EXPLORING THE INFLUENCE OF VIRTUAL MENTORING AND COACHING ON IN-SERVICE TEACHERS

A Dissertation

by

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ABSTRACT

The purpose of this research was to investigate the influence of virtual mentoring and coaching (VMC) on in-service teachers' professional growth and perception through participation in Project ETELL (Empowering Teachers of English Language Learners, Grant Award No. T365Z160229). In Chapter II, I conducted a systematic review to better understand the research on synchronous VMC on in-service teachers. The findings indicated that VMC had a positive effect on instructional practices as well as perceptions through the literature identified.

In Chapter III, I examined mentored teachers' professional growth over six weeks using a mixed-methods approach. Pre and post-classroom observations were collected during the six weeks of intervention and analyzed using a validated classroom observation instrument. Additionally, mentees' perception of their VMC experience was analyzed through a post-course mentoring survey. Quantitative and qualitative results suggested that VMC impacted teachers' professional growth. Specifically, the data indicated growth in the use of dense language content during instructional observation videos and overall positive perceptions of the VMC intervention.

In Chapter IV, I further investigated the VMC experience by analyzing five recorded sessions between mentors and in-service teachers. I compared the types and frequencies of interactions during the VMC sessions using Interaction Process Analysis (IPA). The majority of the codes were identified as Positive Reactions, while Negative Reaction codes were not present. VMC sessions facilitated opportunities for mentoring dyads to have constructive interactions and result in positive teacher self-perception. Additionally, through the use of thematic analysis of

the transcriptions, I identified the following themes: emergent bilinguals (EBs), COVID impact, instructional self-reflections, and establishing mentor-mentee relationships. I concluded with implications and recommendations for future research and practice.

DEDICATION

This work is dedicated to my family and friends. Para mis padres que con su apoyo he podido lograr todo lo que he soñado. Ustedes llegaron a este país para poder brindarnos un mejor futuro a mis hermanos y a mí. Este doctorado es uno de varios ejemplos de que sus esfuerzos y sacrificios no fueron en vano. To my younger siblings, Cristal and Jesus, who served as my first students and, without realizing, set in motion my journey into becoming an educator. Thank you for putting up with me and for being some of my biggest supporters.

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Contributors

This work was supervised by a dissertation committee consisting of Dr. Fuhui Tong [advisor], Department of Educational Psychology, Dr. Rafael Lara-Alecio, Department of Educational Psychology, Dr. Beverly J. Irby, Department of Educational Administration, and Dr. Hector Rivera, Department of Educational Psychology.

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NOMENCLATURE

EB	Emergent Bilingual
EL	English Learners
ESL	English as a Second Language
ETELL	Empowering Teachers of English Language Learners
IPA	Interaction Process Analysis
NCES	National Center for Educational Statistics
PD	Professional Development
TBOP	Transitional Bilingual Observation Protocol
TEA	Texas Education Agency
VPD	Virtual Professional Development
VMC	Virtual Mentoring/Coaching

TABLE OF CONTENTS

Page

LIST OF FIGURES

Page

LIST OF TABLES

Page

CHAPTER I

INTRODUCTION

The demographics in the United States have rapidly diversified, which is reflected in public schools. Specifically, the National Center for Education Statistics (NCES; 2021) has reported that the number of emergent bilinguals (EBs) has significantly increased over the past couple of decades. Around 64% of public-school teachers were described to have at least one EB in their class (National Center for Education Statistics (NCES, 2020).

Ensuring educators receive adequate training and support to serve these students becomes especially important. Professional development (PD) is a standard tool used to help instructors with a broad range of topics, such as emergent bilinguals (EBs), and should be easily accessible to help them feel prepared and secure in their profession. Recent data suggests a relationship between PD and teacher retention rates (Garcia & Weiss, 2019). Although there has been a lot of recent attention to teacher vacancies due to the COVID pandemic, teacher shortages have been a historical issue for decades (Sutcher et al., 2019). Factors such as dissatisfaction with teaching conditions, administrative practices, and policy issues have been reported as significant influences behind teacher attrition (Carver-Thomas & Darling-Hammond, 2017; Sutcher et al., 2019). Adding to this list, although there is limited research available, the pandemic has been reported as a stressor for teachers during these unprecedented times (Pressley, 2021). To combat growing teacher vacancies, President Biden has advocated for federal relief funds to be used towards teacher shortages across the nation (U.S. Department of Education, 2021). With vacancies reaching alarming levels, change is becoming increasingly urgent.

Moreover, teacher attrition has been shown to negatively impact student achievement (Ronfeldt et al., 2013) and bear an economic strain on districts across the country (Sutcher et al., 2019). Now, more than ever, ensuring teachers receive adequate support is crucial to combat teacher these turnover rates. Professional development can serve as a way to address teachers' needs and support teacher retention. Further, classroom instruction is not the only thing that has migrated to a virtual modality; professional development has as well.

