

LEARNING ABOUT TEACHING FROM MENTOR-INTERN CONVERSATIONS – DOES
THE FORM AND FOCUS MATTER?

By

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ABSTRACT

LEARNING ABOUT TEACHING FROM MENTOR-INTERN CONVERSATIONS – DOES THE FORM AND FOCUS MATTER?

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Prospective teachers (PSTs) have consistently identified clinical field experiences (e.g., student teaching) to be the most important experience in their teacher preparation (Wilson, Floden, & Ferrini-Mundy, 2002). One way that mentors support prospective teachers' development within field placements is through conversations about classroom teaching. In this dissertation, I consider *educative conversations* as a product of educative mentoring (Feiman-Nemser, 1998) and teacher noticing (Sherin & van Es, 2002). I explore the nature and quality of these mentoring conversations and I consider the potential of using noticing and wondering language (Smith, 2009) in making mentoring conversations more educative.

This dissertation study focused on three secondary education mentor-intern pairs who participated in a short orientation session offering Smith's (2009) noticing and wondering language for framing mentoring conversations. Participating interns were PSTs in their final year of a five-year teacher preparation program. Participating mentor teachers were all veteran who had a wealth of experience mentoring PSTs. The data for this dissertation were audio-recordings of pre/post conversations about video episodes of someone else's teaching, sample mentoring conversations, and individual interviews.

This dissertation is composed of an introductory chapter, three journal article manuscripts, and a concluding chapter. The introductory and concluding chapters are reflective sections about the dissertation research process addressing my dissertation committee members

as their main audience. The three journal article manuscripts focus on particular aspects of mentoring conversations and are intended to stand alone as complete manuscripts.

In the first manuscript, intended for mathematics teacher educators, I describe the short orientation session that offered mentor-intern pairs the language of noticing and wondering as a way to structure mentoring conversations. I also explore the ways mentors and PSTs adopted the language of noticing and wondering in pre/post conversations about video of someone else's teaching after participating in the short orientation session. Moreover, the first manuscript details the ways the language of noticing and wondering supported mentors and PSTs to adopt an interpretive stance when discussing teaching practice.

In the second manuscript, intended for teacher education researchers, I formulated a theorized definition of an educative conversation and used it to identify *potentially educative* mentoring episodes by applying indicators of educative conversations to pre/post conversations about video episodes of someone else's teaching. I further report on the nature and quality of these conversations, and consider the potential of using noticing and wondering language in making mentoring conversations more educative. Additionally, I explore ways in which such noticing and wondering language may or may not support productive mentoring conversations.

Lastly, I explore three approaches for analyzing mentoring conversations in the third manuscript. Each approach is illustrated with the same mentor-intern pair's conversations to discuss affordances and limitations of each approach. Also intended for teacher education researchers, I consider how each approach can be used to decompose the practice of mentoring conversations to contribute to developing a knowledge base about effective mentoring conversations and support professional development for mentors.

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To my life long educative mentors—my parents.
Thank you for your constant love, support, and guidance.

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Based on my experience, this dissertation has been the most isolating and solitary piece of work of my doctoral studies, while also being the most collectively supported by those closest to me. For this reason, I would like to express my most sincere gratitude to the people who supported me and made this dissertation work possible.

To begin, I am grateful for the three mentor-intern pairs that volunteered to participate in this study and acknowledged that the student teaching space, mentoring practices, and specifically mentoring conversations were worthy of closer examination. Without their generosity in sharing their personal dialogues about teaching (both about their own practice and others), as well as their willingness to adopt noticing and wondering language into their conversations, this dissertation study would not have been possible. In particular, the wealth of experience that mentors shared greatly enhanced this study and demonstrated their passion for improving teaching and mentoring.

I am incredibly fortunate to have Dr. Sandra Crespo as my advisor and director of my dissertation. As I stated in Chapter 5, she has been my *educative mentor* through this entire dissertation process. There are not words enough to express the deepest thanks and appreciation I have for the ways she has supported me and my work. As an educative mentor she has always been accessible to address my concerns, while also scaffolding (unbeknownst to me at the time) the experiences I would need to in the future. Thank you for dreaming bigger for me than I was ever able to imagine, and then helping me make my new dreams come true – I truly could not have done this without you. Thank you for being such a significant person in my life and always

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My previous advisor and dissertation committee member, Dr. Michael Steele has also been extremely influential in my development as a mathematics teacher educator. As a shared passion, he has always understood and supported my heart's need to stay connected to the teaching, particularly when others thought I should be leaving the classroom. Thank you for creating the opportunity to co-instruct the senior year mathematics methods course and for taking me under your wing to teach me to *notice* and *wonder*. Moreover, I am also grateful for my other two committee members, Dr. Randi Stanulis, who was my *educative mentoring* compass during this dissertation process, and Dr. Corey Drake who always seemed to know the exact moments I needed revisions and/or new ideas in committee meetings re-voiced to make them seem achievable. It has been a privilege having these four teacher educators and their unique areas of expertise collectively push me to not only make this dissertation better, but also to help me grow into a better researcher. I am also appreciative to past committee members that aided in my foundational growth and development prior to this dissertation, which included: Dr. Suzanne Wilson, Dr. Peter Youngs, and Dr. Christina Schwarz.

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KEY TO ABBREVIATIONS

“PST” is used to refer to prospective teacher

CHAPTER 1

THE ROAD TOWARD A DISSERTATION ABOUT MENTORING CONVERSATIONS AND THE LANGUAGE OF NOTICING AND WONDERING

As a researcher, my roles in education are diverse. During my tenure as a graduate student, I have been a teacher, a mentor to prospective teachers (PSTs), and a mathematics methods course instructor. Smith's (2009) *noticing and wondering language* first made its way into my teaching repertoire when I was a methods course instructor. As course instructors, we used the language structure to give feedback on papers and lesson plans. Senior year teacher education students used this structure to give each other feedback after microteaching lab lessons. The language embedded within and prompted by Smith's (2009) noticing and wondering language promoted discussion that was focused on the teaching, instead of the teacher. It allowed the PSTs to successfully use explicit pieces of feedback to further analyze their microteaching video (Roller, 2015). Surprisingly, this deceptively simple structure encouraged PSTs to think critically about their teaching and inquire about teaching practices without feeling threatened or having their teaching practice judged by peers.

As a novice methods course instructor, I found myself wondering about the effectiveness in using video with senior year teacher education students. Although I could see the utility in using video to highlight situations and to talk about teaching with PSTs, I still debated internally about whether or not PSTs could observe the finer nuances of practice in a video episode of their teaching. As part of my practicum, I decided to analyze what senior year teacher education students had prioritized from an episode of their own teaching in microteaching lab after the course was over. More specifically, I asked "What aspects of their teaching practice are PSTs able to notice when viewing video of their own teaching?" (Roller, 2015, p. 5) The results impressed me. I was convinced that video self-observation were beneficial to developing teacher

noticing skills prior to entering the classroom. While the results should not have been surprising with the amount of emphasis and modeling of student thinking, mathematics content in the methods course, and practice framing observations with noticing and wondering language, the fact that PSTs had transferred this modeled skill of noticing and applied it to their own teaching practice was exciting. PSTs were now *noticing* and *wondering* about their own teaching practice on their own, and were particularly focused on areas of students and mathematical learning (Roller, 2015).

With a new found belief in PST's abilities to improve their teaching practice through developing their noticing skills, I returned to my classroom as a mentor teacher of senior year teacher education students. In particular, my classroom was home to these teachers during their field placements. I began using the noticing and wondering language and the structure of warm, cool, and challenging feedback with PSTs. PSTs regularly mentioned how much they appreciated the content and form of my feedback. I, comparatively, noticed that using the noticing and wondering language allowed me to raise questions concerning student engagement and achievement in non-evaluative ways. Through this dialogic and recursive feedback cycle PSTs and I explored the teacher thinking and decision-making that occurred in a particular teaching episode. It was not until I started mentoring another teacher in my building, however, who in turn was also mentoring PSTs in her Spanish classroom, that the power of this simple language of noticing and wondering became clear to me. I shared with my colleague how to address situations that had occurred during one of her PST's lessons using noticing and wondering language. As she began to use it with her senior year teacher education students, I realized how knowledge of this language structure to offer feedback to novice teachers was generative, particularly in a school environment where evaluative statements sometimes shut the

door on conversations about teaching and isolate teachers to seek refuge in their classrooms working to avoid judgment.

After sharing the knowledge of the noticing and wondering language and seeing its effectiveness, I accepted an invitation to present at an opening internship day workshop for mentor teachers and student teachers. This workshop and professional development, in particular, illuminated some of the strategies of the mentoring language and illustrated how to give effective feedback using noticing and wondering language (Roller, 2013; Roller, 2014). Many of the mentor-intern pairs left feeling confident about the strategy. Moreover, the field placement supervisors that attended felt the information was very beneficial, as it provided a common ground and language for all stakeholders in the PST's development. While my practical knowledge of using noticing and wondering language in my classroom left me feeling confident the workshops would be helpful to mentor-intern pairs, there was no empirical data or research confirming that this structure for talking about teaching made any difference.

My goal in completing this study, hence, was to explore the form, focus, and educative nature of mentoring conversations. In particular, I investigate if and to what extent the language of noticing and wondering supported the conversations other mentor teachers had with PSTs. To answer questions regarding the quality of mentoring conversations that mentor teachers and PSTs had during student teaching, I conducted a qualitative study. The comparison of a pre- and post-screener activity completed by mentor-intern pairs was the focal point of data collected. In the study, I compared pre- and post-conversations of participants after a short orientation session whereby participants were introduced to the language of noticing and wondering. After, mentor teachers and PSTs participated in an exit interview. I used this source of data to gain further

insight about how noticing and wondering language influenced their conversations about teaching, as well as if it allowed them to talk about different aspects of teaching.

Understanding my background and personal motivation for this dissertation study, however, is only the beginning of how this dissertation commenced, evolved, and was completed. In this introductory chapter, I reveal my thought processes and decisions while completing this dissertation. Sharing insight not typically featured in published manuscripts, I detail the larger experiences and understandings about research gained from this dissertation process. The order in which these sections are introduced mirror the order in which they occurred during my dissertation journey. These sections include the changes that occurred from the original proposal to the actual study, a description of this dissertation structure and manuscripts that appear in it, and a reflection on the experience of writing an *alternate format dissertation* (Duke & Beck, 1999).

Research Study Changes: Road Bumps between the Original Proposal and the Actual Study

During this dissertation process, three main areas required thoughtful adjustment as my original proposal transitioned into an actual study. Below, I unpack these areas, or road bumps if you will, as they signify *who* was involved in this study, *what* data was collected to represent mentoring conversations, and *how* I analyzed the data to answer the research questions.

Reflecting on the Mentors

The process for gaining access to mentor and intern participants in this dissertation study was more difficult than I had anticipated. As a doctoral student, I negotiated and navigated the power dynamics of graduate school as I attempted to elicit volunteers from my own teacher education program to participate in my dissertation study. Multiple conversations were required

between the field placement director and my committee members in order to recruit participants for the study. While my original intentions for the study were to recruit novice mentors to aid in controlling the experience and the background knowledge mentor teachers had for talking to PSTs about teaching prior to the short orientation session, the participants featured in this dissertation all have multiple years of experience mentoring PSTs. As a teacher educator who values local schools and communities, I believe this speaks to the importance of building lasting relationships with teachers and working to sustain partnerships with local schools. Mentors that agreed to participate had long histories working with the university on research, professional development, and providing field placement locations for interns and senior year teacher education students. Mentor teachers viewed engagement with the university as beneficial and thus were the mentors who were more apt to respond, and did respond, to the request for volunteers.

Since I could not have a study without participants, I gratefully accepted the veteran mentors, taking into account that this group had multiple years of experiences that shaped the types of mentoring conversations they typically facilitated with PSTs. Veteran teachers were also likely to have more developed lenses of noticing for teaching observations that could appear as the focus of their mentoring conversations. While my intentions were to start with the clean slates of novice mentors, there were many benefits to studying mentor conversations with veteran mentors. For example, veteran mentors demonstrated how experienced mentors might merge their previous mentoring structures and stances with the language of noticing and wondering. This is very realistic, even for novice teachers, as they would likely have developed a way of talking about teaching prior to being a mentor. Veteran teachers and mentors, furthermore, are frequently more difficult to change or influence, because they too have a wealth

of knowledge and experience (Hargreaves, 2005), so the fact that this mentor group adopted the language of noticing and wondering was also a promising finding; plus they could report on the advantages and disadvantages to using this structure based upon past experiences which spoke to how the language of noticing and wondering fit into the current space of mentoring.

Capturing Mentor Conversations

Capturing mentor conversations in the moment was another road bump throughout the data collection phase. The mere process of having a researcher present to record the conversation, or asking the mentor-intern pairs to record their conversation, hinders the data collection process as the presence of outsiders may influence the mentoring conversations that occur. In short, authentic mentoring conversations are difficult to capture, and one needs to think carefully about how to gather quality data. Therefore, whether I approached this data collection ready to shadow one mentor-intern pair silently and closely followed with a recording device or requested them to record their own conversations, both approaches to data collection lead to inauthentic mentoring conversations.

In an attempt to capture an authentic mentoring conversation, I asked mentor-intern pairs to talk on their own and set up a recording device to capture the conversation that ensued. I decided against video, a form of data generation that would provide more information about gesture, body positioning, and the listeners attention, and requested pairs to audio record their conversations. The audio-recording provided me with the ability to listen to the conversation multiple times and capture the exact words that were used in the conversation. Additionally, teachers were less hesitant about participating in audio recordings which increased the likelihood that mentor-intern pairs would not only complete and submit the recordings, but that they may talk in a more natural way due to the audio-recording format.

Partially determined by my situation and inability to be in schools when these mentoring conversations would likely be recorded, but also so as not to interfere with what or how mentor-intern pairs would discuss teaching, I decided to remove myself (the researcher) from the actual recording of the conversations. As with any qualitative study, there are affordances and limitations to having the researcher play a role in the actual recording of data, particularly if video is being used. However, audio recordings were about capturing sound, and thus could be picked up from any recording device located nearby. All mentor-intern pairs already had a recording device that could capture audio. This made data collection convenient as I did not need to supply pairs with devices. There were disadvantages, however, to not being present during the recordings. Namely, mentor-intern pairs did not always capture the conversation from the lesson debriefing session. Instead, they recorded and submitted other collaborative conversations with PSTs in the classroom or conversed about how they were using noticing and wondering language instead of the authentic mentoring conversations that would demonstrate their usage. These limitations of data collection were definitely road bumps and led to more of the actual data analysis revolving around the pre- and post-conversations about video episodes of someone else's teaching. Although less authentic than a mentoring conversation that might occur within the actual student teaching placement, these conversations allowed me to explore the similarities and differences between mentor-intern pairs conversing about the same teaching episode. Table 1.1 shows the data collection and timeline of this dissertation study.

Table 1.1

Data Collection Overview and Timeline

Timeline	Data Collected	Description of Data	Length of Recording
2 weeks prior to orientation date	Informational Survey	Collection of questions to gain background knowledge about the participants' teaching and mentoring experience.	Two page document
Week prior to orientation session	Pre-screener Conversation #1 (9 th grade English class) Pre-screener Conversation #2 (6 th grade math class)	Mentor-intern pairs recorded conversations about the first 10 minutes of two classroom videos, and wrote a brief narrative about how each conversation compared to their normal conversations in the classroom.	1-15 minutes, written paragraph
	Short Orientation Session Attended		2 hours
3 weeks post orientation session	Sample Conversation #1	Mentoring conversation from field placement that was recorded after the intern had taught a lesson.	4-41 minutes
5 weeks post orientation session	Sample Conversation #2	Mentoring conversation from field placement that was recorded after the intern had taught a lesson.	4-25 minutes
8 weeks post orientation session	Post-screener Conversation #1 (9 th grade English class) Post-screener Conversation #2 (6 th grade math class)	Repeated pre-screener activity	4-12 minutes
8 weeks post orientation session and after post screener	Individual Interviews	Interviews between researcher and individual participants that followed a semi-structured protocol and were audio-recorded.	20-57 minutes

Deciding on a Coding Scheme

My original intentions were to use the conversation foci to create smaller units of dialogue within the larger mentoring conversations. My plan was to read the conversation and identify moments where conversation topics switched. Then, I would apply the Interstate Teacher Assessment and Support Consortium (InTASC) Model Core Teaching Standards (Council of Chief State School Officers, 2011) as a coding framework to categorize the foci of each smaller unit. I had chosen the ten elements of practice in the InTASC Model Core Teaching Standards as a framework for coding the foci of the mentoring conversations as it is familiar and agreed upon as a set of skills beginning teachers should know or do. Furthermore, many teacher preparation programs have student teaching standards that mirror the essential competencies outlined in the InTASC Model Core Teaching Standards. This alignment would help generalizability and foster development and growth to many teacher preparation programs outside of my own University. I had a challenging experience, however, when I attempted to apply the coding categories to mentoring conversations. Frequently, I found myself struggling to identify the exact location where a focus switched or identify which one standard should be used to code each smaller unit of conversation. I wondered if my struggles were due to a lack of familiarity with the standards, or, that the framework was just too large and complex for the scope of a small-scale study.

In response, I adjusted the framework to a more local version of these focal elements of practice, as produced by my university's Secondary Teacher Preparation Team (2013) Internship Guide's teacher education standards. This localized knowledge of categories, while still mapping onto the larger InTASC Model Core Teaching Standards (Council of Chief State School Officers, 2011), could still be generalizable to audiences outside my own teacher

preparation program. However, it did not take long to discover that even within my own university teacher education program, I was still unable to clarify which categorical units of conversation should be coded and what they should be coded as. Mentor-intern motivation for talk was not always clear and defining the purpose behind the conversation is what would make the distinction for coding different categories. Thus, my dilemma was two-fold. First, I was struggling to identify the point in conversations where the topic clearly changed. Then, I was unsure of how to code the foci without understanding motivation behind the conversation and/or without understanding the standard-specifics across the frameworks.

At this point, I returned to my research questions to help me rethink methodology. Since my research questions were focused on addressing the educative potential of mentoring conversations, I was able to change the order of my analysis from coding for foci and educative conversations, to identify *potentially educative* mentoring episodes within the mentoring conversations and then coding the foci of these moments. When the previous frameworks still led to uncertain foci coding, I employed a grounded theory (Glaser, 1978) approach using open coding to identify the foci that were addressed in the potentially educative mentoring episodes.

This order of analysis proved more fruitful. It was encouraging to see that the larger categories of teaching, subject matter, and classroom structure were ones similar to those identified by van Es (2011) for coding topics discussed during video-club meetings. These topics included a focus on pedagogical strategies, behavior or mathematical thinking, and classroom climate. While this revised approach targeted understanding the educative parts of mentoring conversations, a limitation of this methodology and coding scheme was that it did not provide information about the non-educative parts of mentoring conversations or their foci. Knowledge of the non-educative parts of mentoring conversations could provide a comparative case when

discussing and modeling educative conversations with mentors during professional development. This limitation may serve as a fruitful opportunity to consider for future studies.

Dissertation Structure and Overview of Three Manuscripts

This study bridges the literature of teacher noticing (van Es and Sherin, 2002), and educative mentoring (Feiman-Nemser, 2001) by considering *educative conversations* as a product of these skills. Teacher noticing is the means through which the mentor and PST become aware of important teaching moments. Educative mentoring is conversational work, as mentors strategically elicit and share observations they believe will be beneficial to the prospective teacher.

In this dissertation, I explore the mentoring conversations of three mentor-intern pairs before and after a short orientation session that introduces them to the language of noticing and wondering. This dissertation is composed of an introductory chapter, three manuscripts, and a concluding chapter. The introductory and concluding chapters are reflective sections about this dissertation process. These sections, in particular, are directed toward my dissertation committee members. The three manuscripts within this dissertation focus on various aspects of mentoring conversations and are intended to stand alone as complete manuscripts. The article-length chapters are also sequenced to start with a larger grain size. This is purposeful as I want to shed light on the overarching picture of the short orientation session. Then, I focus inward and use three methods to investigate one mentor-intern pair's conversations. Figure 1.1 provides a visual representation of the cohesive set of manuscripts.

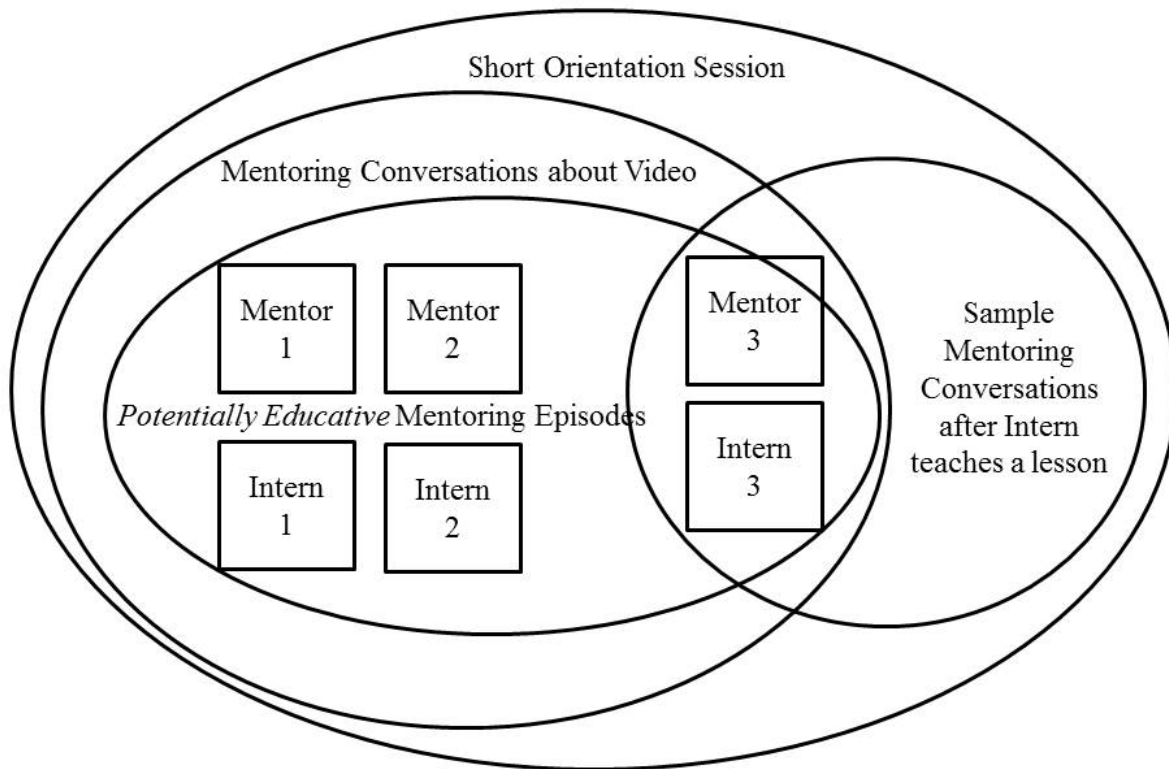


Figure 1.1. Visual Representation of the Various Grain Sizes Used to Analyze Data and Create a Cohesive Set of Manuscripts.

The mid-section of this dissertation is organized as three separate manuscripts that will be ready for article-submission upon completion. The first manuscript, entitled “Noticing and Wondering: A Deceptively Simple Structure to Support Mentoring Conversations,” is written for *Mathematics Teacher Educator*, describes the short orientation session that offered mentor-intern pairs the language of noticing and wondering as a way to structure mentoring conversations. This manuscript explores the ways mentors and PSTs adopt the language of noticing and wondering in pre/post conversations about video someone else’s teaching after participating in the short orientation session. This manuscript details the ways the language of noticing and

wondering supported mentors and PSTs to adopt an interpretive stance when discussing teaching practice. Focused toward an audience of teacher educators, this manuscript, I hope, will be used to inform the ways that mathematics teacher educators support field placement mentors. This research, already, has led to multiple invited professional development sessions with mentors and interns in elementary and secondary teacher education at Michigan State University. As an educator who has been in the classroom for 11 years, it is very important to me as a researcher to have work that supports schools and educators. This particular manuscript and presentation demonstrates my passion and mission as a teacher educator, someone whose research is engaged and connected to teachers.

The second manuscript, entitled “It’s Not Just What They Say, But How They Say It – Exploring the Nature and Quality of Mentoring Conversations,” is written for teacher education researchers and has been written for the journal *Teaching and Teacher Education*. The study in this manuscript analyzes pre/post conversation about video episodes of someone else’s teaching to report on the nature and quality of these conversations. I consider the potential of using noticing and wondering language in making mentoring conversations more educative. The concepts in the manuscript have been presented at the American Education Research Association conference in April 2015, and are accepted for a poster presentation at the Psychology of Mathematics Education North American Chapter (PME-NA) conference in November 2015. As a teacher educator and researcher focused on problems of practice in teaching and teacher education, this piece explores the mentoring conversations that PSTs frequently cite as being the most generative in learning to teach (Wilson, Floden, & Ferrini-Mundy, 2002). It also explores if noticing and wondering language truly *does* or *does not* make a difference in supporting productive mentoring conversations.

The third manuscript, “Investigating Mentoring Conversations Three Ways,” aimed for publication in the *Journal of Teacher Education* is also written for an audience of teacher education researchers. In this third manuscript, I am interested in investigating mentoring conversations. This piece explores three approaches for analyzing mentoring conversations and illustrates the affordances and limitations of each. Moreover, this concluding manuscript provides a natural end to this dissertation as it ties together all of the methods utilized in this dissertation’s individual manuscripts and shares them in one place for researchers to reference and draw upon. As a manuscript dedicated to methodology, this piece introduces me as a new researcher of teacher education and my understanding of how one piece of data can be sliced by various frameworks to not only tell different stories, but to nuance and create more complete understandings of the whole.

Lessons Learned from Writing an Alternate Format Dissertation

Being completely honest, I opted to write an *alternate format dissertation* (Duke & Beck, 1999) that consists of three manuscripts prepared for submission to journals to avoid the painstaking task of writing a traditional book style dissertation and then having to spend more time revising and reorganizing the information into separate publishable pieces. In the moment, I considered it a time saver move more than a choice that would set me up for success in a tenure-track academic career. Upon reflection, however, I would say the knowledge and experiences that I gained from taking this more authentic approach to research and publication has provided me with more than just manuscripts ready for submission, but with a deeper understanding of the work of a teacher education researcher.

In an attempt to make the shifts in my thinking more transparent, I created the following table (Table 1.2) to share some of my pre-conceptions prior to starting this dissertation. These

presuppositions illuminate the ways in which a teacher education researcher, I believed, worked. I align these then with revised conceptions that I gained during this dissertation process. As you may infer by my title, many of these pre-conceptions were myths that I still had in my final years as a doctoral student. However, these were debunked through writing an alternate dissertation. These post-conceptions helped formulate my concept map, *Research and Writing Process for Publishing in Teacher Education* (Figure 1.2).

Table 1.2

Comparison of Pre-conceptions/Myths and Revised Conceptions/Facts about Doing Research in Teacher Education

Pre-conceptions/Myth	Revised Conceptions/Fact
The goal of the conference proposal/presentation is to present finished products and distribute new work, similar to that of a publication. A researcher should have the manuscript completed before submitting a proposal.	The goal of the conference proposal paper is to help the researcher hone in on small aspects of the research project. Creating the PowerPoint presentation for a conference can act as the rough draft or outline of a manuscript. Furthermore, presenting at conferences provides feedback and connections that can enhance the work toward publication. Conferences are an exploratory zone and a helpful step toward getting research writing started.
All research publications have the same structure, tone, and audience.	My dissertation is composed of manuscripts for three different peer-reviewed journals. Two of these are for teacher education researchers and one is for teacher educators. While there are similarities in the manuscript structure, there are also key differences. It is important to review the requirements for these journals and read widely within them in order to successfully write for them.
All of the tools a researcher needs to write a high-quality manuscript are available to them, and thus they can do this work successfully on their own.	Writing alone is actually very difficult. Many of my breakthrough ideas came from having conversations with my advisor, committee members, conference attendees, and peers. While it is easy to expect guidance and support from your advisor, it was refreshing to also recognize that a Skype video conference with a peer could also reignite excitement and purpose behind my writing, as well as provide insights toward moving my writing forward. Collaboration in writing is essential.

Table 1.2 (cont'd)

<p>The sole purpose of revision is to change the format and message of a manuscript into the one the publisher wants.</p>	<p>Revising my JMTE manuscript (Roller, 2015) during my dissertation writing provided me with an example of the standard that is expected for publication. While the reviewer feedback was daunting, I can honestly say that it improved the manuscript ten-fold and has expanded my knowledge concerning teacher noticing. Hence, this process contributed to a deeper understanding of the literature related to my dissertation manuscripts.</p>
<p>Writing is a process that takes time, but is completed by going through a prescribed list of steps (ie. brainstorming, outlining, drafting, revising, editing, and publishing).</p>	<p>Writing is a process that takes A LOT of time, and while it includes all of the writing process steps (i.e. brainstorming, outlining, drafting, revising, editing, and publishing), the steps are frequently out of order, repeated, and supported by various other experiences (i.e. conferences, peers, readings). Figure 1.2 is a concept map which highlights the various rounds of support and revision that are necessary before submitting a manuscript for publication.</p>

Research and Writing Process for Publication in Teacher Education

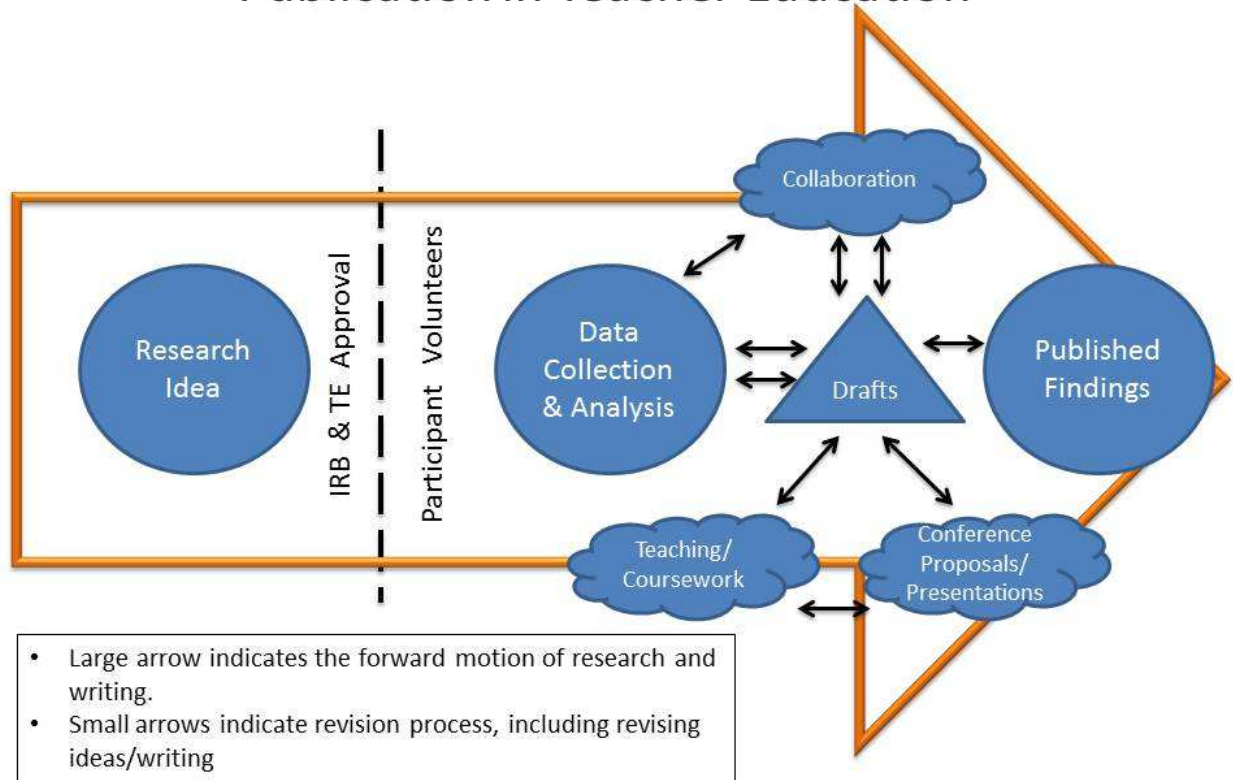


Figure 1.2. Concept map of Research and Writing Process for Publication in Teacher Education

While some may feel that many of these lessons would have been gained through writing a more traditional book style dissertation, the *alternate format dissertation* allowed me to work my way through this writing process three times. Each manuscript acted as a rehearsal of the work and process I would need to complete to meet the expectations of a future tenure-track position. These rehearsals included varying levels of support from committee members regarding writing conference proposals, developing conference presentations, and approaching manuscript revisions.

