CI] went back to [University program coordinators] [with a complaint]. I said to [a program coordinator], 'You can leave this one [the CI], it's fine.' …He [the CI] was a boy, I've only had problems with two boys, never girls. Interesting, two boys, interesting isn't it? And he, he went to them [University program coordinators] and said, 'I don't want her anymore,' and started sending them my emails. My emails were a little strong, but he needed that. And I said to [one program coordinator], 'The worst thing you did was take me away from him, because what's he going to do when he gets a job and he doesn't like his principal? How is he going to handle it?' He just didn't like me telling him [to CI], 'This is great, but this is what you need to work on.' … He didn't want to hear that, you know?…One [the CI who reacted poorly to her feedback] was Hispanic…I don't know if it was a cultural thing [imitating CI], 'You don't tell me what to do.' I don't know what it was…The first time I met with him, I always met ahead of time, and we would sit down and go over the lesson, and although we did go over the lesson plan online and on the phone, I would still sit with them 15 minutes before I went in to observe. And the first time we met, we went into an auditorium, and we were starting to go over it [the lesson plan] and he started to cry. This is the kid who went to [the University program director].

He started crying. It still bothers me to this day because I feel like I failed. (Interview, 7-21)

In this example, Caroline told a story regarding an experience in which she feels she "failed" a CI with mentoring that was too assertive. Caroline reflected on how she provided the CI with feedback and his reaction to the feedback. She acknowledged her part in the conflict in that she might have come on too strong and not have considered the CI's personality. The story concluded with Caroline recounting how this experience stays with her.

Through reflecting on one of her many rich experiences with CIs, Caroline showed her knowledge of mentoring CIs. She noted that there is a difference between coaching a child and an adult and that mentors must have an understanding of how to provide feedback for adults with varied personalities. Caroline also acknowledged that mentors must reflect on their practices in order to become better mentors. However, Caroline also expressed gendered beliefs about the difference between mentoring men and women and beliefs about cultures other than hers: that Hispanic men were not open to receiving feedback.

Through this story, Caroline reflected on past mentoring experiences, specifically one in which she developed an understanding of how to provide feedback to adults. Although I prompted her for a generalized response concerning coaching CIs, Caroline provided this specific, personal story of a perceived failure to illustrate her response, indicating our collaborative practices in the community had built a trusting relationship between us.

Mentors Showed their Knowledge through their Solutions to Joint Problem-Solving

During mentor meetings, mentors often discussed current problems of their mentoring practice (e.g., CTs who did not respond to emails, COVID-related observation concerns). When

a mentor expressed a concern or frustration, that is a "problem," other mentors would offer suggestions. I interpreted these suggestions as evidence of the mentors' knowledge.

Trying to Find Alternate Ways

One example occurred early in the first mentor meeting. You may recall that one objective of this meeting was to introduce ourselves, as relationships are an important part of a design-based research (Cobb et al., 2003). During her introduction, Caroline expressed a COVID-19 related concern about completing observations with a CI who was teaching remotely and the school administrator would not allow Caroline to attend or record her teaching via Google Meet. The mentors discussed the location of the schools in which they were mentoring and then Abby made suggestions about how to address the problem.

> Caroline: She is all upset [because] she [the CI] knows she's way behind, I mean…I'm into like the third formal observation already so I don't know what to do. And what we're going to do in this case. So, I sent an email to Danielle and Emma [University Program Directors] and I'm waiting to hear back.
>
> …
>
> Abby: Well, there's an alternate way that they [University program directors] talked about that [students not being able to complete the requirements] last semester. [They suggested] Trying to find alternate ways of at least getting her [the CI] to show you, her skills. Whether it's writing lesson plans and having her demonstrate [skills] to you.
>
> Caroline: Right, that is what happened in March when COVID hit. They [CIs] just didn't teach, so they had to send me lesson plans and we just had to pretend that they [the CI] did [taught] it.
>
> Abby: Right.

Caroline: Perhaps that's…I don't know…I don't know.

Abby: It'd be interesting because maybe she could write you reflections about what goes on. Like what lessons does she deliver? How does it go? She could show you all the stuff. She could talk about it and then give you her reflections on it, if you can't be there. And then talking to her co teacher, her cooperating teacher. (Meeting, 2-21)

Caroline and Abby engaged in problem solving around Caroline's student failing to meet the requirements despite it being her third formal observation. In response to this problem, Abby suggested that Caroline could have her student complete other tasks to show evidence of her performance such as reflecting on her lessons, a practice that might have helped Caroline assess the CIs skills. She also suggested that the CI show Caroline artifacts from her teaching ("all the stuff") and that Caroline speak with the CT for more information. Although the situation was not resolved during this discussion, Abby's suggestions reflected her knowledge of practices such as reflecting on lesson planning that might help Caroline assess her CI.

The holistic nature of DBR, in which there are many variables of inquiry at play, is evidenced with this example of joint-problem solving. Although our inquiry community selected FA as the focus of our inquiry, because our work occurred during the COVID-19 pandemic, variables such as problems scheduling and engaging in formal observations of CIs arose. The mentors used our community to discuss solutions to such problems.

An Hour From Now, Do You Remember?

In the March meeting, an example of knowledge demonstrated through joint problem solving occurred. You may recall that I opened the meeting with the following quick write exercise: Think of an interaction between a clinical intern and a K-12 student in which the intern was trying to figure out students' understanding related to a lesson objective.

- How did the clinical intern elicit the student's understanding? What questions or techniques did he/she use? Try to be as specific as possible; that is, if you can remember the actual question (whether it was written or asked verbally) etc.
- How did the student respond? Did the clinical intern push for clarification or elaboration? What kinds of feedback did the clinical intern offer? How did the student respond? Did other students participate in the interaction? Was there anything else that was noteworthy about the interaction? (Meeting, 3-21)

Abby provided the following example of a CI who elicited student understanding using whiteboards.

> Abby: [This example is of] a teacher in a third-grade class. It was math and she was reinforcing…working in a small group. She worked with a student who was having trouble understanding and she took out a whiteboard. She went over problem after problem using the whiteboard and they did problems together and then she left him alone to do the second page. He can use the whiteboard on his own and then transfer the answer [to his notebook]. So that was just more. You know it was just very observable.
>
> Caroline: Right, but even the observable ones where they do use little mini whiteboards and they hold it up… [still] my questions to the student teacher is 'So who got it right? An hour from now do you remember? Do you have a checklist? How do you know they got it? What if the parents say, 'How is the child doing?' Do you really know? You're not going to remember with a class of 25 kids who held one [answer] and who held another.' You know? I'm trying to teach them [CIs] that when you're in the classroom it's just not that simple, especially in grades. When you have to give grades, right?

Abby: Yeah, so if you're not writing it down from the whiteboards…She [the CI] was only working with one student, so she…. Yeah, but, overall, when they do the whiteboard… you're right.

Caroline: So that is different, but a whole class…

Abby: And unless you're checking it off… And I've said to students [CIs], 'You need to have a checkoff system.' Because once they erase that and you have and you've done multiple problems, you have nothing to check back to. So totally true. (Meeting, 3-21)

In this excerpt, Abby responded to the quick write task with an example of a CI who used whiteboards as a formative assessment to document a students' performance on a math task. Of note is Abby's conflation that the CI elicited the student's thinking by putting a response on the whiteboard, but this does not indicate understanding, only a correct answer. Caroline identified a problem with Abby's example; notably that the use of the whiteboard does provide the teacher with a permanent record of this student's understanding. She further problematized the issue by asking what the teacher would do with 25 whiteboard responses. Caroline offered a number of solutions to the inquiry group including using a checkoff system. I saw her solutions to the problem as evidence of her assessment knowledge.

The intervention I planned as a researcher-participant initiated this example. Another principal of DBR evidenced by this problem-solving example is the mentors are comfortable problematizing each other's thinking, which showed the social and collaborative nature of DBR in our inquiry community.

Research Question Two: What Conditions Facilitated or Hindered Mentors' Work in the Inquiry Community Engaged in Design-based Research?

Two themes emerged to explain the conditions (e.g., characteristics, features) that supported or hindered mentors' work in the inquiry community engaged in DBR. I titled these themes: symbolic language facilitated the group's work and off-task talk hindered the group's work.

Symbolic Language Facilitated the Group's Work

The phrase thumbs up, thumbs down was used frequently by the mentors to represent poor FA practices. The practice of thumbs up, thumbs down as a poor FA practice was introduced in our first meeting and both mentors and I referenced the practice often. We began to use it without needing to provide any further explanation of the term to the rest of the group. In that sense, thumbs up, thumbs down began to take on a symbolic meaning for the group; thumbs up, thumbs down symbolized all poor FA practices.

In our initial mentoring meeting (February 2021), I introduced the details of our inquiry. As I introduced the inquiry process, Caroline wrote notes. In her sharing of the notes, she presented a specific formative assessment practice in it: asking students to put a thumb up or thumb down as a way for the teacher to determine student understanding. Caroline said:

> I think I just wrote it down: questioning… I actually wrote this out in my notes to talk to you about it, because at the elementary level, I mean, if I was to focus on one thing…[of an example of] what not to question, what not to ask [it would be]. It's always like [to students] 'You got it guys? Everybody got it? Thumbs up, thumbs down.' That doesn't tell a teacher anything. (Meeting, 2-21)

In this excerpt, Caroline introduced the notion that using the practice of asking students for a thumbs up or thumbs down to elicit student understanding is not an effective FA strategy.

This was not the only time in which thumbs up, thumbs down was referred to in a similar fashion in the community. For example, in response to the March quick write prompt, as a poor example of eliciting students' responses, Abby wrote:

> 5th grade English - Whole group - teaching topic sentences. [CI] Had an anchor chart and then reviewed the story. Did not ask specific questions to all, thumbs up, thumbs down, and sent them to work in partners to begin a story summary. Never got personal responses. (Written reflection, 3-21)

In this written reflection, Abby discussed a specific incident observing a CI and uses the phrase thumbs up, thumbs down similarly to Caroline. Abby also indicated that she believes thumbs up, thumbs down is an ineffective FA practice because it doesn't give the teacher "personal responses."

Another reference to thumbs up, thumbs down occurred in a discussion that I initiated in the May mentor meeting about how to help CIs ask better questions using the language from the Moss and Brookhart (2019) book. Caroline used thumbs up, thumbs down to tell a story about a CI who was not asking quality questions.

> Erin: …I really was thinking about clinical interns and I put 'to monitor and refine the quality of the questions they ask.' And how do we help them do that? Because that's a pretty deep skill. And I know that we talked a lot about them [CIs], not being in the place where they have a ton of experience. How could we help them? And I don't have an answer, if you have an answer jump in.
>
> Caroline: To give an example, this one student teacher, it was all 'yes, no, yes, no.' So how I helped him…what I said [to the CI] was, 'By that student saying no or yes, how

does it help you? What did you learn from yes no?' He [the CI] just moved on. 'Who gets it? Thumbs up.' But what does that mean? No probing or making them think further…

Erin: For equity purposes, if a kid in the back put his thumb down you didn't see him and you just moved on. How does that feel? That kid feels like Mr. Blah Blah does not care if….