Virtual professional development (VPD) can offer teachers a way to improve their knowledge and skills through synchronous, asynchronous, or hybrid methods (Elliott, 2017). Specifically, virtual mentoring and coaching (VMC) is a type of VPD that can support educators in a range of contexts. The concept of VMC encompasses both mentoring and coaching practices in a virtual manner (Irby, 2015), and can therefore reach teachers in broad settings. From rural to urban communities and through flexible approaches, VMC can be an accommodating approach. The urgent need to prepare teachers to face their day-to-day professional challenges, unexpected events, and rapidly changing demographics demands innovative ways to support them. VMC has the potential to accommodate educators in different settings, help alleviate PD financial constraints (Abbott & Rossiter, 2011), and positively impact their practice (Garland & Dieker, 2019; Kraft & Hill, 2020; Lee et al., 2018; Matsumura et al., 2019).

1.1 Definition of Terms

The terms and definitions noted below are considerably mentioned throughout this dissertation.

Virtual Mentoring and coaching (VMC)

The terms mentoring and coaching are processes found in many fields. In education, these terms have been used interchangeably to describe supporting teachers with a variety of needs. Although there are various definitions for these two terms attempting to distinguish them from each other, there are researchers who believe that the two practices are intertwined (Stokes et al., 2020). Specifically, Irby (2012) describes mentors taking part in coaching conventions and that coaches rarely engage in mentoring practices. For the sake of consistency, I will be using the term VMC to describe the mentoring and coaching session conducted in a virtual manner and the term mentors to describe the person that leads them.

Virtual professional development (VPD)

The term virtual professional development (VPD) in this dissertation is used to describe the training provided for educators using virtual methods to help them further their pedagogical knowledge and develop new skills. VPD can be carried out in a synchronous, asynchronous, or hybrid manner on numerous subjects relevant to educators in the field.

Emergent Bilinguals (EBs)

The term emergent bilinguals (EBs) in this dissertation refers to students who are learning the English language and have a different home language. Other terms used to refer to

this group include English language learners (ELLs) and English learners (ELs). The data in this study were derived from Texas in-service teachers. In the past decade, the terms used by the Texas Education Agency (TEA) have evolved from ELLs, to ELs and, the most current, EBs (Texas Education Agency, n.d.). This serves as a possible reason for the terms being interchanged by participants in the study and the literature referred to.

TBOP

The acronym TBOP stands for Transitional Bilingual Observation Protocol (TBOP). This protocol was based on the four-dimensional bilingual pedagogical theory (Lara-Alecio et al., 2013, p. 1129) and is a validated classroom observation instrument designed to observe different elements of instruction in bilingual classrooms. Although Lara-Alecio and Parker (1994) developed the tool for bilingual classrooms, TBOP has been utilized and validated in classrooms working with EBs (Tong et al., 2017).

ESL

The term ESL is an acronym for English as a Second Language. In the state of Texas, teachers serving EBs must have either a bilingual or ESL certification to adequately service them (Sikes & Villanueva, 2021). In this dissertation, participants from the studies in Chapters III and IV were part of the VPD course and VMC sessions to help them obtain their ESL certification.

1.2 Significance of the Study

Recent research suggests that VMC can effectively improve general teacher practice, teacher-student interactions, and self-confidence (Lee et al., 2018; Pianta et al., 2008; Wilczynski et al., 2017). The research conducted in this dissertation aims to contribute to this body of

literature and adds additional knowledge regarding the influence of VMC on in-service teachers working with EBs with a specific focus on synchronous interactions. There is scarce research on synchronous VMC sessions and in-service teachers. Research on virtual mentoring is typically conducted with pre-service teachers, so the exploration in this study would help expand knowledge in this field, focusing on in-service teachers.

1.3 Purpose of the Study and Research Questions

The purpose of this dissertation was to explore the influence VMC had on in-service teachers' professional growth regarding their practice, perceptions, and interactions with their mentors. There were six research questions addressed in this dissertation, which presented as three independent and complementary studies: (a) Chapter II: Systematic Literature Review: Synchronous Virtual Mentoring and Coaching In-service Teachers; (b) Chapter III: Exploring the Influence of Virtual Mentoring and Coaching on In-Service Teachers; and (c) Chapter IV: Exploring Interactions Between In-service Teachers and their Mentors During Virtual Mentoring and Coaching Sessions. The following research questions led these studies:

1. How does synchronous virtual mentoring and coaching influence teachers' professional growth?
2. What are some identified features of synchronous virtual mentoring and coaching that affected teachers' professional growth?
3. What influence did VMC have on teacher participants' professional growth over the six weeks as reflected by their instructional practices (e.g., ESL strategy, language content)?
4. How did teacher participants perceive their VMC experience?