Upon completion of this dissertation, I found that each key element of the writing process was central to my experience in finishing this dissertation, and that in many ways the three

manuscripts that I have ready to for submission are no longer the focal point of my experience. Instead it was the opportunity of having a commitee of experts to model and guide me through the work that they do on a daily, monthly, and yearly basis that proved to be the most valuable. With their mentoring and guidance, I am set up for future success. Furthermore, I am unsure if this process was so enlightening to me because I have been a part-time doctoral student and less exposed to the academic work occurring on campus, or if other full-time doctoral students also find this *alternate format dissertation* process to be as revealing too, but it was definitely the right culminating opporutnity for supporting my transition into a tenure-track professor position.

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CHAPTER 2

NOTICING AND WONDERING: A DECEPTIVELY SIMPLE STRUCTURE TO SUPPORT MENTORING CONVERSATIONS

Prospective teachers (PSTs) have consistently identified clinical field experiences (e.g., student teaching) to be the most important experience in their teacher preparation (Wilson, Floden, & Ferrini-Mundy, 2002). Through many of these field experiences, a seasoned teacher with experience and expertise in teaching accepts a PST into their classroom. Together, this pair works to apply institutional coursework knowledge and the more everyday practice and skills of teaching. Although studies suggest mentoring is perhaps the most important support for developing PSTs (Hobson, Ashby, Malderez, & Tomlinson, 2009), the support mentors provide varies significantly based on the variety of ways that mentors engage with PSTs (Wilson, Floden, & Ferrini-Mundy, 2002). These variations across field experiences lead to a greater problem concerning consistency in the quality of mentoring across schools and classrooms that PSTs experience and/or are attempting to learn during field placements.

One way that mentors support prospective mathematics teachers' development within field placements is through conversations about classroom teaching. However, mentoring conversations are not in and of themselves educative. The difference between effective and ineffective mentoring is partially due to the nature and quality of communication and conversations between mentors and PSTs. Similar to how a video club group of teachers notice important moments in a video and decide to highlight and discuss them (Borko, Jacobs, Eiteljorg, & Pittman, 2008; van Es, 2011), mentors notice important teaching moments that they feel are valuable to address and reflect upon with PSTs in mentoring conversations. Mentors also approach how they discuss their observations of teaching similar to the ways in which teachers discuss video episodes of teaching, which is with three analytic stances – descriptive,

evaluative, and interpretive (van Es, 2011). Conversations that are descriptive and interpretive frame talk around investigating teaching, which according to Stigler and Hiebert (2009) enable "[t]eacher [to] learn to teach by treating teaching as an object of study - by trying to improve teaching by studying carefully what works and what doesn't" (p.36). Interpretive conversations are more valuable in field placement experiences as they produce more educative opportunities for PSTs to inquire about instructional practice rather than having descriptive or evaluative conversations which seemingly close educative opportunities (Borko et al., 2008; Clarke, Triggs, & Neilsen, 2014; van Es, 2011). Feiman-Nemser (2001) further supports that the ways in which mentors engage in conversations with beginning teachers which allow novices to express their concerns but also reflect on their teaching is an identified key component of effective mentor programs.

Variations in the types of conversations mentors and PSTs engage in during field placements have also been connected to mentor styles (Clarke et al., 2014; Wang, Strong, Odell, 2004). *Educative mentoring* is conversational work between mentors and PSTs that describes and inquires about episodes of mathematics teaching with a shared goal of improving mathematics teaching practices (Bradbury, 2010; Feiman-Nemser, 2001; Schwille, 2008). Compared to more traditional mentoring practices that tend to evaluate PSTs as supervisors or nurture PSTs emotionally (Bradbury, 2010; Hobson et al., 2009), the focus of educative mentoring is on challenging problems of practices. These problems emerge with a PST's concern and/or a mentor teacher's observation. After highlighting a situation, the mentor and PST reflect on the thinking and outcomes from that instructional event to develop the PST's mathematics teaching practice. These kinds of mentoring conversations provide possibilities for improved mathematics teaching because emphasis and attention are directed toward the teaching

rather than toward the teacher (Hiebert & Morris, 2012). *Educative mentoring*, furthermore, has demonstrated evidence for improving PSTs learning (Stanulis, Little, & Wibbens, 2012), placing this style of mentoring as more beneficial for PSTs in field placements.

Clarke et al.'s (2014) review of mentoring literature reveals part of the reason that PSTs have such varied experiences with their mentors. Many mentors, according to Clark and his colleagues, "lack specific preparation to enable high quality and developmentally appropriate support for student teachers" (p. 191). Feiman-Nemser (1998), comparatively, argues that mentoring skills, particularly those focused on talking about teaching in productive ways, can be developed through professional development sessions and/or involvement in collaborative learning opportunities. However, there are also challenges to addressing this problem and providing these kinds of sustainable supports within the confines of short mentor recruitment and orientation workshops provided by universities. A lack of time and resources are another limitation affecting the ability to provide intense interventions of support, particularly when mentors are overburdened. Considering these challenges and limitations, this study was interested in creating an experience to support mentoring conversations in field placements that would later have a high impact, but low burden on teachers.

Interested in researching the types of educative conversations that emerge through mentor-mentor conversations, I employed Smith's (2009) noticing and wondering language. The language structure, a reasonable answer to this problem, emerged as a central tool for structuring conversations as mentors could easily learn and apply its goals without a large investment in time learning this new mentoring practice. The noticing and wondering language helps frame and ground mentoring conversations in descriptive observations. The language structure uses an interpretive stance to inquire into important teaching moments. The language structure aligns

well with the call for finding ways to support PST's learning to teach by studying teaching (Hiebert & Morris, 2012; Stigler & Hiebert, 2009).

The wondering part of the conversation structure invites the student intern to actively participate with the mentor in the analysis and reflection of the teaching. Clarke, Triggs, and Neilsen's (2014) have argued that invited spaces like these are the most productive for mentors and PSTs as they encourage a genuine engagement involving both parties sharing and guiding the conversation together. When mentors wonder about teaching observations, they are not only inviting the PST to share their thoughts, but are also professionally acknowledging that the PST is thinking about the teaching moment as it occurred and making a decision based on these reflections. Mentoring conversations that maintain an interpretive stance aid in addressing PST's concerns. They work to pinpoint areas of mathematics teaching practice where collaborative reflection may help improve teaching skills and understanding of student learning. This, however, is not always the stance used in mentoring conversations.

A Short Orientation Session about Noticing and Wondering Language

I designed a two-hour discussion-based orientation session that introduced participants to the language of noticing and wondering in mentoring conversations. This study's particular session was informal given the small number of participants. Since the goal of the orientation session was to learn a common language for talking about teaching that mentors and interns could immediately implement in the classroom, I wanted to provide enough information and exposure to the language of noticing and wondering. It was my goal that mentors and interns could then transfer this structure back to their mentoring conversations in the classroom. The use of the language was introduced with three approximations of practice (Grossman et al., 2009), each scaffolding the learning for participants. Participants were first exposed to the language

structure through direct instruction and discussion. Participating mentor-intern pairs then rehearsed using noticing and wondering language using written teaching scenarios. Lastly, mentor-intern pairs rehearsed using noticing and wondering language using video teaching scenarios. Video was used to simulate the types of observation that would occur when watching the intern or mentor teach in the field placement. In an effort to encourage the transition of noticing and wondering language, mentor-intern pairs were encouraged to record two sample conversations after the intern taught a lesson.

The orientation session had three goals. These goals were organized 1) to offer noticing and wondering language as a structure for mentoring conversations, 2) to consider the affordances that may motivate participants to try this language in their classrooms, and 3) to provide time to rehearse and ask questions about the implementation of noticing and wondering language.

Offering the Language of Noticing and Wondering

After introductions and general sharing about mentoring, I began the session by sharing Smith's (2009) *Noticing and Wondering Language*, a structure that encourages more productive conversations about teaching. From this point on, the language structure was referenced as *noticing and wondering language* or *the language of noticing and wondering*. I joined the participants in sharing experiencing where I too had used this language in my own classroom and in instructional-methods courses. We discussed how this language provides a structure in mentoring conversations that allows the conversations to be embedded in the observable practices of the classroom (e.g., "I noticed...") while also leaving the conversation open for teachers to reflect and problem solve teaching practices that need improvement (e.g., "I wonder...")

Building our shared understanding of the language of noticing and wondering, I began by showing mentor-intern pairs how noticing and wondering language can be used to confirm teaching practices that focus on learners' development and the learning environment. For example,

***"I noticed** you moved throughout the room to monitor student work and progress."*

I then shared how the addition of wondering can be used, particularly with beginning teachers, to help hone in on one challenging moment of teaching. I used the example,

***"I noticed** many students had to come and ask you about the directions before they could start finding the area of their shoe, and **I'm wondering** what other ways you might have launched this activity to make the directions clearer for the students."*

After, we discussed how the conversation, following this noticing and wondering statement, could potentially focus on how the beginning teacher now realized that students need more scaffolding. As a group we discussed what that might look like, and how it could lead to a more collaborative discussion about specific terms that confused students in the directions.

The next approximation of practice provided the context of a teaching scenario. We brainstormed how noticing and wondering language may structure the mentoring conversation that followed the scenario. For this part, I read the story of *Olivia's Lesson* (Smith 2009) in which PST, Olivia, teaches a lesson on how to find the slope of a line by making connections between a table, graph, and equation. The story highlights how Olivia confusingly labels the "rise" and "run" of a stair diagram (which I projected for the group to see), to remind her students that slope is the ratio of rise over run. Olivia's instructional move makes it unclear to students whether the rise or run is the horizontal or vertical distance. The lesson concludes with students struggling to solve the slope task in small groups, particularly in regard to what numbers

to use in the ratio formula. Olivia recognizes that students are struggling, but not understanding why. The conversation between Olivia and her mentor provides an example of how teacher observations can be structured into noticing and wondering statements within the context of mentoring. In particular, the language of noticing and wondering illuminates how these statements have the potential to open up the conversation to more productive talk (Table 2.1).

Table 2.1.

Examples of How Olivia's Mentor Used Noticing and Wondering Language during the Postlesson Conference (Smith, 2009)

Noticing and Wondering Olivia's Mentor's Feedback	
<ul style="list-style-type: none"> • <i>"I noticed the diagram on the board at the beginning of class but wondered whether the labeling of the diagram might have been a source of the students' confusion."</i> • Led to a conversation about misinterpretations and other helpful visuals for slope 	<ul style="list-style-type: none"> • <i>"I noticed you asked questions that made students think, as evidence by their responses. For example, you asked, 'If I give you a graph and you want to find the slope, what would you look for?' and one student responded..."</i> • Encouraged behavior of questioning

Thinking about the Possible Affordances of Noticing and Wondering Language

After introducing the language structure, I re-emphasized why the language structure can be leveraged in mentoring conversations to have more productive outcomes. I wanted mentor-
intern pairs to be motivated to use the language when they returned to their classrooms and not dismiss the language structure due to its simplicity. We discussed how the nonthreatening language of noticing and wondering allows mentors to discuss both positive and negative results from teaching decisions without coming across as judgmental or overly critical (Smith, 2009), We also talked about how the language of noticing and wondering allows an observer to ground

their questions and concerns within one observable shared moment of teaching. This places the focus of the conversation on *the teaching* instead of *the teacher*.

Adding this new layer of motivation, another sample conversation (Table 2.2) was presented. This sample conversation modeled how a reactionary conversation might sound evaluative when focusing on *the teacher*. We then compared this non-example to how it may sound when noticing and wondering language is used to describe and inquire *about the teaching* moment. As a group we discussed how the wondering part of noticing and wondering language (Smith, 2009) acknowledges that the teacher knows something about the situation that the observer is references and may have thinking to share regarding the teaching episode. This situates interns as beginning professional teachers versus novices who lack all expertise.

Table 2.2

Example of Teacher-focused vs. Teaching-focused Conversation

Classroom Observation	
Cody is off task and refusing to start the set of questions assigned in the book. A few students try to help Cody, but he completely refuses and the bell rings before he is able to get anything done.	
Teacher-Focused	Do you realize Cody didn't start anything? Why didn't you do something?
Teaching-Focused	I noticed Cody didn't get much accomplished today. I'm wondering if there were things you might have been able to do as a teacher to help get him started or to support his learning better.

This section concluded the instructional part of the short orientation session. Before moving on to rehearsing the language structure, I reviewed how the combination of noticing and wondering works together to develop a focus on the practice of teaching. Highlighting how the language of noticing and wondering aids in creating a safe environment for closely analyzing and

thinking about teaching without seeming judgmental or evaluative, moves which shut down conversations about teaching and/or makes them unpleasant.

Rehearsing the Noticing and Wondering Structure

With participants understanding the structure and motivation for using noticing and wondering language, the short orientation session transitioned into a space for transforming observations into actionable conversation starters. In an effort to help mentor-intern pairs transition their comfort level and use of the noticing and wondering language into the classroom, we first attempted applying the language to written teaching scenarios. Next, we tried using the language to analyze a video observation. This again increased with levels of approximation of practice as mentors and interns were given the observations first to formulate the noticing and wondering statement for rehearsing with written teaching scenarios, and then transitioned to mentor-intern pairs using their own teacher noticing skills. Teacher noticing skills identify important moments to develop into noticing and wondering statements.

Rehearsing with Written Teaching Scenarios. The focus of the first rehearsal was transforming an observation and statement of inquiry about the teaching into noticing and wondering language structure. To support this practice, I provided each mentor and intern with a one-paragraph written scenario of a common situation that might be observed in the classroom (Table 2.3), thus reducing the amount of teacher noticing skill work. The mentor-intern pairs were told that they had just watched their mentor/intern teach a lesson and this piece of paper detailed their observation. Their task was to write a piece of feedback using noticing and wondering language connecting to the observation, which we then called a *noticing and wondering statement*.

Table 2.3

Two Written Scenarios about Mathematics Teaching

<p>Case 1 – Ms. Jones is teaching 7th grade math. She has a task where students are looking for ways to build the largest area for a playground using the supplies given. The students are instructed to work for five minutes on their own and then work together in the groups they are sitting in. Shortly following the start of group time, Zeke rips his paper in half and screams, “I don’t care! Make it however you want!’ Ms. Jones calmly walks over to the group and has a quiet discussion with them. When she walks away, Zeke is getting out another sheet of paper and the group seems to be waiting for him so they can work together.</p>
<p>Case 2 – Mr. Erickson’s sixth grade math class is doing a graphing warm up where students use a table and a graph of the same data to answer questions about the population growth of wolves in the past five years. Mr. Erickson walks around the room monitoring students work, and when most students appear to have tried the problems he begins the class discussion about the questions. A piece of the classroom discussion sounded like this:</p> <p style="padding-left: 40px;">Mr. Erickson: Number one asks during what decade was the wolf population the largest? Can anyone get us started on how we might begin this problem?</p> <p style="padding-left: 40px;">Lucy: I thought the answer was in the 1970s.</p> <p style="padding-left: 40px;">Mr. Erickson: And how did you come up with that?</p> <p style="padding-left: 40px;">Lucy: Because I looked for the high spots on the graph and they were all in the 1970s.</p> <p style="padding-left: 40px;">Benjamin: Ya, but wouldn’t it be 1979 because that’s the highest?</p> <p style="padding-left: 40px;">Mr. Erickson: Class what do we think about Benjamin’s question?</p>

Mentor-intern pairs were encouraged to share their written teaching scenarios and noticing and wondering statements with each other. Participants then shared with the larger group. In many conversations, further brainstorming of other possible noticing and wondering statements were discussed.

A noticing and wondering statement for case 1 (Table 2.3), for example, might have included “I *noticed* Zeke had quite the outburst during group time, and I’m *wondering* what you said to him that encouraged him to give it another shot.” The aforementioned statement acknowledges Zeke as struggling while opening up the discussion to share strategies that a

teacher may use to help refocus students. This kind of noticing and wondering takes the conversation beyond a reactionary remark such as, “Wow! I couldn’t believe you got him to get back on task” and turns it into a valuable conversation that focuses on Zeke’s individual behavior needs or strategies while maintaining student learning and collaborative work in the classroom.

Similarly, a noticing and wondering statement for case 2 (Table 2.3) might have included “I *noticed* you turned Benjamin’s question back on the class to promote more student discourse in the classroom.” This noticing statement confirms and encourages student discourse as part of the classroom culture of mathematics learning. Another noticing and wondering statement might have stated

I *noticed* Lucy had the right answer during the warm up, but you took the time to still address Benjamin’s confusion. I’m *wondering* if this happens frequently and if so, how do you juggle between moving on to the next part of the lesson with the class versus holding everyone back or slowing things down so that all students get it.

This is a valuable question to ask a teacher who seems to be struggling with pacing; or, to ask a teacher who has demonstrated successful pacing and student achievement, in order to encourage learning from teaching.

The noticing and wondering statements in case 1 and 2 are similar to other examples provided in the short orientation session. Due to the multiple subject areas involved, the cases centered on observations concerning classroom management, student behaviors, and/or teacher instructional moves that would be understood by all disciplines. This was different from Smith’s (2009) example of Olivia’s Lesson wherein she provided observations that could support a conversation solely about how students’ mathematical learning was inhibited by a confusing diagram of slope.

Rehearsing with Video Episodes of Teaching. The last approximation of practice in the orientation session provided mentor-intern pairs the opportunity to watch 5-10 minutes of a recorded teaching episode and write noticing and wondering statements for the teacher. To help scaffold the teacher noticing and language adoption, I encouraged mentors and interns to jot down notes on an observational tool (Roller, 2015; Appendix B) while watching the video. They were instructed to write one noticing and wondering statement. Similar to the written teaching scenarios, and in order to make connections from the orientation session back to the classroom, interns were encouraged to treat this simulation as if they were watching their mentor. Mentors were asked to imagine they were giving feedback to their intern. Afterwards, noticing and wondering statements were shared in pairs and with the group.

In professional development session I facilitate, I use video of my own middle school teaching when appropriate. One of the affordances of doing this is that it allows me to role play the conversation. Typically, I am the teacher receiving feedback when noticing and wondering statements are shared with the whole group. Collectively, this demonstrates the depth of conversation that can be produced from using this language. Sharing a moment of my own classroom also builds a sense of trust and respect. Similar to how noticing and wondering statements are about the observations written in the teaching scenarios, the video noticing and wondering statements can only be about the teaching provided in the video clip. In this particular case, the video illuminated beginning class and engagement strategies.

Teachers attempting to practice conversations about teaching that incorporate the language of noticing and wondering while also addressing the practices that support mathematics learning might consider viewing mathematics teaching videos and using the language structure to write feedback for the teacher in the video. Resources for videos include Beginning Teacher

Support and Assessments (Beginning Teacher Support & Assessment, 2012) videos which I had previously utilized for an elementary professional development (Roller, 2014) and the Annenberg Media (1995) videos were also used by McDuffie et al. (2014) for developing various aspects of mathematics teacher noticing. Mentors and beginning teachers can watch the videos together and consciously use noticing and wondering statements to talk about the teaching they just observed and shared together.

Context of the Research Study

The research study took place with participants from a secondary teacher preparation program at a large public university in the Midwest. Participants were mentor-intern pairs who had responded to an email asking for volunteers to participate in a research study interested in exploring the conversations that take place between mentors and interns. Participating interns were PSTs in their final year of a five-year teacher preparation program. The internship placement is a yearlong teaching experience in which student interns are responsible for teaching one class. As the year progresses so do the levels of teaching responsibility. This study occurred during the ten week period of lead teaching. During this time interns take on the highest amount of responsibility and are doing the majority of lead teaching (at least four classes) in the classroom. This is an optimal time to conduct the study, as mentors focus more on mentoring interns when the interns are teaching more. Participating mentor teachers were all veteran who had a wealth of experience mentoring PSTs. All mentors have mentored between five and fourteen PSTs previous to the commencement of the study.

The mentor-intern pairs in the study represented mathematics and social studies content areas. The short orientation session included secondary teaching scenarios from a variety of content areas. The inclusion of all subject areas makes this orientation practical, as mentor

orientations often include all of the recruited mentors for the year. It also provides a language that elementary teachers may feel comfortable using across subject areas in their classroom. However, for the purposes of this article, I focus on the examples connected to mathematics teaching and analyzing mathematics mentoring conversations.

Out of the three mentor-intern pairs who participated in the short orientation session, I investigated the conversations from the two mentor-intern pairs. These pairs entered the orientation session with no evidence of the language of noticing and wondering in their prior conversations. I made this decision in order to see how mentor-intern pairs who were not currently using “notice” or “wonder” in their discussions adopted the phrasing into their mentoring conversations. From this point on in the paper I will refer to them as Pair 1 and Pair 2.

Prior to meeting for the short orientation session, mentor-intern pairs completed a pre screener activity. This activity asked the mentor and intern to watch two video episodes of teaching together. After each episode, the pairs had a conversation about the teaching episode they just watched. Mentor-intern pairs were responsible for audio recording and electronically submitting these conversations to me.

After the short orientation session, I emailed the group of mentor-intern pairs biweekly encouraging the use of noticing and wondering language. Additionally, I asked the participants to audio record and electronically submit two sample conversations that took place after the intern taught a lesson. At the end of the study, approximately eight weeks after the short orientation session, mentor-intern pairs were asked to complete a post screener activity. This was identical to the pre screener activity. I also conducted semi-structured exit interviews with each mentor and intern individually (see Appendix A for more).

Research Questions

This study, drawing from the pre- and post-conversations about the sixth grade mathematics video and semi-structured exit interviews, responds to the following research questions.

- 1) In what ways do mentors and PSTs adopt the language of noticing and wondering after learning about it?
- 2) In what ways does the language of noticing and wondering support mentors and PSTs to adopt an interpretive stance when discussing teaching practice?

The noticing and wondering language structure was selected for the short orientation session because it provided a structure that combines descriptive observations with interpretive wonderings about the observations as a way to have more productive mentoring conversations (Smith, 2009). Whereas research has identified that much of the talk around video and classroom observations is evaluative (Borko et al., 2008; Clarke et al., 2014; van Es, 2011), the goal was that by providing mentor-intern pairs with the language of noticing and wondering that it might support descriptive and interpretive conversations that provide PSTs more opportunities to be learning about and improving their teaching practices within field placements (Hiebert & Morris, 2012; Stigler & Hiebert, 2009).

Data Analysis

To explore the adoption of the language of noticing and wondering in mentoring conversations, the pre- and post-conversations were transcribed and each conversation was analyzed based on frequency of the words *notice* and *wonder*. In order to illuminate how the language of noticing and wondering influenced the stance of mentoring conversations, each turn in the conversations was coded for analytic stance. Based upon the definitions provided in van

Es' (2011) framework for learning to notice student mathematical thinking in video, I coded each speaker turn as either descriptive, evaluative, or interpretive. Turns were identified using Johnstone's (2008) description of a turn which states that, "a turn begins when one speaker starts to speak, and ends when he or she stops speaking" (p. 102). In a few cases, where a speaker's turn finished one topic and then began the next, the turn was split into two turns that occurred back to back. One turn was responding to the previous and one was introducing the next topic. Examples of each of these coded turns and definitions can be found in Table 2.4 and will be described below.

Table 2.4

Stance Type Descriptions and Examples of Coded Speaker Turns

Stance	Stance Description	Examples of Turn
Descriptive	Creates a picture of the video moment observed through script and/or detailed descriptions.	Intern: <i>I think, I noticed once she said Jordan.</i> (Pair 1, Pre-conversation 2)
		Mentor: <i>Then she had said at the beginning she wanted to review those three strategies and then she asked Brianna how</i> (Pair 2, Post-conversation 2)
Evaluative	Makes a judgement that approves, disproves, or critiques the video moment in terms of how something should have been done.	Mentor: <i>That was hard to watch. I do understand the idea of handing things out at the door and saying things, but it became that monotonous broken record. Ya know?...</i> (Pair 1, Pre-conversation 2)
		Mentor: <i>I liked how she said these are the three strategies we're gonna use, but I felt like she kind of rushed through em, but I think her class moves at quite a clip.</i> (Pair 2, Post-conversation 2)

Table 2.4 (cont'd)

Interpretive	Statements or questions that attempt at understanding and explaining a particular observation.	Mentor: <i>Five percent of 200, and he got 4.3. So what did he do to get the 4.3 and what mistake did he make?</i> (Pair 1, Post-conversation 2)
		Intern: <i>It might also be the difference between sixth graders and high schoolers energy level though too.</i> (Pair 2, Pre-conversation 2)

Descriptive Turns. Descriptive turns ground the mentoring conversation in the observed practice of teaching and aid in having a shared understanding of teaching moments to discuss (Smith, 2009). Turns were coded descriptive when the speaker solely described what they observed in the video. These turns *told* what happened in the video. These turns included descriptions of what was observed and/or quotes from the teacher or students in the video. For example, Pair 2's intern's descriptive turn "She gave them like five different ways. They were allowed to choose which one is best for them" retells how the teacher provided students with five different ways to solve the problem and how the teacher had given the strategy of choice to the students. I coded this as descriptive because it is a basic description void of opinions, judgments, or justifications for the teaching choices.

Evaluative Turns. Mentoring conversations that maintain an evaluative stance not only place judgements on the observed teachers but lack discussion regarding the improvement of teaching practice. Evaluative turns are less desirable in field placements where PSTs are encouraged to study their teaching practice (Clarke et al., 2014). Van Es (2011) defined evaluative as "uninformed judgments about what was good or bad or should have been done differently" (p. 138). These turns include moments where the teachers approved of the teaching they observed. Statements such as "I did like that" or "there was good participation," as well as moments that were unsatisfactory, such as "it just was not very efficient" are indicative of

evaluative turns. Evaluative turns sometimes include the words “could” or “should” to indicate that the teacher believes there was a better way of doing the action in the video. Turns were also evaluative in situations where observations were compared to another teacher (suggesting that one was better or worse) or the frequency of an action was critiqued (e.g., “Teacher X did something a lot”).

Interpretive Turns. Mentoring conversations that demonstrate an interpretive stance ask questions and reflect on teaching moments to understand and improve future teaching practice. This is a habit of mind (Schwille; 2008) that is beneficial for PSTs to develop during student teaching as it will help them continue to problem solve their future practice as beginning teachers. Turns were coded as interpretive if the speaker was trying to explain and/or figure something out about the video observation. Van Es (2011) described the interpretive stance as, “reasons about what they observe, to understand the roots of an idea, and to explain what was meant by a particular statement, drawing, gesture, or expression” (p. 138). Interpretive turns included questions about the video, as well as hypothetical suggestions (e.g., “...maybe it’s because...”). Speaker turns that merely confirmed what the other person stated, such as “Mhm” or “Yeah” were coded the same as the previous comment since they were in agreement with the prior statement and stance.

Results

The following sections share insights about the adoption of noticing and wondering language in mentoring conversations through the analysis of two data points: the pre- and post-conversations and the exit interviews. The first section focuses on the first research question and addresses the ways in which mentors and PSTs adopt the language of noticing and wondering after participating in the short orientation session by comparing the frequency of the words

notice and wonder in the pre- and post-conversations to gauge how much the mentor-intern pairs adopted this new structure after the short orientation session. This section also utilizes the exit interview data to gather the mentors' and interns' perceptions of using the language. The second section focuses on the second research question and addresses the ways in which using the language of noticing and wondering support mentors and PSTs to adopt an interpretive stance when discussing teaching practice. In particular, I examine the coded turns for analytic stance from the pre- and post-conversations.

Exploring Mentor and PST Adoption of the Language of Noticing and Wondering

In answering the first research question, I examined the frequency of the words *notice* and *wonder* as a way of acknowledging the degree to which the mentor-intern pairs adopted the language after the short orientation session. The pre-conversations lacked any intentional form of noticing and wondering language and only contained either the word *notice* or *wonder* once. In contrast, Pair 1's post-conversations contained the word *notice* six times and the word *wonder* three times. Pair 2's post-conversations included the word *notice* four times. Based on the increase in frequency of the words *notice* and *wonder*, the post-conversations indicated that the mentor-intern pairs were attempting to use the language of noticing and wondering from the short orientation session (Table 2.5).