Caroline: What's the point of it? Exactly right, yeah.

Abby: And it's brave to put your thumb down. Because a lot of them wouldn't even do it. So, do you address it right there because maybe the kid will never do it again because you're pointing them out, you know, or do you address that later on?

Caroline: I addressed it right away like it was a badge of honor. [To students] 'Good, let's hear what… How can I help you more? I'm sure you're probably thinking the same thing.'

Abby: Yeah, but I wouldn't even know how to give advice, because hardly anybody put their hand up. But, how do you address that? And maybe you don't even address it by saying [to student], 'Oh Johnny, you put your thumbs down. Tell me what's wrong.' Maybe I would repeat my directions, or maybe I would do something where it's general instead of saying [to student], 'Oh John… or thank them and say, "I'm sure, a lot of people feel this way like yes.' You would have to be able to make sure that you help them address… how are you going to address that?

Caroline: And you need to create a culture of mistakes in the very beginning in your classroom. Yeah that's the culture, everybody makes a mistake. I would point out, all this is "[I] made a mistake. Who can tell me what I should have done?" And they felt more comfortable than putting their thumb down whenever I asked the, 'thumbs up thumbs

> down' That's a no for me, I can't do that in the classroom but if it was a student teacher, I would explain that as well you know establish that culture it's okay that you make a mistake we all make mistakes. (Meeting, 5-21)

In this example Caroline referred again to thumbs up, thumbs down as an ineffective assessment technique. As the discussion continued, the other members and I unpacked why thumbs up, thumbs down is an ineffective FA practice. Although this is not an example of how the phrase is used as a symbol, it does explain what the phrase meant to mentors. In future meetings, mentors and I began to use the thumbs up, thumbs down examples in a symbolic manner.

An example where thumbs up, thumbs down was used symbolically in a meeting was in the June mentor meeting. Directly after Abby shared her story, mentioned above, concerning documentation and assessment, Beth affirmed her story by saying, "I usually tell my students if it's not aligning, it doesn't exist because that's what you need, documentation. I also have seen and I'm sure a lot of your student teachers go, 'Okay, if you agree with a thumbs up, thumbs down' (Meeting, 6-21). Donna then said, "Oh year, that is the same thing" (Meeting, 6-21). Here Beth contrasted a positive FA practice, collecting data and using it to inform grading and instruction, with the symbolic phrase, thumbs up, thumbs down, which, in this instance, meant a poor FA practice. Donna then confirmed Beth's statements and agreed that Beth's statement was the "same thing" as her story.

Over the course of our inquiry, there were many other instances in which the mentors (alone in individual interviews or together in the community) referenced thumbs up, thumbs down. For example, in a second interview with Abby in July, I asked her "So, since we've started our inquiry have your ideas about feedback changed at all?" Abby responded:

> Abby: I have to make sure that the clinical intern sees it [feedback] through, and not just accepts… that informal response for a whole class without asking her [the CI], 'Well, how do you know this person got it?'... That has been the thing that has changed for me: just not accepting. Just like something informal [practice] where everybody responds at the same time is… How do I move it [the CIs FA practices] forward? And I know that's going to take more time, because they may not have the time, but I can't just be satisfied with just hearing… thumbs up, thumbs down. (Interview, 7-21)

In this example, Abby used the phrase in a symbolic manner. She indicated that, to mentor CIs, she must encourage them to move beyond the FA practice of asking a whole group to indicate understanding by putting their thumbs up or thumbs down and to more, in her words, formal FA practices which would elicit individual student understanding.

DBR's iterative and collaborative nature were principles that facilitated the use of symbolic language. Because DBR is a cyclical process that, in this case, unfolded over nine months of inquiry, as evidenced by the examples from varied meetings and interviews, mentors had the time and space to develop the symbol of thumbs up, thumbs down. However, developing a common language cannot solely be related to the amount of time, the collaborative and social nature of DBR encourages mentors to develop symbols that are significant to the members of the community, but may not have the same meaning to those outside of the community.

Off-task Talk Hindered the Group's Work

Instances of off-task talk, most notably off topic discussions, appeared to hinder the group's work. Off-task talk is defined as conversations that led the group away from the focus of our inquiry. When mentors engaged in off-task talk, it typically related to concerns with CT or the effects of the pandemic on mentoring.

How CTs Are Selected

In the April mentor meeting, as the mentors discussed a post-observation conference with both the CT and the CI, Beth asked: “So the question is how do..I am probably going off topic… but how do these individual CTs get student teachers? Some of them, maybe, should not receive student teachers, because they're in it for the wrong reasons. I don't know” (Meeting, 4-21).

This question led to a lengthy discussion of how CTs are selected for CIs. Abby, who used to place CIs for the University, explained the process and the other mentors asked questions. Abby reported, “Every district does it [placing CIs with CTs] differently. When I was on the Operations Committee we listened to how every district does it. Everyone does it differently…” (Meeting, 4-21). The conversation continued onto the topic of placements until Beth prompted:

> Let me ask you this, I used to go, around 2015, when I was in a district office, we arranged for the University to come and train teachers who wanted to be CTs and become clinical faculty members. Only those individuals who went through three classes to become a mentor, could have student teachers. (Meeting, 4-21)

From there, the conversation changed to how CTs are prepared. This conversation continued in a similar vein for six minutes until I said, “We're at 6:08. And I did say we would end at six, but this is fine. I love it when we go over because it means the conversations have been good” (Meeting, 4-21). After I said this, I tried to close the meeting by refocusing on FA practices and our inquiry by saying “I was curious about the articles [the assigned readings I selected]. What did you like? Which one spoke to you? Did any of them remind you of current clinical interns? Before I let you go, I didn't want to pivot so fast, but…” (Meeting, 4-21). We

spoke briefly about the readings and then discussed our tasks for the next meeting, but the group lost a lot of work time on FA practices by engaging in the off-task talk.

Identifying a Misconception

In a second example, as Caroline reported on her recent experiences with a CI to the group, she explained how her CI struggled to anticipate where students might have misconceptions in the lesson. Abby asked if Caroline had spoken to the CT or looked at the CTs observations. This led the conversation away from the CIs misconceptions and towards concerns about CTs.

> Caroline: They don't get it; they just don't get it. [To CI] 'Give me a misconception.' And they look at me like I have three heads. [To CI] 'What do you think is going to happen after you teach this lesson?' 'What do you think your students might not understand?' That's where you need to start. It's like, I don't know, maybe I'm doing something wrong I don't know.
>
> …
>
> Abby: What did the CT say? or Just out of curiosity, have you looked at the CTs observations or have you talked to the CT?
>
> Caroline: I have the CTs…from the last one I handed in the grade. I went back and looked at her observational notes and she only had one done.
>
> Abby: Okay.
>
> Caroline: Great, I talked to her in person, and she told me that she's… [CT speaking] 'I just want you to know,' she [the CT] said. 'I didn't make suggestions to her, I did tell her some of the things that you told her that she needed to improve upon,' she said. 'But she doesn't listen to me.' That's what she said. I just think they [CTs] don't have the time

Abby, I really don't. I think they're so overwhelmed they're just letting them do what they do.

Abby: Some of them, some of them definitely there's some that are so controlling and then there are others that don't really check what they're doing and say go teach a lesson. (Meeting, 12-21)

In this example, Caroline expressed frustration over a problem of practice directly related to our inquiry: helping CIs identify where students may have misconceptions during a lesson during a pre-conference meeting. Terry elaborated on her concerns, but, after she had explained her concerns, instead of responding to Caroline's question and frustration, Abby directed the conversation back to concerns surrounding CTs. The conversation continued until I asked Caroline the following question: "Can I ask you a question? With this experience, do you feel like this clinical intern, the student teacher, was even ready for the questions we created?...Do you think, honestly, these questions were beyond her?" (Meeting, 12-21). This question redirected Caroline back to her original concerns, however I am not confident that the mentors would have returned to the topic of FA practices without my redirecting.

Although the first example is a direct question concerning CTs and the second example arises from a conversation, in both examples the off-task talk led the conversation away from the focus of the meetings: FA.

Because of the open and holistic nature of DBR, mentors had the space to engage in off-task talk. In a real-life setting, such as the university-based mentoring program, concerns not related to our inquiry arose and mentors used our community to discuss these concerns. Additionally, because the inquiry community engaged in their work during the pandemic, there

were unexpected variables, such as challenges with CTs, which is why examples of off-task talk reflected the holistic nature of DBR.

Chapter Six: Discussion, Significance, Implications, Future Directions

The purpose of this chapter is to investigate the underlying meaning of my research findings including the connections to the existing literature; significance and implications of my research findings to research, theory and practice, recognizing the study's limitations and how I see my work informing the direction of future research.

Discussion

I organized this discussion by the two research questions.

Research Question One: In what ways do mentors show their knowledge in an inquiry community engaged in design-based research?

Research Question Two: What conditions affected mentors' work in the inquiry community engaged in design-based research?

I returned to the two frameworks presented in Chapter Two: A Knowledge Base for Mentors and A Theory of Knowledge Development: Social Learning, to think about how my research findings confirmed and extended existing theory. As I explored the underlying meaning of my findings, I thought deeply about how the extant literature on mentor knowledge, practices, and inquiry communities might help me understand and contextualize my findings. In addition to these frameworks and literature, I report novel findings that emerged from the data and how they might add to the existing literature base.

Research Question One: What Conditions Affected Mentors' Work in the Inquiry Community Engaged in Design-based Research?

I will address research question one by unpacking the ways in which mentors made their knowledge explicit in the inquiry community and the features of DBR that facilitated this

phenomenon. To do this, I discuss how mentors showed knowledge through storytelling and through their solutions to joint problem-solving and the features of the DBR that facilitated this.

Mentors Showed their Knowledge through Storytelling

From the initial interview to the final meetings, mentors used storytelling to express their knowledge by providing stories from their rich experiences in teaching and mentoring. These stories helped mentors illustrate their knowledge to the group.

Storytelling can be used to share practice-based knowledge (Clandinin & Connelly, 1996; Salter & Kouthari, 2016). Clandinin and Connelly (1996) described teacher narratives as "storied life compositions," which reflect a teacher's history, both social and personal (p. 150). These stories may reveal the teacher's personal professional knowledge, or what a teacher knows not concerning theory, but instead concerning their practice (e.g., "how to carry out instructional tasks, resolve conflicts, adjudicate competing considerations, and connect aspirations to plans and then to instructional performance;" Elbaz (1983) as cited in Fenstermacher, 1994, p. 20).