5. What are the types and frequencies of interactions between in-service teachers and their mentors during the VMC sessions?
6. What themes are found in the interactions between in-service teachers and their mentors during the VMC sessions?

1.4 Limitations

A primary limitation of the data used in this dissertation is the length of the interventions. The VMC sessions occurred three times over six weeks. This amount of time may or may not be sufficient for a significant impact to be seen. There may be more meaningful results if the VMC sessions were for more sessions or if data was gathered over a more extended period. Additionally, following up this study with larger samples and more diverse groups could provide a bigger picture. The teachers in these samples were mostly novice, white, and female teachers. Although this reflects current teacher demographics across the country, these have also slightly changed over the past decades (U.S. Department of Education, 2016), and it is important to study diverse types of educators to know how to properly support them.

1.5 Organization of the Study

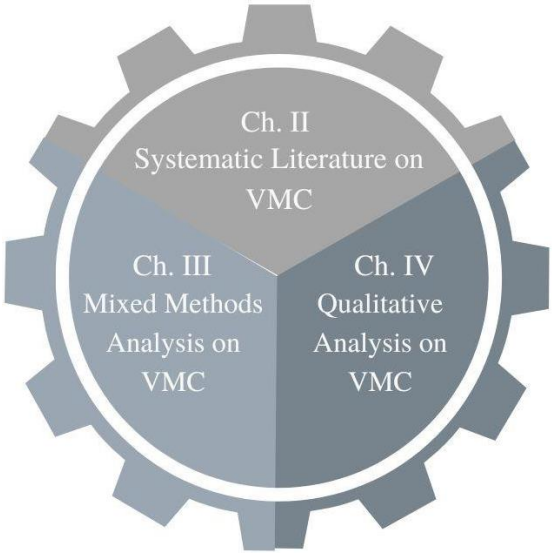
A three-article format was utilized for this dissertation. Chapter I offers a general overview of the chapters, the background of the overall study, the definition of terms, the significance and purpose of the study, the research questions, and an overarching summary of the chapters that follow.

Chapters II, III, and IV are interdependent studies presented in a journal article structure, as displayed in Figure 1 below. Specifically, the second chapter of my study centers around the

available literature on synchronous virtual mentoring and coaching (VMC) for in-service teachers in U.S. public school settings. I also described the procedures taken for the systematic literature review conducted in order to collect an extensive pool of literature on the topic. Topics identified throughout the studies were highlighted and discussed to develop overarching themes in existing literature applicable to this topic.

Figure 1

Three Journal-Format Articles



Chapter III of my study is the second journal-style article that explores the influence virtual mentoring and coaching had on teachers' perceptions and instructional practices. The data analyzed in this paper is derived from a five-year federal research project (Project ETELL) that provided in-service teachers seeking their Bilingual or English as a Second Language (ESL) certification with virtual professional development (VPD) courses. Classroom observations obtained from teachers recording themselves teach and mentoring surveys were used to collect and analyze the data. A mixed-methods approach helped convey the influence of VMC on in-

service teachers. Results were discussed as well as recommendations for future development and implementation of VMC programs.

Chapter IV focuses on exploring the interactions between mentors and in-service teachers during VMC sessions. The data analyzed in this paper was also gathered from Project ETELL and specifically focused on the recorded VMC sessions between the mentoring partnerships. A total of five videos were coded and analyzed using two different approaches. The first, Interaction Process Analysis (IPA; Bales, 1950), is a type of content analysis in a basic sense which includes observations of both verbal and non-verbal behavior. The second was a thematic analysis (Braun & Clarke, 2006) used to capture recurring themes found in the sessions. Results were used to discuss the practical implications and provide recommendations for future research areas.

The last chapter, Chapter V, presents a comprehensive synthesis of chapters II, III, and IV. I share concluding statements and implications of this study as a whole, as well as suggestions for areas of future research in the field of VMC.

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CHAPTER II

SYNCHRONOUS VIRTUAL MENTORING AND COACHING FOR IN-SERVICE TEACHERS: A SYSTEMATIC LITERATURE REVIEW

2.1 Introduction

Over the past decades, a considerable amount of attention has been placed on designing and delivering professional development for public school educators. As the diversity of students across the country becomes more varied (U.S. Census Bureau, 2019), ensuring their teachers are adequately prepared to teach them is essential. In the 2019-20 school year, the National Center for Educational Statistics (NCES; 2021a) reported that 14% of all public-school students received special education services under the Individuals with Disabilities Education Act (IDEA) and that as of 2018, 10% of all public-school students were Emergent Bilinguals (EBs) (NCES, 2021b). These special populations seem to be rapidly growing with no signs of slowing down. Between fall 2009 and fall 2018, the total number of students enrolled in public schools pk-8 increased by an average of 3 percent (NCES, 2021a), requiring teachers across levels to be prepared to serve them as they continue navigating through the grades.