Table 2.5

Frequency of Coded Turns and Inclusion of Noticing (N) and Wondering (W) Language

	Descriptive	Evaluative	Interpretive
Pair 1			
Pre-conversation	3 (1N)	8	1
Post-conversation	8 (3N)	31 (2N)	19 (1N, 3W)
Pair 2			
Pre-conversation	8	27	5 (1 W)
Post-conversation	4 (2N)	27 (2N)	4

Mentors and interns, more interestingly, when adopting the language of noticing and wondering, implemented the word *notice* more frequently than the *word* wonder. This may be demonstrating the learning curve mentors and interns experienced as they tried to make the new language fit within their already occurring mentoring conversations. Noticing may have also been adopted more frequently as it is used to describe a shared observation versus wondering which requires an extension of thinking about the observation that is used to advance the examination of that particular moment of teaching.

Within the exit interviews, all mentors and interns commented that the language of noticing and wondering successfully facilitated nonthreatening and open conversations. For example,

This type of conversation really helped facilitate open communication (Pair 2 mentor).

I think the advantage was that it kind of softened things or gave me an opportunity to explain what I was doing (Pair 2 intern).

The attitude about the language being beneficial aligns with the increased frequency of the words *notice* and *wonder* in the post-conversations.

When pairs were asked about the advantages of using the language of noticing and wondering, Pair 1 reported feeling like the noticing and wondering language was more productive for conversations that require deeper thought and reflection. However, according to Pair 1, they may not be as effective if you needed to share something quickly. Conversely, Pair 2 implemented the language of noticing and wondering in a way that facilitated quick conversations, sometimes even during classes that might draw an intern's attention to something important in the middle of a teaching moment. The mentor in this case felt the language was so nonthreatening that it could even be used in front of students. Pair 2 mentioned how the whole

class sometimes became part of the conversation responding to wonderings about student learning. While the beliefs concerning which conversations the language was most helpful in facilitating varied, all of the mentors and interns perceived the language structure as creating productive mentoring conversations and worthy of adopting. The Pair 1 intern argued that noticing and wondering language required him to think carefully and identify the specific concern he needed to address with his mentor.

I think in the end, again it was along the lines of, it was a little easier to sometimes get an idea of what I wanted to say because I was forced to think about it first, how do I word this, using this language, which kinda helped me refine the question itself or the statement, and realize, oh I have extra stuff in there I don't need to add, or that might be kind of offensive (Pair 1 intern).

When mentors and interns were asked about disadvantages of the language, Pair 1 mentor mentioned that

It is really useful for a conversation you want to have extend[ed]. Something that's very quick, not necessarily, and it might impede that, it might actually overcomplicate something that's not very complicated in the first place (Pair 1 mentor).

The Pair 2 intern also expressed a disadvantage regarding how wondering might potentially make points less clear, particularly if the mentor wanted him to do something specific.

A disadvantage would be that [Mentor] is a direct person, so if she wanted to say something and she chose to use that avenue, then I would be less sure of what she was trying to get across.

While these two participants identified situations where a direct response would be more helpful than structuring a conversation with noticing and wondering language, Pair 2's mentor

provided the most powerful response. As an experienced mentor of interns and a principal that had evaluated teachers, she said,

The only disadvantage is that I wish I had known about this sooner.

This mentor expressed her plans to use the language of noticing and wondering with her new intern next fall. She also advocated for sharing this structure with other mentors and interns as it supported collaborative, respectful, and productive mentoring conversations. The positive perception from mentors and interns, and the increased frequency of the words *notice* and *wonder*, indicate that mentor-intern pairs were able and willing to adopt the language of noticing and wondering in their mentoring conversations productively.

Supporting Mentors and PSTs to Adopt an Interpretive Stance within Mentoring Conversations

This section addresses the second question. By reviewing the results of the pre- and post-conversation turns that were coded for analytic stance, I illustrate the ways in which the language of noticing and wondering supported mentors and PSTs to adopt an interpretive stance when discussing teaching practices. Before the orientation session, mentor-intern pairs' conversations contained a majority of evaluative turns with fewer descriptive and interpretive turns (Table 2.5). These conversations lacked educative opportunities for PSTs to reflect or inquire about the practice of teaching (Borko et al., 2008; Clarke et al., 2014; van Es, 2011). The pre-conversations tended to include judgments and disapproval of the teacher's choices. While the post-conversations still contained a large amount of evaluative turns, there was an increase in the amount of interpretive turns from the pre-conversations which encourages reflection and inquiry about teaching.

The word *notice* appeared in all three stance categories. Mentor-intern pairs had adopted the use of *notice* to highlight an observation in the video. However, their stance was dependent on if the teaching observation was just being described, a judgement was attached to an observation, or the observation was used to begin an inquiry of the teaching moment.

A turn was coded as descriptive if the speaker was just explaining what had happened in the video episode. An example of this descriptive use of noticing is,

Mentor: *Well, I noticed that she was walking around and monitoring and checking for their progress and then she said the one thing, like, “give me a thumbs up” or, ya know, when that kid gave the answer (Pair 2, Post-conversation 2).*

This example demonstrates how noticing used alone is described by Smith (2009). The noticing statement grounds the comment in exactly what occurred during the teaching episode.

Sometimes, however, the mentor-intern pairs further extend the use of noticing by adding evaluative words or comments at the end of the noticing statement. An example of how the mentor shifts noticing toward an evaluative stance is represented in how the mentor adds the word “limited” in the turn below.

Mentor: *I notice that there is limited individual processing time, and there really was a, almost a race, a speed... (Pair 1, Post-conversation 2).*

This shifts the turn from being about the actual measurable time students were given for thinking, and turns it into the mentor making the evaluative decision that it was limited or not enough. This type of evaluative talk in conversations has been associated with more traditional styles of mentoring versus educative mentoring that supports PST growth and development.

Pair 1 also included the word *notice* in an interpretive turn. This section of the post-conversation is particularly interesting because it opens with the mentor *noticing* something he

finds interesting. After the intern confirms this shared observation, the mentor continues his inquiry about the time inconsistency by using two follow-up *wondering* turns.

Mentor: *Now, it's interesting, the previous video we commented on, I **noticed** that his, 30 seconds we're gonna do this but then he pushed it. She said in a couple minutes we'll be playing a bingo game and then at some point they say 12 minutes into the lesson, they still hadn't gotten there. Somehow that feels, his sense of time was 30 seconds well we're going to take a short period of time.*

Intern: *yeah*

Mentor: *Um Hers, I think, I **wonder** if she actually believed was gonna be a couple minutes, but then her preparation and the technology issues and whatever delayed that, and so I **wonder** if it was intended to take that long, to get to that point.*

Intern: *Or if she found formatively they're not as ready as I thought they were.*

Mentor: *Right. Was it a planning thing? Was she adjusting things on the fly?*

This set of turns more accurately portrays the way the short orientation session had intended for the language of noticing and wondering to be used. It successfully grounds the discussion in an important shared observation while modeling the extended thinking regarding *why* a teacher might lengthen a lesson. Using the words *notice* and *wonder* in this context can encourage more productive conversations between mentors and interns as they think of possibilities for what might change a lesson's timeline. These productive conversational moments where the mentor-intern pairs unpack observations in an attempt to make sense of some aspect of the video teaching episodes tend to follow interpretive turns in the conversation more frequently than evaluative or descriptive turns.

While there is evidence that mentor-intern pairs adopted the word *notice* more frequently than the word *wonder*, the examples of noticing statements across all three stances demonstrates the ways in which mentor-intern pairs were trying to merge this new language structure within pre-existing conversation conventions. The appearance of noticing in all three stances also demonstrates how grounding the conversation in the practice of teaching is just the first step in making conversations more productive when using noticing and wondering language (Smith, 2009). For meaningful conversations that promote an investigation of shared teaching moments to occur, wondering needs to also be included. The pattern of *notice* in all three stance categories and *wonder* being coded only as interpretive further supports the importance of not only adopting the noticing part of the language, but emphasizes how vital it is for mentor-intern pairs to also wonder about these shared moments together. Mentors should model wondering. Overall, the combination of noticing and wondering in mentoring conversations supports the shift toward an interpretive stance, improving teaching practice through inquiry, reflection, and analysis of teaching (Hiebert & Morris, 2012; Stigler & Hiebert, 2009).

Implications

In this section, I detail three implications from this study for mathematics teacher educators. These include: empirical evidence supporting Smith's (2009) noticing and wondering language, research tools for exploring and supporting mentoring conversations, and design principles for introducing the language of noticing and wondering to support conversations about mathematics teaching.

Empirical Evidence Supporting Noticing and Wondering Language

This study extends the knowledge about a proposed noticing and wondering language (Smith, 2009) for talking about teaching by collecting empirical data to better nuance the

understandings of adoption and implementation in mentoring conversations. In particular, the increased frequency of the words *notice* and *wonder* and the positive perceptions of mentors and interns concerning the language of noticing and wondering provide support for introducing this language to future mentor-intern pairs. The analysis of analytic stance further provides understanding about the ways in which mentor-intern pairs merge a new conversation structure into pre-existing habits of mentoring and explores the use of noticing in all three analytic stance categories. While the mentor-intern pairs who were new to the language of noticing and wondering were inconsistent in implementing the complete structure that included both *notice* and *wonder*, glimpses where mentor-intern pairs *did* follow the structure (interpretive example above) demonstrate the potential for using this language as a way to structure conversations that investigate and make sense of shared teaching moments. These learning opportunities have the potential to improve PST teaching practice (Hiebert & Morris, 2012; Stigler & Hiebert, 2009) and are thus worthwhile of future research.

Research Tools for Exploring and Supporting Mentoring Conversations

This study also contributes practical research tools for exploring and supporting mentoring conversations (the short orientation session and the tools used to capture and analyze mentoring conversations). The design of the short orientation session focused mentor-intern pairs on a high-leverage practice that fits within the constraints of a teacher preparation program's mentor orientation. Tools demonstrated in this study for capturing mentoring conversations included the mentoring conversation prompt of the pre/post screener activity, audio recordings of mentoring conversations, and the analytic stance framework (van Es, 2011) for coding turns. Together, along with the orientation session, these tools provided a way of gathering mentoring conversations about videos episodes regarding someone else's teaching

while simultaneously providing a small enough grain size with the turn analysis to highlight the small, yet significant shift that the words *notice* and *wonder* have on the mentoring conversations.

Finally, I offer suggestions for introducing and supporting the language of noticing and wondering to mentor-intern pairs. This short orientation session was developed for a broad audience of secondary teachers. I focused on general classroom management and/or themes of student behaviors that all teachers could easily access. However, my attempt to pick something general across subjects resulted in reduced opportunities for teachers to engage in conversations about subject specific pedagogical knowledge. The generalist content of the scenarios did not support that kind of engagement with discipline specific learning.

Design Principles for Introducing the Language of Noticing and Wondering to Support Conversations about Mathematics Teaching

Future professional development opportunities for mathematics teachers need to include written scenarios that provide observations of students' mathematical understanding and particular mathematical tasks. These subject specific scenarios should provide better opportunities to showcase the full potential of mentoring conversations that utilize noticing and wondering language to structure discussions with a purpose of improving teaching in the content area. Similarly, for mathematics teachers, the video clip should be replaced with a more robust mathematical video clip that supports noticing students' mathematical understanding. The goal in making these changes is to focus on students' mathematical sense-making through noticing and wondering language.

Finally, given that mentoring is conversational work, and because educative mentoring has demonstrated increases in PST learning and development (Stanulis et al., 2012), it is a logical

next step to continue studying and supporting mentoring conversations in ways that encourage more productive and intentional conversations that improve teaching (Hiebert & Morris, 2012; Stigler & Hiebert, 2009). Investigation into how elementary and secondary mathematics mentors and PSTs adopt and implement the language of noticing and wondering into mentoring conversations after a short orientation session focused on mathematics teaching will further support redesigns and illuminate if there is a difference in the ways in which mentors and interns adopt the language of noticing and wondering across the K-12 spectrum. Data may also indicate ways that mentoring supports should be differentiated to support variances in elementary versus secondary mathematical mentoring conversations.

APPENDICES

APPENDIX A

Semi-Structured Interview Protocol

1. Tell me about a conversation you and your mentor/intern had about teaching before starting this studying.
2. Tell me about a conversation you and your mentor/intern had about teaching after starting this study.
3. Did your conversations change before and after?
 - a. How were they different or same?
 - b. Were they more/less productive? How?
4. Were your discussions about lessons always verbal or did you give/receive written observations/feedback too?
5. Is there a format you would say conversations in your field placement tend to follow?
 - a. How did these conversations normally go?
 - b. Who normally initiated them?
 - c. Where and when did they take place?
6. How did you decide what you would talk about after a teaching episode?
 - a. What were some of the specific topics that you thought were most helpful to discuss?
7. Do you think it's important that teachers talk about teaching practices? Why?
 - a. Do you have any evidence or examples that support this thinking?
8. What did you think about noticing and wondering language? How new was this language to you?
9. Did you use noticing and wondering language in your placement when talking about teaching? How did that go or why not?
10. What advantages or disadvantages did you discover from using this type of language?

11. Were there any topics that you were able to discuss after learning the noticing and wondering language that you felt were difficult to bring up or address in a conversation prior to this study?

APPENDIX B

Organizational Tool for Video Observation¹

This tool is to help you document what you are noticing while watching your teaching video. The goal is to help you create a complete list of everything you noticed and then to have you focus in on the three observations that you think are the most important and why these stuck out as the most important to you.

Part 1: List of things I noticed...

Directions: While watching the video of yourself teaching, make a list of all the things you notice. The list doesn't need to be in any particular order, just observations that you noticed and are now aware of from watching the video. I've placed some bullets below to get you started, but feel free to add more or use less depending on what you see in your video.

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¹ From “What They Notice in Video: A Study of Prospective Secondary Mathematics Teachers Learning to Teach,” by S. A. Roller, 2015, *Journal of Mathematics Teacher Education*, Advanced online publication, doi: 10.1007/s10857-015-9307-x

Part 2: Prioritizing which observations were important

Directions: After watching the video and making your list of observations, you need to pick the top three things you noticed from your video. Rank these 1 (Most important observation), 2 (Next important), and 3 (Least important out of your top three observations). Write down what your observation was and then go into detail (at least a paragraph) as to why that specific observation was so important and how you decided to rank it there.

1. (Most important observation)

2. (2nd most important observation)

3. (3rd most important observation)

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CHAPTER 3

IT'S NOT JUST WHAT THEY SAY, BUT HOW THEY SAY IT – EXPLORING THE NATURE AND QUALITY OF MENTORING CONVERSATIONS

Student teaching under the guidance of a mentor teacher is one way teacher preparation programs have tried to help prospective teachers (PSTs) develop their teaching practice prior to entering their own classroom. It is in this environment that a teacher with experience and expertise in teaching accepts the placement of a PST into their classroom to apply their coursework knowledge and practice the skills of teaching. Field experiences, like student teaching, vary significantly however based on the variety of ways that mentors engage with PSTs (Wilson, Floden, & Ferrini-Mundy, 2002). Regardless of these differences, “[s]tudy after study shows that experienced and newly certified teachers alike see clinical experiences as a powerful—sometimes the single most powerful—component of teacher preparation” (Wilson et al., 2002, p. 195).

One key component of the student teaching experience is how mentors engage in conversations with PSTs, allowing PSTs to express their concerns and reflect on their teaching (Feiman-Nemser, 2001). This approach to mentoring, known as educative mentoring (Feiman-Nemser, 1998), situates and supports the PST as a learner. As Bradbury (2010) describes, “[e]ducative mentoring is based on ambitious goals for the potential influence that mentor teachers can have. Attaining these goals is dependent upon educative mentors exhibiting specific behaviors that promote novices’ learning” (p. 1053).

Feiman-Nemser (1998) identified *observation, co-planning, co-teaching, joint inquiry, critical conversation, and reflection* as tools for mentoring, as well as tools for continuous improvement in teaching. Many of these mentoring tools, or practices, are dependent on the mentor’s ability to draw upon their own teacher noticing skills (van Es & Sherin, 2002) to

highlight important moments in teaching episodes and help the PST make connections across experience and theory to improve their teaching practice.

Although some of these tools or mentoring practices have been studied, little is known about mentoring conversations and the extent to which they are—or can be—educative. For this study, I theorized a definition of what an educative conversation would include. I used the definition's criteria as indicators to identify *potentially educative* mentoring episodes in a set of pre/post mentor-intern conversations about video teaching episodes of someone else's teaching. In this paper, I report on the nature and quality of these conversations, and I consider the role that using noticing and wondering language may or could have played in making mentoring conversations more educative.

Theoretical Framework

This study bridges the literature on teacher noticing and educative mentoring by considering *educative conversations* as a product of both of these professional skills. Teacher noticing is the interpretive means through which the mentor and PST become aware of important teaching moments. Educative mentoring is conversational work, as mentors strategically elicit and share observations they believe will be beneficial to the PST. This study analyzed the ways that mentors and PSTs integrate these skills of noticing and educative mentoring within their conversations. Next I discuss the theories and research literature on teacher mentoring that provide support for this research study, paying close attention to how mentoring practices and conversations have been characterized as structures that support novices—in particular, PSTs' learning to teach.

Teacher Mentoring

Learning theories help describe the ways that PSTs' learn to teach and the ways in which teacher mentoring supports such learning. According to Sfard (1998), learning theories can be described with two metaphors for learning. The *acquisition metaphor* describes learning as gaining bits of knowledge, essentially collecting or acquiring knowledge. Conversely, the *participation metaphor* describes learning as an action through which new knowledge is created. Both of these metaphors can be used to describe how PSTs learn to teach as they gain knowledge and skills in the classroom through PST interactions with a mentor. In particular, mentoring conversations that support PSTs to notice and perform beyond their own developmental level are an example of Vygotsky's (1978) zone of proximal development. Over time, this level of assisted performance will become what PSTs are able to do independently. Here, the participation metaphor is observed as the PST creates new understanding through experiences in the classroom and within mentoring discussions. Responsibility is released from the mentor to the PST, who would have eventually acquired or internalized the previously constructed skill. In short, mentoring can be characterized as mediating learning to teach through *both* acquisition and participation metaphors. Both of these learning metaphors recognize that learning happens in interaction and that the mentor teacher plays a crucial role in assisting PSTs in learning to teach.

Mentoring mediation studies have been categorized into three domains by a review of published studies between 1991-2014 on mentoring in *Teaching and Teacher Education* (Orland-Barak, 2014). These domains focus on "1) Mentors' performance and behaviors; 2) Mentors' reasoning, beliefs and identity formation; and 3) The place of culture, context and discourse in mentoring" (p. 180). In the literature review these three domains explore the what/how, why, and where of mentoring. This study is situated within the first domain and

focuses on what and how mentors choose to interact with PSTs to support their learning. This domain includes exploration of mentoring practices, behaviors, and approaches that help PSTs learn to teach. The second and third domains were not specifically explored in this study, however these are also influential factors that shape the experience of mentoring and what PSTs may learn from mentoring.

In the literature, two general approaches to mentoring are discussed: constructivist- and transmission-oriented mentoring (Richter, Kunter, Lüdtke, Klusmann, Anders, Baumert, 2013), which are aligned with the Sfard's (1998) two metaphors mentioned earlier. Evidence indicates that constructivist-oriented mentoring has a positive impact on beginning teachers' levels of efficacy, teaching enthusiasm, and job satisfaction, as well as lower levels of emotional exhaustion (Richter, et al. 2013). Mentoring behaviors associated with constructivist-oriented mentoring situate the PST as an active participant and support joint collaboration and critical reflection for learning in and from teaching. Mentor teachers adopt various ways of participating in teacher education (Clarke, Triggs, & Nielsen, 2014) and utilize a combination of mentoring moves (Schwille, 2008) for responding to individualistic needs of the PST as a learner. Mentors interact with PSTs in intentional ways, aligning with their predominately perceive role as an academic supporter (Koc, 2012). Less apparent in the literature is which mentoring strategies are more or less effective in promoting various outcomes of learning to teach (Hobson, Ashby, Malderez, & Tomlinson, 2009).

In a recent study connecting intensive mentoring as a way to improve beginning teacher practice significantly, Stanulis, Little, and Wibbens (2012) wonder "if there are particular kinds of mentor actions that are more successful in changing beginning teacher practice than others" (p. 41). The authors suggest observing mentor and PST interactions to understand and identify

specific high-leverage mentoring practices. One way to interpret interactions is to examine mentoring conversations (the talk that occurs between mentor and PST within the context of teaching). Mentoring conversations act as an interactive space for mentors with more expertise in teaching to share and highlight classroom moments for the PST (Berliner, 1988), as well as a space for the PST to express insight and concerns with the mentor. It is through mentoring conversations that mentors have influence on how and what PSTs learn (Feiman-Nemser, 2001). The power of mentoring conversations influencing mentoring experiences and PST learning has led to studies that explore interventions for supporting and strengthening dialogue between mentors and PSTs (van Velzen, Volman, Brekelmans, & White, 2012; Helgevold, Naesheim-Bjorkvik, & Ostrem, 2015; Hennissen, Crasborn, Brouwer, Korthagen, & Bergen, 2011). Examination of mentoring conversations from exemplary mentors (Orland-Barak & Hasin, 2010) and those within international contexts (Wang, Strong, & Odell, 2004) have also been explored to understand how context influences mentoring practices and PST learning opportunities. Turn taking (Crasborn, Hennissen, Brouwer, Korthagen, & Bergan, 2011) and timed increments of conversation (Helgevold et al., 2015; Hennissen et al., 2011) are two ways researchers have limited the amount of text for coding purposes. These smaller grains also make it possible to notice the intricacies (i.e. moves, foci, language, etc.) in the conversations and begin to decompose how mentors talk about teaching with PSTs to support learning to teach. However, not all conversations are educative in nature.

Educative Mentoring

The coexistence of both metaphors for learning (Sfard, 1998) is exhibited in Dewey's (1938) definition of an educative experience. In particular, an experience is educative when a learner experiences growth from engaging in his/her environment. Carried over to mentoring,

educative mentoring intentionally creates meaningful experiences for PSTs to promote growth and development as teachers. The term, educative mentoring, was coined by Feiman-Nemser (1998), who identified it as being more productive for PST development compared to more traditional mentor styles that focus on supervision, emotional support, and/or quick fixes in the classroom. Educative mentoring supports the development and improvement of a novice's teaching practice by "cultivating a disposition of inquiry, focusing attention on student thinking and understanding, and fostering disciplined talk about problems of practice" (Feiman-Nemser, 2001, p. 28). In these ways, educative mentoring focuses on the joint work that mentors and PSTs do to study teaching in the classroom, placing focus on both in-the-moment concerns as well as future teaching needs. This collaborative work is deeply rooted in professional conversations about teaching where the purpose is to improve teaching practices. By teaching PSTs the intellectual habits of mind (Schwille, 2008) that aid in noticing, reflection, and analysis, educative mentors are modeling an inquiry stance that PSTs can use on their own to problem solve, assess student learning, and think about future teaching experiences.

Educative mentoring is composed of many professional skills, which Feiman-Nemser (1998) identified as the "tools of mentoring – observation, co-planning, co-teaching, joint inquiry, critical conversation and reflection" (p. 73). Talk between the mentor and PST has been identified as "a vital element in helping novices learn to teach" (Schwille, 2008, p. 158). Schwille (2008) further identified many forms of mentoring that occurred outside the action of teaching that also rely on professional and critical conversations. These included: *brief, informal conversations or mentoring on the move, mentoring sessions, debriefing sessions, and coplanning sessions*, where mentor and PST would be communicating about teaching. However,

there is limited research that deeply analyzes the composition of mentoring conversations at all (Wang et al., 2004), let alone educative ones.

Since educative mentoring has been associated with PST learning (Stanulis et al., 2012), I wanted to theorize a definition of what an educative mentoring conversation might entail. I used Bradbury's (2010) comprehensive table of *Themes of Educative Mentoring and Associated Mentor Behaviors*. Within this table, behaviors of educative mentors were grouped into "three overarching themes: respecting the developmental level of the novice, using teaching as a site for situated inquiry, and striking a balance." (p. 1053). Of particular interest in regard to the student teaching experience were the associated mentor behaviors classified as *Using Teaching Practice as a Site for Situated Inquiry*. The mentor behaviors included within this category were as follows:

- 1) Adopt an analytic stance
- 2) Use student thinking and work as a source of knowledge
- 3) Connect theory and practice
- 4) Use the expertise of both partners to develop new ideas

Because many of the actions that Bradbury (2010) called behaviors are communicated between the mentor and intern via conversations, I began thinking about how these identified educative mentoring behaviors might provide insight about the professional conversations between mentors and PSTs within the shared classroom space. Behaviors 1 and 4 focus on analyzing teaching and collaborative work, which suggests how mentors and interns might approach or structure mentoring conversations. In particular, these suggest that within educative conversations the PST would be an active participant in the thinking, communicating, and studying of teaching. Behaviors 2 and 3 provide insight into what mentors and interns might discuss in their

conversations, suggesting that the content and purpose of these conversations would focus on evidence of student thinking, learning, and making supportive connections between theory and practice.

Therefore, it is possible to call the conversations that are associated with educative mentor behaviors *educative conversations*. In this study, I define educative conversations as the talking that occurs between mentors and PSTs where the purpose of these conversations is to provide opportunities for novice teachers to:

- 1) learn in and from practice;
- 2) generalize from particular instances of their teaching practice; and/or
- 3) focus their attention on student learning.

I used this definition to develop a framework that helps identify *potentially educative* mentoring episodes that match one or more of the above three criteria to evaluate the educative potential of mentoring conversations. Considering the challenge of attending to all three of these criteria within a single mentoring conversation, I focused on episodes that contained at least two criteria and wondered whether those kinds of conversations would provide more opportunities for educative mentoring.

Teacher Noticing

Mentor teachers use their teacher noticing skills to make classroom observations and decisions about which observations should be shared to help support the PST's trajectory of development as a teacher. Therefore, the second professional practice this study built upon is teacher noticing. Teacher noticing is a growing base of research focused on the professional vision of teachers (Goodwin, 1994), and specifically what teachers are able to see as professionals in the classroom that other individuals may not. Expert teachers who have

developed the skills of noticing are able to make sense of classroom situations and to describe them in greater detail and with more specific language than novice teachers (Berliner, 1988). Articulating these observations and thoughts is an important piece of educative mentoring conversations.

Teacher noticing research has recently been expanding beyond the original investigations that focused on what teachers were and were not attending to in the classroom (Erickson, 2011; Mason, 2011). Recent studies also have considered how teacher educators can aid in the development of noticing skills in practicing and PSTs (Sherin, 2004; Sherin, Jacobs, & Philipp, 2011). One framework for teacher noticing that also focuses on the key components of educative conversations— student learning and making connections between theory and practice—is van Es and Sherin’s (2002) three key aspects of learning to notice. These aspects include a) identifying important moments, b) making connections from observations to experience and knowledge, and c) using context to understand teaching situations.

Although everyone has the capacity to notice things in the classroom, teacher noticing is a professional skill that distinguishes experts from novice teachers (Sherin et al., 2011). Mentors modeling expert teacher noticing skills within mentoring conversations provide PSTs exposure to advanced noticing skills that have the potential to aid in the development of teacher noticing skills and improvement of teaching practices centered on student learning. To further analyze mentoring conversations’ educative potential, this study aligns the first two aspects of learning to notice (van Es & Sherin, 2002) with the second and third educative conversation criteria (student learning and generalization) with the belief that when instances in the conversation focus on one of these criteria there is also a possibility for PSTs to be developing their own noticing skills.

Noticing and Wondering Language

It can be challenging to hold 'the kinds of educative conversations that Feiman-Nemser (2001) identified as key to supporting novices learning in and from practice because language about teaching practice tends to be very evaluative. In fact, similar protocols for talking about teaching and student work are commonly set norms for teacher professional learning communities. Such norms make it possible to establish the trust necessary to hold potentially sensitive conversations without someone feeling hurt, disrespected, or getting defensive. Smith's (2009) *noticing and wondering protocol* is suggested as a language that can support more productive mentoring conversations about teaching. It offers a structure that highlights the moments mentors noticed when viewing a PST's enacted lesson (Smith, 2009). When used purposefully, noticing and wondering language allows conversations to be focused on the observable practices of the classroom (I noticed) while leaving the conversation open for reflection and problem-solving about teaching practices that need improvement (I wondered). This language, when used by mentors, supports components of teacher noticing and educative mentoring that have the potential to affect PST learning. For example, noticing provides PSTs with a model of teacher noticing skills, and wondering helps to inquire and reflect on moments from the classroom that might be improved.

Research Questions

Bridging the two bodies of literature (educative mentoring and teacher noticing), I developed a study to investigate the nature and quality of the conversations mentor teachers and their interns had before and after they were introduced to the language of noticing and wondering. I use the following research questions to examine mentor-intern pairs' mentoring conversations.

1. How did the pre/post mentoring conversations compare in terms of the frequency and quality of *potentially educative* mentoring episodes?
2. What is the relationship, if any, between the foci of the *potentially educative* mentoring episodes and their classification of being potentially more or less educative?
3. What role, if any, did the use or disuse of the noticing and wondering language play in those episodes identified as potentially educative?

This qualitative study was conducted primarily through the comparison of mentor-intern pairs' pre- and post-conversations about two video teaching episodes of someone else's teaching.

While these conversations were not about the intern's teaching practice in the classroom, they can still be considered mentoring conversations because the mentor and intern are talking about the shared experience of watching and thinking about teaching together. I compared the frequency and foci of *potentially educative* mentoring episodes within the pre- and post-conversations following a short orientation session in which both participants were offered the structure of *noticing and wondering language* for mentoring conversations.

Method

This qualitative study analyzed pre/post conversations between three sets of mentor- intern pairs in secondary education. The interns were enrolled in a five-year teacher preparation program at a large public university in the Midwest. The internship placement is a year-long experience in which interns are always responsible for teaching one class, and add various levels of teaching responsibility throughout the year. This study was purposefully situated during the ten week period of lead teaching during which the intern assumes the greatest amount of responsibility and was doing the majority of the lead teaching (at least four classes) in the classroom. This was a favorable time to conduct a mentoring conversation study because the

mentor is released from teaching obligations, and is free to support the intern's development by observing and discussing teaching moments.

Participants

The participants were mentor-intern pairs who had responded to an email asking for volunteers to participate in a research study about the conversations that take place between mentors and interns. The mentors who volunteered for the study were all veteran teachers who had a wealth of experience mentoring PSTs (seniors and interns) with each one mentoring between five and fourteen. Overall, there were three mentor-intern pairs that volunteered and participated in the study. The mentor-intern pairs are referred to throughout the study as Pair 1, Pair 2, and Pair 3, and they are described below.