Similar to Elbaz (1983), in this study the act of telling stories also showed mentors' knowledge of practice-based knowledge (Salter & Kouthari, 2016). In "I never thought about that," the story Beth told of Hangman illustrated enacting the practice of equity-based conversations (Achinstein & Athanases, 2003; Athanases & Achinstein, 2005; Achinstein & Barrett, 2004). She used the mentor's lesson plan as an opportunity to illustrate to the CI that the activity might be offensive or harmful to students. As stated in her participant description, Beth started her career teaching ELLs and worked for the NJDOE's Office of Equal Education Opportunity (OEEO). It is logical that Beth's experiences in teaching ELLs and working for the DOE shaped her knowledge of her practice (Cochran-Smith & Lytle, 1999).

Achinstein and Barrett (2004) posited that mentors may avoid equity-based conversations out of concern that it might negatively affect their relationship with the novice. However, Beth's comfort engaging in equity-based conversations is contrary to what Achinstein and Barrett (2004) argued. Beth did not appear to worry that this conversation might have damaged her relationship with the CI. Of course, Achinstein and Barrett (2004) research was published in 2004. As such, it is possible (and promising) that in 2022, individuals might be more comfortable and open to engaging in equity-based conversations. However, in the mentor meetings, equity-based mentoring did not emerge as a commonly addressed practice, which may mean that it was Beth's career experience that informed her mentoring on equity.

Although this was not the purpose of my research, in the "I feel like I failed," example it is impossible to ignore that as Caroline showed her knowledge, she also exposed her beliefs about teacher abilities. Recall that in that conversation, Caroline stated, "One [the CI who reacted poorly to her feedback] was Hispanic…I don't know if it was a cultural thing [imitating CI], 'You don't tell me what to do'," (Interview, 6-21).

Historically, researchers have struggled with the delineation between beliefs and knowledge (Parajes, 1992). Some consider beliefs and knowledge to be interconnected (Kagan, 1990), while others view beliefs as an entity separate from knowledge (Calderhead, 1992 as cited in Chiavola et al., 2019). In a review of the literature surrounding teacher beliefs, Chiavola et al. (2019) argued that beliefs may influence practice, possibly even more so than knowledge. For example, Parajes (1992) asserted that beliefs play a part in defining one's tasks and the tools one selects to enact them. However, discerning how beliefs influenced practice is complex and may have varied according to the individual's experience (e.g., level of experience, type of belief; Buehl & Back, 2015 as cited in Chiavola et al., 2019). In other words, if Caroline believed that

her CIs race affected their relationship, for example, this may have influenced the way she mentored her CIs.

Another example of an instance in which a mentor's beliefs were exposed as part of their storytelling was in the story "I'm a little data driven," where Abby told a story about using data to inform instruction and the importance of keeping records of student progress. Recall that in this conversation, Abby stated:

> Abby: And so I talked [to a CI] about documentation and how this is great, and no one could ever argue with data and how important data is.…So keeping data may be a step more. But when it comes to addressing needs, people are going to say they don't see the same thing you do. You have proof of it, so that. (Meeting, 6-21)

Abby's statement can be interpreted as showing a belief that the purpose of assessment is accountability. In 2015, Barnes et al., identified four types of beliefs about assessment espoused by teachers including: accounting beliefs in which teachers believe the purpose of assessment is accountability, such as reporting assessment grades to parents. Abby's example appeared to support this work.

I attributed mentors' storytelling in part to the interventionalist and collaborative design of the inquiry community. In DBR, the designer of the community must intervene (Bakker & van Eerde, 2014), but also remain aware that the community must be open, in other words, the community is set in a real-world context (Anderson & Shattuck, 2013; Barab & Squire, 2004). Interventions such as common readings and reflections that facilitated discussion, which provided opportunities for the mentors to show their knowledge through story. An example of a mentor showing knowledge that was related to an intervention is Abby's statements on data and assessment; this story originated from a quick write prompt that I created to facilitate discussion

surrounding the Moss and Brookhart chapter (2019). Because the community was set in a real-world context, the university-based mentoring program, mentors had many stories through which they showed their knowledge of this specific program and context. Additionally, mentors came to the community with this experience, and the open nature of DBR enabled them to share the stories with both me and the community.

Mentors Showed their Knowledge through their Solutions to Joint Problem-Solving

Mentors routinely discussed current problems they encountered in their practice (e.g., CI's FA practices, misconceptions, observations of CIs), or other aspects of mentoring (e.g., observations, testing). As problems were presented to the group, mentors offered solutions to the problems. In chapter 5, I argued that the solutions mentors' suggested can be seen as evidence of their knowledge.

Recall the first example, "An hour from now, do you remember?," in which mentors showed their knowledge through the solutions they offered during joint problem-solving occurred when Abby shared a quick write on a CIs use of whiteboards to discern student understanding. Caroline suggested to Abby that the CI may not have had observable data to inform grading and instruction. Although Abby defended her CI in this instance (i.e., "She was only working with one student"), she did recognize that Caroline's suggestion was a valid one. Both mentors showed their knowledge of how to identify, collect, and analyze data about the CIs teaching and students' understandings. A second example, "Trying to find alternate ways," in which a mentor showed their knowledge through the solutions they offered as the group engaged in joint problem solving occurred when Caroline shared that she was struggling to schedule an observation due to COVID-related school concerns. Abby suggested that Caroline enact

practices suggested by the university administration including using a CI's reflections when an observation was not possible.

When learners collaborated in joint activities, it provided opportunities for learning through incorporating novel influences into the learners own understandings (John-Steiner & Mahn, 1996). However, unlike Lave and Wenger's (1991) theory that group members learn from more experienced others in the group, my research findings show how mentors with equal levels of experience and expertise contributed to each other's development. Throughout the study, there were many instances in which the mentors discussed and problematized each other's work and helped each other consider and reconsider their mentoring practice and externalized their knowledge. For example, as Abby shared her quick write, or her thinking, Caroline helped her reflect on her practice by making the suggestion that the CI needed to collect data that they (i.e., students) would remember "in an hour." Caroline's suggestion resonated with Abby, she reported that she had, in the past, asked students to use a checkoff system and called Caroline's suggestion "So totally true." This may be evidence that Abby examined her thinking about FA practices more explicitly than she might have done alone (Daiute & Dalton, 1993; Salter-Kouthari, 2016), as Abby praised the CI for their use of whiteboards and did not note that the CI should have also documented what they saw even though she knew this was a good practice. My findings support the literature on mentor inquiry in that members who are assumed to be equal in terms of expertise and experience can contribute to each other's learning.

An important principal of DBR is that it occurs in a real-world setting (Anderson & Shattuck, 2012; Barab & Squire, 2004). This is important because DBR should inform theory and real-world practice (Bakker & van Eerde, 2014), which means that the participants situated in the context of the study should be able to use work of the community to inform their current

practice (Anderson & Shattuck, 2012). The real-world setting that the mentors shared, the university's mentoring program, created opportunities for the mentors to present context-specific problems of practice. This type of opportunity for context-specific problem solving was evident in the "Trying to find alternative ways" example in which Abby proposed solutions for Caroline's COVID-19 related observation concerns. Abby referenced guidance from the university's teacher education program and suggested that Caroline could have her PST complete other tasks to show evidence of her performance such as reflecting on her lessons, a practice suggested initially by the university-based mentoring program.

One idea of note is that my outsider status may have influenced the inquiry community. In their definition of DBR, Anderson and Shattuck (2012) indicated that teachers (or other participants, such as mentors) were "too busy and often ill trained" to conduct research, and the researcher was "not knowledgeable of the complexities of the culture, technology, objectives, and politics of an operating education system" (p. 17). Therefore, they suggested a partnership between participants and the researcher in the design of the study (Anderson & Shattuck, 2012). Although Anderson and Shattuck (2012) felt that the researcher-participant did not have to be familiar with the context to facilitate effectively, I felt that my lack of knowledge of the university mentoring program hindered my ability to participate in the community. I was not a mentor to clinical interns and was not employed at the university; therefore, I did not have the understanding of the local context that the mentors had. Hudson (2013) reported that mentors must know both the logistical details of a school and details of the students' needs. In the "Trying to find alternative ways" example, Abby and Caroline knew the university-based guidance for observing CIs during remote instruction; guidance that, as someone who was not part of the program, I did not have access to.

Research Question Two: What Conditions Facilitated or Hindered Mentors' Work in the Inquiry Community?

From this research study, I identified two conditions that facilitated or hindered mentors' work in the inquiry community engaged in DBR. They included: symbolic language and off-task talk.

Symbolic Language Facilitated the Group's Work

There was only one example, the use of "thumbs up, thumbs down," in this inquiry community of the members' use of symbolic language. However, it was used so frequently by the members that it became an important condition that facilitated their work. In her first mention of the phrase, Caroline used it as an example of a flawed strategy for eliciting student understanding. As time passed, other members of the group also began to use this language, "thumbs up, thumbs down" to communicate a less effective FA practice.

Because of its regular use, the language (i.e., thumbs up, thumbs down) began to take on a symbolic nature; a symbol to represent all poor formative assessment processes. Symbolic language can be viewed as a type of shorthand. In other words, when mentors wanted to communicate to the group that a FA was ineffective, they would just say "thumbs up, thumbs down" instead of presenting a new example each time, and then needing to explain it. Just the phrase alone, carried with it, all the information they needed each other to know.

The benefits of symbolic language are that it can lead the group to a shared understanding. When a group has shared understanding of stories or symbolic language, with which others outside of the group are unfamiliar, it can create a shared, practice-based knowledge and increase the group's sense of cohesion (Salter & Kouthari, 2016). Cohesion is created because there is a sense that those "in the group" have knowledge that is unknown or not

understood by those outside the group. So then the symbol comes to represent a shared understanding among the group, so much so that the symbol itself does not need to be explained every time it is utilized (Salter & Kouthari, 2016). This could also potentially increase the group's efficiency; by reducing the need for members to share and reshare stories, when they could instead communicate their point with a single phrase.

DBR's iterative and collaborative nature were principals that facilitated the use of symbolic language. The cycles of invention and revision in DBR (Cobb et al., 2003; Penuel et al., 2011) may have provided the time and space necessary for the mentors to develop a symbol. However, developing a common language cannot solely be related to the amount of time, the collaborative and social nature of DBR (Barab & Squire, 2004; Penuel et al., 2011) may have also played a part in the mentors developing a symbol that was significant to them but may not have the same meaning to those outside of the community.

Off-task Talk Hindered the Group's Work

As evidenced in the discussion of Research Question One, the mentors' talk was an important way that they showed their knowledge. However, in communities such as this, not all talk facilitated the group's work (Cochran-Smith & Lytle, 1992). Recall the example in which Caroline discussed a FA problem-of-practice, specifically how to identify student misconceptions. Unfortunately, instead of discussing that direct problem, Abby revisited the topic of CTs which stymied the group's discussion of the topic at hand.