Teachers are the key players in schools that directly influence students academically. During these past decades, the United States has struggled with significant turnover and teacher attrition rates (Harris & Adams, 2007; Newberry & Allsop, 2017). Teacher turnover includes teachers who move between schools or leave the profession entirely (McCreight, 2000), which can gravely affect schools financially and organizationally (Newberry & Allsop, 2017). According to a recent survey, reasons for teachers to leave their campus or the profession altogether include accountability pressures, dissatisfaction with working conditions, and a lack of opportunities for advancement (Carver-Thomas & Darling-Hammond, 2017). The most recent

report on teacher turnover rates from NCES shows the total annual turnover rate as 16%, bringing the average number to 3 out of every 20 teachers leaving their post (National Center for Education Statistics, 2015). More specifically, the turnover statistics for teachers who work in special education and English language development are exceptionally higher (Carver-Thomas & Darling-Hammond, 2017). In addition, due to the unprecedented 2020-21 school year, Zamarro et al. (2021) found that nearly one-quarter of teachers they surveyed expressed thoughts about leaving the profession by the end of the year. Alternative certification programs were initially developed in response to teacher shortages (Porter, 2011) and are typically taken by individuals with little to no knowledge of pedagogical practices. Combining the formerly mentioned trends, with approximately 18% of teachers in 2016 entering the teaching profession through alternative certification programs (NCES, 2018), effective professional development, such as synchronous virtual mentoring and coaching, can serve as a mighty tool in supporting them.

Professional Development

Effective teacher professional development (PD) supports teachers in advancing complex and unique skills necessary to reach various learners. Darling-Hammond et al. (2017) defined effective professional development as "professional learning that results in changes in teacher practices and improvements in student learning outcomes" (p.5). Professional development is a continuous process with ongoing goals for teachers to keep growing in their profession (Saberi & Amiri, 2016). Technological advances from unique recent challenges have amplified interest in virtual professional development (VPD). The complications created by COVID-19 for educators across the country were unpredictable and forced adaptation through virtual means (Marshall et al., 2020). Student learning was not the only element pushed into online platforms; professional training was also (Trikoilis & Papanastasiou, 2020).

Some advantages teachers appreciate using VPD include the flexibility to digest content at their leisure and efficient use of their time (Vernon-Feagans et al., 2015). Recent surveys aimed at teachers across the country showed that many were interested in VPD (Leibel et al., 2021) and also perceived participation in online PD as beneficial (Parsons et al., 2019). Nevertheless, a considerable concern from teachers regarding VPD experiences is similar in both pre-and post-COVID-19 perception, which is spending time on topics that are not relevant to them (Parsons et al., 2019; Tang et al., 2020). Despite inevitable growing pains, virtual professional learning will continue to establish itself as a growing and fundamental element in education.

Providing PD through the internet is commonly labeled as web-based, online, and, what will be primarily used in this paper, virtual. Virtual professional development can be synchronous, asynchronous, or a hybrid combination of both (Elliott, 2017). As Bates et al. (2016) discussed, synchronous VPD occurs in real-time and aims for the web-based experience to possess the supportive features found through in-person learning. In contrast, asynchronous VPD engages participants at their own pace. Participants digest information and navigate activities such as emails, modules, and discussion posts at their convenience. Hybrid learning blends the features of both synchronous and asynchronous learning. Depending on the program, virtual learners may find themselves completing asynchronous tasks on an online platform and receive synchronous support such as virtual mentoring and coaching. In the literature, supporting individuals through online mediums have been referred to as web-based, online, and e-mentoring/coaching. The term used for consistency in this paper is virtual mentoring and coaching (VMC). Irby (2015) defined VMC as a "method which involves having the mentor/coach present at the time of a teaching session (teacher is the mentee/coachee)" (p.183).

The mentor/coach is not physically in the classroom but observes virtually through a device. In this paper, VMC participants interacted with their mentor/coach virtually (technology: computer, phone, Bluetooth) in real-time to discuss their instructional plans, goals, and receive feedback. Some studies used in this paper included teachers receiving feedback while teaching, while others recorded themselves teaching and received the input through a later virtual appointment.

Mentoring and Coaching

In the field of professional development, mentoring and coaching are intervention tools used to support teacher knowledge and performance. Often, these two terms are used interchangeably. Although they possess many similar qualities, researchers in the field have noted some distinctions (Garvey, 2018; Irby, 2012; Viera, 2021). The fundamental differences between mentoring and coaching are found in the structure and expectations of the parties involved.