Pair 1. Pair 1 consisted of a male mentor and a male intern who were teaching Algebra I and II. The mentor was a veteran teacher in his 20th year of teaching; he was an experienced mentor because this was the 14th intern he had mentored, and he had 16 years of mentoring seniors from the university. He had experience teaching math and English, and was also certified to teach physics. The mentor shared that he liked project-based learning, and that he enjoyed staying connected to the university community to keep thinking about things. The intern in Pair 1 was a math major and a biology minor who was leaning toward only getting a mathematics teaching certification. The intern shared that he hoped to learn how to be a better collegial member of his teaching community by learning ways to talk to others in order to work out the best course of action for moving forward in a classroom. He also shared a difficult conversation he had recently had with his mentor. He said, “[It] was a difficult discussion to hold in the sense that it was hard to say what I needed to and not have it come out in a way that was critical instead of curious.”

Pair 2. Pair 2 consisted of a female mentor and a male intern who were teaching eighth grade social studies in a middle school. The mentor was a veteran teacher in her 33rd year of teaching, and this was her fifth time being a mentor. She had experiences in private and public education, had taught in a fourth grade resource room for one year, and had taught reading and English to sixth graders. The subject this mentor had taught the most during her teaching career was middle school (sixth to eighth grade) social studies. This mentor had also previously been a principal and an assistant principal for a few years: she shared how she had to evaluate teachers and, in one case, dismiss a tenured teacher. This mentor was interested in joining the study because she was looking for “some tips for constructive cognitive conversations with an intern.” Her attitude was that she always had room for improvement in her mentoring and teaching practice, and that she might be able to share her experiences to help others. The intern in Pair 2 had shifted his major from history to interdisciplinary studies after dropping a Spanish minor that would have required more coursework and postponed graduation. He was quieter in nature than his mentor, and recognized that she always had his best interest in mind. The intern joined this study to learn more about the various kinds of conversations and the ways these conversations were taking place in different internships. He acknowledged that the relationship he was building with his mentor was one unlike any other in his teacher development. He was also curious to see how he and his mentor could “interact through this process and recognize the growth that we make in our relationship.”

Pair 3. Pair 3 consisted of a female mentor and a female intern. The mentor was a veteran teacher certified in elementary education who had taught third and fifth through eighth grades. She had taught language arts, one year of math, and recently seventh grade social studies the past four to five years. This was the mentor’s sixth intern, and she expressed how she

enjoyed the aspect of teaching and sharing her knowledge with interns. The mentor joined the study because she hoped to “learn ways to make conversations meaningful and productive...[and] to find ways to make my intern feel comfortable asking all sorts of questions [...] yet also feel comfortable sharing ideas without feeling intimidated.” The intern in Pair 3 had an interdisciplinary studies major and minors in English and history. She expressed that her internship was an important experience and how vital it was that she got along with her mentor. When asked what she hoped she would learn in this study, she stated, “I hope to learn about how other mentors and interns have initiated in more intentional conversations rather than surface level conversations about events.” The intern also believed it was imperative to have her mentor’s constant feedback and support, and she recognized this was not the case in all internships. She hoped that by participating in this study it might help promote this kind of interaction in future interns’ placements.

Data Collection

Mentor-intern pairs were invited to participate in a study about mentoring conversations through an email that I wrote and sent to a department secretary who forwarded it to a secondary education mentor listserv. Mentor-intern pairs volunteered for the study by emailing me and completing an informational survey, which included questions about the length of time they had been teaching, how many interns they had mentored, what grade and subject they were currently teaching, and what they hoped to learn from participating in this study. All the mentor-intern pairs who volunteered were accepted for the study and notified via email.

Within the acceptance email, mentor-intern pairs were asked to complete a pre-screener activity. This activity (Appendix A) directed the mentor and intern to watch two publicly available video teaching episodes (BTSA, 2012; BTSA, 2013) together and after each episode to

have a conversation about what they just watched. To minimize influence about what the pair discussed, the directions did not suggest focusing on things the mentor or intern thought were important, concerning, or curious. The participants were asked to audio record these two conversations and then upload the recordings to an online learning environment. Due to difficulties with the online learning environment, some mentor-intern pairs submitted their recordings by emailing them to me. Since I was absent during the pre-screener activity, audio was preferred over written response in an attempt to get a complete picture of how the pairs were having conversations about teaching. This audio recording provided a record of elements that might otherwise be absent in a piece of writing, such as the specific language and moves that were made to introduce topics and ideas, as well as how teachers listened and responded during the conversations.

After completing the pre screener, mentor-intern pairs attended a short orientation session that I designed and implemented, titled “Let’s Talk about It—Effective Ways of Communicating about Teaching.” I had originally created and presented this short orientation session as a break-out session at the university’s Fall Internship Kick-off where it received positive feedback, but was not well attended due to location. The mentors and interns had neither attended my earlier session nor demonstrated explicit knowledge about the language of noticing and wondering. The short orientation session was located on campus in a conference room. The session lasted approximately two hours, and snacks were provided. The goals of the short orientation session were to offer mentor-intern pairs the language of noticing and wondering and to provide opportunities to practice using the language of noticing and wondering to discuss written teaching scenarios and video episodes of teaching. Table 3.1 provides an overview of the short orientation session.

Table 3.1

Overview of Short Orientation Session Activities

Short Orientation Session Activity	Description
Offering the Language of Noticing and Wondering.	Introduced to <i>noticing and wondering</i> language using examples.
Thinking about the Possible Affordances of Noticing and Wondering Language	<p>Affordances of noticing and wondering language were shared and Smith's (2009) Olivia's lesson is shared as a model mentor conversation that includes noticing and wondering language.</p> <p>One more scenario is used to compare reactionary conversation starter places the focus on the teacher, versus noticing and wondering conversation starter that direct attention to the teaching. Affordances of this language are again highlighted.</p>
Rehearsing with Written Teaching Scenarios	<p>Written teaching scenarios that describe a situation in a fictional classroom were used to write a noticing and wondering statement that mentor-intern pairs could use to provide feedback or to inquiry about the teaching practice they just observed/read.</p> <p>Mentor-intern pairs shared their scenarios and statements, and were encouraged to discuss if they would like to use this language in their placement.</p> <p>Mentor-intern pairs shared their scenarios and noticing and wondering statements, along with where they envision the conversation then going with the whole group. The use of noticing and wondering language and the direction of the conversation were discussed together and questions/clarifications are answered.</p>
Rehearsing with Video Episodes of Teaching	<p>A 6-10 minute video clip of teaching was viewed by the group. Everyone makes observations and then wrote a noticing and wondering statement that could be shared with the teacher in the video. Again, the noticing and wondering statements were shared between pairs, and volunteers from the group were asked to share to create a group discussion about using noticing and wondering language.</p> <p>Since the video clip in this study's short orientation session was from the researcher, the researcher was then able to role play how the conversation would continue by responding to the noticing and wondering statements.</p>

I emailed mentors and interns biweekly following the short orientation session, encouraging the use of the noticing and wondering language and requesting two recorded sample conversations that took place after the intern taught a lesson (Appendix B). The sample conversations provided information about the ways mentor-intern pairs were using or not using the language of noticing and wondering in their field placements, as well as generally about the nature and quality of the conversations. Mentor-intern pairs again uploaded their conversation recordings to a secure learning environment page, or emailed them directly to me. These conversations were again collected with audio recordings to gain a primary account of the back and forth conversation, rather than a written secondary account of how one of the participants thought the conversation went, which could suffer from bias.

At the end of the study, the mentor-intern pairs completed a post-screener activity, which was identical to the pre-screener activity. Each mentor and intern engaged in a separate exit interview with me that followed a semi-structured interview protocol. I decided to interview participants individually so that teacher perspectives regarding mentoring conversations could be compared and contrasted, and so that individuals could emphasize unique conversations and experiences. This style of interview allowed me to probe for more information, and to gather a complete picture of the conversation's form and focus, and how these conversations may have affected the PST's progress in learning to teach. Since the interviews would not be shared, this format supported interns to fully disclose information and thoughts without influence from their mentor. The interviews were audio-recorded and I also recorded a brief reflection after each conversation to keep track of the main themes that the participant had discussed.

Data Analysis

Since the purpose of the study was to analyze the educative potential of mentoring conversations, I used the educative mentoring literature to theorize a definition of an educative conversation. I defined an educative conversation as the talking that occurs between a mentor and a PST where the purpose of these conversations is:

- 1) to help a novice teacher learn in and from practice;
- 2) to generalize about a novice's teaching practice from particular instances; and/or
- 3) to help purposefully focus a novice teacher's attention on student learning.

Since I was analyzing mentoring conversations about shared teaching observations (criteria 1), I used criteria 2 and criteria 3 as indicators for locating episodes of mentoring talk that could be considered educative and supportive of PST learning within the field placement. For this study, I defined a *potentially educative* mentoring episode thusly as turns within the mentoring conversation meeting criteria 2 and/or criteria 3 while focused on one topic.

In order to identify the *potentially educative* mentoring episodes, I coded the transcripts for the second and third criteria and then used **the topic** of each coded moment to determine **the length** of the *potentially educative* mentoring episode based on where the topic started and ended. In some instances, multiple coded moments were contained within the same topic and thus were identified as one *potentially educative* mentoring episode. Figure 3.1 provides a visual representation of how I conceptualized the definition of a *potentially educative* mentoring episode for coding, and how I used criteria 2 and 3 as indicators of learning in and from teaching.

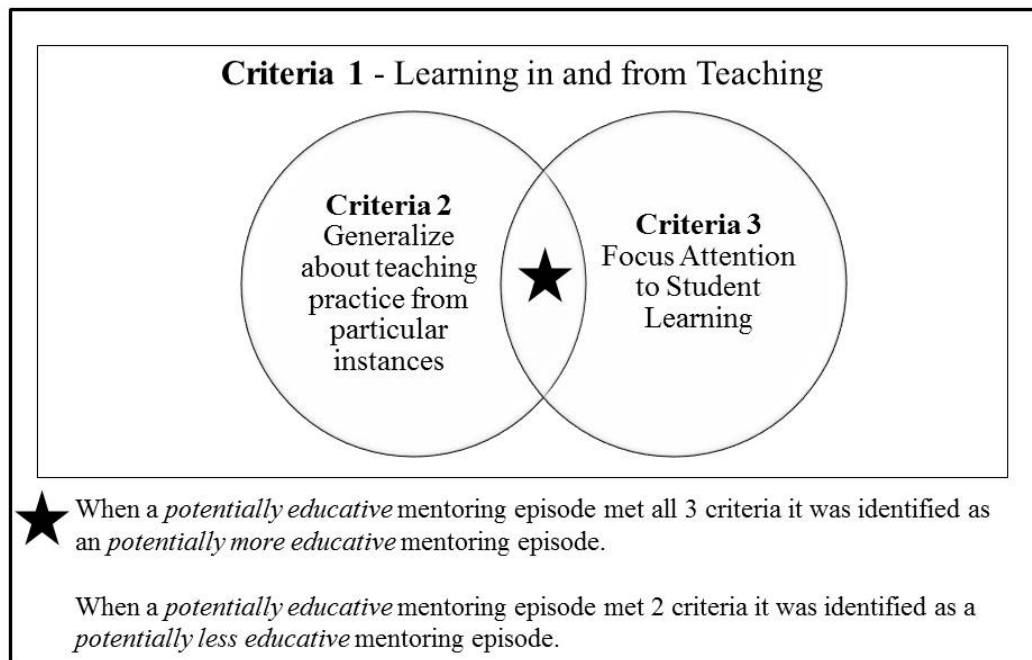


Figure 3.1. Indicators for Identifying *Potentially Educative* Mentoring Episodes.

I abbreviated criteria 2 and criteria 3 to the coding categories: generalization and student learning. I used the following working definitions of each category to highlight moments of conversation that met a criterion, and in some instances contained coding for both criteria.

Generalization. I used this category to identify when mentors and interns purposefully generalized about their teaching practice from particular instances within mentoring conversations, and thus was an indicator that this section of conversation might fulfill criterion 2 of an educative conversation. I classified *potentially educative* mentoring episodes within the mentoring conversations as generalization when the mentor or intern demonstrated a connection to theory, coursework, a previous teaching experience, or generalizing students by grade level. Note that I slightly broadened this criterion to include the possibility that either the mentor or the intern were doing the generalization (not just the mentor). One way I noticed these generalizing

moments was by a pronoun shift from talking about the teacher in the video (he or she), to the mentor or intern stating “I do,” “We do,” or “You do that.” Another example of generalization was where teachers noticed something about the teaching practice on video and discussed a more general application. Below is an example of a *potentially educative* mentoring episode that I classified as meeting criteria 2 of generalizing from an instance of practice. This example shows the intern developing a generalization from an observed instance in the video, remarking that repeating directions is going to be a commonplace teaching practice.

***Intern:** Yeah, I just think that’s just students. You’re gonna have to repeat your directions regardless of what you [do], you can do it in a nice way and get as many as you can, but every time there’s gonna be someone... (Pair 2, Post-conversation 1)*

Student Learning. I used this category to identify when mentoring conversations purposefully focused novices’ attention on student learning, and thus might fulfill criterion 3 of an educative conversation. I also coded this category more broadly to include the possibility of being led by either interns or mentors, since the mentoring conversation was about a teacher in a video episode rather than an intern’s lesson. To help develop a working definition, I asked myself the question, “What does student learning look like?” I decided student learning included lesson engagement, completing content tasks, teacher monitoring student progress, learning targets/goals, and specific subject matter. Therefore, any part of the conversation that discussed students’ learning, understanding, engagement, or monitored student learning I coded as a mentoring episode focused on student learning. Below is an example of a mentoring episode coded with criterion 3 that highlighted how the English teacher in the video supported student learning.

Mentor: So it was a good introduction, because they're actually gonna look at some of the things the guy does in the book, like when he talked to that first boy he said, "What are some of the things you do throughout your day that would describe your character?" and he says, "that's how we're gonna look at the book with this character and what will describe his character, and it might not just be spelled out right there but they'll have to read the text and decide through his actions what his character was."

Intern: Right, and he said the one character was brave, and then he was like, ok, now what about yourself?

Mentor: Yeah, and I thought, ya know, he's trying to make these connections and helping them understand the whole concept of what character is. (Pair 2, Pre-conversation 2)

Both Generalization and Student Learning. Once I completed the above coding, it became apparent that some *potentially educative* mentoring episodes included both criteria (Figure 3.1). I identified these *potentially educative* mentoring episodes as *potentially more educative* mentoring episodes. Below is an example where Pair 2 discussed the engagement of students in the second video (student learning), and then they compared it to the engagement in the first video (generalization).

Mentor: I guess you could tell if kids were actively more engaged in her classroom, 'cause you would definitely [see] the kids that wouldn't be doing the clapping and the speech back to her would not be engaged. Where he had, it seemed like, most of them were kind of not engaged until he specifically walked up to them and started talking to them, because they didn't have pencils, they didn't have notebooks. (Pair 2, Pre-conversation 2)

Below is another example of a *potentially more educative* mentoring episode meeting both criteria. In this episode the intern pointed out how the teacher had used context clues to help students define vocabulary words (student learning), and the mentor then confirmed this observation, and connected this teaching practice to their classroom and how “we work on that all the time,” (generalization).

Intern: *The two times that he tried to get them to define those words, like he said attentive and prominent, rather than saying what they were. I think he uses good context clues to get them to figure out what those things meant.*

Mentor: *I thought that too. I thought that that was good, however, don't you think he should have had the definition kind of more clearly stated, and then he could have made the connection by giving the example, because, I mean, we work on that all the time. Ya can't just give the definition. Ya gotta try to help them understand. (Pair 2, Pre-conversation 1)*

Since these two turns were connected by the topic of vocabulary instruction, together they made a *potentially more educative* mentoring episode.

After coding each category, I made a list of all the *potentially educative* mentoring episodes that took place in each of the pre- and post-conversation transcripts. This list included the mentor-intern pair, the pre- and post-conversation in which the *potentially educative* mentoring episode occurred, what coding criterion was met (generalization, student learning, or both), and a brief description of the topic discussed.

I used a word processing program to locate and highlight the words *notice* and *wonder* in the transcript. This was done last in the coding process so that these highlighted words would not interfere with coding the sections of transcript that met criteria. After highlighting these

words, I added a section to the list that included who initiated that section of the conversation (mentor or intern) and the turns that were involved. I also marked if one of the turns used the word *notice* or *wonder*. An example of this part of the list would be: MN, MWW, I, MN, M, in which the mentor started this *potentially educative* mentoring episode and used the word *notice*, the mentor spoke again using *wonder* twice, the intern contributed, and then the mentor had two more turns, the first of which included the word *notice*. This was recorded not only to observe who had initiated the *potentially educative* mentoring episodes and used noticing and wondering language, but also to see the extent to which conversations contained the language of noticing and wondering.

The list allowed me to see how many *potentially educative* mentoring episodes in each pre- and post-conversation were *potentially more educative* (demonstrating both generalization and student learning) or *potentially less educative* (only generalization or student learning). I inputted all of these lists into an Excel table and sorted the data to compare pre- and post-data, *potentially more/less educative* mentoring episodes, and the amount of noticing and wondering language. This allowed me to compare the kinds of *potentially educative* mentoring episodes that were occurring during the pre- and post-conversations, for each mentor-intern pair individually and across pairs. It also allowed me to sort out *potentially educative* mentoring episodes, to analyze who was having these episodes, and the precise frequency of noticing and wondering language in these episodes.

I further analyzed the foci of *potentially educative* mentoring episodes with a grounded theory (Glaser, 1978) approach using open coding. I parsed and sorted the original table of *potentially educative* mentoring episodes that contained brief descriptions of the topic into groups. I also reviewed the *potentially educative* mentoring episode transcripts during the

sorting with their brief descriptions in order to ensure that the focus of each *potentially educative* mentoring episode was coded accurately. The creation of coding categories started with reading a *potentially educative* mentoring episode and writing a category on a card that described its general topic, or placing it under a category that was already created. As I did this, I started to notice that some category cards fit under larger topic cards. I collapsed the subcategories into three main categories that formed the following: Classroom Structure, Teaching, and Content (Figure 3.2). Van Es (2011) has also used a similar coding system to code topics discussed during video-club meetings, which included a focus on pedagogical strategies, behavior or mathematical thinking, and classroom climate. My categories contain similar topics of teaching, content, and classroom structure. I will further discuss each of the categories and subcategories (Figure 3.2) that I used for coding in the next section.

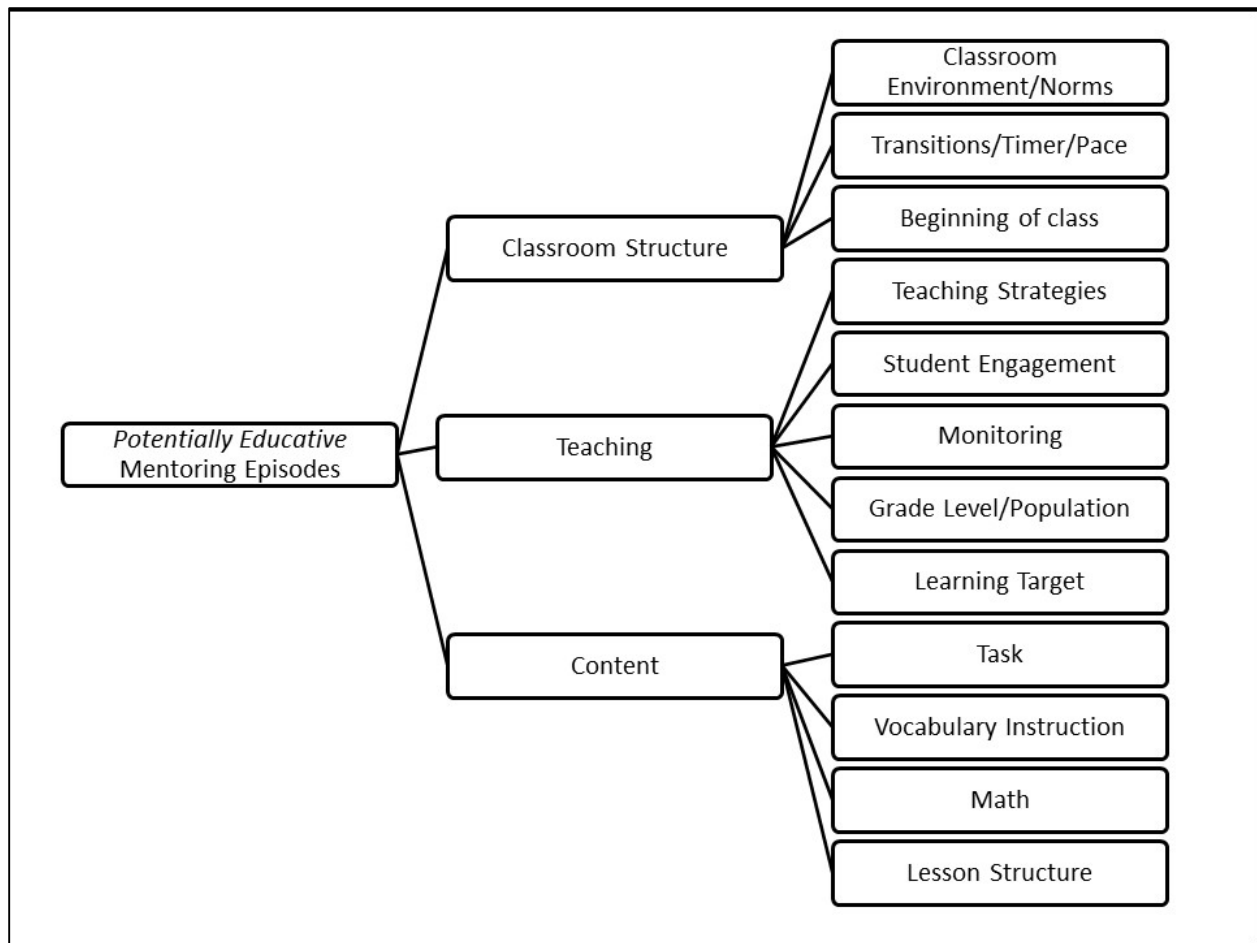


Figure 3.2. Coding Categories and Subcategories for the Foci of *Potentially Educative* Mentoring Episodes

Classroom Structure. The coding category Classroom Structure included *potentially educative* mentoring episodes that focused on the organization of the classroom and the structures used to provide an effective learning environment. It also included talk about classroom expectations and norms, as well as the physical set-up of the classroom.

The Classroom Structure category consisted of the following subcategories: Classroom Environment/Norms, Transitions/Timer/Pace and Beginning of Class. The subcategory Classroom Environment/Norms was a collection of discussion points that centered on classroom expectations such as getting materials, classroom desk arrangements, general student talking, and

an expectation to have quiet work time. *Potentially educative* mentoring episodes coded for Transitions/Timer/Pace were discussions that examined the teachers' pacing of the lesson or how a timer might aid in pacing and transitions from one activity to another. Finally, the subcategory Beginning of Class focused on the routines a teacher puts into place to help students begin activities immediately upon entering the classroom. Samples from *potentially educative* mentoring episodes coded for each of these subcategories can be found in Table 3.2.

Table 3.2

Examples of Coding for Each Subcategory in Classroom Structure

Category	Subcategory	Samples of <i>Potentially Educative</i> Mentoring Episodes
Classroom Structures	Classroom Environment/Norms	Intern: <i>They sit in the groups, I did like that. I picked up on the fact that none of the people in the groups weren't facing her. There was a good setup where they were all looking at the front and nobody was distracted or out of the class...</i> (Pair 2, Post-conversation 2, #21)
	Transitions/Timer/Pace	Mentor: <i>Sure...One of the things I noticed when we watched the video this time is how the teacher gave the students a certain amount of time, but didn't give the students a timer, and I wonder how it impacted the students being on task. One thing that I've been trying to do differently...</i> (Pair 3, Post-conversation 1, #38)
	Beginning of Class	Intern: <i>They got learning done within like the first ten minutes or so. They reviewed information from the day before and then they were starting in on something new. So, I thought that was good.</i> Mentor: <i>It kind of reminded me of that Anita Archer thing too, was the brisk pace...So what kinds of things do you think probably happened before, previous days that led to it being that much more organized?</i> (Pair 3, Pre-conversation 2, #27)

Teaching. The category Teaching focused on *potentially educative* mentoring episodes that discussed the strategies or moves a teacher makes in the classroom, the ways a teacher monitors students, and how a teacher promotes student engagement. The subcategories for Teaching were Teaching Strategies, Student Engagement, Monitoring, Grade Level/Population, and Learning Targets (Table 3.3). The subcategory Teaching Strategies coded *potentially educative* mentoring episodes that were about how the teacher conducted class and the moves teachers used to execute lessons. Other Teaching Strategy *potentially educative* mentoring episodes were focused on repeating directions, using engagement strategies (Archer & Hughes, 2011), and how the teacher needs to be a facilitator. The subcategory Student Engagement contained episodes directed at how on-task students appeared to be in the video or how teachers were engaging students in the lesson. This included moments when a teacher addressed one student who was not beginning a task individually, observations of on-task students, and suggestions of how partners were or could have been used to engage students more. *Potentially educative* mentoring episodes that were coded as Monitoring included how the teacher kept track of the learning taking place in the classroom. *Potentially educative* mentoring episodes coded as Monitoring were focused on actions, or lack thereof, like moving around the room, formative assessment techniques, and helping struggling students individually. The subcategory Population and Grade Level identified moments when teachers generalized something about the needs or abilities of a grade level of students, or referenced something about the general population in the videos. Lastly, the subcategory Learning Target was focused on the teacher articulating a clear goal of what the students were supposed to accomplish during the lesson.

Table 3.3

Examples of Coding for Each Subcategory in Teaching

Category	Subcategory	Samples of <i>Potentially Educative Mentoring Episodes</i>
Teaching	Teaching Strategies	<p>Mentor: <i>And then, did you notice some of her follow up questions, when somebody shared an answer?</i></p> <p>Intern: <i>Yeah, they would ask her, to ask them to explain further. “Ok, so how did you get that answer?” and then if they couldn’t exactly say it right, she would say like, “Ok, so talk to your partner and then figure it out”. Or like, I liked how the one students got the answer wrong, and ya know, if I was that one student and I got the answer wrong, I wouldn’t feel bad because of the way she was just kinda like, “It’s not that big of a deal. So-and-so next to you is going to tell you how she got that answer.”</i></p> <p>Mentor: <i>Right</i></p> <p>Intern: <i>Like, It just seemed like it was blown over, like “Yes, you got the answer wrong, but let’s see why you got it wrong and hear about a different way to get it.” I thought that was nice. How it wasn’t just like, “Um no,” because I know sometimes I run into that problem. That’s why I don’t like randomly calling on people so much.</i></p> <p>Mentor: <i>I remember when I taught math, for believe it or not, I taught sixth grade math for a year. It was a long time ago, and it was so different from, and prior to that I had taught mostly language arts and some social studies. And a lot of times there are ways in language arts and social studies that you can take an answer and do something with it besides say no, the answer is not one half....</i> (Pair 3, Pre-conversation 2, #32)</p>
	Student Engagement	<p>Mentor: <i>I guess you could tell if kids were actively more engaged in her classroom, ‘cause you would definitely [see] the kids that wouldn’t be doing the clapping and the speech back to her would not be engaged. Where he had, it seemed like, most of them were kind of not engaged until he specifically walked up to them and started talking to them, because they didn’t have pencils, they didn’t have notebooks.</i> (Pair 2, Pre-conversation 2, #11)</p>

Table 3.3 (cont'd)

Teaching	Monitoring	<p>Mentor: ... I saw him, some kids he would just check in and glance and say you're good to go, and other ones he would sit down and have more in depth conversations. I'm assuming he knows which kids are more successful at being on task, ya know, self-motivating to be on task and which ones are going to struggle more. The one student playing the game of, I don't even know if it's playing a game, I'll look through my stuff as a stalling technique.</p> <p>(Pair 1, Post-conversation 1, #73)</p>
	Grade Level/Population	<p>Mentor: Yeah, but it did seem like if you were to compare the two videos, it's sort of hard to make comparisons because the age of the kids is different and there's a pretty significant differences between sixth grade and ninth grade.</p> <p>Intern: Even sixth grade and seventh grade it seems, because sixth grade they seem a little bit more like babies, like they'll do anything to please her.</p> <p>(Pair 3, Pre-conversation 2, #35)</p>
	Learning Target	<p>Mentor: I see that the guy's got all like his agenda or purposes and I can's um, or essential questions up on the board. Ya know, obviously he's doing that. So we're just looking at the beginning of class, but seems like you'd want to cover that ahead of time.</p> <p>(Pair 2, Post-conversation 1, #14)</p>

Content. *Potentially educative* mentoring episodes coded as Content discussed what was being taught, or the tasks in which students were engaged to encourage content understanding. Content also included the larger structure of how a lesson plan would be organized to engage students in learning content ideas. The Content category consisted of the subcategories: Task, Vocabulary Instruction, Math, and Lesson Structure (Table 3.4). *Potentially educative* mentoring episodes coded as Task were focused on activities that students were expected to do and learn, such as using strategies to solve math problems or to identify character traits. The subcategory Vocabulary Instruction specifically referenced how teachers were introducing and teaching new vocabulary words to students. The subcategory Math was identified uniquely to

the second video that mentor-intern pairs observed. The Math subcategory specifically encompassed educative discussions that looked at mathematical knowledge being created, as well as questions about the use of mathematics terms. This subcategory contained subject specific *potentially educative* mentoring episodes. Lastly, the subcategory Lesson Structure focused on the overarching goals of a lesson and how it would be planned and executed.

Table 3.4

Examples of Coding for Each Subcategory in Content

Category	Subcategory	
Content	Task	<p>Mentor: <i>I thought it interesting when he was talking about, like, he wanted them to come up with examples of a prominent character trait, but not physical, but what was the example he gave!</i></p> <p>Intern: <i>yeah. It was all physical.</i> (Pair 3, Pre-conversation 1, #61)</p>
	Vocabulary Instruction	<p>Mentor: <i>I mean, I noticed it seemed like he made an effort to make sure kids knew what to do by explaining the words that they might not know, and sometimes it's hard to tell when you're just watching it, 'cause you don't know what happened the day before, you don't know the ability of the students...</i></p> <p>Intern: <i>Yeah, I did notice that he had the words underlined, the words that he was going to talk about and I liked how he would say, "Okay, if I want a ___ this type of class what do I mean? Like, besides this, like, what does this word mean?"</i> (Pair 3, Post-conversation 1, #42)</p>

Table 3.4 (cont'd)

Category	Subcategory	
Content	Math	<p>Mentor: <i>I noticed she seems to have a particular answer she's expecting and when students don't provide that answer, she just sort of continues on and just keeps asking kids until she hears it the way she wants the other kids to hear it.</i></p> <p>Intern: <i>It doesn't seem like she's prepared for those other pieces or she doesn't find them as worthwhile.</i></p> <p>Mentor: <i>Right and she doesn't run with them. I was really interested in how the kid got 4.3. You know, of all the kids that raised their hand and answering stuff, they tended to be alright, and then one kid, it was five percent of 200, and he got 4.3. So what did he do to get the 4.3 and what mistake did he make?</i> (Pair 1, Post-conversation 2, #81)</p>
	Lesson Structure	<p>Intern: <i>I guess from my standpoint after getting done doing all this teaching, I can see more the structure he was trying to accomplish when he planned this upfront and how he's implementing it.</i></p> <p>Mentor: <i>Some of the big picture?</i></p> <p>Intern: <i>Yeah, some of the bigger picture pieces, so that's kind of neat.</i> (Pair 1, Post-conversation 1, #77)</p>

The brief descriptions in the Excel table were replaced by the coded topic categories and subcategories in the Excel table. I then sorted again to further analyze the frequency of *potentially educative* mentoring episodes, to compare the foci of pre- and post- *potentially educative* mentoring episodes, and to examine the amount of noticing and wondering language incorporated in the mentoring conversations.