Even though this group's work suffered when the group engaged in off-task talk, it may have served other, more positive, functions. Cochran-Smith and Lytle (1992) call off-task talk "small talk," which refers to "when teachers swap classroom stories, share specific ideas, seek each other's advice, and trade opinions about issues and problems in their own schools and the

larger education arena" (p. 310). They argued that small talk is important in creating and sustaining relationships within the community and may, once revisited in a different context, serve a larger function for the group's work (Cochran-Smith & Lytle, 1992).

In the example from the April mentor meeting, the mentors engaged in a conversation about how CTs were selected and CIs were placed. Within this story, the mentors shared ideas and traded opinions about the selection and quality of CTs. This small talk veered the group away from their selected topic: FA. However, it may have aided in creating relationships among the group members as they lamented a problem-of-practice they had all experienced. For Abby in particular, the off-task talk allowed her to demonstrate expertise in this field, as she once worked on placing CIs in field experiences for the University. So in this particular case, even though the off-task talk did hinder the group's work, it seemed to produce other social benefits.

One of the principals of DBR is that the community is both social and collaborative (Barab & Squire, 2004; Penuel et al., 2011). I made the decision to open meetings with check-ins and allow off-task talk to occur to facilitate a community in which participants felt comfortable and an important contributor to the inquiry. Something to consider here is why the mentors may have joined the inquiry community initially. Although my intentions for forming the inquiry community was to facilitate mentor's work and, possibly, inform theory, the mentors' reasons for joining the group may have been more focused on creating and sustaining relationships with other mentors of CIs. If it was the latter, then this might explain why they enjoyed and routinely engaged in off-task talk.

Significance, Implications, and Future Directions

This study addressed the research questions:

Research Question One: In what ways do mentors show their knowledge in an inquiry community engaged in design-based research?

Research Question Two: What conditions affected mentors' work in the inquiry community engaged in design-based research?

The findings related to each of these questions hold significance, implications, and future directions for theory, research, and practice.

Mentors use Storytelling to Show their Knowledge

This theme confirmed the existing literature on storytelling in that it is used to externalize complex practices of teaching (Salter & Kouthari, 2016). The mentors used stories to illustrate their complex mentoring practices and knowledge. Although much has been written about the use of storytelling (Clandinin & Connelly, 1989, 1996; Cochran-Smith & Lytle, 1992; Salter & Kouthari, 2016), there was a need to explore *how* mentors told stories, particularly in communities of inquiry. Therefore, my finding that mentors used story to illustrate their knowledge extends the theory on mentors and storytelling in inquiry communities.

A constructivist approach to learning would argue that prior knowledge needs to be accessed before new learning can take place (Phillips, 1995). Using stories might be an effective strategy to expose and then build on educators' knowledge. Given this, teacher education and PD for mentors may be able to promote storytelling as a strategy to elicit mentor knowledge. Authentic examples of how mentors used stories to show their knowledge, can be cataloged and used as teaching exemplars to prepare new mentors or improve the practice of established mentors.

Additional research is needed to see if and how storytelling can provide evidence of mentors' knowledge. Specifically, researchers might investigate how storytelling captures mentors' knowledge, what makes a good story, when storytelling is and is not an appropriate way to capture knowledge, and what other strategies can be used, either in addition to or in place of storytelling, to evidence knowledge.

I had an unexpected, but interesting finding that in telling stories mentors also exposed their beliefs. Although the relationship between knowledge and beliefs is often parsed in the beliefs literature, it was not in the storytelling research base (Calderhead, 1992 as cited in Chiavola et al., 2019; Kagan, 1990). That storytelling may be a way to expose knowledge and beliefs is an area for future research that also has implications for teacher education and development. Researchers can examine how mentors' express their beliefs through storytelling and how those expressed beliefs may have influenced their mentoring practice, what beliefs they expressed, and how or if those beliefs were aligned with knowledge or practice.

Solutions to Problem of Practice

This theme also confirmed existing literature regarding how joint activities, such as problem-solving, can provide opportunities for learners to demonstrate what they know and how they incorporate new ideas into their current understandings (John-Steiner & Mahn, 1996). However, unlike Lave and Wenger's (1991) CoPs, there were not members on the periphery. Instead, in this inquiry community, all members had experience both in teaching and mentoring. Despite their equal status, they still problematized each other's work, and contributed solutions to each other's problems. Therefore, although much has been written about levels of unequal participation in CoPs, there is a need to explore how

participants with similar levels of expertise, in this case mentors, problematize each other's work.

To do this, researchers can examine how experienced teachers and mentors problematize each other's work. To do this, we need opportunities for mentors to work in communities where they are encouraged to engage in joint activities to examine the ways mentors engage in this problematization, and how this problematization shows mentors' knowledge. Because joint problem solving can help teachers to incorporate new ideas into their current understandings (John-Steiner & Mahn, 1996), teacher educators can use joint problem solving to elicit preservice and practicing teachers' knowledge. Similarly, practitioners in K-12 schools could also engage in professional development that encourages mentors to discuss and problematize their mentoring practices to show, and perhaps develop their knowledge.

Confirms and Extends Theory on Mentor Inquiry Communities

The current study affirmed existing theories of teacher knowledge and social learning theory. In the mentor inquiry community, the members engaged in shared work surrounding a research-based practice they selected. This shared work allowed the mentors to speak about and examine their thinking on their mentoring practices (Daiute & Dalton, 1993; Salter& Kouthari, 2016). During this process, the mentors suggested solutions to their selected problem-of-practice (Cochran-Smith & Lytle, 1992) by talking and listening as they collaborated on a joint task of researching, creating and testing the FA protocol (Daiute & Dalton, 1993; Scardamalia & Bereiter, 1989). Ultimately, the findings of this study reflect previous research concerning knowledge in an inquiry community.

In addition to confirming existing theory – this research also extends theory by suggesting *how* teachers showed their knowledge in a mentoring inquiry, and that symbolic language facilitated mentors' work. It also confirms and extends what we know about the conditions that facilitated and hindered mentors' work in the inquiry community.

That teacher educators can use inquiry communities, and specifically the techniques of storytelling and joint problem solving, as ways to expose mentors' existing knowledge, is a promising application of this work to practice.

Symbolic Language Facilitated the Group's Work

Narrative devices, such as symbols, may aid in creating a shared understanding in an inquiry community (Salter & Kouthari, 2016). This symbolic language may create shared, practice-based knowledge within the group (Salter & Kouthari, 2016). This was true for the inquiry community in this study. The mentors created a symbol - thumbs up, thumbs down - which came to mean poor FA practices to the group. The mentors used it often as a shorthand for poor FA practices in order to arrive at the point of their talk promptly. However, it is of note that this was the only symbol that became common language for the group.

Although the use of symbolic language in a CoP has been explored, the use of symbolic language in a mentor inquiry community has not. Particularly, how and why the mentors used the symbol and what it meant to them. Future research into this topic is necessary to determine how and why mentors use symbolic language in an inquiry community, particularly because there is only one specific, ongoing example in this community. Researchers could also examine what symbolic language is used in differing contexts and focuses. For example, when discussing FA practices, the mentors used an FA

practice (thumbs up, thumbs down) as a symbol; if studying a different problems-of-practice or other research questions, might affect which symbols are selected and why? Teacher educators may want to consider how to use symbolic language to facilitate PSTs knowledge of practice and to create a common language for their specific contexts.

Off-task Talk Hindered the Group's Work

The last finding was that off-task talk hindered the mentors' work in the inquiry community. Inquiry community member talk is an important way that members showed their knowledge (Cochran-Smith & Lytle, 1992). However, in communities such as this, not all talk facilitated the group's work, even though in some instances it led to other social benefits. Therefore, future research could focus on longitudinal studies in which small talk and the ways in which it is revisited could make explicit or even generate mentor knowledge. Teacher educators may want to encourage small talk in appropriate situations to not only build camaraderie, but also to serve a larger purpose generating future topics for the group to discuss.

Principals of DBR

The design principals of DBR – interventionalist, open, holistic, social and collaborative, context-specific, focused in theory, and iterative – fostered an inquiry community in which mentors showed their knowledge. However, further study is needed regarding how storytelling and joint-problem solving can be encouraged through the principals of DBR. Additionally, how the iterative nature of DBR may facilitate a shared language among participants. Researchers may want to more closely study how each principal fostered storytelling, joint-problem solving, and common symbolic language in a DBR community.

However, a novel finding in this study related DBR was the researcher-participant's understanding of context may have hindered the mentors' work. In other words, although I knew the details of the University's mentoring policies and practices, I had never been a mentor of CIs for the university myself. It is important for other researchers interested in taking on the role of researcher-participant in an inquiry community to consider their understanding of the context of the group. Although I was comfortable engaging in research and discussing research-based practices, because I was not a mentor, I was less familiar with the context of the University's mentoring program, which impacted the group's work. Although DBR does not require the researcher to also be a participant (Bakker & Van Eerde, 2014), perhaps it may be beneficial for the researcher-participant to be embedded in the context of the inquiry community.

More study is also needed concerning the role of a researcher participant, such as how does their outsider status influence their decisions or affect the group. When engaging in future research concerning the researcher-participant role in an inquiry community, researchers may want to explore what choices the researcher-participant makes and, additionally, how they explain those choices to the group. In other words, just because the researcher-participant has a good plan for the inquiry community, the way they enact that plan may facilitate or hinder the groups' work. Finally, in inquiry communities in PK-12 school districts, educational leaders who may make decisions for inquiry communities should be careful to consider both what work they select for the teachers in the communities and how they explain that work to the teachers.

The last finding that hindered the mentors' inquiry community was off-task talk. Inquiry community member talk is an important way that members showed their

knowledge and it also may generate ideas for future inquiry (Cochran-Smith & Lytle, 1992). Therefore, future research could focus on longitudinal studies in which small talk and the ways in which it is revisited could make explicit or even generate mentor knowledge. Researchers may want to encourage small talk in appropriate situations to not only to facilitate the social and collaborative nature of DBR, but also to serve a larger purpose generating topics for the future inquiry.

Limitations

The limitations of my study were its possible lack of generalizability because of a small sample size. However, this small sample allowed me to delve deeply into the study of one mentoring inquiry community and provide insights into how mentos show their knowledge.

Another limitation of this study was the use of purposeful convenience sampling to select mentors involved in the university's CI mentoring program. The inherent bias in convenience sampling meant that the sample was unlikely to be representative of other university-level mentoring programs.

A third limitation was my personal bias towards mentoring and collaborative practices. Throughout my career, I have had positive experiences working in professional learning communities and participating in mentoring, whether it was being a mentor or being mentored. As said previously, I used my researcher's journal as a way to address my bias.