A coach typically targets specific tasks or goals to improve the teacher's practice (Aguilar, 2017; Cox et al., 2018; Irby, 2012). Essentially, they are facilitators of another individual's learning process. Making coaches available to teachers can help them acquire knowledge and skills surrounding relevant classroom practices at different career stages (Sugar & Van Tryon, 2014). Additionally, having instructional coaches available has been associated with reducing turnover rates for novice teachers (De Jong & Campoli, 2018). Granting early-career teachers access to coaches can therefore influence retention rates. The definition of a mentor usually includes emotionally charged words such as trust, friend, and relationship (Shrestha et al., 2009). Some have described mentoring as a process in which the professional relationship between both parties is central and part of the enriching experience (Cox et al.,

2018). The interactions themselves facilitate mentoring techniques such as reflection to influence the professional development of the teacher (Wortmann et al., 2008).

Both mentoring and coaching include an observation component as pivotal in the process (Garvey, 2018). Also, the element of trust is present in both, which may arguably be highlighted more in one concept than the other. The mentoring process is a two-way relationship where both parties connect through experiences and work through opportunities together. Conversely, coaching typically involves the coach leading the process while the teacher performs. Overall, coaching has been described as having more of a structure than the mentoring process does. The coaching process is more task-centered, while mentoring is focused on connections (Viera, 2021). Further, mentors usually have had experience in the area the mentee expects to grow in and use these collective experiences through the mentoring process (Shrestha et al., 2009; Wortmann et al., 2008).

The reality is that mentoring and coaching will convey a particular significance to various educators, dependent on the context. Rather than dwelling on providing exact definitions for the concepts, considering descriptions instead and noticing the overlap of the two can help strengthen their application. As Irby (2012) mentions, “mentors can coach, but coaches hardly ever mentor” (p.297). Mentoring and coaching share many overlapping qualities and applications, but being cognizant of them and their differences is essential to keep in mind as PD programs are designed in order to establish clear expectations and goals.

Technology Integration- Virtual Mentoring and Coaching

Incorporating technology into professional practice development has gone from a trendy option to a necessity in the past couple of years (Arifin et al., 2020). Integrating technology with

mentoring and coaching processes can help reach educators in remote locations, with constrained schedules, or help alleviate PD costs for their schools. Virtual mentoring and coaching (VMC) is a promising method for individualizing feedback and tailoring plans for specific situations teachers face in their classrooms. Wortmann et al. (2008) discuss six different types of mentoring in their research on online teacher support programs: 1) Task-based mentoring: short-term need to improve skill/knowledge, 2) Experience-based mentoring: pairs experienced mentor with novice, 3) Just-in-time mentoring: matches individual that has an unanticipated need for assistance, 4) One-to-one mentoring: one mentor is paired with one mentee, 5) Team mentoring: groups of mentors with groups of mentees, and 6) Formal mentoring: has explicit expectations and/or goals (i.e., timelines, progress reporting). The type of mentoring focused on in this paper is one-to-one mentoring, where each mentee had only one mentor.

2.2 Purpose

Synchronous virtual mentoring and coaching is a valuable tool used in the professional development of teachers. This systematic literature review aims to examine the use of synchronous VMC in educational settings, using specific research questions, and identifying themes weaved throughout. The research questions that guided this paper are the following: (1) How does synchronous virtual mentoring and coaching influence teachers' professional growth? (2) What are some identified features of synchronous virtual mentoring and coaching that affected teachers' professional growth? Additionally, I will address the findings and implications on ways to support teachers in their professional development.

2.3 Methodology

Systematic literature reviews are "a method of making sense of large bodies of information, and a means of contributing to the answers to questions" (Petticrew & Roberts, 2012, p.2). This systematic review was conducted using their detailed approach, which includes: clearly establishing a question, determining the types of studies that need to be located using inclusion and exclusion criteria, conducting a comprehensive literature search, screening results, synthesizing studies, and disseminating findings. The synthesis from this review is necessary to help support educators interested in the development and execution of synchronous VMC. To provide a comprehensive synthesis on the topic of synchronous VMC, I specified the following inclusion and exclusion parameters.

Inclusion criteria

The inclusion criteria used during the process of advancing through articles were:

1. Studies that were conducted in the United States. Focusing on this context helps with relevant implications for educators of this specific population. Although there are differences in policy and measures set per state across the country, some minimum requirements set by the U.S. Department of education provide a clear base.
2. Articles where the teachers that participated as mentees or coachees were in-service teachers in public schools (P-12). Public schools follow national standards as private and religious-affiliated schools vary.
3. Studies with a virtual mentoring or coaching component and was synchronous in nature. Seeing as there are particular elements and interactions that unfold in real-time settings, a

key focus of this paper was on the interpersonal experiences and themes that resulted from them.