Results

The results section is organized into two sub-sections that respond to the research questions, addressing the quality of mentoring conversations and the foci of these *potentially educative* mentoring episodes. The first section explores the quality of mentoring conversations by

examining the number of *potentially more/less educative* mentoring episodes produced by each individual mentor-intern pair, and how noticing and wondering language is being implemented in *potentially educative* mentoring episodes. The second section explores the foci of *potentially educative* mentoring episodes between mentor-intern pairs and provides insights about the consistency of topics among individual mentor-intern pairs. The third research question regarding the use of noticing and wondering language is explored briefly in both sections, and will be further discussed in the discussion and implementations section.

Quality and Quantity of *Potentially Educative* Mentoring Episodes

This section discusses the quality of mentoring conversations by examining the pre- and post-conversations of participating mentor-intern pairs. During the coding process the overlapping of highlighted criteria necessitated closer examination. I reasoned that those mentoring episodes that met only one of either criteria 2 or 3 for an educative conversation (by discussing either student learning or generalizing beyond a specific moment) could be identified as *potentially less educative* mentoring episodes, while those meeting both criteria could be identified as *potentially more educative* mentoring episodes. The frequency of such *potentially educative* mentoring episodes is explored below, as well as a deeper analysis of *potentially more educative* mentoring episodes. Finally, further information regarding the use of noticing and wondering language within *potentially more educative* mentoring episodes is included.

Mentor-Intern Pairs' *Potentially Educative* Mentoring Episodes. A comparison of the mentor-intern pairs' pre- and post-conversations (Table 3.5) revealed an increase in the conversational quality for all pairs. There were, however, subtle but important differences across all pairs. For Pairs 1 and 2, this quality was indicated by the increase in the number of *potentially educative* mentoring episodes. For Pair 3, the increase was in the quantity of

potentially more educative mentoring episodes. Said another way, Pairs 1 and 2 had demonstrated an increase in the quantity of *potentially educative* mentoring episodes, whereas Pair 3 demonstrated an increase in the quality of their *potentially educative* mentoring episodes with more of them being classified as *potentially more educative*. Thus, two different kinds of increases were distinguished.

Since each *potentially educative* mentoring episode is considered an opportunity for interns to learn from a mentoring conversation, an increase in the number of *potentially educative* mentoring episodes suggests more opportunities within mentoring conversations for interns to be learning in and from teaching. Similarly, shifts from *potentially less* to *potentially more educative* mentoring episodes also demonstrate more possibilities for interns to be focused on both student learning and generalizing from practice in a way that is educative. The individual mentor-intern pairs' data analysis follows.

Pair 1 displayed two *potentially less educative* mentoring episodes (only student learning) in their pre-conversation, while their post-conversation contained four *potentially more educative* mentoring episodes (generalization and student learning) and 11 *potentially less educative* mentoring episodes (one generalization and ten student learning). This large increase in *potentially educative* mentoring episodes may be connected to the fact that Pair 1 had completed their pre-conversations on campus before the short orientation session, rather than in a more relaxed space, as in the post screener where they perhaps felt they could talk longer. Pair 1's pre-conversations were also shorter (2:57 minutes total) in comparison to their post-conversations (17:58 minutes total).

Pair 2 also demonstrated an increase in the number of *potentially educative* mentoring episodes that occurred from the pre-conversations to the post-conversations. The pre-

conversations contained 11 *potentially educative* mentoring episodes. Out of these 11 episodes, five were *potentially less educative* mentoring episodes (two generalizations and three student learning) and six were *potentially more educative* mentoring episodes that met both criteria. The post-conversations contained a decrease in the *potentially more educative* mentoring episodes, but an overall increase in the number of *potentially educative* mentoring episodes (15 total). Of these 15 episodes, 11 were *potentially less educative* mentoring episodes (eight student learning and three generalization) and four were *potentially more educative* mentoring episodes.

Pair 3 had pre and post-conversations with the highest frequency of *potentially educative* mentoring episodes. Their pre-conversations contained 23 *potentially educative* mentoring episodes and their post-conversations contained 20. While the number of *potentially educative* mentoring episodes decreased over time, the quality of those episodes increased from ten *potentially more educative* mentoring episodes in the pre-conversations to 11 in the post-conversations. There were also 13 *potentially less educative* mentoring episodes (seven student learning and six generalization) in the pre-conversations and nine in the post-conversations (six student learning and three generalization).

Table 3.5

Educative Potential of Mentor-Intern Pair Pre/Post Mentoring Conversations about Video

Mentor-Intern Pair	Length of Recording (minutes)	Pre/Post Conversation	<i>Potentially Educative</i> Mentoring Episodes	Less/More Educative Potential	S, G, or SG
Pair 1	2:57	Pre	2 Episodes	2 Less	2 Student Learning
	15:01	Post	15 Episodes	11 Less	10 Student Learning 1 Generalization
				4 More	4 Both

Table 3.5 (cont'd)

Pair 2	10:38	Pre	11 Episodes	5 Less	3 Student Learning
					2 Generalization
			6 More	6 Both	
	10:34	Post	15 Episodes	11 Less	8 Student Learning
					3 Generalization
		4 More	4 Both		
Pair 3	27:02	Pre	23 Episodes	13 Less	7 Student Learning
					6 Generalization
			10 More	10 Both	
	19:18	Post	20 Episodes	9 Less	6 Student Learning
					3 Generalization
		11 More	11 Both		

Cumulatively, the data set of mentor conversations contained 86 *potentially educative* mentoring episodes. Out of the 86 *potentially educative* mentoring episodes, 41% (35 episodes) were identified as *potentially more educative* and 59% were identified as *potentially less educative*. Out of the 51 *potentially less educative* mentoring episodes, 36 were coded for student learning (71%) and 15 were about generalizations of teaching (29%). Thus, it seems that the *potentially less educative* mentoring episodes were slightly more than twice as likely to be about student learning than generalizing something from practice. This finding further aligns with developing the first aspect of noticing (van Es & Sherin, 2002) regarding identifying important moments in a teaching episode more frequently than the second aspect of noticing, which is making connections between practice and theory. Moreover, because identifying the important moments in a teaching episode is foundational to teacher noticing, it would follow to support interns in this kind of work more frequently.

Incorporation of Noticing and Wondering Language. All mentor-intern pairs demonstrated an increase in frequency of noticing and wondering language between their pre- and post-conversations (the total number of time the words “notice” and “wonder” appeared in the conversation). Overall, Pair 1 increased by 16 words, Pair 2 increased by 2 words, and Pair 3 increased the most with 44 words. All three mentor-intern pairs seemed to make some attempt to implement the noticing and wondering language into their conversations after the short orientation session, although the different increases shows that this was accomplished to varying degrees.

Potentially educative mentoring episodes from both pre- and post-conversations that included both *notice* and *wonder* created a small data set of seven *potentially educative* mentoring episodes for analysis. This set was used to gather information about the kinds of conversations that the language of noticing and wondering make possible. The data set contained one *potentially educative* mentoring episode in the pre-conversation and six *potentially educative* mentoring episodes in the post-conversations, for an increase of five *potentially educative* mentoring episodes that used noticing and wondering language. This shift in usage aligns with the provision of a short orientation session after the pre-conversations. Additionally, the data set included four *potentially more educative* mentoring episodes from the collection of seven, all from Pair 3. The data set also included three *potentially less educative* mentoring episodes, two from Pair 3 and one other from Pair 1.

Pair 3 was the only mentor-intern pair to use *notice* and *wonder* together in a *potentially more educative* mentoring episode. Ten out of 11 *potentially more educative* mentoring episodes from Pair 3’s post-conversations included the words *notice* or *wonder* at least once. This frequency suggests the level to which this pair developed their use of the noticing and wondering

language, but also indicates that this language may be helpful in generating *potentially educative* mentoring episodes, even if they are not all *potentially more educative* at this stage of the mentor-intern pair's language adoption.

Potentially More Educative Mentoring Episodes. The *potentially more educative* mentoring episodes from all three mentor-intern pairs were analyzed as a collection in order to understand more about the way a language of noticing and wondering might increase the possibility for interns to learn from mentoring conversations. Thirty-five conversations in total were coded as *potentially more educative* mentoring episodes (generalization and student learning), and thus could have provided opportunities for interns to develop both teacher noticing skills and the ability to make connections between teaching experiences and theories. Twenty-one of these *potentially more educative* mentoring episodes were from Pair 3, ten episodes from Pair 2, and four episodes from Pair 1. Out of the 35 *potentially more educative* mentoring episodes, 19 episodes, or 54%, included some evidence of a noticing and wondering language, demonstrating that noticing and wondering language could be used by mentor-intern pairs to have mentoring conversations that indicated potentially greater opportunities for learning.

Only Pair 3 demonstrated the ability to combine both noticing and wondering language within a *potentially more educative* mentoring episode a total of four times within their pre- and post-conversation transcripts. Below are two examples of Pair 3's *potentially more educative* mentoring episodes that incorporated noticing and wondering language which also represent the varied length and amount of detail among *potentially more educative* mentoring episodes. The varied lengths illuminate how *potentially more educative* mentoring episodes might support more or fewer learning opportunities based on variations of conversational depth about student learning and generalizing the teaching moment.

Mentor: *Sure... One of the things I **noticed** when we watched the video this time is how the teacher gave the students a certain amount of time, but didn't give the students a timer, and I **wonder** how it impacted the students being on task. One thing that I've been trying to do differently...*

Intern: *Oh yeah, I've **noticed** that.*

Mentor: *so the kids can see how much time they have left.*

(Pair 3, Post-conversation 1, #38)

This mentor and intern pair had many discussions about engagement strategies (Archer & Hughes, 2011) introduced to them during a common school-wide professional development workshop, one of which used a timer with students to help them stay on task. The mentor noticed this strategy was not implemented in the video episode and highlighted it in her noticing statement. The mentor then further connected this practice to students being on-task, where the student learning criteria for a *potentially educative* mentoring episode was met and indicated the importance of noticing this video moment—the first aspect of learning to notice (van Es & Sherin, 2002). The mentor also shared that using a timer for this purpose is something she has been trying to do in the classroom, which generalized the practice to her own teaching practice, meeting the generalization criteria of a *potentially educative* mentoring episode and modeling how to make connections between observations and one's own teaching practice to think about teaching. Overall, this is a shorter *potentially more educative* mentoring episode by the mentor, although the intern agreed she noticed this absence of strategy too; the ideas are not unpacked and lack connections to specific mathematical student learning.

The next *potentially more educative* mentoring episode also included multiple uses of the words *notice* and *wonder*. This mentoring episode was guided by the intern who introduced the

topic of participation with observations about the question-and-answer technique the teacher used and how some students were not doing it. This observation connected to the first educative conversation criterion of student learning and identifying important moments in a teaching episode, which is a foundational aspect of teacher noticing (van Es & Sherin, 2002). She further generalized how this observation made her think of her own teaching, which demonstrates her ability in this case to utilize the second aspect of teacher noticing (van Es & Sherin, 2002), and generalize the teaching moment to concerns she has about her own teaching practice. The intern's comments are confirmed by the mentor who continues to think about the situation and other possibilities the teacher might employ to get all students involved.

***Intern:** Ok. So, I **noticed**, once again, I sort of remembered this from the last time, that she uses the table partners towards the end of the video. And then also, it's a lot of like question-and-answering. The only thing that I'm **wondering** though is what she's losing when she does that because I did **notice** that there were a couple students who weren't necessarily doing anything, or when she said, "Ok, give me a thumbs-up." There were students giving thumbs up even though they might not have been participating or known what was going on, which made me think about my own teaching, and when I do that. But, yeah, so I **noticed** that some students were paying attention and yet they looked like they were participating whenever she would ask them to.*

***Mentor:** That's funny 'cause I **noticed** the same thing and I **wondered** if doing some of the questioning and answering, they're sitting in small groups, could you have them share a strategy they used first at their small group and then go to whole group just because it calls on more to interact. I mean, granted she could have faced the same thing*

that we do, which is time. But considering it could've just been maybe 30 seconds or a minute

Intern: *Yeah*

Mentor: *and it seems like that could have been a valuable strategy. It's funny because I remember watching this before and thinking "Wow, this is" and now, I mean obviously she's established some routines, but I thought the same thing that you did. Like when she said thumbs up and the one kid never even did anything.*

(Pair 3, Post-conversation 2, #44)

Both of these *potentially more educative* mentoring episodes demonstrated mention of student learning and generalizing a practice, as well as noticing and wondering language. However, the length and detail in the second episode suggests that it might be a more productive conversation in terms of learning about teaching because the mentor continues to express thought and reflection about the topic the intern wondered about earlier in the *potentially educative* mentoring episode. This exploration extends the episode and pushes the mentor-intern pair to investigate and think about the moment highlighted in the video. This kind of conversation is different than the first *potentially more educative* mentoring episode which also includes wondering about how a timer might help keep students on task, but does not explore the reasoning behind it or how it might be implemented. In this case, I believe the topic was not explored because the pair had already learned the strategy in a prior professional development workshop and were attempting to implement it. Nevertheless, it is a good example of how just using *wonder* does not necessarily extend learning in mentoring conversations unless the mentor and intern follow a path of unpacking and thinking about wondering.

Foci of *Potentially Educative* Mentoring Episodes

In an effort to learn more about what mentor-intern pairs were choosing to discuss, the 86 *potentially educative* mentoring episodes from the pre- and post-conversations of the three pairs were analyzed and coded for focus. The analysis resulted in three categories that the mentor-intern pairs discussed during educative conversations: Classroom Structure, Content, and Teaching. The most frequent focus out of the pre- and post- *potentially educative* mentoring episodes was Teaching, with 42 episodes, compared to 24 episodes about Classroom Structure and 20 episodes about Content. Content was the category least discussed, however the *potentially educative* mentoring episodes about Content more than doubled from pre-conversations (six episodes) to post-conversations (14 episodes).

The most frequent sub-categories (Table 3.6) discussed in *potentially less educative* mentoring episodes were: Student Engagement (15 episodes), Classroom Environment/Norm (12 episodes), and Teaching Strategies (11 episodes). Together these three sub-categories made up 44% of the *potentially educative* mentoring episodes' foci were the aspects mentor-intern pairs identified as the most important to discuss from the two 10-minute video episodes of the beginning of class. Mentor-intern pairs noticed how engaged students were from the start of the lesson. Two main ideas that surfaced in the Teaching category were about wait time for student processing and how a teacher handles wrong answers. Finally, because it was the beginning of the lesson, mentor-intern pairs noticed and discussed how students collected materials in a timely manner and how pacing varied between teachers. Furthermore, Content was probably discussed less because the video episodes never featured the heart of the lesson. However, this does not explain the increase in *potentially educative* mentoring episodes coded for content, other than that Pair 1 had a longer post-conversation and tended to address content more frequently than the other two mentor-intern pairs.

Table 3.6

The Frequency of the Focus Subcategories in Potentially Educative Mentoring Episodes

Focus	Subcategory	Number of <i>Potentially Educative Mentoring Episodes</i>
Classroom Structure	Beginning of Class	4
	Class Environment/Norm	12
	Timer/Pace/Transition	8
Teaching	Grade Level/Population	6
	Learning Target	4
	Monitoring	6
	Student Engagement	15
	Teaching Strategies	11
Content	Lesson Structure	1
	Math	6
	Task	9
	Vocab Instruction	4

This initial analysis provided the main areas on which the collection of *potentially educative* mentoring episodes was focused. Because educative mentoring is differentiated work and relies on the mentor teacher's noticing skills to highlight important observations, I was still curious if the pairs were all focused equally on the same topics, or if they were just averaged. An individual pair analysis provided a narrower comparison that was not skewed by Pair 1's short pre-conversation (2:57 minutes vs 15:01 minutes for the post-conversation). Further shading of the category that was most frequent in each of the pre- and post- conversations revealed a consistent focal area for each pair (Table 3.7). Pair 1 tended to focus on Content, while Pair 2 discussed Teaching more often. Pair 3 tended to discuss the Classroom Structure during the first video and Teaching during the second video. While the focus stayed consistent

before and after the short orientation session, an increase in the number of *potentially educative* mentoring episodes on that focal area was documented for the majority of pairs.

Table 3.7

Focus of Individual Mentor-Intern Pair Potentially Educative Mentoring Episodes in Pre- and Post-conversations

Mentor-Intern Pair	Pre- and post-conversation	Classroom Potentially Educative Mentoring Episodes	Content Potentially Educative Mentoring Episodes	Teaching Potentially Educative Mentoring Episodes
Pair 1	Pre1	-	-	1
	Post1	2	5	2
	Pre2	-	1	-
	Post2	1	3	2
Pair 2	Pre1	-	1	3
	Post1	-	2	6
	Pre2	3	1	3
	Post2	2	1	4
Pair 3	Pre1	6	3	4
	Post1	4	1	2
	Pre2	3	-	7
	Post2	3	2	8

Consideration of the topics that mentor teachers highlighted for interns provided a glimpse at the areas mentor teachers felt were worthwhile for teacher development and revealed some of the contexts that supported these discussions. For example, Pair 1's *potentially educative* mentoring episodes focused on Content, mirroring the mentor's values of teaching and learning mathematics conceptually versus procedurally. Conceptual understanding of mathematics was a goal in his classroom, and also a goal the intern mentioned during a conversation about grading. Therefore, it might be inferred that Pair 1's *potentially educative* mentoring episodes were mainly focused on Content because this mentor valued understanding

the subject matter, and believed that highlighting the moments that strengthened or posed questions for him regarding the content was most valuable to discuss with his intern.

The other two mentors had similar conversational practices, but about different foci. Pair 2 highlighted moments of Teaching and Pair 3 discussed Teaching and Classroom Structures, depending on the video. These topics developed from what was observable in the short video clip and included moments that mentors and interns either thought were important parts of the teaching practice observed, or moments in the video that connected with what the mentor and intern were attempting in their own classroom. For example, the intern in Pair 3 mentioned in her exit interviews that she had spent a lot of time working on classroom management, which would have aligned with their *potentially educative* mentoring episodes about Classroom Structure. Similarly, some of the conversations from Pair 2 that focused on Teaching were about learning targets, and how they noticed and discussed these because they were also working at implementing them in their classroom.

Overall, based on the data, the mentor-intern pairs' *potentially educative* mentoring episodes tended to focus on Teaching the most and Content the least. Over time, their individual conversations continued to have the same focus with or without noticing and wondering language, but contained more *potentially educative* mentoring episodes after the short orientation session. This increase in *potentially educative* mentoring episodes suggests that there may have been more opportunities for interns to be learning from teaching within individual focal areas when mentor-intern pairs were attempting to use the language of noticing and wondering. It also shows that the length of time for a mentoring conversation or structure of conversation did not impact the topics being discussed in *potentially educative* mentoring episodes.

Discussions and Implications

The results of this study are a small step toward understanding more about mentoring conversations, and the extent to which they are—or can be—educative. Central to the goal of this study is an effort maximize the potential for PST support and development within field placements. The definition of an educative conversation integrates educative mentoring and teacher noticing practices, and the results of this study will begin to bridge these two frameworks by studying the educative potential and focus of *potentially educative* mentoring episodes within mentoring conversations. I begin by sharing how my study of educative conversation indicators extends Feiman-Nemser's (2001) educative mentoring framework, supports teacher noticing (van Es & Sherin, 2001), and provides a way to begin investigating the educative nature of mentoring conversations. Within this initial section, I explore the first research question about the comparison of pre- and post-conversation data in regard to educative potential before and after a short orientation session. The second section aligns with the second research question. Within it, I explore the focus of *potentially educative* mentoring episodes and insights about the consistency of topics addressed by individual mentor-intern pairs. Next I consider how offering the language of noticing and wondering may have influenced the mentor-intern pairs' conversations. In the final sections of this paper, I discuss the possible implications for teacher education programs.

Educative Potential in Mentoring Conversations

Mentoring is conversational work, so studying the educative potential of mentoring conversations is an important way to understand how well these conversations are supporting PSTs' abilities to notice students and generalize about teaching. This study expands Feiman-Nemser's (2001) educative mentoring framework by identifying *potentially educative* mentoring

episodes in mentoring conversations using indicators developed from Bradbury's (2010) list of associated behaviors of educative mentors under the theme of *Using Teaching Practice as a Site for Situated Inquiry*. Episodes of more or less potential talk were defined based on whether they met all or some of the educative conversation criteria. *Potentially educative* mentoring episodes that were identified thusly as sections of conversations that could possibly support PST learning and teaching practice development.

The search for *potentially educative* mentoring episodes containing indicators for PST learning further aligns with the development of teacher's noticing skills. The intern and the mentor use their own teacher noticing skills focused on student learning or generalizing about the practice of teaching to make conversations more educative. Within the teacher noticing framework, the *potentially less educative* mentoring episodes coded as student learning were highlighting an important moment which is the first aspect of noticing (van Es & Sherin, 2002), and the *potentially less educative* mentoring episodes on generalization focused on van Es and Sherin's second aspect of noticing, which is to make connections to experience and knowledge. However, when both of these indicators were identified in the same section of conversation, a *potentially more educative* mentoring episode was identified, meaning that together the mentor and intern were practicing both aspects of teacher noticing: 1) to notice what was important in a moment of teaching, and 2) to generalize beyond that moment to other experiences, knowledge, and/or larger teaching practice within the context of their classroom or a shared teaching experience. *Potentially more educative* mentoring episodes could be created by a mentor modeling this kind of thinking, a mentor guiding the intern through the noticing with questions, or the mentor supporting the interns as they expressed their own observations. Regardless of the

level of scaffolding, engaging in *potentially more educative* mentoring episodes is one way that mentors can expose PSTs to noticing and investigating important aspects of teaching.

A comparison of the pre- and post-conversation data from this study indicated an increase in *potentially educative* mentoring episodes for Pair 1 and Pair 2, and an increase in the number of *potentially more educative* mentoring episodes for Pair 3. Containing indicators of educative conversations, *potentially educative* mentoring episodes have the makings to be more productive in helping interns develop their teaching practice and noticing skills. Increased frequency of *potentially educative* mentoring episodes could be the product of stronger relationships developing between the mentor and intern as the internship moves toward completion. It could also be that interns' teaching practices and understanding of teaching develop over the course of an internship to support and encourage mentors to have more *potentially educative* mentoring episodes. Finally, it is likely that mentor-intern pairs tried to draw on the short orientation session experience when they recorded conversations for this study. The short orientation session might have promoted conversations heavier in the language of noticing and wondering since I had introduced them to this language. Knowledge that someone else would be listening to their recorded conversations may have generated a greater awareness of how and about what they were speaking. These possibilities, however, do not outweigh the fact that there is evidence of increased frequency of *potentially educative* mentoring episodes within mentor-intern pairs' conversations.

Foci of *Potentially Educative* Mentoring Episodes

While the educative potential of mentoring conversations improved from the pre-conversations to the post-conversations, the foci of *potentially educative* mentoring episodes was fairly constant among individual mentor-intern pairs. The analysis of foci of *potentially*

educative mentoring episodes indicated that each individual mentor-intern pair had its own focal area and that this focal area did not change from the pre-conversations to the post-conversations.

While the focus of this set of *potentially educative* mentoring episodes was dependent on what mentors and interns were able to observe during the video episodes of teaching, the consistency in the focal area also suggests that the focus of mentoring conversations is responsive to the context and the needs of the PST. Focus may also be attributed to how mentors and interns use and prioritize their own unique lenses of noticing when observing teaching. Overall, however, *potentially educative* mentoring episodes were identified in all of the focus categories, perhaps suggesting that what mentors and interns are talking about is not as important as making sure they are talking about them in quality ways that include student learning and generalizing about teaching.

Noticing and Wondering Language

The increased frequency of the words *notice* and *wonder* between the pre- and post-conversations supports that the short orientation session was successful at sharing noticing and wondering language with mentor-intern pairs. Investigation of the seven *potentially educative* mentoring episodes that contained both *notice* and *wonder* also supported an increase in noticing and wondering language, as six of the seven *potentially educative* mentoring episodes were located within post-conversations.

The increased frequency of the words *notice* and *wonder* between the pre- and post-conversations support that the short orientation session was successful at sharing noticing and wondering language with mentor-intern pairs as a structure to talk about teaching. While the data set of *potentially educative* mentoring episodes that contained complete noticing and wondering language is small, it also speaks to the learning curve that mentor-intern pairs

experienced as they attempted to merge the language into their already-occurring mentor conversations. Pair 3 was already using the words *notice* and *wonder* naturally in the pre-conversation and adopted its usage the most in the post-conversations. Pair 3 also demonstrated the highest number of *potentially more educative* mentoring episodes among the mentor-intern pairs. This suggests that the language of noticing and wondering may support the production of more educative conversations, but the examples of *potentially educative* mentoring episodes also further illuminate the importance of unpacking the thinking in these episodes. Finally, the language of noticing and wondering did not seem to shift the focus of any mentor-intern pair's *potentially educative* mentoring episodes.

It is worth noting that the mentor-intern pairs volunteered and were not required to implement the noticing and wondering language, but rather decided on a level of implementation that worked for them. The increased frequency of the words *notice* and *wonder* also makes me question if the short orientation session played a role in encouraging mentor-intern pairs to be more intentional about their talk that helps create increases of *potentially educative* mentoring episodes. In this sense it seems that offering noticing and wondering language to mentor-intern pairs provided them with a structure for conversations, or even a way to thinking about conversations before speaking. This new language may have helped focus the discussion on student learning and generalizations in teaching, ultimately making it worthwhile to use and study further.

Implications for Teacher Education

Experienced teachers are not always provided with the knowledge and skills needed to be effective mentors. Introducing mentors and interns to the language of noticing and wondering through a short orientation session can provide experienced teachers with a structure for talking

about the practice of teaching, as well as sharing the things they notice in the classroom. By making mentors and interns more aware of mentoring conversations and providing them with a noticing and wondering structure (Smith, 2009) that they can use to frame feedback, the mentor-intern pairs in this study seemed to become more intentional with their talk, increasing the quantity or quality of *potentially educative* mentoring episodes within conversations that encourage development.

Overall, this study suggests that the key to educative mentoring conversations may not be the topics mentors and interns discuss, but how mentors and interns discuss their classroom observations to increase the number of *potentially educative* mentoring episodes and possibly provide more conversational moments for interns to learn in and from teaching during their field placement. This study provides an initial entry point for testing out a theorized definition of educative conversations by using definition criteria as indicators, and providing language and examples to discuss the importance of unpacking ideas within *potentially more educative* mentoring episodes among teacher educators, mentors, and interns. This study also begins an examination of how mentors and interns adopt a language of noticing and wondering after a two-hour short orientation session. The shifting in language occurring gradually and at different rates seems natural for this timeline. While there is not enough information in this small data set to confirm or deny if or to what extent noticing and wondering language enhances the quality of mentoring conversations, the increased adoption and increased appearance of the language of noticing and wondering within *potentially educative* mentoring episodes suggests this might be a helpful and welcomed structure for mentoring conversations that is worthy of further investigation. Future studies about educative conversations would be helpful in developing

improved short orientation sessions and in supporting veteran teachers' mentoring skills to continue to enhance the educative function of field placements.

APPENDICES

APPENDIX A

Pre/Post Initial Screener

[Insert Your Names Here]

The purpose of this initial screener activity is to get a feel for how teachers talk about teaching after watching a lesson. The screener will take approximately 60 minutes and will consist of two videos, recording two conversations, and completing two written responses and should be completed in one day if possible. **You will need to be able to record audio to complete this activity.**

Video 1 - Directions:

1. Together with your mentor/intern, sit down at a computer, or with the computer screen projected in the classroom so that both people will be able to see the video comfortably.
2. Watch this video clip of a 9th grade English teaching episode uninterrupted for at least 10 minutes (<http://www.youtube.com/watch?v=8sm1ZXQzXXo>). Please do not re-watch or stop/restart the video for this activity. (Pretend you are watching it in real time)
3. Have a conversation about the teaching episode you just watched. Be sure to **audio record** this conversation.
4. Upload conversation to the D2L page or email it.
5. Reflect on the conversations you typically have with your student/mentor teacher. How did the conversations you just submitted about the video clip compare and contrast with the conversations you have in the classroom with your student/mentor teacher?

Write your Comparison Here

Video 2 - Directions:

1. Together with your mentor/intern, sit down at a computer, or with the computer screen projected in the classroom so that both people will be able to see the video comfortably.
2. Watch this video clip of a 6th grade math teaching episode uninterrupted for at least 10 minutes (<http://www.youtube.com/watch?v=-YvIR7M34nk>). Please do not re-watch or stop/restart the video for this activity. (Pretend you are watching it in real time)
3. Have a conversation about the teaching episode you just watched. Be sure to **audio record** this conversation.
4. Upload conversation to the D2L page or email it.

Reflect on the conversations you typically have with your student/mentor teacher. How did the conversations you just submitted about the video clip compare and contrast with the conversations you have in the classroom with your student/mentor teacher?