Conclusion

This study served to examine how mentors showed their knowledge in an inquiry community and how features of an inquiry community might facilitate or hinder mentors' work while engaged in DBR. Mentors showed their knowledge through their storytelling and problematizing each other's work. The inquiry community was facilitated by shared symbolic

language. Mentors' off-task talk hindered the current work of the community but may have opened up new avenues of inquiry for the mentors in the future. The principals of DBR may have supported mentors in showing their knowledge and engaging in collaborative inquiry.

It is important for mentors to have a bifocal knowledge base to mentor PSTs (Achinstein & Athanases, 2006). Mentors must have knowledge of learners and learning, curriculum and teaching, and contexts and purposes; they also must be able to focus this knowledge base on both student needs and PST needs, a daunting task (Achinstein & Athanases, 2006). One way to address this task is through collaboration in mentor inquiry communities. If an inquiry community can expose mentor knowledge, it may also be a place where mentors can develop knowledge. However, although inquiry communities are forwarded as beneficial, not all communities function ideally; therefore, it is important to discern what conditions facilitate or hinder these communities. The principals of DBR may be a successful methodology for an inquiry community, such as the one in the study. This study serves as an initial exploration of how mentors showed knowledge in an inquiry community and the conditions that facilitated or hindered their work while engaged in DBR.

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Appendix A: Table of Studies

Authors, Year	Purpose	Participants	Design/ Methods	Findings	Subhead
Abramo & Campbell, 2019	To study mentor teachers' conceptions of educative mentoring	Five cooperating music teachers mentoring pre-service teachers	Qualitative Study Mentor survey Mentor focus group Individual mentor interviews	Four themes garnered from mentors' responses: conceptions of mentoring strategies of mentoring learning to be a mentor refinements of their original conceptions of mentoring.	Mentor Practices
Achinstein & Fogo, 2015	To discern what mentors need to know and do to develop novice teachers PCK	A mentor and his two novice teachers	Qualitative Study Transcripts of mentor and novice meetings, videos of teaching, interviews with mentor and novices, and documents related to teaching and mentoring.	Two themes of mentor knowledge: knowledge of novices' PCK and knowledge for developing novices' PCK.	Mentor Knowledge

Achinstein & Athanases, 2005	To address what knowledge and skills mentors need to mentor novices who teach culturally and linguistically diverse students.	A mentor and novice pair, 37 mentors	Qualitative Study Survey of mentors regarding knowledge Case study of mentor and novice	Mentors need a bi-level and multi-domain knowledge base, targeting both students and teachers. Mentor used organic opportunities during mentoring conversations to address novice equity related beliefs and practices, including offering strategies for students of differing abilities, and emphasizing students' strengths.	Mentor Practices

Athanases & Achinstein, 2003	To determine what mentors need to know and do to help sharpen novices' focus on individual student learning and growth	37 teacher induction leaders and two case studies of mentor/mentees involved in a mentoring program in California	Mixed-methods questionnaires, Case Studies audiotapes and transcripts of mentoring conversations, taped interviews with mentee and mentors	Five areas of knowledge a mentor needs for mentoring for equity. Case study mentors show knowledge of assessment through collaborative analysis of classroom data. Case study mentors' knowledge of multiple domains of assessment is powerful and complex.	Mentor Knowledge
Achinstein & Barrett, 2004	To examine how mentors frame or reframe novice's thinking or how mentors shape novices practice	15 novice teachers and 11 full-time release mentors with at least 15 years of experience	Case study Audiotapes and transcripts of mentoring conversation, observations and videos of classroom practice documents of collaborative mentor and novice work	Mentees often used a managerial frame Mentors also used this frame, and the human relations frame the political frame To do this mentors used reframing or examine the situation from multiple perspectives.	Mentor Practices

Ambrosetti, 2014	To investigate "the role of professional development in the preparation of mentor teachers for their mentoring role"	11 mentors	Qualitative Study PD with corresponding survey	Mentor preparation influenced mentors understanding of mentoring and an awareness of mentoring practices.	Mentor Knowledge
Barnett & Friedrichsen, 2015	To study how educative mentoring practices help a mentee develop PCK, specifically the strategies an educative mentor might use.	A science teacher and her mentee	Case study Audio recordings of mentor and mentee observations, interviews individual journals	Five educative mentoring strategies which increase topic-specific knowledge of secondary school biology: comparing teacher-centered practices to student-centered practices, modeling instructional strategies and critical reflection of these strategies, highlighting common student misconceptions, helping analyze and then revise assessments	Mentor Practices

		to better align with the curriculum, helping develop topic-specific curriculum knowledge through collaboration

Betlem et al., 2019	The aim of each inquiry group was to study a PD model for mentors	Two inquiry communities, both of which included mentors and other stakeholders	Qualitative Study Focus groups and individual interviews	Sustained, cyclical nature of the inquiry positively impacted all participants.	Inquiry Community
da Graça Nicoletti Mizukamia et al., 2015	To identify how mentors contribute to a PD community, how these mentors appropriate the current knowledge in the area to have tools for their management of beginning teachers, and how they make explicit their professional knowledge	Three mentors and nine novice teachers	Qualitative Study Mentor journals Videotapes of mentor and novice meetings	Mentors needed a disposition to seek theory to support their mentoring practices, an understanding of the teachers' formative processes, and an ability to research and analyze their own mentoring practice and to communicate their findings to others.	Mentor Knowledge

da Rocha, 2014	The author was interested in what factors helped to establish successful mentoring, how mentoring could help build novice professionalism, how in-service preparation facilitated novice's burgeoning professional life, and the role of social and digital networks in challenging new teachers' professionalism.	Novice teachers (n=42), mentors (n=35), and principals (n=32)	Mixed-methods study Surveys group discussions with all stakeholders individual interviews	To enact successful educative mentoring, the principal must be willing to establish a program and support mentors. Regional context is important to mentoring. Mentors must volunteer, be given time to mentor, be reflective in their beliefs and attitudes, and develop a trusting relationship with mentees.	Mentor Practices

Gilles & Martille, 2009	To investigate both how and how much a school-university partnership might influence P-12 teachers	University of Missouri and one school (Senior Year On-Site Program (SYOSP), and interns (student teachers); and second, the Teaching Fellowship Program), 11 teachers, 12 mentors (past and current), 2 administrators, 1 school-university liaison	Qualitative Study Individual interviews of 30 to 60 minutes	The school's action research created a synergistic relationship with the university. The mentors and principal fostered professional communities in the school. The mentor linked resources from the school to the university and vice versa. The principal supported the teachers and set an agenda with them.	Inquiry Community

Grimmett et al., 2018	To bring schools and universities together with the goal of improving the experience for all participants	Five mentors selected from a school-university program	Qualitative Study Semi-structured interviews	The authors found that mentors reported shifts in how mentors understood and enacted their role. They also noted that mentors reported a change in how they viewed themselves; previously they felt like "anonymous," but repositioned themselves as fellow teacher educators.	Mentor Knowledge
Hudson, 2013a	To determine how mentors perceived their professional development as a part of the mentoring process.	Australian study 101 mentors for a survey 10 mentors for interviews	Mixed-methods Survey for 101 mentors after a four-week mentoring experience. Interview for 10 mentors after a four-week mentoring experience	Mentors reported mentoring on pedagogical knowledge practices of literacy, numeracy, and science The mentors reported that mentoring can act as professional development, can enhance leadership and can bolster communication skills	Mentor Knowledge

Hudson, 2013b	To explore mentoring of pedagogical knowledge and to explore the professional needs of mentors	Australian study 27 teachers, all of whom had mentored a PST	Mixed methods Survey and interviews	PD for mentors builds capacity for quality mentoring of PSTs through clear mentoring practices, and reflecting and deconstructing teaching practices for mentors	Mentor Knowledge
Hudson & Hudson 2011	To examine the importance of mentors' pedagogical knowledge	Australian study 14 university academics and teachers who were nominated by their principal	Qualitative Study Written responses, recordings of meetings	Determined eleven strategies mentors could use to facilitate PSTs pedagogical knowledge development	Mentor Knowledge

Langdon, 2014	To determine if and how mentors learned and developed through these programs, if the substance of those programs reflected the goals established by the inquiry community, and if mentors' practice reflected the intent of those goals	13 mentors with their novice teachers	Qualitative Study Recordings of mentoring conversations Interviews and focus groups of mentors	Content of mentoring conversations did not consistently reflect educative goals. Mentors who committed to two or more years of engaging in the inquiry cycles were more likely to engage in conversations with their mentors that reflected the goals they set in their inquiry communities.	Inquiry Community
Langdon, 2017	To study mentor's preconceptions concerning mentoring, how mentor knowledge and skills were reflected in mentor's stated intentions and in their program, with mentees, and how the mentor community affected learning	Two mentor teachers in New Zealand	Two case studies Mentor reflections, action research documents, field notes, interviews, focus groups, mentor-mentee conversations	The development of mentor expertise is complex and takes time, and mentors' self-confidence and school context can affect the development of the expertise	Inquiry Community

Langdon & Ward, 2015	To understand the knowledge, attitudes and skills needed for mentors to focus on students, novices, and their own learning	22 mentor teachers	Qualitative Recordings, Documentation Reflections	There was a shift in mentoring practice from a focus on the transmission of knowledge-for-practice to inquiry into knowledge-of-practice, but it took a long time and was not guaranteed	Inquiry Community
Michailidi & Stavrou 2021	To determine how mentors support novice teachers to implement cutting-edge research topics in classrooms	5 mentors, 32 mentees They were divided into 5 Communities of Learners	Qualitative Research Recordings of the CoL meetings	There are 4 mentoring roles: initiator, imperator, advisor, encouraged. Mentors engaged in mentoring conversation in different roles. .	Mentor Practices

Norman, 2011	To create and study an inquiry community focused on lesson planning and conversations about mentor and novice's practices	Six veteran teachers who had all served as cooperating teachers the previous year	Case study Recordings of teacher study groups collected relevant documents interview mentors individually and as a group	There was a lack of consensus on a vision of good teaching between herself and the mentors, and, although the mentors understood that they played a role in teaching mentees lesson planning, their ability to reach shared understandings was stymied	Mentor Practices
Parker-Katz & Bay, 2007	To investigate mentor knowledge, what it is what guides mentors' actions with novices, and how that shapes their use of mentoring.	17 mentors	Qualitative Study Transcripts and observations	The authors presented three themes that emerged from the discussions: not what, but who; focusing on pupils' learning as the means to learning about teaching; and changing the image: teacher learning as collective responsibility	Mentor Knowledge