4. Articles that included empirical studies with VMC as an intervention (i.e. quantitative, qualitative, and mixed-methods).

Exclusion criteria

1. International studies were excluded since they involve a variety of influential factors such as distinct national policies, official languages, and unique characteristics bound to specific parts of the world.
2. Articles in which the participants were pre-service teachers, administrators, and paraprofessionals or taught in higher education, private, or religious schools. This exclusion helped narrow the focus while providing relevant implications for the public-school populations.
3. Articles that included asynchronous VMC programs (they did not interact with the mentor or coach in real-time).
4. Articles without specifications on the VMC intervention or teacher outcome results.

Search and screening process

After establishing the research questions and setting the parameters during the summer of 2021, I met with a librarian versed in systematic reviews to start the search and screening process. The databases I searched were ERIC (Education Resources Information Center), Education Source, Academic Search Ultimate, APA PsycInfo, Professional Development Collection, and ProQuest Dissertations. The search terms used derived from conversations with the librarian, suggestions from professors, and the scanning of key words from relevant articles.

Search terms included a combination of the following key words: virtual*, online, mentor*, e-mentor*, web-based, and teacher.

The detailed search syntax used is in Appendix A.

Also, I continued the extensive review and searched for three concepts using the previously mentioned databases with additional search terms. The following concepts were used:

Concept #1: in-service teachers

DE (Descriptor/Subject heading) = beginning teachers OR experienced teachers OR teachers OR elementary school teachers OR middle school teachers OR secondary school teachers

Title/Abstract = "in-service teacher*" OR "beginning teachers" OR "experienced teacher" OR "teacher*"

Concept #2: virtual mentoring

DE (Descriptor/Subject heading) = no descriptors

Title/Abstract = "virtual mentor*" OR "online mentor*" OR "e-mentor*"

Concept #3: virtual coaching

DE (Descriptor/Subject heading) = no descriptors

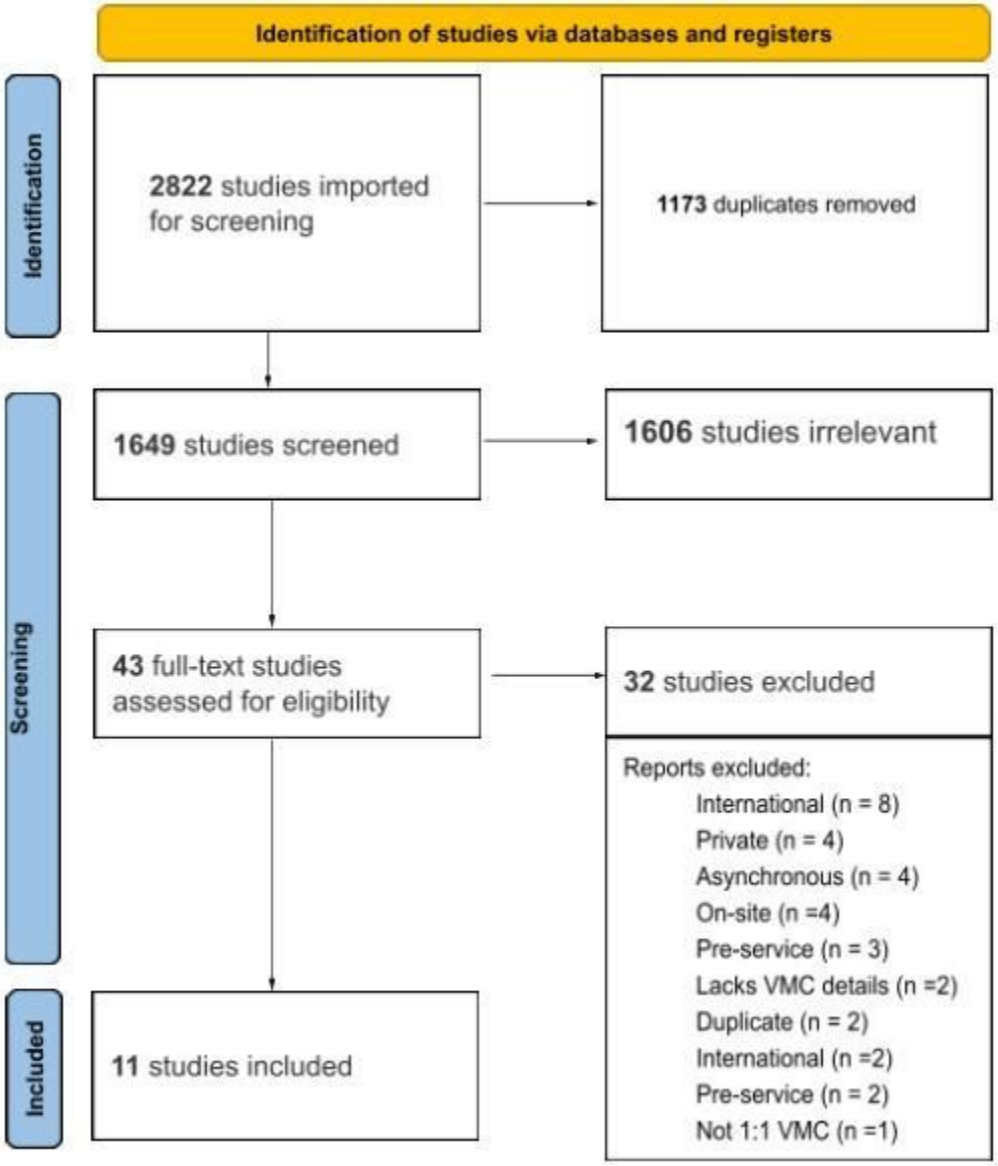
Title/Abstract = "virtual coaching*" OR "online coach*" OR "e-coach*"