Write your Comparison Here

APPENDIX B

Sample Group Emails

Email #1 – The Reminder (Sent 1 week after the intervention)
<p>Hi [Participant Name and Participant Name],</p> <p>I hope you found the “Let’s Talk about It – Effective Ways to Communicate about Teaching” workshop informative, especially the piece about how to use noticing and wondering language to expand conversations about teaching. The simple use of saying “I noticed” seems to really help us focus on what happened in a teaching episode, and using the phrase “I wonder” allows us to ask questions of a teacher’s lesson openly, in hopes of finding out more about their thinking and having a conversation.</p> <p>For example, after observing a secondary science lesson where all of the groups started the lab except one. You might say, I noticed the group in the back didn’t really delve into the science lab this hour and I was wondering what steps a teacher might do to get them started OR I was wondering if these students really struggle with science or if something else was going on today. Both of these wonderings might then lead to a larger conversation about students’ learning needs, teacher questioning/prompting or even selecting accessible labs for all. The conversations are endless!</p> <p>I hope you’ll give noticing and wondering a try! I’ll be checking back in a couple weeks to see how it’s going!</p> <p>Sarah Roller</p>
Email #2 – Data Collection & Response (Sent 3 weeks after intervention)
<p>Hi [Participant Name and Participant Name],</p> <p>Thank you again for participating in the “Let’s Talk about It – Effective Ways to Communicate about Teaching” workshop introducing noticing and wondering language for talking about teaching. I wanted to check in and see how your noticing/wondering conversations have been going. Please audio record a conversation with your mentor/intern during a planning hour or at the end of the day after the intern has taught a lesson. Post the audio file to the D2L (Desire2Learn) page so I can view it.</p> <p>I look forward to hearing about what you’ve been noticing and wondering about!</p> <p>Sarah Roller</p>

Thank you so much for sending me a sample of your conversation! Keep up the noticing and wondering! You'll be hearing back from me again in a couple weeks!

Sarah Roller

Email #3 – Data Collection & Response (Sent 5 weeks after intervention)

Hi [Participant Name],

I noticed in your last email that you were having some great conversations about teaching and was wondering what you've been talking about lately!

Please audio record a conversation with your mentor/intern during a planning hour or at the end of the day after the intern has taught a lesson. Post the audio file to the D2L (Desire2Learn) page so I can view it.

I look forward to see what you've been thinking about and discussing lately!

Sarah Roller

Thank you so much for sending me a sample of your conversation! Keep up the noticing and wondering! You'll be hearing back from me again in a few weeks to complete the final step in this study!

Sarah Roller

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CHAPTER 4

INVESTIGATING MENTORING CONVERSATIONS THREE WAYS

“Study after study shows that experienced and newly certified teachers alike see clinical experiences as a powerful—sometimes the single most powerful—component of teacher preparation.” (Wilson, Floden, and Ferrini-Mundy, 2002, p. 195).

The clinical component of teacher preparation programs rests on the shoulders of mentors who volunteer to take a teacher intern into their classroom. Like the quote above, Hobson, Ashby, Malderez, and Tomlinson’s (2009) literature review also suggests mentoring is perhaps the most important support for developing PSTs. However, while the conversations between mentors and interns play a key role in teacher education, there is evidence to show that simply providing time and space for these conversations does not make them productive (Wang, Strong, & Odell, 2004). Research on mentoring lacks studies that move beyond broad descriptions and conceptions to closely investigate mentoring practices, such as conversation (Clarke, Triggs, and Nielsen, 2014). If teacher educators are to support and develop effective mentors, it is crucial to know more about what makes some mentoring conversations better than others. Understanding the composition of better mentoring conversations can guide teacher educators’ efforts to support mentors and their interns in learning to talk about teaching practice in productive ways.

Grossman and McDonald (2008) call for teacher education research to develop a common language and agreed-upon core practices to drive purposeful research and creation of a cohesive knowledge base. Similarly, I argue in this paper that mentoring practice within teacher education also needs a common language for describing the practice, agreed-upon measures for studying the practice, and an established collection of core practices to foster growth of

productive research and knowledge. These core practices are the critical components of mentoring that can be improved with targeted instruction and practice. Grossman, Compton, Ronfeldt, Shahan, and Williamson (2009) suggest the concept of decomposition as part of a three-part framework to identify and understand the pedagogies of practice in professional education. Decomposing core practices of teaching into its constituent parts can be introduced sequentially to gradually develop competencies of core teaching practices. The practice of mentoring could be developed following this same concept if core practices were agreed upon and investigated in ways that aid in the decomposition of them.

Since mentoring is conversational work, I selected mentoring conversations as one mentoring practice to examine in an attempt to identify educative ways of speaking about teaching. Specifically, I selected mentoring conversations that utilized Smith's (2009) language of noticing and wondering. This language supports a descriptive and inquiry stance toward talking about teaching that has been identified as productive (Borko, Jacobs, Eiteljorg, & Pittman, 2008; Clarke et al., 2014; van Es, 2011). This paper explores three approaches for exploring the nuanced ways in which the language of noticing and wondering supports educative mentoring conversations focused on problems of practice. These narrow approaches of analysis aid in identifying small changes that have the potential to make a large impact for improving and/or supporting mentoring conversations. Understanding what makes mentoring conversations effective and how to decompose them begins to contribute toward a program of research on mentoring practice, similar to the one for teaching described by Grossman and McDonald (2008).

A Review of Mentoring Literature

Much of the research completed about mentoring in teacher education has focused on broad descriptions and conceptions. These descriptions have included *forms of mentoring* (Schwille, 2008), utilized *mentor moves* (Feiman-Nemser, 2001), and even *categories of participation* (Clarke et al., 2014). In particular, Schwille (2008) characterizes mentoring as a professional practice, describing the way mentors purposefully select and sequence forms of mentoring to intentionally support PST learning and development beyond that of just technical skill application. However, a lack of common language for talking about mentoring hinders the growth of a knowledge base and leaves making connections across the literature up for interpretation. For example, one of Schwille's (2008) identified forms of mentoring roles is *mentoring sessions and debriefing sessions*, which are defined as reflective talk about the intern or mentor's teaching. Meanwhile, Feiman-Nemser's (2001) mentor move of *finding openings*, which describes the purposeful ways that mentors draw upon particular observations to prove and ask questions that intentionally help the novice teacher learn from teaching. Here there is overlap between the two terms because the move of *finding openings* could be utilized in mentoring sessions and debriefing sessions.

Clarke and his colleague's (2014) literature review is another example of an attempt to move mentoring research beyond commonly held conceptions to specific practices by exploring the ways cooperating teachers participate as teacher educators. The results described the work of mentors, but this time with attention to eleven *categories of participation*. Again however, with interpretation, Schwille's (2008) mentoring and debriefing sessions could be considered as areas where mentors were participating as *providers of feedback* and *supporters of reflection* (Clarke, et. al).

Being able to provide feedback on and support for reflective habits about PST's daily lessons and observations is one of the vital ways that mentors act as teacher educators. Varied among mentors, however, is *what* is addressed and *how* mentors provide feedback and reflection.

Providing feedback is clearly one the most significant elements of cooperating teachers' work with student teachers and this provision is not only expected but also largely defines the work of cooperating teachers. Although this review reveals that cooperating teachers provide a great deal of feedback to their student teachers, that feedback tends to be narrow, particularistic, and technical. Feedback that promotes deep and substantive reflection on practice by student teachers is rare (Clarke et al., 2014, p. 175).

Similarly, Schwille (2008) also advocated that, "While talk is an important form of mentoring, we cannot ignore the substance of the conversations between a mentor and novice" (p. 151). In order to decompose the practice of mentoring conversations and create approximations of practice (Grossman et al., 2009) to support its development in mentors, it is necessary to study the detailed aspects of mentoring conversations, specifically the topics discussed and the ways in which mentors and interns talk about teaching.

In my reading, the literature on mentoring conversations seems to be limited and lacks a common language for investigating and communicating about mentoring conversations. The power of mentoring conversations to influence mentoring experiences and PST learning has led to studies that explore interventions for supporting and strengthening dialogue between mentors and PSTs (van Velzen, Volman, Brekelmans, & White, 2012; Helgevold, Naesheim-Bjorkvik, & Ostrem, 2015; Hennissen, Crasborn, Brouwer, Korthagen, & Bergen, 2011). Examination of exemplary mentors' mentoring conversations (Orland-Barak & Hasin, 2010) and influences of context on mentoring conversations (Feiman-Nemser & Parker, 1993; Wang et al., 2004) have

also been explored. Turn taking (Crasborn, Hennissen, Brouwer, Korthagen, & Bergan, 2011) and timed increments of conversation (Helgevold et al., 2015; Hennissen et al., 2011) are two ways researchers have divided mentoring conversations into sections for coding. Fine grain analysis allows researchers to notice intricacies (i.e. moves, foci, language, etc.) in the conversations and begin to decompose how mentors provide support by talking about teaching with PSTs. Fine grain analysis will aid in decomposing mentoring conversation practice into parts essential for accessing and enacting productive mentoring conversations.

Overall, mentoring conversations are referenced as an essential mentoring practice (Clarke et al., 2014, Feiman-Nemser, 2001; Schwille, 2008), but the literature on mentoring conversations lacks a common language and cohesive direction of research questions to drive future work. Intentionally focused research dedicated to understanding mentoring conversations would provide the research-based knowledge to develop opportunities for mentors to learn to discuss teaching in productive ways. Feiman-Nemser (1998) suggested this approach to address the problem that many mentors are rarely prepared to be teacher educators.

In this study, I share three approaches that I argue can help decompose mentoring conversations and advance the agenda of identifying core, effective, and learnable mentoring practices. The three approaches shared here explore the form and focus of these conversations by unpacking *what* mentoring conversations are focused on and *how* these topics are discussed. Both the focus (what) and stance (how) are critical for creating productive learning opportunities for PSTs (Clarke et al., 2014; Schwille, 2008; Wang et al., 2004). Furthermore, PST development and learning has been at the forefront of why mentoring is vital, and a reason for understanding the differences among conversations in two comparison studies (Feiman-Nemser & Parker, 1993; Wang et al., 2004). Therefore, this paper will also introduce an approach for

considering the *educative potential* of mentoring conversations that can be used as a unit of analysis for investigations. Finally, I attempt to begin the decomposition of mentoring conversations based on the findings from the three approaches.

Research Design

The three approaches described in this paper originated from a small study focused on better understanding mentoring conversations. The purpose of this study was to identify the ways mentor-intern pairs who adopted the language of noticing and wondering incorporated the language into their conversations and how this tended to influence the quality, focus, and stance of their conversations. Understanding more about the ways mentor-intern pairs adopt and utilize the language of noticing and wondering can also inform future professional development sessions that introduce mentors and interns to this professional language for talking about teaching. This qualitative study was conducted by comparing a sequence of mentoring conversations from one mentor-intern pair, selected because they had exhibited the highest frequency of noticing and wondering language in the pre- and post-conversations. The sequence included two pre-conversations about video episodes of someone else's teaching before a short orientation session, two sample conversations from mentoring conversations in the classroom after a short orientation session, and two post-conversations about the same two video episodes at the end of the study. While the subject of the conversation varies, all these conversations can be classified as mentoring because the mentor and intern are talking about shared teaching experiences that they either observed or enacted.

Participants

The participants were volunteers from a secondary teacher preparation program at a large public university in the Midwest. The participants were mentor-intern pairs who had responded

to an email asking for volunteers to participate in a research study about conversations between mentors and interns. All the interns were prospective teachers in their final year of a five-year teacher preparation program. The internship placement was a year-long teaching experience in which prospective teachers were always responsible for teaching one class, but then added on various levels of teaching responsibility throughout the year. This study occurred during the ten week period of lead teaching, during which the prospective teacher was taking on their highest amount of responsibility and doing the majority of the lead teaching (at least four classes). This was a favorable time to conduct this study, because mentor teachers can typically focus more on mentoring when interns are doing more teaching. The mentors who volunteered for the study were all veteran teachers who had a wealth of experience mentoring prospective teachers, with each one mentoring between five and fourteen prospective teachers.

The mentor-intern pair on which this study will focus was unique because they used the language of noticing and wondering in their pre-conversations before a short orientation session, and continued to have the highest frequency of the words *notice* and *wonder* in their post-conversation transcripts. For the remainder of this paper, I will refer to this mentor-intern pair as Pair 3.

Pair 3 consisted of a female mentor and a female intern. The mentor was a veteran teacher certified in elementary education who had taught third and fifth through eighth grades. She had taught language arts, one year of math, and recently seventh grade social studies the past four to five years. This was the mentor's sixth intern, and she expressed how she enjoyed the aspect of teaching and sharing her knowledge with interns. The mentor joined the study because she hoped to "learn ways to make conversations meaningful and productive...[and] to find ways to make my intern feel comfortable asking all sorts of questions [...] yet also feel comfortable

sharing ideas without feeling intimidated.” The intern in Pair 3 had an interdisciplinary studies major and minors in English and history. She expressed that her internship was an important experience and how vital it was that she got along with her mentor. When asked what she hoped she would learn in this study, she stated, “I hope to learn about how other mentors and interns have initiated in more intentional conversations rather than surface level conversations about events.” The intern also believed it was imperative to have her mentor’s constant feedback and support, and she recognized this was not the case in all internships. She hoped that by participating in this study it might help promote this kind of interaction in future interns’ placements.

Data Collection

Mentor-intern pairs were invited to participate in a study about mentoring conversations through a forwarded email that I wrote and a department secretary forwarded on a secondary education mentor list serve. Mentor-intern pairs volunteered for the study by emailing me and completing a survey which included information about the length of time they had been teaching, how many interns they had mentored, what grade and subject they were currently teaching, and what they hoped to learn from participating in this study. All the mentor-intern pairs who volunteered were accepted for the study and notified via email.

Within the acceptance email, mentor-intern pairs were asked to complete a pre-screener activity. This activity (Appendix A) directed the mentor and intern to watch two publicly available video teaching episodes (BTSA, 2012; BTSA, 2013) together and after each episode to have a conversation about the episode they just watched. The directions avoided suggestion to focus on things the mentor or intern thought were important, concerning, or curious, so as not to influence the discussion. The participants were asked to audio record these two conversations

and then upload the recordings to an online learning environment. Due to difficulties with the online learning environment, some mentor-intern pairs submitted their recordings by emailing them to me. Since I was not present during the pre-screener activity, audio was used to capture the conversation about teaching, rather than having pairs write out a response. This audio recording provided an account of the specific language and moves made to introduce topics and ideas, as well as how teachers were listening and responding during the conversations—details which might otherwise have been absent in a piece of writing.

After completing the pre screener, mentor-intern pairs attended a short orientation session that I designed and implemented, titled “Let’s Talk about It – Effective Ways of Communicating about Teaching.” I originally created and presented this short orientation session as a break-out session at the university’s Fall Internship Kick-off where it received positive feedback, but was not well attended due to location. Therefore, none of the mentors or interns had attended or demonstrated explicit knowledge about the language of noticing and wondering. The short orientation session was located on campus in a conference room. The session lasted approximately two hours, and snacks were provided. The goals of the short orientation session were to offer mentor-intern pairs the language of noticing and wondering and to provide opportunities for mentor-intern pairs to practice using noticing and wondering language to discuss teaching through written teaching scenarios and video episodes of teaching. Table 4.1 provides an overview of the short orientation session.

Table 4.1

Overview of Short Orientation Session Activities

Short Orientation Session Activity	Description
Offering the Language of Noticing and Wondering.	Introduced to <i>noticing and wondering</i> language using examples.
Thinking about the Possible Affordances of Noticing and Wondering Language	<p>Affordances of noticing and wondering language are shared and Smith's (2009) Olivia's lesson is shared as a model mentor conversation that includes noticing and wondering language.</p> <p>One more scenario is used to compare reactionary conversation starter places the focus on the teacher, versus noticing and wondering conversation starter that direct attention to the teaching. Affordances of this language are again highlighted.</p>
Practicing with Written Teaching Scenarios	<p>Written teaching scenarios that describe a situation in a fictional classroom are used to write a noticing and wondering statement that mentor-intern pairs could use to provide feedback or to inquiry about the teaching practice they just observed/read.</p> <p>Mentor-intern pairs shared their scenarios and statements, and were encouraged to discuss if they would like to use this language in their placement.</p> <p>Mentor-intern pairs share their scenarios and noticing and wondering statements, along with where they envision the conversation then going with the whole group. The use of the noticing and wondering language and the direction of the conversation are discussed together and questions/clarifications are answered.</p>
Practicing with Video Episodes of Teaching	<p>A 6-10 minute video clip of teaching is viewed by the group. Everyone makes observations and then writes a noticing and wondering statement that could be shared with the teacher in the video. Again, the noticing and wondering statements are shared between pairs, and then volunteers from the group are asked to share to create a group discussion about use of noticing and wondering language.</p> <p>Since the video clip in this study's PD was from the researcher, the researcher was then able to role play how the conversation would continue by responding to the noticing and wondering statements.</p>

I sent mentors and interns biweekly emails following the short orientation session to encourage the use of noticing and wondering language and to record two sample conversations that took place after the intern taught a lesson (Appendix B). The sample conversations provided information about the ways mentor-intern pairs were using or not using the language of noticing and wondering in their field placements, as well as about the nature and quality of the conversations. Mentor-intern pairs again uploaded their conversation recordings to a secure learning environment page, or they emailed them directly to me. These conversations were again collected with audio recordings to gain a primary account of the back and forth conversation, rather than a written secondary account of how one of the participants thought the conversation went, which could suffer from bias.

At the end of the study, a post-screener activity identical to the pre-screener activity was completed by the mentor-intern pairs. Each mentor and intern engaged in a separate exit interview with the researcher that followed a semi-structured interview protocol. I made the decision to interview participants individually so that teacher perspectives regarding mentoring conversations could be compared and contrasted, and so that individuals could emphasize different conversations and experiences from the placements. This style of interview allowed me to probe for more information, and to gather a complete picture of the conversation's form and focus, and how these conversations may have affected the PST's progress in learning to teach. Since the interviews would not be shared, this format supported interns to fully disclose information and thoughts without influence from their mentor. The interviews were audio-recorded and I also recorded a brief reflection after each conversation to keep track of the main themes that the participant had discussed. Table 4.2 provides an overview of the study timeline and data collection.

Table 4.2

Data Collection Overview and Timeline

Timeline	Data Collected	Description of Data	Length of Recording
2 weeks prior to orientation date	Informational Survey	Collection of questions to gain background knowledge about the participants' teaching and mentoring experience.	Two page document
Week prior to orientation session	Pre-screener Conversation #1 (9th grade English class) Pre-screener Conversation #2 (6th grade math class)	Mentor-intern pairs recorded conversations about the first 10 minutes of two classroom videos, and wrote a brief narrative about how each conversation compared to their normal conversations in the classroom.	1-15 minutes, written paragraph
	Short Orientation Session Attended		2 hours
3 weeks post orientation session	Sample Conversation #1	Mentoring conversation from field placement that was recorded after the intern had taught a lesson.	4-41 minutes
5 weeks post orientation session	Sample Conversation #2	Mentoring conversation from field placement that was recorded after the intern had taught a lesson.	4-25 minutes
8 weeks post orientation session	Post-screener Conversation #1 (9 th grade English class) Post-screener Conversation #2 (6 th grade math class)	Repeated pre-screener activity	4-12 minutes
8 weeks post orientation session and after post screener	Individual Interviews	Interviews between researcher and individual participants that followed a semi-structured protocol and were audio-recorded.	20-57 minutes

Illustrating the Three Approaches

This section illustrates each of the approaches for analyzing mentoring conversations and is guided by the following three research questions.

1. How can *potentially educative* mentoring **episodes** be identified within a recorded mentoring conversation and what do these episodes reveal about the quality of Pair 3's mentoring conversation?
2. What does an analysis of **the foci** of *potentially educative* mentoring episodes reveal about the range of topics covered within recorded Pair 3's mentoring conversations?
3. What does an analysis of **the analytic stance** reveal about the ways Pair 3 approaches talking about teaching?

This sequence allows for a broader analysis of larger *potentially educative* mentoring episodes first, with the opportunity to use these episodes as the unit of analysis for thinking about the foci of mentoring conversations. Finally, in contrast to the larger units, a smaller unit—a speaker's turn, is utilized in the final approach explored.

This section focuses on the approaches used to explore the mentoring conversations of Pair 3, the mentor-intern pair who had developed the most fluent use of noticing and wondering language after a short orientation session. These approaches illuminate the quality and nature of mentoring conversations by individually considering the educative potential, focal areas, and analytic stances in mentoring conversations.

First Approach: Identifying *Potentially Educative* Mentoring Episodes

Mentoring conversations are the primary source of communication between mentors and PSTs. Within mentoring conversations, mentors are able to highlight important moments in the shared teaching experiences and model making connections across teaching moments, creating more educative opportunities for PST learning. The purpose of this first approach was to find a way to analyze the educative potential of mentoring conversations. To do this, I used the educative mentoring literature to theorize a definition of an educative conversation. I defined an

educative conversation as the talking that occurs between a mentor and a PST where the purpose of these conversations is:

- 4) to help a novice teacher learn in and from practice;
- 5) to generalize about a novice's teaching practice from particular instances; and/or
- 6) to help purposefully focus a novice teacher's attention on student learning.

Since I was analyzing mentoring conversations about shared teaching observations (criteria 1), I decided to use criteria 2 and criteria 3 as indicators for locating episodes of mentoring talk that could be considered educative and supportive of PST learning. Thus, for this study a *potentially educative* mentoring episode was defined as turns within the mentoring conversation that met criteria 2 and/or criteria 3 and was focused on one topic.

In order to identify *potentially educative* mentoring episodes, I coded the transcripts for the second and third criteria and then used **the topic** of each coded moment to determine **the length** of the *potentially educative* mentoring episode based on where the talk about this topic started and ended. In some instances, multiple coded moments were contained within the same topic and thus were identified as one *potentially educative* mentoring episode. Figure 4.1 provides a visual representation of how the definition was conceptualized for coding, and how criteria 2 and 3 were used as indicators of learning in and from teaching.

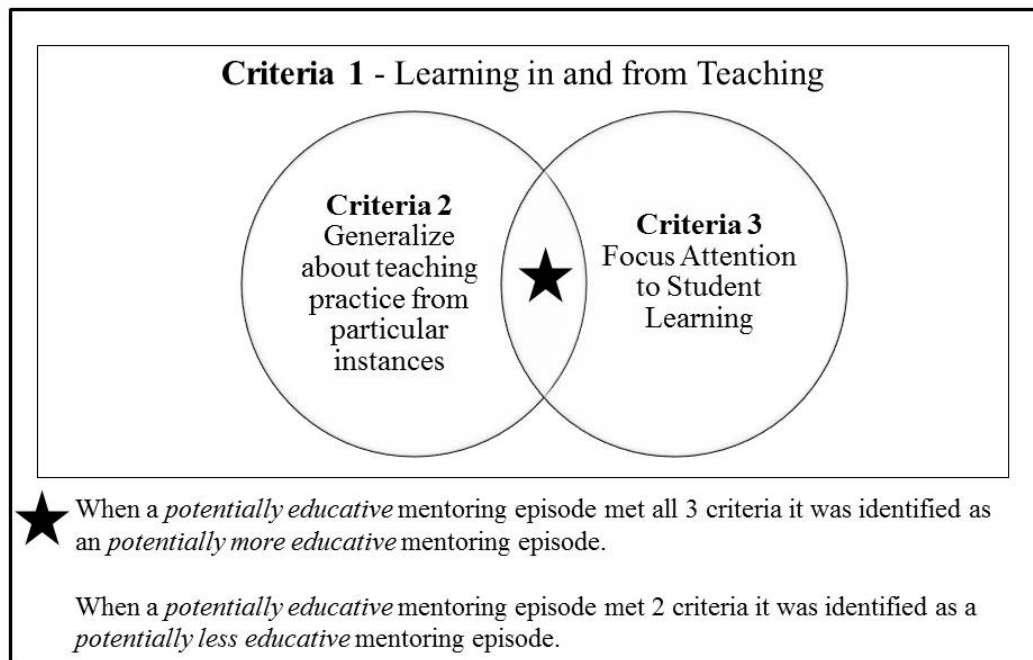


Figure 4.1. Indicators for Identifying *Potentially Educative* Mentoring Episodes.

I abbreviated criteria 2 and criteria 3 as indicators of a *potentially educative* mentoring episode to the following coding categories: generalization and student learning. I used these working definitions of each category to highlight moments of conversation that met a criterion, and in some instances contained coding for both criteria.

Generalization. This category was used to identify when mentors and interns purposefully generalized about their teaching practice from particular instances within mentoring conversations, and indicated that a section of conversation might fulfill criterion 2 of an educative conversation. *Potentially educative* mentoring episodes within the mentoring conversations were classified as generalization when the mentor or intern in the mentoring conversation demonstrated a connection to theory, coursework, a previous teaching experience, or generalizing students by grade level. Note that I slightly broadened this criterion to include

the possibility that either the mentor or intern were doing the generalization (not just the mentor). One way these generalizing moments were noticed was by a pronoun shift from talking about the teacher in the video (he or she), to the mentor or intern stating “I do,” “We do,” or “You do that.” Another example of generalization is where teachers noticed something about the teaching practice on video and discussed a more general preparation for these routines. Below is an example of a *potentially educative* mentoring episode that was classified as criterion 2 of generalizing from an instance of practice. This example shows the mentor exploring the option to compare the sixth grade and ninth grade video episodes, and how she decides that these age groups are very different. The intern follows up, expressing how she has even noticed a difference between the maturity of levels of sixth and seventh graders.

Mentor: *Yeah, but it did seem like if you were to compare the two videos, it's sort of hard to make comparisons because the age of the kids is different and there's a pretty significant differences between sixth grade and ninth grade.*

Intern: (giggles) *Even sixth grade and seventh grade it seems, because sixth grade they seem a little bit more like babies, like they'll do anything to please her.*

(Pair 3, Pre-conversation 2, #35)

Student Learning. This category was used to identify when mentoring conversations purposefully focused novices’ attention on student learning, and thus might fulfill criterion 3 of an educative conversation. This category was also coded more broadly to include the possibility that focus on students’ learning was led by either interns or mentors. To help develop a working definition for coding this, I asked myself the question, “What does student learning look like?” I decided student learning included lesson engagement, completing content tasks, teacher monitoring student progress, learning targets/goals, and specific subject matter. Therefore, any

part of the conversation that discussed students' learning, understanding, engagement, or a form of monitoring learning was coded as a mentoring episode that focused on student learning.

Below is an example of a mentoring episode coded as student learning that highlighted how the English teacher supported student learning by introducing vocabulary that might have been challenging for students.

Mentor: *I mean, I noticed it seemed like he made an effort to make sure kids knew what to do by explaining the words that they might not know, and sometimes it's hard to tell when you're just watching it, cause you don't know what happened the day before, you don't know the ability of the students.*

Intern: *Mhm*

Mentor: *Um, so*

Intern: *Yeah, I did notice that he had the words underlined, the words that he was going to talk about and I liked how he would say, "Okay, if I want a ____ this type of class what do I mean? Like, besides this, like, what does this word mean?"*

(Pair 3, Post-conversation, #42)

Both Generalization and Student Learning. Once the coding was complete for student learning and generalization, it was apparent that some *potentially educative* mentoring episodes included ideas about both student learning and generalizations about teaching practice (Figure 4.1). These *potentially educative* mentoring episodes were identified as *potentially more educative* mentoring episodes. Below is an example where Pair 3 makes the connection coded for generalization with a strategy used in the video that is also utilized by the intern in the classroom. This strategy involved having a student read aloud from the board. It is briefly

mentioned in the episode how this is more engaging for students, and since student engagement was something that could promote student learning, this part was coded as such.

Mentor: *I thought one of the things he did well that I've had, seen you do is, like he had the kid read it off the board.*

Intern: *Yeah.*

Mentor: *So you know that that is a little more engaging.*

(Pair 3, Pre-conversation 2, #33)

Next is another example of an episode meeting both criteria, in which the mentor makes a connection (generalization) that both she and the intern had not debriefed class in a way that collected data about what the students had learned (student learning). The mentor asks the intern how they might have done this differently. With a lack of response from the intern, the mentor models in a talk-aloud how she might close class next time.

Mentor: *Yeah, and I'm noticing how we both closed the class time, well it varied because of the time frame, but what we missed was, even if we had closure to be able to do a meaningful debriefing in terms of, I know for me, it was me talking. It wasn't me asking them, "So what did you learn?" which ya know, that's not a good strategy. Ya know, because then I'm wondering who walked away with what from this.*

Intern: *Yeah*

Mentor: *But a perfect], if we weren't doing the assessment tomorrow, what do you think would be a perfect follow-up? If we didn't have those questions on the quiz.*

Intern: *Then you could talk about like,*

Mentor: *Then you could get, I mean I would probably do it as a, on a half sheet bell ringer, half sheet 'cause I'd want to collect it. Have them all write something or do it on*

the wipe board, so, ya know, to make that connection of “So did we learn anything from that experience, and if so what?” And I don’t know if I’d even want to start with a, with a group, talk about it in your group, I’d want to know first individually who got what out of it.

Intern: *Kind of like how we for [person’s name], how like after he came in and then we had the students write on their own, what did they learn from this?*

Mentor: *Yeah, that he travelled back in time from [laughing], because that tells you something.*

Intern: *Yeah*

Mentor: *And that’s the feedback that you need, so, I know. And that’s why too, when we were talking about the, ya know, the class period, um, I guess sometimes probably the most crucial part happens at the end of class. And that’s when you’re pressed for time and, and that’s where I depend sometimes on the bell ringer the next day.*

(Pair 3, Sample conversation 2, #120)

Since these two turns were connected by the topic of assessment, they together made a *potentially more educative* mentoring episode (one *potentially educative* mentoring episode containing both coding categories).

After coding each category, I made a spreadsheet listing all *potentially educative* mentoring episodes that took place in each of the mentoring conversation transcripts. This list included the mentor-intern pair, the pre- and post-conversation or sample conversation in which the *potentially educative* mentoring episode occurred, and what coding criterion or criteria was met in the conversation.

The spreadsheet allowed me to see for each pair how many *potentially educative* mentoring episodes in each pre- and post-conversation and sample conversations were potentially more educative (demonstrating both generalization and student learning) or potentially less educative (only generalization or student learning). Sorting the kinds of *potentially educative* mentoring episodes in each of the mentoring conversations allowed me to compare the number of *potentially **more** educative* versus *potentially **less** educative* mentoring episodes within each mentoring conversation, as well as to consider how the educative potential of the collective group of mentoring conversations changed over time.

What Did an Analysis of *Potentially Educative* Mentoring Episodes Reveal about Pair 3's Mentoring Conversation Quality?

The identification of *potentially educative* mentoring episodes, as well as classification of these episodes into *potentially more educative* and *potentially less educative* provides information about the quality of each mentoring conversation. I will first demonstrate how this approach can be used to discuss one mentoring conversation, and then demonstrate how this approach can be used for comparing the educative potential between two or more mentoring conversations. Finally, I will examine the educative potential across a set of mentoring conversations.