Pylman, 2016	To explore how a mentor used video of co-planning sessions to reflect and develop educative co-planning	One mentor teacher with a year of mentoring experience, 1 pre-service intern, and one researcher coach.	Exploratory Case Study Video recordings of mentor-intern meetings and mentor writing reflections, debriefing sessions, semi-structured interviews with the researcher coach	Intentional, educative co-planning is important. Video can be used for mentoring reflective practice. Mentors need time to learn, discuss, experiment and reflect on their practice.	Mentor Practices
Sempowicz & Hudson, 2018	To examine how mentoring may facilitate PST's behavior investigates how mentoring may facilitate the development of a mentee's behavior management strategies	One mentor and PST pair	Qualitative Study Researcher observations, mentor-PST meeting recordings, audio recordings of teaching, lesson plans, written reflections, evaluations, individual interviews	Mentor supported the mentee in classroom management practices through talk and time. The pairing of mentor and mentee was positive, which may have influenced the pairing.	Mentor Practices
Schwille, 2008	To explore "the relationship between contexts of mentoring and mentoring practice" (p. 142).	26 novice or preservice and mentor pairs from U.S., England, and China	Cross-national study (article based upon this study) Methods unclear	Mentoring to help preservice and beginning teachers learn to teach is a professional practice with specific skills that must be developed and	Mentor Practices

				honed over time.	
Stanulis & Floden, 2009	To determine if intensive mentoring, as part of a larger induction program, improved novice teaching practice	24 novice teacher (12 comparison, 12 treatment)	Mixed methods Researcher observation of all teachers Survey of novice teacher	Intensive mentoring focused on balanced instruction improved novice teaching practices.	Mentor Practices
Stanulis et al., 2019	To understand what educative mentoring practices look like through a mentor's eyes	10 mentor teachers selected from a larger pilot program	Qualitative study Audio recordings of mentoring conversations with the mentee, written reflections, video recordings of MSGs, one interview with each mentors	The authors identified three common practices of any mentoring practice: planning and co-planning, observing and debriefing, and analyzing student work. To make these practices educative, the mentors must be provided with targeted learning opportunities that provided	Mentor Practices

				ongoing support.	
Tonna et. al., 2017	To examine reflective practices of mentors across three studies	Three studies Norway, Malta, and Ireland	Qualitative Study	Reflective conversations reduced fear of evaluation and reflective practices enabled the novice to gain confidence in their teaching, identify their learning needs, and develop their skills.	Mentor Practices

Thomassen & Munthe, 2021	To determine how mentors perceive their work in giving PSTs opportunities to learn and practice in multicultural and multilingual classrooms in Norway	654 PSTs and 340 mentor teachers	Quantitative Study	There was a "variation in perceptions in both groups of respondents" (p. 245). Mentors believe they need a knowledge of multicultural and multilingual practices.	Mentor Knowledge
Yendol-Hoppey et al., 2008	To illustrate ways that inquiry-oriented Professional Development Schools (PDS) can help individual schools improve	Four PDS in four different schools	An article reporting on the schools	Although there are many ways to enact a PDS, a PDS can increase both professional knowledge and professional content knowledge. PDS can also give K-12 school stakeholders the tools to enact change.	Mentor Inquiry

Appendix B: Application to Join a Mentoring Inquiry Community

Name (Last, First):

Email Contact:

How long have you been mentoring new teachers?

Did you mentor a new teacher last year? If so, what subject and grade level did the new teacher teach?

Are you mentoring a new teacher this upcoming school year? If so, what subject and grade level will the new teacher be teaching?

What do you hope to gain by joining a mentoring inquiry community?

Appendix C: Data Collection and Analysis Timeline

Data Collection

Data Source	Month, Year Collected	Purpose	Sample Question (if applicable)
Demographic Questionnaire Five prompts	January 2021	To gather background information	Please choose a category that most closely describes your race: Please indicate the highest level of education you have achieved:
Initial Questionnaire Six prompts	January 2021	To collect initial information on mentors' conceptions of mentoring	What makes for effective teaching in your subject area? How do you develop yourself professionally?
Semi-Structured Interview 1 M = 46 minutes 13 questions	January 2021	To collect information on mentors' knowledge and conceptions of collaborative practices	How do you describe your role as a mentor? In what ways do you currently collaborate with your fellow mentors?
Semi-Structured Interview 2 M = 49 minutes 17 questions	June/July 2021	To reflect on their experiences in our inquiry community and about their current beliefs on mentoring, formative assessment, and collaborative practices	Has your understanding of formative assessment changed at all since we started our community? Were there any moments or comments from other mentors that stood out to you? If so, what?
Meetings	February – December 2021 (excluding July, August, and September)	To engage in inquiry	N/A
Artifacts Mentor reflections Emails	Throughout the study	To support our understanding of the case and to help develop rich descriptions	N/A

Shared materials Mentor log of meeting Meeting agendas and slides Meeting notes Researcher's journal	To triangulate with transcripts and interviews to ensure internal validity

Appendix D: Demographic Information Questionnaire Items

Background Information

Race: Please choose a category you feel most closely represents your race. You may select more than one option or self-describe.

- ○ African American
- ○ Anglo-American (Caucasian)
- ○ Asian-American
- ○ Hispanic-American
- ○ Native American
- ○ Self-describe:

Please describe your gender:

How old are you?

- ○ 21 – 31
- ○ 32 – 42
- ○ 43 – 53
- ○ 53 or older

Education: Please indicate the highest level of education you have attained from the list below.

- ○ Bachelor's Degree
- ○ Bachelor's Degree plus some graduate level courses
- ○ Master's Degree
- ○ Master's Degree plus some graduate level courses
- ○ Doctoral Degree

What grade level(s) do you currently teach?

What content area(s) do you currently teach? (you may select more than one)

- ○ All subjects (self-contained classroom)
- ○ Art
- ○ English
- ○ Foreign Language
- ○ Language Arts
- ○ Mathematics
- ○ Music
- ○ Physical Education
- ○ Science
- ○ Social Studies
- ○ Special Education
- ○ Other, please describe:

Appendix E: Initial Questionnaire Items

Teaching

1. How do you describe your overall teaching approach?
2. What makes for effective teaching in your subject area?

Professional Development

1. How do you develop yourself professionally?
2. What professional learning experiences have you engaged in during the past five years?

Lesson Planning

1. When creating a lesson, how do you decide the instructional goals and the objectives?
2. How do you select the lesson activities?
3. How do you select the lesson resources?

Appendix F: Initial Interview: Mentors

Purpose of interview: to gather participants reflections of themselves as mentors, the process of mentoring, and engaging in collaborative practice.

Introduction
Hello _____. Thank you for meeting with me and for the opportunity to discuss your teaching. As a reminder, this study is about your professional vision, and how it develops because of participating in an inquiry community. This interview should take approximately 50 minutes. Please answer the questions to the best of your ability. I am just as interested in negative responses and comments as positive responses and comments. There are no wrong answers, just different points of view. Although I will audiotape the interview your identity will never be revealed or connected in any way to your responses or comments. You are free to stop participating or withdraw at any time. If I pose a question you would like to skip altogether or come back to just let me know. Also, if you make a comment that you do not want included in the study, you may ask me at any time to strike it or erase it from the audio.

Example Questions:
How are you doing?

Mentoring

1. How do you describe your role as a mentor?
2. What do you feel are important roles and responsibilities as a mentor?
3. What do you believe mentor's need to know about mentoring novice teachers?
4. What qualities do you think a mentor should possess?
5. What makes a good mentor?
6. How supportive is your district and school administrators of the mentoring process?
7. Describe a time when you felt successful as a mentor.
8. Describe a time when you experienced frustration as a mentor.

Collaborative Practice

1. In what ways do you currently collaborate with your fellow teachers?
2. Have you ever collaborated with a teacher outside of your discipline? If so, tell us a little about that experience.
3. On what do you currently collaborate with your fellow teachers?
4. What are your expectations for collaboration with your fellow teachers?
5. What do you learn from collaboration with your fellow teachers?

General prompts to elicit elaboration:

- Can you tell me more about that?
- What do you mean by….?
- Can you give me an example?
- Why do you say that?
- I noticed that you did….can you explain why…?

Appendix G: Reflection Interview: Mentors

As a reminder, this study is about your professional vision, and how it develops because of participating in an inquiry community. This interview should take approximately 50 minutes. Please answer the questions to the best of your ability. I am just as interested in negative responses and comments as positive responses and comments. There are no wrong answers, just different points of view. Although I will audiotape the interview your identity will never be revealed or connected in any way to your responses or comments. You are free to stop participating or withdraw at any time. If I pose a question you would like to skip altogether or come back to just let me know. Also, if you make a comment that you do not want included in the study, you may ask me at any time to strike it or erase it from the audio.

1. What is your definition of formative assessment?
    a. Has your understanding of formative assessment changed at all since we started our PLC?
    b. If so, what would you attribute this to?
2. Can you provide an example of formative assessment?
3. What does formative assessment look like for K and Pre-K? 1-5? 6-12?
4. What is your definition of feedback?
    a. Has your understanding of feedback changed at all since we started our PLC?
    b. If so, what would you attribute this to?
5. Can you provide an example of feedback?
    a. What does feedback look like for K and Pre-K? 1-5? 6-12?
    b. How would you coach a CI to give effective feedback?
    c. When conferencing with your CIs next year, in what ways (if any) do you plan on addressing how and when feedback is delivered?
6. How would you define an “open question”?
7. A “closed question”?
8. Has your understanding of these terms changed at all since we started our PLC?
    a. If so, what would you attribute this to?
    b. Can you provide examples?
9. How might you mentor a CI to create more open questions and follow-up questions?
10. Has your thinking about coaching a CI changed?
    a. If so, in what ways?
11. In our group meetings, did any discussions stand out?
12. Were there any moments or comments from other mentors that stood out to you?
    a. If so, what?
13. What have you shared in the meetings that you felt added to or pushed people’s learning?
14. How would you define my role in the group?
    a. Can you provide an example of this role?
15. I’m so glad you are going to continue learning with me. What made you decide to continue with the group?
16. What, do you think, are the purposes of collecting data (evidence of student learning)?
17. You mention that you will use some of the group’s ideas and our readings in your own teaching, can you provide examples?