PRISMA

To skillfully display the process, I used the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA; Page et al., 2021), as indicated in Figure 1.

Figure 2

PRISMA Flowchart Diagram of Synchronous VMC Review Search Process



In total, 2,822 search results were found. Since multiple databases were used for the search, there were duplicated results (n=1,173). All the searches were exported into my Covidence account, which helped remove the duplicates and store the remaining articles for review (n=1,649). Covidence (2013) is a systematic review management tool that helps with efficiency in uploading search results, screen abstracts, and reviewing full-text study reports. Using the inclusion and exclusion criteria, I screened titles and abstracts and ended up with a total of 43 articles. I continued with the process and exported the results to the next phase of screening the full text. Articles were excluded if they were from countries outside the U.S. (n=8), were asynchronous (n=4), took place in a private school (n=4), or strictly did not meet any of the other exclusion and inclusion criteria mentioned previously (n=16). At the end of the process, a total of 11 articles were left.

2.4 Data Analysis

The earliest empirical study following the set parameters was from Lee et al. (2008), and the most recent was from Kraft and Hill (2020). I created a matrix to capture the information from the 11 articles used in this review. The data collected from each of the studies included the following details: VMC program name, participants, mentors, context, content, grade-level(s), materials, duration, mentorship arrangement, key findings, type, and authors. Once I gathered the information, the analysis process began. There were two parts to the analysis process. The first part was to ensure that I was accurate in collecting and extracting the data from the articles. The second part was to conduct a thematic analysis once the interrater was established.

Table 1

Synchronous VMC studies

Program	Participants	Mentors	Context	Content	Grade-level(s)	Materials	Duration	Mentorship Arrangement	Key Findings	Type	Author(s)
Web-based training-Coaching/feedback (WBT-CF)	n=1	experience of 6 years	Indiana	SPED (ASD)	preschool	videoconferencing, feedback form, online portal	8 training modules; 4 coaching sessions	Teacher submitted video, coach viewed and completed a feedback form, then both would meet for coaching session	Increased teacher knowledge Teacher practices improved (increased student praise)	quantitative	(Wilczynski et al., 2017)
Distance-Based Instructional Coaching (DBIC)	n=1 (participated in both PDs)	project-hired coaches w/30 years of experience; peer teachers from project	Rural Midwestern school	science	middle school	videoconferencing, camera, online portal	6- to 8-week period	First meeting was to test technology and co-plan 1st lesson; then the teacher recorded the lesson with what was discussed and uploaded to Dropbox. Both parties review videos independently before their coaching session.	Teacher confidence levels. instructional beliefs, and their teaching practices improved (across the three instruments used)	mixed-methods	(Lee et al., 2018)
Computer-mediated mentoring Program	n=15; 11 new and 4 experienced	n=2; science background	U.S. Midwestern state	science	elementary	tablet, online portal	5 months	One-hour weekly mentoring session, participation in face-to-face lunch meetings, designing a lesson plan using a specific model, teaching the lesson, and reflecting upon their experiences	Videoconferencing mentoring group took on multiple roles, were more active and engaged than the other two conditions; excited about technology	qualitative	(Bang, 2013)

Table 1 (continued)