This first approach can be used to describe the quality of an individual mentoring conversation. For example, Pair 3's sample conversation 2 contained 16 *potentially educative* mentoring episodes. The high number here suggests that there were a lot of moments in this conversation for the PST to be learning about teaching from discussions about student learning and generalization (Table 4.3). The fact that over half of these *potentially educative* mentoring episodes were classified as *potentially more educative* further supports the high level of quality.

Analysis of the *potentially less educative* mentoring episodes indicates that Pair 3 was equally talking about student learning (4 episodes) and generalizing the teaching (3 episodes).

Next, I display how this approach can be used to compare two conversations, for example pre-conversation 2 and post-conversation 2 which were about the same video episode of teaching (Table 4.3). In this case, I compared the total number of *potentially educative* mentoring episodes (10 episodes in the pre-conversation and 13 episodes in the post-conversation) and based on this data make an argument that the post-conversation was more educative than the pre-conversation because it contained more conversational moments where the PST could possibly be learning deeply about teaching. However, the fact that *potentially more educative* mentoring episodes differed only by two episodes might suggest that the quality of these two conversations was more similar.

Finally, looking across the entire set of *potentially educative* mentoring conversations (Table 4.3), I noticed trends or patterns in the data. For example, the number of *potentially more educative* mentoring episodes in Pair 3's conversations seemed to be increasing slightly over time, and the *potentially less educative* mentoring episodes seemed to have a consistent balance between student learning and generalizing the practice, compared to other pairs who tended to discuss one coding category over the other.

Table 4.3

Frequency of Potentially Educative Mentoring Episodes Occurring in Pair 3's Mentoring Conversations and the Frequency in each Category

Mentoring Conversation	Total Number of Potentially Educative Mentoring Episodes	Potentially More Educative Mentoring Episodes	Potentially Less Educative Mentoring Episodes	Potentially Less Educative Mentoring Episodes Coded for Student Learning	Potentially Less Educative Mentoring Episodes Coded for Generalization
Pre-conversation 1	13	4	9	5	4
Pre-conversation 2	10	6	4	2	2
Sample conversation 1	12	4	8	3	5
Sample conversation 2	16	9	7	4	3
Post-conversation 1	7	3	4	3	1
Post-conversation 2	13	8	5	3	2

Affordances and Limitations of Educative Potential Approach

The first approach of study is powerful in that it provides some insights into the *educative potential* of mentoring conversations, which is valuable information for teacher educators and mentors who are attempting to support PST learning in field placements. While there are many benefits to using the first approach, there are also limitations to consider, each of which are discussed below.

Affordances. The main benefit to the first approach is that it aids in selecting moments within mentoring conversations that might be particularly fruitful for analysis. The differentiated levels of *potentially more/less educative* further describe the varying levels of dialogue in mentoring conversations. As demonstrated in the analysis, another affordance of the first approach is that it can be used to describe one, compare across two, or examine across a continuum of mentoring conversations to identify patterns and trends.

Limitations. One of the primary limitations of the first approach is that it only takes into consideration sections of conversation highlighted by the educative conversation indicators, rather than creating a holistic understanding of the conversation. These *potentially educative* mentoring episodes furthermore do not indicate actual learning from the conversation but only suggest that indicators are being met that might potentially increase learning from the conversation. As highlighted, when a *potentially more educative* mentoring episode was introduced, the first approach did not differentiate between the lengths of mentoring episodes or to what degree the ideas about student learning or generalization were unpacked for understanding, thus lacking a depth of topic analysis. Also, because the episodes are only coded for student learning and generalization it is difficult to know more about *what* mentor and interns are discussing within these categories.

In summary, the first approach contributes to a program of research on mentoring practice, similar to the one Grossman and McDonald (2008) suggested for teaching practice, by decomposing mentoring conversations into *potentially more/less educative* mentoring episodes. It provides a technical language for distinguishing the quality of mentoring conversations and in particular aids in helping mentor teachers develop an awareness of the sections of conversation where PSTs might learn most. Specifically, the two criteria (student learning and making generalizations about teaching) for identifying *potentially more/less educative* mentoring episodes may be used as a lens for noticing the range of quality in mentoring conversations. Moreover, the examples above provide representations of mentoring conversations that could be used to illustrate *potentially more/less educative* mentoring episodes to mentors. Sharing examples of *potentially educative* mentoring episodes may build awareness of the criteria, and eventually a professional vision of what quality mentoring conversations address.

Second Approach: Open Coding to Categorize the Focus of Mentoring Conversations

Continuing to use *potentially educative* mentoring episodes as the object of study, the next approach used grounded theory (Glaser, 1978) open coding to identify the focal areas of educative discussions between mentors and PSTs. The creation of coding categories started with reading a *potentially educative* mentoring episode and either writing a category on a card that described its general topic or placing it under a category that was already created. As I did this, I started to notice that some categories fit under more general topics. I decided to collapse the subcategories into three main categories: Classroom Structure, Teaching, and Content (Figure 4.2). A similar coding system has been used by van Es (2011) to code topics discussed during video-club meetings to show a focus on pedagogical strategies, behavior or mathematical thinking, and classroom climate. Van Es's categories contain similar strands of teaching, content, and classroom structure. Next, I will further discuss each of the categories and subcategories (Figure 4.2) used for coding.

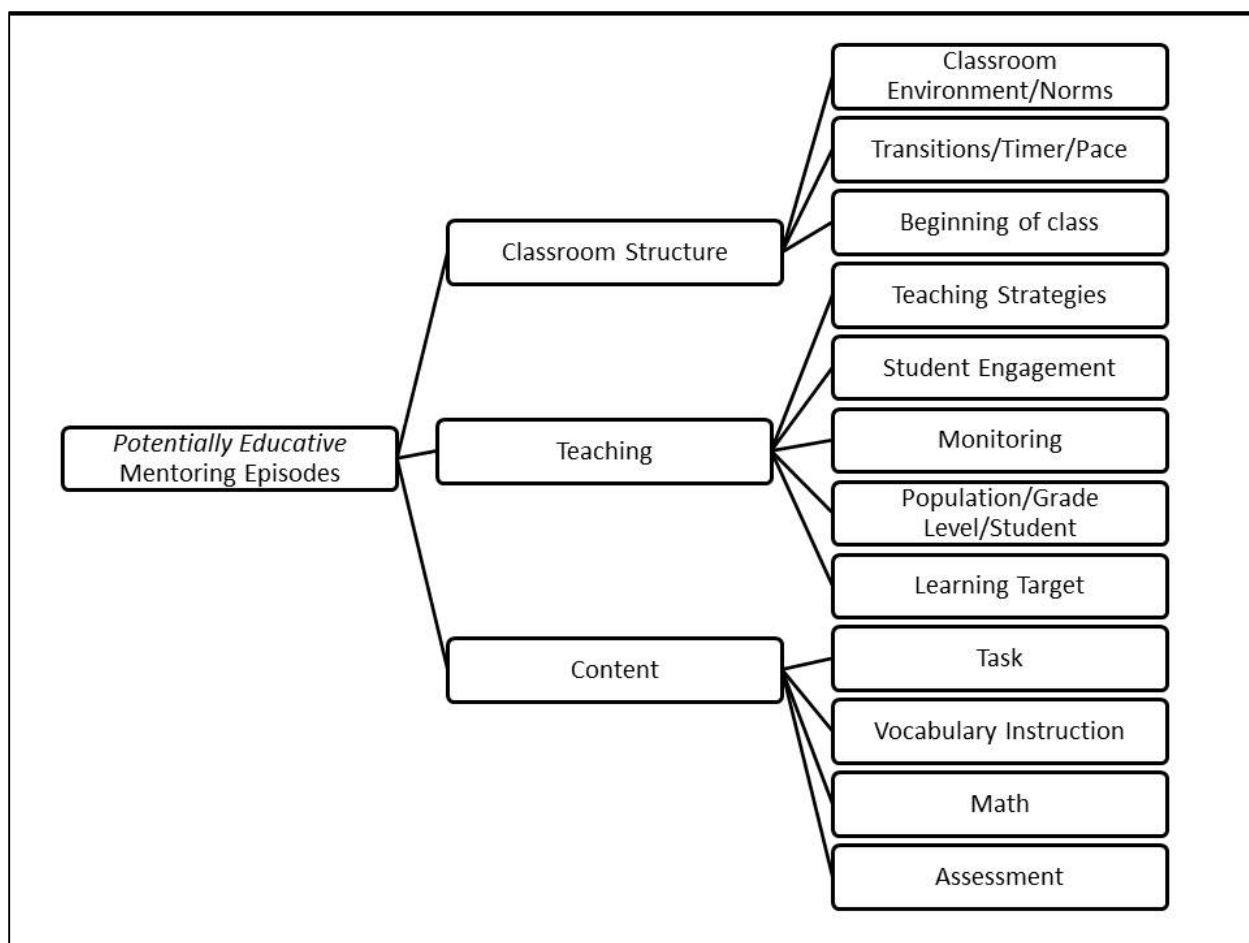


Figure 4.2. Coding Categories and Subcategories for the Foci of *Potentially Educative* Mentoring Episodes

Classroom Structure. The coding category Classroom Structure included *potentially educative* mentoring episodes that focused on organization of the classroom and structures teachers used to provide an environment in which students would be able to learn. It also included talk about classroom expectations and norms, as well as the physical set-up of the classroom.

The Classroom Structure category consisted of the following subcategories: Classroom Environment/Norms, Transitions/Timer/Pace, and Beginning of Class. The subcategory Classroom Environment/Norms was a collection of discussion points centered around classroom expectations, such as getting materials, classroom desk arrangements, general student talking,

and an expectation to have quiet work time. *Potentially educative* mentoring episodes coded for Transitions/Timer/Pace were discussions that examined the teacher's pacing of the lesson or how a timer might aid in pacing and student transitions from one activity to another. Finally, the subcategory Beginning of Class focused on routines the teacher might put into place to help students begin activities immediately upon entering the classroom. Samples from *potentially educative* mentoring episodes that were coded for each subcategory can be found in Table 4.4.

Table 4.4

Examples of Coding for Each Subcategory in Classroom Structure

Category	Subcategory	Samples of <i>Potentially Educative</i> Mentoring Episodes
Classroom Structures	Classroom Environment/Norms	Intern: <i>They were gluing in the worksheet and just starting to work. And there was really only, maybe a couple students that I noticed that weren't participating with what they were doing, just a couple of those boys, but, the majority of the class seemed to be doing what she had asked them. So I wonder what are her expectations and how did she set those up?</i> (Pair 3, Post-conversation 2, #53)
	Transitions/Timer/Pace	Mentor: <i>Sure...One of the things I noticed when we watched the video this time is how the teacher gave the students a certain amount of time, but didn't give the students a timer, and I wonder how it impacted the students being on task. One thing that I've been trying to do differently...</i> (Pair 3, Post-conversation 1, #38)
	Beginning of Class	Intern: <i>They got learning done within like the first ten minutes or so. They reviewed information from the day before and then they were starting in on something new. So, I thought that was good.</i> Mentor: <i>It kind of reminded me of that Anita Archer thing too, was the brisk pace...So what kinds of things do you think probably happened before, previous days that led to it being that much more organized?</i> (Pair 3, Pre-conversation 2, #27)

Teaching. The category Teaching focused on *potentially educative* mentoring episodes that discussed the strategies or moves a teacher makes in the classroom, the ways a teacher monitors students, and how a teacher promotes student engagement. The subcategories for Teaching were Teaching Strategies, Student Engagement, Monitoring, Grade Level/Population, and Learning Targets (Table 4.5). I used the subcategory Teaching Strategies to code *potentially educative* mentoring episodes that were about how the teacher conducted class and the moves teachers used to execute lessons. Other Teaching Strategy *potentially educative* mentoring episodes were focused on repeating directions, using engagement strategies (Archer & Hughes, 2011), and how the teacher needs to be a facilitator. The subcategory Student Engagement regarded episodes directed at to what degree students in the video seemed to be on-task, or how teachers were engaging students. This included moments when a teacher addressed a student who was not beginning a task individually, notes about students who were on task, and suggestions of how partners were or could have been used to engage students more. *Potentially educative* mentoring episodes coded as Monitoring included how the teacher was keeping track of learning taking place in the classroom. *Potentially educative* mentoring episodes coded as Monitoring were focused on actions (or lack thereof) like moving around the room, formative assessment techniques, and helping struggling students individually. The subcategory Population/Grade Level/Student identified moments when teachers generalized something about the needs or abilities of individual students, a grade level or class hour of students, or referenced something about the general demographic in the videos. Lastly, the subcategory Learning Target was focused on provision or exclusion of clear goals for the students during the lesson.

Table 4.5

Examples of Coding for Each Subcategory in Teaching

Category	Subcategory	Samples of <i>Potentially Educative</i> Mentoring Episodes
Teaching	Teaching Strategies	<p>Mentor: <i>And then, did you notice some of her follow up questions, when somebody shared an answer?</i></p> <p>Intern: <i>Yeah, they would ask her, to ask them to explain further. "Ok, so how did you get that answer?" and then if they couldn't exactly say it right, she would say like, "Ok, so talk to your partner and then figure it out." Or like, I liked how the one students got the answer wrong, and ya know, if I was that one student and I got the answer wrong, I wouldn't feel bad because of the way she was just kinda like, "It's not that big of a deal. So-and-so next to you is going to tell you how she got that answer."</i></p> <p>Mentor: <i>Right</i></p> <p>Intern: <i>Like, It just seemed like it was blown over, like "Yes, you got the answer wrong, but let's see why you got it wrong and hear about a different way to get it." I thought that was nice. How it wasn't just like, "Um no," because I know sometimes I run into that problem. That's why I don't like randomly calling on people so much.</i></p> <p>Mentor: <i>I remember when I taught math, for believe it or not, I taught sixth grade math for a year. It was a long time ago, and it was so different from, and prior to that I had taught mostly language arts and some social studies. And a lot of times there are ways in language arts and social studies that you can take an answer and do something with it besides say no, the answer is not one half....</i> (Pair 3, Pre-conversation 2, #32)</p>

Table 4.5 (cont'd)

Teaching	Student Engagement	<p>Mentor: <i>I noticed especially since you just said that, I think it's impressive that you are really looking at "How can I get everybody involved?" because I think that engagement, that is huge buzzword right now, for good reason. Because we need to at least have an indication if they are engaged. I mean, there's some things where it's like, ya know, how much do you, um, how much do we have to do to be the ones to set that up. Like why can't they just attend because they're either motivated, curious, or whatever, and so I do think that there's a fine line there too. But, getting feedback from a lot of 'em all at once can only benefit you as an instructor.</i></p> <p>Intern: <i>Mhm</i></p> <p>Mentor: <i>Um, so, I need to continue to use a lot of those strategies too, like the wipe boards and just different things like that.</i></p> <p>Intern: <i>We haven't used wipe boards in a while.</i></p> <p>Mentor: <i>A couple week ago! That's not, ya know! (Pair 3, Sample conversation 2, #105)</i></p>
	Monitoring	<p>Intern: <i>One thing I did notice about that though is she really stays up at the front of the room a lot, and doesn't really move around, and I wonder if that's because her tables are in groups, if she can't like really walk around that well, but it seemed like she was just upfront a lot. She might have just been observing, but it never seemed like are the kids actually writing down, like, 50% of 200. (Pair 1, Post-conversation 1, #73)</i></p>
	Population/Grade Level/Student	<p>Mentor: <i>Yeah, but it did seem like if you were to compare the two videos, it's sort of hard to make comparisons because the age of the kids is different and there's a pretty significant differences between sixth grade and ninth grade.</i></p> <p>Intern: <i>Even sixth grade and seventh grade it seems, because sixth grade they seem a little bit more like babies, like they'll do anything to please her. (Pair 3, Pre-conversation 2, #35)</i></p>

Table 4.5 (cont'd)

Category	Subcategory	Samples of <i>Potentially Educative Mentoring Episodes</i>
Teaching	Learning Target	<p>Mentor: <i>I notice when you said, “I’m not sure if they got it” and I’m wondering like how often when you’re instructing, because I know that I need to do this, I go back to what’s my learning goal. Ya know, starting out with my learning goal and then going back to my learning goal, and asking myself “Which part of this is crucial? Which part of it is not?”</i></p> <p>Mentor: <i>Um, but, I do like the idea of, ya know like, you’re saying that these items could actually end up all the way to the other end of the empire, even if the people themselves never did and I do think that that’s important for them [students] to get as a concept. (Pair 3, Sample conversation 2, #115)</i></p>

Content. *Potentially educative* mentoring episodes coded as Content discussed what was taught to students or the tasks students were engaged in to encourage subject matter understanding.

Content also included the larger structure of how a lesson plan might be organized to engage students in learning specific content ideas. The Content category consisted of the subcategories: Task, Vocabulary Instruction, Math, and Lesson Structure (Table 4.6). *Potentially educative* mentoring episodes coded as Task were focused on activities students were expected to learn and do, such as using strategies to solve math problems or to identify character traits. The subcategory Vocabulary Instruction specifically referenced how teachers might introduce and teach new words to students. An additional subcategory was identified as unique to the second video mentor-intern pairs observed: the Math subcategory specifically encompassed educative discussions that looked at the mathematical knowledge created, as well as questions about the use of mathematics terms. Lastly, the subcategory Assessment focused on evaluation of what students learned at the end of a lesson and techniques of gathering this information.

Table 4.6

Examples of Coding for Each Subcategory in Content

Category	Subcategory	Samples of <i>Potentially Educative Mentoring Episodes</i>
Content	Task	<p>Mentor: <i>I thought it interesting when he was talking about, like, he wanted them to come up with examples of a prominent character trait, but not physical, but what was the example he gave!</i></p> <p>Intern: <i>Yeah. It was all physical.</i> (Pair 3, Pre-conversation 1, #61)</p>
	Vocabulary Instruction	<p>Mentor: <i>I mean, I noticed it seemed like he made an effort to make sure kids knew what to do by explaining the words that they might not know, and sometimes it's hard to tell when you're just watching it, cause you don't know what happened the day before, you don't know the ability of the students...</i></p> <p>Intern: <i>Yeah, I did notice that he had the words underlined, the words that he was going to talk about and I liked how he would say, "Okay, if I want a ___ this type of class what do I mean? Like, besides this, like, what does this word mean?"</i> (Pair 3, Post-conversation 1, #42)</p>
	Math	<p>Mentor: <i>I don't know to what extent they have already, like they're gonna do the bingo thing. So to me, it sounds like maybe it's going to be a practice of the skill that they already know, so there is an expectation that yes we've done this enough, choose a strategy, and apply it. And that's one thing I noticed that I thought is probably good in this situation, is they're learning different strategies and can choose ones that work for them.</i></p> <p>Intern: <i>Yeah</i></p> <p>Mentor: <i>Which in math, that's really, ya know.</i> (Pair 1, Post-conversation 2, #46)</p>

Table 4.6 (cont'd)

Content	Assessment	<p>Mentor: <i>Yeah, and I'm noticing how we both closed the class time, well it varied because of the time frame, but what we missed was, even if we had closure to be able to do a meaningful debriefing in terms of, I know for me, it was me talking. It wasn't me asking them, "So what did you learn?" which ya know, that's not a good strategy. Ya know, because then I'm wondering who walked away with what from this.</i></p> <p>Intern: <i>Yeah</i></p> <p>Mentor: <i>But a perf[ect], if we weren't doing the assessment tomorrow, what do you think would be a perfect follow-up? If we didn't have those questions on the quiz.</i></p> <p>Intern: <i>Then you could talk about like,</i></p> <p>Mentor: <i>Then you could get, I mean I would probably do it as a, on a half sheet bell ringer, half sheet cause I'd want to collect it. Have them all write something or do it on the wipe board, so, ya know, to make that connection of "So did we learn anything from that experience, and if so what?" And I don't know if I'd even want to start with a, with a group, talk about it in your group, I'd want to know first individually who got what out of it</i></p> <p>Intern: <i>Kind of like how we for [person's name], how like after he came in and then we had the students write on their own, what did they learn from this</i></p> <p>Mentor: <i>Yeah, that he travelled back in time from [laughing], because that tells you something.</i></p> <p>Intern: <i>Yeah</i></p> <p>Mentor: <i>And that's the feedback that you need, so, I know. And that's why too, when we were talking about the, ya know, the class period, um, I guess sometimes probably the most crucial part happens at the end of class. And that's when you're pressed for time and, and that's where I depend sometimes on the bell ringer the next day.</i> (Pair 3, Sample conversation 2, #120)</p>
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A spreadsheet was used to organize each *potentially educative* mentoring episode and its corresponding topic category and subcategory. Sorting within the spreadsheet, I could identify

the main foci of each mentoring conversation or compare across the collection of mentoring conversations to identify any shifts in conversation focus. This, in turn, provided information about what topics mentors and interns were discussing in educative ways, and also whether or not their foci were consistent or changing.

What Did a Further Analysis of the *Potentially Educative* Mentoring Episode Foci Reveal about Pair 3's Mentoring Conversations?

Since the first approach lacked information about *what* was discussed in productive mentoring conversations, the second approach was developed as a way to investigate foci of the *potentially educative* mentoring episodes in mentoring conversations. This section reviews the data gathered by the second approach which, in turn, coded Pair 3's *potentially educative* mentoring episode foci as being centered on the following: Classroom Structure, Teaching, or Content. Table 4.7 contains the frequency of particular foci in *potentially educative* mentoring episodes for each of Pair 3's mentoring conversations. This approach can again be used to describe one, to compare two or more, and to review data across a continuum of mentoring conversations to notice any shifts or consistency in focus.

This second approach can be used to describe the overall focus of a mentoring conversation. For example, the *potentially educative* mentoring episodes within pre-conversation 2 were predominately focused on Teaching, with a secondary focus on Classroom Structure (Table 4.7). Furthermore, Pair 3 did not talk about Content in a way that was identified as educative in this mentoring conversation.

Each focal category could be considered as a way to extend the analysis for comparing foci between sample conversation 1 and 2. For example, in sample conversation 1 and 2, Teaching was discussed for a majority of the time within *potentially educative* episodes, whereas

sample conversation 1 addressed Classroom Structure, and sample conversation 2 focused on Content (Table 4.7). In this way the second approach may be used to identify similarities and dissimilarities between mentoring conversations.

Insight about topics Pair 3 tended to engage during mentoring conversations can be found by studying the coded foci of *potentially educative* mentoring conversations across the entire set of conversations. Pair 3's conversations tended to be about Teaching, only focusing on Classroom Structure for a majority of the time when discussing the first video as part of pre- and post-conversation 1 (Table 4.7). Furthermore, looking across categories, it seems Pair 3's intern might have lacked opportunities to learn about Content in mentoring conversations because this category appeared infrequently in *potentially educative* mentoring episodes.

Table 4.7

Frequency of Potentially Educative Mentoring Episode Foci for Pair 3's Mentoring Conversations

Mentoring Conversation	Classroom Structure	Teaching	Content
Pre-conversation 1	6	4	3
Pre-conversation 2	3	7	0
Sample conversation 1	5	7	0
Sample conversation 2	0	10	6
Post-conversation 1	4	2	1
Post-conversation 2	3	8	2

Affordances and Limitations of Foci Approach

Like the first approach, the second approach for exploring mentoring conversations also has affordances and limitations. The second approach's affordance is that it addresses a limitation of first approach concerning *what* mentors and interns are discussing in educative ways. The second approach's limitation however, identifies another area of need for

understanding mentoring conversations fully, that is *how* mentors and interns approach talking about teaching in mentoring conversations.

Affordances. The second approach responds to the need to identify *what* mentor and interns are discussing in ways that could potentially help interns learn from teaching. Because the second approach uses *potentially educative* mentoring episodes as the unit of study, this approach logically follows an analysis of conversation quality to inform what is discussed. The second approach, again, provides support for describing individual mentoring conversations, for comparing them, and also for identifying patterns or trends across a continuum.

Limitations. There are two limitations to investigating the foci of mentoring conversations with the second approach. The first is that mentor and intern pairs can only discuss topics that are shared observations or that connect to observations—they are limited by the focus of whatever they observed. Such is the case in the first ten minutes of video episodes used for the pre- and post-conversations; the mentor-intern pair will only discuss the events that they witnessed in those first minutes. This lack of diverse exposure may be responsible for the lower results of foci coded for content. Secondly, while the second approach begins to isolate characteristics of mentoring conversations by identifying what mentors and interns are discussing, it lacks a depth of analysis. This second approach also ignores information about other characteristics of the mentoring conversation, for example, *how* mentor-intern pairs approach talking about teaching.

Connecting back to the goal of developing a knowledge base (Grossman & McDonald, 2008) of mentoring practice and research, this approach to mentoring conversation analysis provides another strategy for decomposing mentoring practice and unpacking what mentors chose to discuss with interns. This method decomposes mentoring conversations to the level of

identifying focal areas. Sharing data and examples to represent mentoring conversation foci might develop an awareness of what topics are present and/or absent in one's own mentoring conversations. Furthermore, as mentoring practices support teaching practice development, more studies of this nature may hone in on specific teaching practices mentors believe to be essential in PST's success.

Third Approach: Exploring Analytic Stance in the Mentoring Conversation Turns

The third approach for analyzing mentoring conversations takes a look at a smaller grain size, speaker turns (Johnstone, 2008), to consider how mentors and interns approach talking about teaching. The mentoring conversation transcript was divided into speaker turns, and each turn was coded for analytic stance. Based on the definitions provided in van Es's (2011) framework for learning to notice student mathematical thinking in video, I coded each speaker turn as descriptive, evaluative, or interpretive. Turns were identified using Johnstone's (2008) description of a turn which states that, "A turn begins when one speaker starts to speak, and ends when he or she stops speaking" (p. 102). In a few cases, where a speaker's turn finished one topic and then began the next, the turn was split into two turns that occurred back to back, where one was responding to the previous turn and one was introducing the next topic. Examples of each of these coded turns and definitions can be found in Table 4.8.

Table 4.8

Stance Type Descriptions and Examples of Coded Speaker Turns

Stance	Stance Description	Examples of Turn
Descriptive	Creates a picture of the video moment observed through script and/or detailed descriptions.	Intern: <i>And then he went back to the question, and then he was like this is how prominent relates to this question.</i> (Pair 3, Pre-conversation 1)
		Intern: <i>She [student] was like, "I didn't find any words that I was stumped on."</i> (Pair 3, Sample conversation 2)
Evaluative	Makes a judgement that approves, disproves, or critiques the video moment in terms of how something should have been done.	Mentor: <i>Yeah, and I'm noticing how we both closed the class time, well it varied because of the time frame, But what we missed was, even if we had closure to be able to do a meaningful debriefing in terms of, I know for me, it was me talking. It wasn't me asking them, "So what did you learn?" which ya know, that's not a good strategy. Ya know, because then I'm wondering who walked away with what from this.</i> (Pair 3, Sample conversation 2)
		Mentor: <i>Um, but see for me, I feel like, a little bit more detail into the Silk Road before actually using it would have been good.</i> (Pair 3, Sample conversation 2)
Interpretive	Statements or questions that attempt at understanding and explaining a particular observation.	Mentor: <i>So, kind of reflecting on the week then, I've noticed the last two days the lessons have been very efficiently done, and I'm wondering what do you feel was different, uh, if anything, ya know. Um, today and yesterday compared to Wednesday or earlier in the week.</i> (Pair 3, Sample conversations 1)
		Intern: <i>But then also, ya know, I just wonder like does he always go to those students first, and when he does go to those students does the other class know that he always goes to those students first, and so maybe they don't do their work right away or maybe they don't pay attention.</i> (Pair 3, Pre-conversation 1)

Descriptive Turns. Descriptive turns ground the mentoring conversation in the observed practice of teaching, and aid in having a shared understanding of teaching moments to discuss (Smith, 2009). Turns were coded Descriptive when the speaker was only describing what they had seen in the video. This type of turn could include reports of what they saw or quotations from the teacher or students in the video. For example, when the intern from Pair 3 said, “And then he went back to the question, and then he was like ‘this is how prominent relates to this question’” she retold the steps the teacher in the English video took to introduce the new word, “prominent.” This turn is coded as descriptive because it is a basic description void of opinions, judgments, or justifications for the teaching choices.

Evaluative Turns. Mentoring conversations that maintain an Evaluative stance not only place judgments on the observed teachers, but lack further discussion about improving the teaching. This lack of application makes Evaluative turns less desirable in field placements where PSTs need to be studying their own teaching practice (Clarke et al., 2014). Van Es (2011) defined Evaluative as “uninformed judgments about what was good or bad or should have been done differently” (p. 138). These turns included moments where the teachers approved of the teaching they observed, such as “I did like that” or “there was good participation,” as well as moments that were unsatisfactory, such as “it just was not very efficient.” Evaluative turns sometimes included the words “could” or “should” to indicate that the teacher believed there was a better way of doing the action in the video. Turns were also Evaluative in situations where observations were compared to those of another teacher—thus suggesting that one was better or worse—or the frequency of an action was critiqued, such as “[he or she] did something a lot.”

Interpretive Turns. Mentoring conversations that demonstrate an Interpretive stance ask questions and reflect on teaching moments to aid understanding and improve future teaching. This is a habit of mind (Schwille, 2008) that is beneficial for PSTs to develop during student teaching, as it will help them continue to problem-solve as beginning teachers about their own lessons. Turns were coded as Interpretive if the speaker was trying to explain or figure something out about the video observation. Van Es (2011) described the Interpretive stance as, “reasons about what they observe, to understand the roots of an idea, and to explain what was meant by a particular statement, drawing, gesture, or expression” (p.138). Interpretive turns included questions about the video, as well as hypothetical suggestions, “maybe it’s because...”

Speaker turns that merely confirmed what the other person stated, such as “Mhm” or “Yeah” were coded the same as the previous comment since they were in agreement with the prior statement and stance. The sorting of turns was recorded in a table where three columns were labeled with the analytic stances, and each row represented a speaker turn. The actual text of the speaker turn was placed in the column that best coded that turn. The total number of turns was counted for each column. This data was then inputted into a spreadsheet to allow for individual analysis, as well as analysis of analytic stance across the mentoring conversations.

What Does an Analysis of Analytic Stance Reveal about the Ways Mentors and Interns Approach Talking about Teaching?