Appendix H: Codebook

Code	Definition	Example
Talk		
Storytelling	When mentors told stories.	I said to her a supervisor once told me when I started teaching that "You don't cover the book, you uncover the book. Do you understand what that means?" She said, "No." It's that mentality, where, if I plug in the hole, it's good enough. Everything was just good enough. She didn't have a basic understanding of whether they learned it. She just executed it and the execution wasn't good and she moved on and I don't think she had the… What should I say? Some student teachers just happen. They're born to be a teacher. She…no. She took every shortcut there was to take, and when she showed me a video I went right on Teachers Pay Teachers and there it was. Then she told me she made herself. (Caroline, Meeting, 12-21)
Off-Task Talk	When mentors engaged in talk that was not focused on FA practices but was focused on other issues or problems.	"So the question is how do..I am probably going off topic… but how do these individual CTs get student teachers? Some of them, maybe, should not receive student teachers, because they're in it for the wrong reasons. I don't know. (Beth, Meeting, 4-21)
Questioning	When mentors asked direct questions related to problems-of-practice. These could be focused on our topic of inquiry or other topics related to mentoring.	"You know, sometimes the feedback or the acceptance isn't there. So how do you go about that? How do you reach that student teacher? Those are some of the things I'd like to focus on too because I struggle with that, you know? I mean sometimes I'm very forthcoming and I kind of see that I'm not received the way I should be received. So how do you…." (Caroline, Meeting, 4-21)

Helping	When mentors offered help on specific problems of mentoring practice.	Abby to Caroline about a COVID-related observation problem: "It'd be interesting because maybe she could write you reflections about what goes on. Like what lessons does she deliver? How does it go? She could show you all the stuff. She could talk about it and then give you her reflections on it, if you can't be there. And then talking to her co teacher, her cooperating teacher." (Meeting, 2-21)
Sharing	Mentors either verbally shared suggestions for books, speakers, videos or emailed me or the group an item of interest.	Debbie shared a FA YouTube video: "Thought this might be of interest. There is a plethora of information on this topic!!! (No doubt you know this already!!)" (Email, 4-8-2021)
Mentor Practices		
Conversations	When mentors reported having conversations with CIs.	"I'm talking to my student teacher yesterday, and I was caught in between a couple of assignments, so I. say, "Look I'm not going to get home to do the pre-conference. Can we just talk? I'll talk to you in my car. I have your lesson plans. I always bring your lesson plans with me, is it because you never know. And ''m looking at the lesson plan. And she says, for her culminating exercise or culminating activity she's gonna play, in second grade, Hangman. I go, "Oh?" She's says, "I got that from Teachers Pay Teachers."... I've been doing this for 47 years plus so I said, "I don't think that is appropriate in today's setting, today's world." She goes, "Really?" I said, "Think about it I know some of the students in your class are…it's a very r'cially diverse…" (Beth, Interview, 7-21)

Planning	When mentors reported either planning with CIs, examining CIs lessons, or providing feedback on CIs lessons	"It's not and sometimes it's a scripted, you know, curriculum, so they don't get to do what they want. They don't get to bring in what they want and it's like, "Okay, what if this was your classroom, and you were allowed to do things. Tell me what you would do differently?" I've even asked them to write different lesson plans sometimes," Okay, I know what I'm going to see but tell me, what would it be for you?" Write me a lesson plan that would be for what you would do with it. If you didn't have the slides that you had to present." (Abby, Interview, 7-21)
Data	When mentors reported discussing data or examining data with their CI.	"And so I talked [to a CI] about documentation and how this is great, and no one could ever argue with data and how important data is. Just like a lot of them use exit tickets, which is fine, but if you don't do anything after you look at those exit tickets, what do you do with them? So if you just do it to find it and then you don't address it, then what's the sense of doing it? So I'm a little data driven. And I know that teachers don't always have the time to do it, but being the learning consultant on a child study team, I say to these teachers: "What happens if a parent comes to you and the kid has a C. And you say, "They are weak in this…" And they say, "Oh not at home, He can do all of this. You're wrong." What are you going to show them so…if you're doing it in your head you can't show it. So keeping data may be a step more. But when it comes to address needs, people are going to say they don't see the same thing you do. You have proof of it, so that." (Abby, Meeting, 6-21)
Reflecting	When mentors reported either reflecting with CIs or encouraging CIs to reflect.	"It [video taking a lesson] was so effective. I wish I could do that with everybody because we went over together and, not only that, I was able to stop it, and say,

		"Well, why did you do this? Or can you tell me about that? So it gave you such a better understanding of the lesson or the moments because you've got to get all that background information…" (Abby, Meeting, 12-21)
Formative Assessment (FA)	When anyone in the community discussed FA practices.	"...I have to just share one example of this high school situation that I was in…I think what she did in this particular lesson was good. It was an English lesson and she gave a quote to each individual and they would have to reflect on it…each student was given a slide they had to respond and their statements blew me away! Because they had something concrete to respond to, there was no right or wrong answer, but the creativity was through the roof. I love that and that was her last lesson and I said, Amen!" (Beth, Meeting, 5-21)
Mentor Knowledge		
Learners and Learning	When mentors showed their knowledge of learners and learning. The learners and learning could be related to CIs or PK-12 students.	"I've also told them [CIs] to you have to be aware of teaching with intention, but on top of that, I told them when you're about to give this lesson, set it up with your students. I stood all the time, "Guess what? Mrs. Murphy is going to count to 15, any question that I ask, I'm going to wait. I'm going to give some time for you to process. Also, Ms. Murphy's going to call on some students that don't have their hands raised." I've set it up all ahead of time, so they're [students] thinking about where I'm going with this lesson as well. "I'm going to probably call on a few of you that don't have your hands raised so I'd like you all to.. " And that really helped, I think, because they knew what to expect. They knew what to expect with my questioning. What was coming, what to do." (Caroline, Meeting, 5-21)

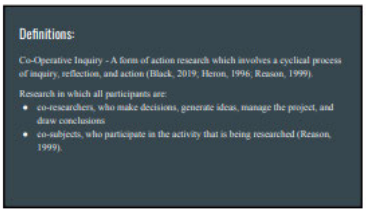
Curriculum and Teaching	When mentors showed their knowledge of curriculum and teaching. This could be in relation to the subject matter they taught and experiences they had when they were teachers or it could be in relation to curriculum the CIs were teaching or their teaching practices.	Abby: [This example is of] a teacher in a third-grade class. It was math and she was reinforcing…she worked in a small group. She worked with a student who was having trouble understanding and she took out the manipulative [what was it]. She had a whiteboard. She went over problem after problem using the manipulatives on the whiteboard and they did problems together and then she left him alone to do the second page using them. So he could use the manipulatives on his own. He can use the whiteboard on his own and then he transferred the answer. So that was just more. You know it was just very observable. Caroline: Right, but even the observable ones where they do use little mini whiteboards and they hold it up, but then my questions to the student teacher is "So who got it right? An hour from now do you remember? Do you have a checklist? How do you know they got it? What if the parents say, "How is the child doing?" Do you really know? You're not going to remember with a class of 25 kids who held one and who held another." You know? I'm trying to teach them that when you're in the classroom it's just not that simple, especially in grades. When you have to give grades, right? (Meeting, 3-21)
New ideas or conceptions	When mentors expressed that an idea was new to them or that they have never considered something before.	"I never thought about it, like, because it's preschool, so like, you know, they did A one week and then they do B another week and. Like do they go back over the alphabet for A and B? And do they go back "Go get me a's and b's!" And so they use scavenger hunts, they all kind of like they're all very good and enthusiastic and they have really good like they apply it to things in their house and then they run and get it, and then they come back and they really have good control because they come back like and they want to show it. So they, you

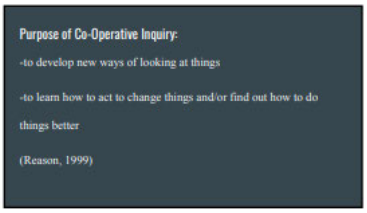
		know, it's all but like where does it connect to like? That's a really good question." (Abby, Meeting, 3-21)
Confirmed ideas or conceptions	When mentors confirmed each other's ideas or conceptions.	Caroline: Explicit, right. "I'm not just going to call on someone with your hands raised. If you raise your hand right away, I'm going to ask you to put it down. We're going to all process the question first and give you time to think. And then, after that I will call on you and tell you to raise your hand or I may call on someone else who doesn't have their hand raised because I'd like you to unpack your thinking and tell me what you're thinking about the questions. High level questions also. Not just yes or no questions. Abby: Right, I see that in elementary school more than I see it in upper grades. They use popsicle sticks and they use stuff so a lot of people [students] they're used to getting called on. Because they're using different ways of just picking out whenever your name comes. And the wait time is really important, another is yours. And so they're just not jumping the gun and just coming to the first thing, but once you get beyond elementary school, like, I don't see people in the middle school that I was in or in high school using popsicle sticks. They are not choosing people who are not raising their hand. (Meeting, 5-21)
Other Factors		
COVID	When anyone in the inquiry community discussed issues of the pandemic.	"One student teacher, his CT has been quarantined for months now with COVID. So he's been flying by the seat of his pants and doing what she gives him. There's a story for every one of my kids. My one student teacher, she teaches at Roselle, none of the kids can see one another, it's only audio. What's that about? So how is

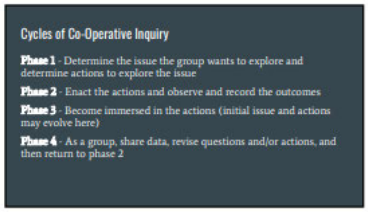
		she going to really assess when it's only audio? She can only hear they can't see what..nobody can see anyone. Then the other one in Newark they are waiting for…they had to get a permission slip back from the parents to say that I can watch her record her lessons. That just came in this week. So every situation has been challenging." (Caroline, Meeting, 3-21)
Testing	When mentors mentioned standardized assessments, such as New Jersey Student Learning Assessment (NJSLA), a state standardized test given to students in grades 3-11, or edTPA, the state-sanctioned performance assessment for PSTs.	I don't think it [NJSLA] tells us a lot and I think that they should really wave it. And now with this year, they really need to wave it because everybody's at different levels and have different access and you're going to give a state test? And what if you're not in school? You're going to give it from home? It's just, really? Come on. And here I am the test prep coordinator for [the University] and I feel so bad for those teachers, because they have to do edTPA on top of all of that [clinical internship during a pandemic]. (Abby, Meeting, 2-21)
Context	When mentors discussed the University context. This could involve logistics of their practice (e.g. who to email about a concern, how many CIs are place with one mentor) or it could involve policy and practices of the university (e.g. a change in the program, a change the computer system in which evaluations are entered).	Abby:...But I really want to try to get…now that we're moving towards being year mentors, moving some of that into Clinical I as discussions, so you could see it in clinical II. Because you only do two observations in Clinical I. Beth: Yeah, that's what I''m experiencing with my other University, which I like. So then I'm finishing up my practicum for the interns, but I'm still with them for the regular student teaching and it's nice to have that continuum because you can really see how much they have grown. Abby: Right and you can start practicing this stuff right away in Clinical II you can set it up in Clinical I. Then to carry it on instead of trying to put it into Clinical II where like you're kind of implementing it later. Like if you have it set up it will work well for your other university. (Meeting, 11-21)

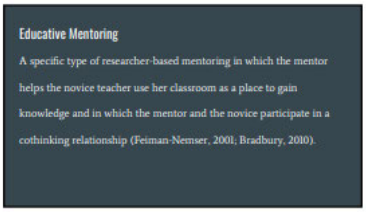
Virtual Meeting	When the mentors discussed the benefits or challenges of meeting virtually. Additionally, when mentors discussed the difference between meeting in person or virtually. This could be related to our mentor meetings, meetings with CIs, or CI observations.	"...That's why I said I'm so Zoomed out. I want to meet [in person]. So in a way Zooming is a little intimidating for me. It's different when someone's talking and you're not in a group. You're not, well, looking at one another. So I think if we collaborated in a personal setting, I think they would see my personality more." (Caroline, Interview, 7-21)
Cooperating Teachers (CTs)	When mentors discussed the CTs of their CIs or CTs they have experienced in previous mentoring situation.	"I think they [CIs] discuss it with their CT and they say, "So where do we go from here?" I think they use that for guidance, sometimes we'll talk about it as well….As a mentor you can go so far, but it's really the CT and their relationships are very different, I think, in this period of time [the pandemic]. Some are flawless and others it's almost a burden [to host a CI'. Like, then don't, why did you do this? And it hurts me to see these students who, some of them are really anxious and really gung-ho and they don't have… I don't really feel that they had that significant support. And I talk to them [the CI], and say, "Do you want to stay?" Yeah, she [the CI] can definitely stay on as we're on the Zoom meeting, but normally they have to run because it is their little break. (Beth, Meeting, 3-21)

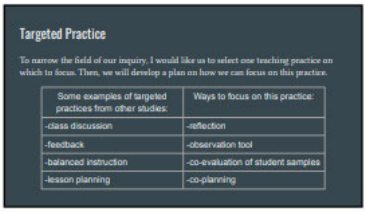
Appendix I: February Mentor Meeting Slides











Appendix J: Inquiry Topic Survey

Practice for Mentor Study

Please select your first and second choice of targeted practice for our group to study. These are the practices that you feel your clinical interns would benefit from honing. Equally important is that the targeted practice is a skill that you feel YOU could benefit from developing.

Choice 1: Eliciting student feedback – For this practice, we could study ideas such as: -how to ask targeted and specific questions in class -how to assess students' understanding of a topic -how to give directions and determine if students are following directions appropriately.

Choice 2: Lesson planning – For this practice, we could study ideas such as: -how to write an appropriate and useful lesson plan -how to align standards to lesson plans -how to think about one's thinking when creating lesson plans.

Choice 3: Differentiation – For this practice, we could study ideas such as: -how to write differentiated lesson plans -how to create differentiated assignments -how to differentiate for the specific students in your classroom.

Appendix K: Bibliography of Shared Readings

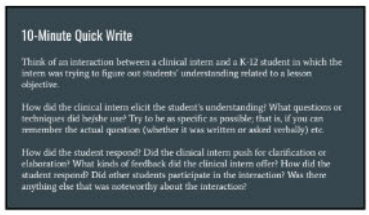
March/April Mentor Meeting

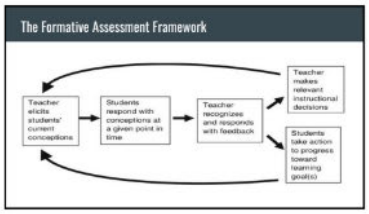
1. "Chapter 6 Enriching classroom discourse: Planning for and asking strategic questions" from Moss, C., & Brookhart, S. (2019). *Advancing Formative Assessment in Every Classroom: A Guide for Instructional Leaders*. ASCD.
2. "What reality TV taught me about everyday assessment" from Furtak, M. (2020). *What reality TV taught me about everyday assessment"* Phi Delta Kappan. https://kappanonline.org/what-reality-tv-taught-me-about-everyday-assessment-furtak/
3. "Formative use of assessment information: It is a process so let's say what we mean" from Good, R. (2011) Formative use of assessment information: It is a process so let's say what we mean. Practical Assessment Research and Evaluation 16(16). https://doi.org/10.7275/3yvy-at83

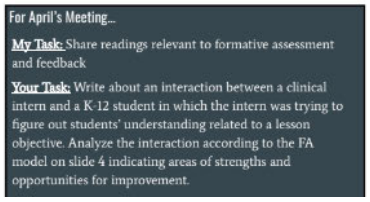
June Mentor Meeting

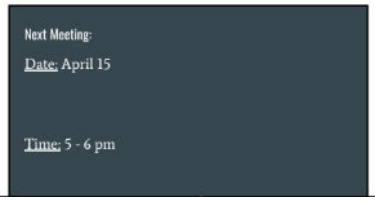
1. "Shifting from correcting to informing: Feedback that feeds forward" from Moss, C., & Brookhart, S. (2019). *Advancing Formative Assessment in Every Classroom: A Guide for Instructional Leaders*. ASCD.
2. Bullough, R. V., & Draper, R. J. (2004). Making sense of a failed triad: Mentors, university supervisors, and positioning theory. *Journal of Teacher Education*, *55*(5), 407–420. https://doi.org/10.1177/0022487104269804

Appendix L: March Mentor Meeting Slides

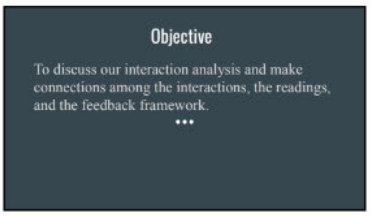


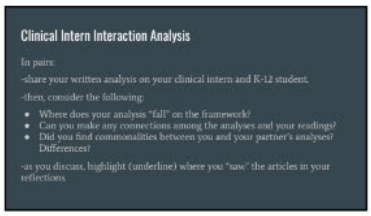


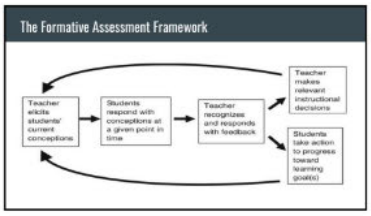


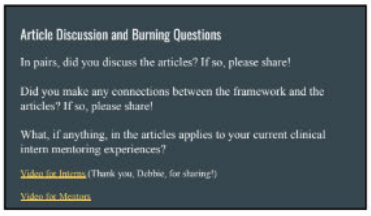


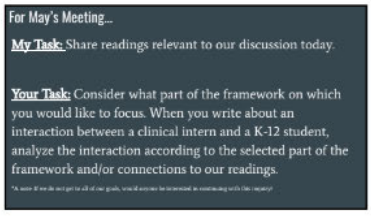
Appendix M: April Mentor Meeting Slides



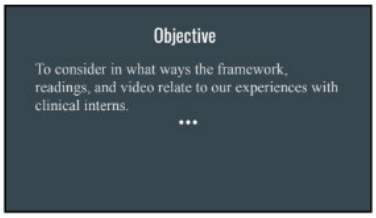


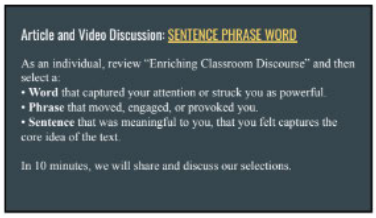


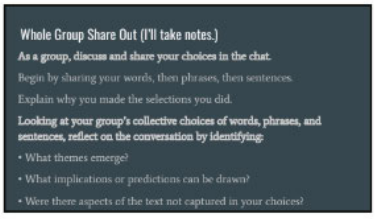


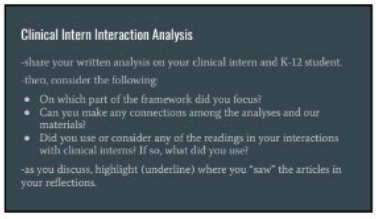


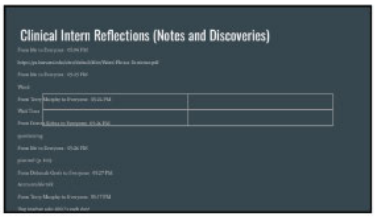
Appendix N: May Mentor Meeting Slides

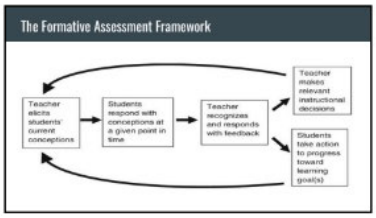


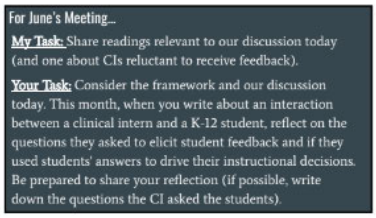












Appendix O: June Mentor Meeting Slides

Appendix P: October Mentor Meeting Agenda

Mentor Inquiry Community Agenda

Agenda for October 20, 2021

Materials: Pen or pencil, paper

Objectives: To develop a tool with which to help preservice teachers evaluate their formative assessment practices.

Time	Task
5:00 to 5:10	Welcome and Catch Up
5:10 to 5:20	Share our lists
5:20 to 5:45	Let's Unpack our Lists • What do we have in common? • What is similar/could be combined? • Is there something that we could or should remove? • How does the list we have align to the FA model?
5:45 to 5:55	What do we want to do with our list? (Create a tool to use with preservice teachers.)
5:55 to 6	Our Tasks Our next meeting: November 10, 2021

Appendix Q: Formative Assessment Protocol

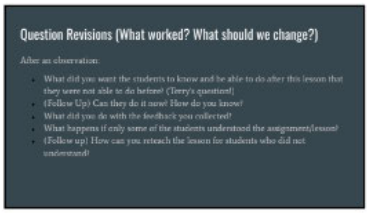
For lesson planning meetings:

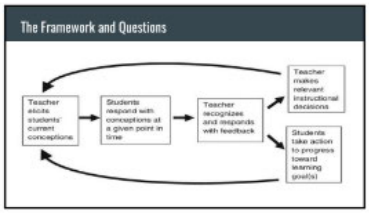
- How do you plan on garnering feedback from around the room?
- How can you offer a variety of ways for students to give you feedback?
- Where can I give students choice in the ways they provide feedback for me?
- Where can you insert three specific feedback strategies into this lesson?
- What misconceptions might students encounter in your lesson? Why do you think this?
- (Follow up) How will you make the misconception "visible" to students so that they understand?
- (Follow up) What checks for understanding can you put in the plan now to garner feedback on their understandings/misunderstandings?

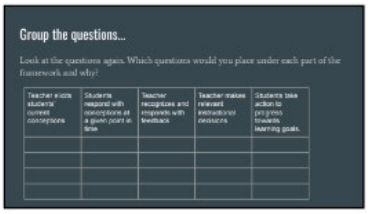
After an observation:

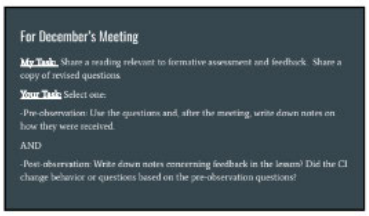
- What did you want the students to know and be able to do after this lesson that they were not able to do before? (Terry's question!)
- (Follow Up) Can they do it now? How do you know?
- What did you do with the feedback you collected?
- What happens if only some of the students understood the assignment/lesson?
- (Follow up) How can you reteach the lesson for students who did not understand?

Appendix R: November Mentor Meeting Slides









Appendix S: December Mentor Meeting Slides