Whereas the first two approaches only analyzed sections of conversation that were *potentially educative*, this approach reviews the entire conversation by coding every speaker turn. It also addresses the limitation of the second approach, which is a lack of understanding other characteristics of mentoring conversations, such as *how* mentor-intern pairs talk about teaching. This third approach was used to analyze Pair 3’s mentoring conversations, and

provided the distribution of turns for each analytic stance (Table 4.9). Because the conversations varied in length and number of speaker turns, I used percentages to compare how much of each mentoring conversation was coded for each analytic stance. I then looked across the continuum of conversations to see if the analytic stance was changing or staying consistent. The data shows a shift in the analytic stance from predominately evaluative pre-conversations to slightly more interpretive post-conversations. The sample conversations also support a transition toward more interpretive approaches to talking about teaching, while still maintaining a very high percentage of evaluative turns. The data also suggests that the way Pair 3 talked about teaching was similar regardless of the identity of the teacher. Proportions remained fairly consistent despite the fact that the pre- and post-conversations were about video episodes of someone else's teaching and the sample conversations were about a lesson that the intern had just completed teaching in the classroom.

Table 4.9

Number of Speaker Turns Occurring in Pair 3's Mentoring Conversations for Each Analytic Stance and the Percentage of Turns in Each Analytic Stance

Mentoring Conversation	Descriptive	Evaluative	Interpretive
Pre-conversation 1	4 (5%)	55 (65%)	25 (30%)
Pre-conversation 2	7 (10%)	41 (56%)	25 (34%)
Sample conversation 1	15 (11.7%)	56 (43.8%)	57 (44.5%)
Sample conversation 2	25 (15%)	62 (38%)	76 (47%)
Post-conversation 1	2 (5%)	18 (44%)	21 (51%)
Post-conversation 2	12 (16%)	35 (45%)	30 (39%)

Affordances and Limitations of Analytic Stance Approach

Using the third approach to study mentoring conversations, again, affords understanding for parts of the conversations, but is limited in addressing other parts.

Affordances. As stated at the beginning, the third approach analyzes mentoring conversations as a whole interaction made of many smaller speaker turns. Because every speaker turn is coded, rather than just the *potentially educative* mentoring episodes, the analysis provides a description of entire mentoring conversations, not just the parts that might be identified as helpful for the PST to learn to teach. This complete analysis informs the researcher about *how* mentor-intern pairs talk about teaching by examining the stances mentors and interns are using in mentoring conversations. This approach, when used to analyze a sequence of mentoring conversations like Pair 3's conversations, can also provide some understanding about the stances Pair 3 consistently uses, or about subtle shifts that might demonstrate changes in their stances.

Limitations. A limitation of using this approach is that it can be time consuming to code every turn, particularly when some mentoring conversations are quite lengthy. Furthermore, the third approach continues to lack a gravity of analysis that considers the *depth of talk* occurring in mentoring conversations because the size of analysis is a brief turn being viewed in isolation from the other turns.

The development of another compositional strategy for mentoring conversations also connects to the goal of developing a knowledge base (Grossman & McDonald, 2008) for mentoring practice research. This third approach analyzes the stance mentors and interns use to talk about teaching. It adds technical language and representations of the analytic stances mentors and interns use to discuss teaching to the body of knowledge advanced in the first two approaches. Moreover, the third approach, different from the other two, was able to uncover how a noticing and wondering language (Smith, 2009) has the potential to structure mentoring conversations that support interpretive turns. The fine grain size of the analysis made visible

small shifts in a speakers' stance from evaluative to interpretive, which has been identified as more productive for PST development (Borko et al., 2008; Clarke et al., 2014; van Es, 2011).

Discussion and Implications

This paper offers three approaches that can be used individually or in combination with one another to explore and decompose mentoring conversations. These approaches include examining *educative potential* as a way of thinking about mentoring conversation quality; exploring *what* is being discussed, or the mentoring conversation foci; and identifying *how* mentors and PSTs discuss teaching by studying the analytic stance of the conversation. The second approach, which considers the mentoring conversation foci, is similar to the method Wang and his colleagues (2004) used to analyze the topic of mentoring conversations, however this set of approaches differs when it comes to the analysis of how topics were discussed. They (Wang et al., 2004) draw from intentions for proposing the topics, whereas I drew from van Es's (2011) work in teacher noticing groups to examine mentoring conversations for analytic stances, namely an interpretive stance that would lead to more intentional consideration of student learning and understanding. Finally, the study of *potentially educative* mentoring episodes has the possibility to further begin making connections between professional practices of mentoring and PST learning and development.

Approach Needed

During the exploration of affordances and limitations of the three approaches, it became apparent that one area that requires study beyond this set: an approach to investigate the depth of topic analysis that occurs in mentoring conversations. This was the fourth area of analysis within Wang and colleagues' (2004) mentoring conversation investigation, and has similarly been explored by van Es (2011) in understanding more about the ways in which teachers develop

noticing skills. While my original research questions about form, foci, and educative potential of mentoring conversations did not lead me to utilize this approach, a detailed analysis of topical depth could be applied after the first approach condensed the unit of study to *potentially educative* mentoring episodes. Such an approach could also be applied considering the groups of turns that have the same stance in the third approach as a unit for exploring the depth of topic analysis within these sections.

Call for Mentoring Conversation Future Research

Mentoring as a professional practice (Schwille, 2008) is influential in the development of PSTs, but the current research lacks a common language, agreed upon measures, and established core practices or mentoring. These components are the ones Grossman and McDonald (2008) argue are necessary to drive purposeful study and the creation of a cohesive research base. More knowledge about the characteristics of mentoring conversations is necessary to develop appropriate and effective learning experiences that support the development of mentors' abilities to facilitate productive mentoring conversations.

Following Grossman and colleagues' (2009) concept of decomposition may aid in teaching the complex practice of mentoring to mentor teachers. Decomposing mentoring as part of a three-part framework to identify and understand the pedagogies of practice in professional education reveals constituent parts including mentoring conversations. Further, the constituent parts of mentoring conversations themselves can then be decomposed into topics—such as episodes of educative potential, foci, and analytic stance—that support conversational interactions between mentors and PSTs. Discussion of each particular topic may enable mentors to become aware of and interpret these aspects of mentoring conversations, as well as to provide opportunities to safely rehearse them. Finally, decomposing the practice of mentoring—

specifically mentoring conversations—provides mentors and teacher educators with a common technical language for discussing and providing feedback to improve mentor conversation skills.

This paper demonstrates how three approaches to mentoring conversation analysis may be beneficial. Specifically, the approaches provide technical language for discussing mentoring conversation qualities (*potentially more/less educative* mentoring episodes, foci, and stance) and example conversations to represent and easily share each idea with other teacher educators. Decomposition using the third approach further highlights how a simple structure, noticing and wondering language, may support more interpretive stance turns in mentoring conversations. This finding is particularly generative because it illuminates a way mentors might improve this teachable aspect of their mentoring conversations.

Overall, I began this paper by adopting Grossman and McDonald's (2008) approach to studying teaching practice, and applied it to another professional practice—mentoring. I suggest three analytical approaches to better understand mentoring conversations and the extent to which they are or have the potential to be educative. Further utilizing Grossman and colleagues' (2009) concept, I considered how the three approaches aid in decomposing the practice of and contribute to knowledge about effective mentoring conversations. Future research might consider other approaches for exploring mentoring conversations, particularly depth of topic analysis, which was identified as a limitation of the approaches introduced in this paper. Creating studies that focus on the nuances of elementary or secondary mentoring conversations, as well as subject-specific mentoring conversations would be productive avenues for informing differentiated ways to support and develop mentoring conversation practices in all mentors.

APPENDICES

APPENDIX A

Pre/Post Initial Screener

[Insert Your Names Here]

The purpose of this initial screener activity is to get a feel for how teachers talk about teaching after watching a lesson. The screener will take approximately 60 minutes and will consist of two videos, recording two conversations, and completing two written responses and should be completed in one day if possible. **You will need to be able to record audio to complete this activity.**

Video 1 - Directions:

6. Together with your mentor/intern, sit down at a computer, or with the computer screen projected in the classroom so that both people will be able to see the video comfortably.
7. Watch this video clip of a 9th grade English teaching episode uninterrupted for at least 10 minutes (<http://www.youtube.com/watch?v=8sm1ZXQzXXo>). Please do not re-watch or stop/restart the video for this activity. (Pretend you are watching it in real time)
8. Have a conversation about the teaching episode you just watched. Be sure to **audio record** this conversation.
9. Upload conversation to the D2L page or email it.
10. Reflect on the conversations you typically have with your student/mentor teacher. How did the conversations you just submitted about the video clip compare and contrast with the conversations you have in the classroom with your student/mentor teacher?

Write your Comparison Here

Video 2 - Directions:

5. Together with your mentor/intern, sit down at a computer, or with the computer screen projected in the classroom so that both people will be able to see the video comfortably.
6. Watch this video clip of a 6th grade math teaching episode uninterrupted for at least 10 minutes (<http://www.youtube.com/watch?v=-YvIR7M34nk>). Please do not re-watch or stop/restart the video for this activity. (Pretend you are watching it in real time)
7. Have a conversation about the teaching episode you just watched. Be sure to **audio record** this conversation.
8. Upload conversation to the D2L page or email it.

Reflect on the conversations you typically have with your student/mentor teacher. How did the conversations you just submitted about the video clip compare and contrast with the conversations you have in the classroom with your student/mentor teacher?

Write your Comparison Here

APPENDIX B

Sample Group Emails

Email #1 – The Reminder (Sent 1 week after the intervention)
<p>Hi [Participant Name and Participant Name],</p> <p>I hope you found the “Let’s Talk about It – Effective Ways to Communicate about Teaching” workshop informative, especially the piece about how to use noticing and wondering language to expand conversations about teaching. The simple use of saying “I noticed” seems to really help us focus on what happened in a teaching episode, and using the phrase “I wonder” allows us to ask questions of a teacher’s lesson openly, in hopes of finding out more about their thinking and having a conversation.</p> <p>For example, after observing a secondary science lesson where all of the groups started the lab except one. You might say, I noticed the group in the back didn’t really delve into the science lab this hour and I was wondering what steps a teacher might do to get them started OR I was wondering if these students really struggle with science or if something else was going on today. Both of these wonderings might then lead to a larger conversation about students’ learning needs, teacher questioning/prompting or even selecting accessible labs for all. The conversations are endless!</p> <p>I hope you’ll give noticing and wondering a try! I’ll be checking back in a couple weeks to see how it’s going!</p> <p>Sarah Roller</p>
Email #2 – Data Collection & Response (Sent 3 weeks after intervention)
<p>Hi [Participant Name and Participant Name],</p> <p>Thank you again for participating in the “Let’s Talk about It – Effective Ways to Communicate about Teaching” workshop introducing noticing and wondering language for talking about teaching. I wanted to check in and see how your noticing/wondering conversations have been going. Please audio record a conversation with your mentor/intern during a planning hour or at the end of the day after the intern has taught a lesson. Post the audio file to the D2L (Desire2Learn) page so I can view it.</p> <p>I look forward to hearing about what you’ve been noticing and wondering about!</p> <p>Sarah Roller</p>

Thank you so much for sending me a sample of your conversation! Keep up the noticing and wondering! You'll be hearing back from me again in a couple weeks!

Sarah Roller

Email #3 – Data Collection & Response (Sent 5 weeks after intervention)

Hi [Participant Name],

I noticed in your last email that you were having some great conversations about teaching and was wondering what you've been talking about lately!

Please audio record a conversation with your mentor/intern during a planning hour or at the end of the day after the intern has taught a lesson. Post the audio file to the D2L (Desire2Learn) page so I can view it.

I look forward to see what you've been thinking about and discussing lately!

Sarah Roller

Thank you so much for sending me a sample of your conversation! Keep up the noticing and wondering! You'll be hearing back from me again in a few weeks to complete the final step in this study!

Sarah Roller

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CHAPTER 5

REFLECTING ON MY MENTORING CONVERSATIONS

My advisor and committee members held integral roles in guiding and shaping not only my dissertation research, but my development as a mathematics teacher educator and researcher. Although their diverse areas of expertise led to many successful mentoring conversations, many of these conversations were similar to the ones highlighted in this dissertation. Mentors tended to focus on specific topics in their *potentially educative* mentoring episodes. Similarly, I believe each committee member has brought a specific topic or question to the forefront of our conversations. With great appreciation for their mentoring and guidance, this last chapter responds to a set of noticing and wondering statements about this dissertation (one per committee member) that maintains the focus of many of our previous mentoring conversations.

Dr. Steele's Hypothetical Noticing and Wondering Statement

I had the privilege of teaching two secondary mathematics methods courses with Dr. Michael Steele in 2010-2011. During this time, he introduced me to *noticing and wondering language* as a classroom norm and language structure that prospective teachers (PSTs) and instructors utilized for discussing teaching cases (written and video). He also encouraged the use of noticing and wondering language for providing feedback on assignments, lessons, and teaching observations. This was the beginning of my trajectory with Smith's (2009) noticing and wondering language. It later structured PST feedback in my own classroom, provided a common language for mentor-intern professional development workshops, and perhaps most importantly, drove this dissertation. I envision Dr. Steele starting a conversation with the following noticing and wondering statement.

I noticed the purpose of the short orientation session was for mentor-intern pairs to adopt the structure of noticing and wondering as a way to support more productive conversations. I was wondering if the mentor-intern pairs in this study were able to use the language of noticing and wondering to unpack important shared observations to examine student learning and mathematical/subject-specific understanding.

I offered the noticing and wondering language to mentor-intern pairs as part of the short orientation session for this dissertation study given the powerful experiences I had using the language structure with PSTs. This decision was augmented by the positive feedback received from other mentors when they participated in my workshops (Roller, 2013; Roller, 2014). As a critical question, however, it causes me to step back from the work and reflect on how the conversations gathered in this study compare to the ones I participated in during those two secondary mathematics methods courses. Essentially, if the recorded mentoring conversations did support a deep analysis of the teaching and learning, the short orientation was a success. In contrast, if the recorded mentoring conversations did not facilitate nuanced understandings of mathematics instruction it would be important to identify the differences and consider what may be done differently in preparation of future professional development activities.

As Chapter 3 reported, out of all three mentor-intern pairs, only seven *potentially educative* mentoring episodes included both the words *notice* and *wonder*. While the data indicated an increase in the frequency of the words *notice* and *wonder* after the short orientation session, the mentor-intern pairs had not entirely developed this way of talking about teaching. Perhaps, they were showcasing what a learning curve for using this language *might* look like, particularly if a veteran mentor already had a style and practice for mentoring. This slower

adoption may be a result of a one-time workshop, compared to a more intense, full emersion, type of professional development or course (Wilson & Berne, 1999).

While the slower adoption of the noticing and wondering language was not overly bothersome to me as a researcher, the types of conversations that mentor-intern pairs were participating in when using the language also varied in ways that were less rigorous than my previous experiences during the secondary mathematics methods course. As Chapter 2 suggested, this may be a result of the written case scenarios and video episodes utilized during the short orientation session and also during the pre- and post-conversations. These videos were more generalist as they focused on issues of classroom management and student behaviors that all teachers would be able to relate to, regardless of their subject matter. Based on my experience facilitating these workshops in other settings (Roller, 2013; Roller, 2014), I had thought any teaching observation could be used to learn about and practice the language of noticing and wondering because the goal was to rehearse the language structure. Upon reflection and deeper analysis of the data, I wonder if introducing the language of noticing and wondering with rigorous examples of student learning with a subject matter focus would remind mentor-intern pairs to engage in these same kinds of conversations in the classroom. This will be one of the first changes I make in revising the professional development activity and something I intend to keep in mind when selecting videos for teacher preparation, mentoring, and teacher development purposes.

Dr. Stanulis' Hypothetical Noticing and Wondering Statement

As a new recruit to my dissertation committee, I was honored to have Dr. Randi Stanulis join given her expertise in teacher learning through mentoring and induction, as well her deep understanding of Feiman-Nemser's (1998) *educative mentoring* work. Because this dissertation

bridged the professional practices of educative mentoring and teacher noticing to explore educative conversations, Dr. Stanulis quickly became my compass in making sure all things educative were truly *educative mentoring*. Hence, how the term of *potentially educative* mentoring episodes was created to clarify that this study was focusing on indicators that highlighted sections of conversation as spaces where a PST *might* learn from the mentoring conversation. To continue our mentoring conversations about educative mentoring, the following noticing and wondering statement is one I believe Dr. Stanulis would appreciate being addressed.

I noticed your dissertation research identifies potentially educative mentoring episodes within mentor-intern conversations as spaces that could lead to PST learning, and I am wondering what you would need to know about the conversations as a whole to identify it as educative conversations?

An essential part of writing and communicating about this dissertation research is making the distinction between the theorized definition for an *educative conversation*, and what the *potentially educative* mentoring episodes include in a mentoring conversation. Thus, this research only begins to consider the areas in which PSTs might be learning in educative ways about their teaching practice. Using the methods for analyzing mentoring conversations mentioned in Chapter 4, I hypothesize the following four assumptions to be true of educative conversations.

1. Mentoring conversations contain a high density of *potentially educative* mentoring episodes.

2. The foci of these *potentially educative* mentoring episodes are focused on student learning and understanding of content, particularly in ways that inform instruction and greater support for student learning.
3. The analytic stance of these *potentially educative* mentoring episodes is predominately interpretive as mentors and PSTs engaged together in thoughtful reflection and purposeful inquiry to improve teaching.
4. Additionally, the depth of talk analysis of *potentially educative* mentoring episode foci demonstrate a rigorous and deep discussion that unpacks the observations in the classroom while also elaborating on the habits of mind required to analyze and improve teaching practice.

While these four findings alone would produce a very productive conversation for learning in and from practice, educative mentoring is a differentiated approach that treats PSTs as learners of teaching. Therefore, a mentoring conversation that addresses an important moment that experienced teacher noticing skills would highlight could not be considered an educative conversation. Educative conversations include an intentional decision from the mentor to not only address PSTs immediate concerns, but to also select and sequence critical observations. Together, these rhetorical moves support PSTs' current and future needs for sustained growth. This reflects differentiated and individualized conversational work that surpasses just talking about teaching. Furthermore, it would be difficult to identify if a conversation is an educative conversation without knowing more about the ways in which that conversation aligns with other conversations in the PSTs developmental trajectory.

Conversations require attention and communication between two people. Therefore, I would also like to address that while much of this description of educative conversations focuses

on the ways in which mentors intentionally support PSTs, it would be unwise to think that all of the responsibility of maintaining educative conversations should rest on the shoulders of only one communicator. Therefore, I want to address that, as a learner, the PST needs to be attentive and present in the mentoring conversation, enacting a critical thinking stance and offering ideas so that a collaborative relationship can occur and facilitate the work within mentoring conversations. Mentor-intern pairs gradually release from the initial work of modeling inquiry to learn from teaching toward inquiring about teaching episodes together to improve instructional practice. Lastly, the outcome of educative conversations should be an improvement in practice. These conversations and instructional next steps should manifest into habits of mind that support a PST's inquiry into their own practice.

Dr. Drake's Hypothetical Noticing and Wondering Statement

As the Director of Teacher Education, and someone who is interested in developing elementary mathematics teachers, I was extremely fortunate to have Dr. Corey Drake join my dissertation committee. As a new member to my committee, Dr. Drake supported me presenting to elementary education mentor-intern pairs, but also attended the workshop session in order to gain a better understanding of the short orientation session I was providing in my dissertation study. She was curious to observe how teachers were engaging with the session. As someone who works across the programmatic scope and sequence of teacher education, I hypothesize that this might be Dr. Drake's noticing and wondering statement.

I noticed that your study is situated within student teaching and specifically speaks to the development of mentors in this context, and particularly within spaces that are able to provide a short orientation session for mentor development. I am wondering what

some of the different ways might be that teacher educators could think about this research and apply it to the work that they do in developing PSTs.

It is common knowledge that time and resources are limited in school and universities to support mentoring practices, and that the veteran teachers who typically accept the role of mentoring PSTs are already overburdened with school responsibilities. As a mentor of PSTs for eight years, this tension came to fruition as universities gave me little to support the mentoring process and practice. I only received electronic teacher education handbooks and a collection of summarized syllabi with important dates from the universities.. These experiences, along with the unique perspectives gained from being a mentor and doctoral student in a teacher education program has greatly impacted my interest in ensuring field placements as more educative spaces and experiences for PSTs. While the context of my study is situated within the student teaching field placement, this decision was based on utilizing the experience where mentors-intern pairs had the most contact hours for having mentoring conversations. In the field experience PSTs were doing more of the teaching and were guided to learn from their teaching experiences through reflection and inquiry. Hence, the field experience was an exemplar space for nuancing the particulars of mentoring conversations.

Teacher educators may think about the research I did through an array of perspectives. They may consider how it pertains to mentoring conversations teacher educators have with PSTs about teaching in coursework and advising. They may also see how this dissertation sheds light on a reflection tool, illuminating how teacher educators consider their own mentoring conversation foci, stance, and educative potential when engaging in mentoring conversations with PSTs about teaching. They may see it as a how-to guide, decoding how to intentionally make these conversations more productive for PST development. Teacher educators may also consider this

work as a guide toward thinking about conversations that occur about teaching in their own courses and how these discussions could be more or less educative depending on their foci, stance, and educative potential. Finally, teacher education programs that do not have the resources to develop mentors with face-to-face interactions may consider alternative routes for effectively and efficiently sharing information to support the mentoring that their PSTs are receiving.

Reflecting on Individual Mentoring Talk

Teacher educators that read Chapter 2 in a future version of *Mathematics Teacher Educator* or Chapter 3 in the journal of *Teaching and Teacher Education* might be drawn to reflect on their own mentoring conversations with PSTs. In particular, the methods used in Chapter 2 and 3 provide lenses for teacher educators to more closely consider the foci, stance, and overall educative potential of their current mentoring conversations. Furthermore, findings reported in these chapters could also be used to hone in and improve one's own mentoring skills. Just as the experience of teaching secondary mathematics methods courses introduced me to the language of noticing and wondering (Smith, 2009), Chapter 2 could be the space that introduces teacher educators to the noticing and wondering language structure. Teacher educators may likely find the language helpful for focusing the conversations on the particulars of teaching in various situations instead of the teacher. Conversations that focus on the teacher come across evaluative and less approachable. These are just a few of the ways that individual mentors may use my work to reflect and structure their conversations with PSTs in more productive ways.

Structuring Productive Talk in Coursework

Similar to the ways in which a teacher educator might use this work to reflect and improve their own practice for talking about teaching, teacher educators might adopt the noticing

and wondering language and implement it as a way of productively talking about teaching in a teacher education course. Chapter 2 describes the short orientation session that can be adapted into similar teacher education course experiences. While this article is located within the mathematics subject area, the language of noticing and wondering can be used to provide feedback about microteaching episodes or written and video case scenarios across subject areas. Noted as a future design principle, teacher educators implementing the language of noticing and wondering may want to ensure they are addressing rigorous ideas about student learning in their particular subject area versus just technical and rote skill. Overall, the language of noticing and wondering can be introduced to teacher educators through my work and adopted as a classroom norm for talking about teaching.

Considering Alternative Routes for Supporting Mentoring Practices

Despite limited resources, there are alternative pathways to facilitating professional development experiences in having productive mentoring conversations that lead to PSTs instructional development. For example, one could create a free online space that mentors can access. This space would contain direct mentoring strategies (e.g., noticing and wondering language and/or brief overviews of Schwille's (2008) forms of mentoring) to help induct novice mentors into educative mentoring roles. The space could also include examples of productive conversations that work to unpack student thinking and learning while answering the question of "What would a high quality mentoring conversation sound like?" The main concern in constructing this kind of space is time, as mentors may feel that the navigation of an online repository might consume time they otherwise do not have

A second approach toward improving mentoring conversations works within the university to educate PSTs about mentoring conversations and the utility they may serve in

having more productive forms for discussing teaching. If the approach to talking about teaching is cohesive across teacher education coursework, interns may feel confident enough in their skills to initiate more conversations with mentors (and thus, modeling productive ways to talk about teaching). PSTs, for example, can be assigned to share the ways they have been communicating about teaching in the teacher preparation program and asked if they would be willing to continue this work. As you see, the challenges of approaching this work with mentors may be sensitive. However, if the habit of talking about teaching in productive ways has already been formed from years in the teacher education program, this habit would more likely continue and encourage more productive talk in field placement. While alternate routes for supporting mentoring practices can be challenging to develop, particularly because they require thinking outside the norm for how professional development is commonly done, there are a number of ways to offer mentoring that can be supported and considered.

Dr. Crespo's Hypothetical Noticing and Wondering Statement

Through a combination of writing an alternate format dissertation and being on the job market, my advisor, Dr. Sandra Crespo, inducted me into the world of teacher education research and the work of a tenure-track professor. Dr. Crespo, through her mentoring across these years, has fulfilled the role of *educative mentor*. The quality time and feedback she provides *addresses my current concerns* while simultaneously encouraging me to dream bigger. In hindsight, she understood *the types of experiences and knowledge needed* for future career steps. In the conversations we shared, she frequently would not only *listen* to the work I was doing, but would inform me about the research, writing retreats, and tenure steps she was attending as well. She approached conversations with an *open-mind* and an attitude of *joint collaboration*. Our work together has been *productive* and *sustainable* and something I hope we continue. As someone

who has helped mold and shape my own vision for the future, I have provided a hypothetical and intentional noticing and wondering statement that my educative mentor and advisor might inquire about.

I notice you have three manuscripts ready for submission to peer-reviewed journals, but I am wondering in what other ways you plan to use this dissertation study to launch you into your new tenure-track position and space in teacher education.

Broadly, I envision my research having three main areas or foci which have already begun to crystalize across my work. These areas are: 1) teacher preparation and mentoring practices, 2) research-based instructional strategies for teaching mathematics education, and 3) development of prospective and practicing teachers. The research work outlined in my dissertation begins to combine these three areas as well as provide a starting point for my future work. In what follows, I describe how I will utilize each piece in this alternate format dissertation to develop a research space within teacher education. Then, I will move beyond this dissertation to discuss the trajectory of my work and how I intend support this work.

Developing a Research Space with This Study

One way I intend to carve out a space in teacher education is to publish. As announced in Chapter 1, each manuscript in this dissertation is developed with a particular journal in mind for potential submission. While some still need revising to be within the word limit constraints, the ideas are ready for polishing. My goal is to send each of these manuscripts out by early fall. I have been accepted to present a poster on Chapter 3's data and findings. My goal for this poster presentation is to engage attendees with my method for identifying *potentially educative* mentoring episodes. This will make visible and create an awareness of my work and hopefully build connections with others. I hope to gain insight about the ways in which others may think

about and use my coding framework. I will also be applying to present my Chapter 2 data regarding using speaker turns to identify the analytic stance in mentoring conversations at The National Council of Mathematics Teachers (NCTM) Research Conference. My past experience at NCTM proved fruitful as I made connections with other mathematics educational researchers. Networking with peers and colleagues is something I would like to continue to develop, as I transition and become more familiar with the mathematics teacher education research field.

Continuing to Create a Research Space with Future Studies

In this section, I unpack the next two research studies that I envision as part of my trajectory for developing a better understanding of mentoring conversations. I see these pieces working to articulate and make visible my impact within educational research, a necessary step for tenure. Specifically, there are two areas that I have an interest in exploring. These areas are: 1) Identifying the unique components of mathematical mentoring conversations, and 2) Understanding the similarities and differences between secondary education and elementary education mentoring conversations and will be discussed in more detail below.

Unpacking a Noticing and Wondering Language Specific to Mathematics. While the sample conversations from my mathematics mentor-intern pair were not the sample conversations I hoped for, my course assignment and supervision of two secondary mathematics interns next fall will support this next piece of research. These emerging questions stem from the content foci of the mathematics mentor-intern pair (Pair 1) who had extended discussions about the mathematical content of the math video lesson. This was a rich point of data as other mentoring conversations in this dissertation generally focused on the teaching and classroom structure of the observed lesson. I plan to analyze mentoring conversations from two secondary mathematics mentor-intern pairs to identify subject-specific educative functions of their

conversations. These two case studies will then be utilized to hone in on specific questions regarding the educative function of mentoring conversations in mathematics, including topics that are unique to or absent from mentoring conversations, and how a language of noticing and wondering is used by mathematics teachers. This work will inform mentoring practices in teacher preparation programs, as well as inform teacher educators of the supports mentor teachers need in order to create more intentional dialogue and learning in mathematics field placements. Further inclusion of more rigorous examples of mathematics teaching will also be added to the short orientation session for this work.

A Comparison Study of Elementary and Secondary Mentoring Conversations. A comparison study focused on similarities and differences between mentoring conversations about mathematics lessons in elementary and secondary field placements is another possible pathway for future research that I intend to explore. This future pathway is supported by positive feedback I collected during a post-study professional development session that I offered to elementary mentors and interns about noticing and wondering language practice. This work, I hope, will inform both what we know about the practice of mentoring and how the ways in which we differentiate elementary and secondary teacher education programs. This study will involve collecting a sample of mentoring conversations from elementary teachers and then comparing these to my initial work regarding secondary education conversations.

Supporting My Professional Growth and Development as a Researcher

Professional growth and development as a researcher is typically delivered in two forms: people resources and financial resources. While I hope to maintain connections with faculty from my doctoral work, I am also excited to continue networking at conferences and with teacher educators involved with the Alabama Math, Science, and Technology Initiative (AMSTI) near

the University of Alabama in Huntsville. Equally, I am eager to continue to partner with mathematics teachers in Alabama. These relationships will broaden my understanding of mathematics teaching while also providing me the context of mathematics teaching in Alabama. I hope to act as a support for teachers in schools. Another group that I look forward to collaborating with is undergraduate and graduate students. Whether making the journey towards becoming a teacher or working on a research project in education, I welcome the opportunity to work with energetic students. Finally, I intend to apply for the Service, Teaching, and Research (STaR) Program. As a form of professional development that facilitates junior faculty into the roles and responsibilities of being a pre-tenure-track mathematics professor, I see this as a valuable opportunity and experience to socialize and network with peers who are also interested in mathematics education research. Furthermore, one of the more exciting parts of joining a research intensive institution are the scaffolded experiences leading toward financial support for continued scholarship. Internal monetary awards such as junior faculty research grants can be used to fine tune research tools and methods. Additionally, I hope to leverage application support during the writing process for more prestigious external grant support from organizations like the National Science Foundation.

In sum, thanks to my advisor and committee members for teaching me to dream bigger. Thank you for helping me understand the ways in which the components of research, presenting, and publication fit together while completing this alternate format dissertation. Through your mentorship and guidance, I am able to critically think about noticing and wondering language in mentoring conversations and search for the mathematical thinking that is necessary to consider them productive. I can articulate what an educative conversation might look like, in a way that is aligned to *educative mentoring*. I can think beyond my study to consider the ways in other

teacher educators might use my work to think about mentoring PSTs. And most of all, I have the skills and knowledge necessary to map a future research agenda and begin thinking about the resources I will need to support it.

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