Program	Participants	Mentors	Context	Content	Grade-level(s)	Materials	Duration	Mentorship Arrangement	Key Findings	Type	Author(s)
Remote webcam coaching	n=58; 14 control, 44 treatment	n=6 doctoral students; elementary teaching and reading specialist experience	Rural North Carolina, Texas, New Mexico, and Nebraska (years 3 and 4)	literacy (struggling readers)	kindergarten and first grade	webcam	1 year	3-day FTF summer institute; 2 ongoing PDs: (1) grade- or school-level TRI team meetings (2) PD workshops based on teacher needs Coach provided feedback to the teacher via webcam as the teacher worked 1:1 with a student	There were greater benefits with webcam literacy coaching for teacher fidelity and efficacy	quantitative	(Vernon-Feagans et al., 2015)
Web-mediated consultation	n=113; 61 treatment, 52 control	n=4; consultants were experienced in early childhood	24 different school districts statewide; at-risk population	language and literacy skills	pre-k	laptop, online portal, videoconferencing	1 year	Teachers attended a training and introductory workshop, and all had access to online resources. Teachers recorded their lessons and mailed the tape to their consultant, who edited the tape into segments and paired them with written feedback on the web. Both parties met online to debrief.	Teachers showed significantly greater increases in independent ratings of the quality of interactions than control group.	mixed-methods	(Pianta et al., 2008)
Web-based (WEB) coaching	n=49; 16 control, 16 FTF coaching, 17 WEB	n=2; authors	2 mid-southern states	SPED	not specified	laptop, webcam, headphones, video camera	1 year	Teacher recorded lesson, consultant scored video, both parties discussed teaching plans and together reviewed the video.	No significant differences in overall change across goal domains between the FTF and WEB groups.	qualitative	(Ruble et al., 2013)

Table 1 (continued)

Program	Participants	Mentors	Context	Content	Grade-level(s)	Materials	Duration	Mentorship Arrangement	Key Findings	Type	Author(s)

Online Content-Focused Coaching (CFC)	n=15	n=1; teaching experience	Mid-Atlantic and Northeastern region	literacy	4th and 5th grade	online modules; emails, phone calls	6 weeks	Virtual PD followed by individual remote coaching sessions; Teacher emailed the coach a lesson plan and goals, had a phone conference to discuss. Next, teachers uploaded video, coach views it, uploads short video segments w/questions for the teacher to respond to in writing. Individual phone conferences where both parties watch the lesson clips together.	Teachers in surveys and interviews responded positively to the different components of the program; Teachers' videoed class discussions showed that teachers grew in their implementation of questioning and accountable talk	mixed-methods	(Matsumura et al., 2019)
Bug-in-ear (BIE) coaching	n=7	n=4; from state agency	Midwestern United States	SPED	from grade 3 to grade 8	video conferencing, Bluetooth headset, E-mail, online portal	6 months	Reflection sessions between the coaches and teachers occurred virtually; Used asynchronous tools such as email and Wikispaces to schedule and share written reflections and PD resources	virtual BIE coaching can increase teachers' use of specific, prescribed teaching practices	qualitative	(Snyder, 2013)

Table 1 (continued)

Program	Participants	Mentors	Context	Content	Grade-level(s)	Materials	Duration	Mentorship Arrangement	Key Findings	Type	Author(s)
Mathematical Quality of Instruction (MQI) Coaching	n=140 year 1; n=132 year 2	n=24; long-time MQI raters, experienced classroom teachers, and/or instructional coaches	Midwestern state	math	Grades 3 to 8	videoconferencing	varied; most treatment teachers had an average of 9.7 cycles	Two-day summer training institute, then a BOY conversation with the coach regarding goals and plans. Teacher chooses skill to work on, films a lesson, coach views lesson and extracts two clips to share back. Teacher watched them along with other exemplars and then met to discuss. Teacher would implement the plan within two weeks	Teachers demonstrated significant and sustained effects on teachers' ability to analyze instruction and on their instructional practice	quantitative	(Kraft & Hill, 2020)
Individualized clinical coaching (ICC) with bug-in-ear (BIE) technology	n=3 (novice)	n=1; researcher/first author	Suburban public-school district	SPED science	secondary (6, 7, 9)	videoconferencing, Bluetooth earpiece	varied; depended on time spent in baseline condition	Primary researcher met w/teachers twice to practice using BIE technologies and then scheduled virtual observations. 15-minute online observations were done through the web and w/ a Bluetooth earpiece	ICC with BIE was effective in improving teacher practices	quantitative	(Garland & Dieker, 2019)

Table 1 (continued)

Program	Participants	Mentors	Context	Content	Grade-level(s)	Materials	Duration	Mentorship Arrangement	Key Findings	Type	Author(s)
Advanced online bug-in-ear (BIE)	n=15	n=1; first author	Southeastern U.S.; a mix of rural and urban settings	SPED and regular literacy	elementary	camera, Bluetooth headset, and videoconferencing	4 observations (time range not specified)	Participants installed and tested their BIE technology (4-6 weeks); Coach virtually observed during 3 30-minute lessons to establish a baseline. Teachers were trained on instructional practices (read an article). Coach taught and modeled instructional practices, then teacher scheduled a 4th observation and received feedback	Teachers increased their rate of praise statements and instructional practices	mixed-methods	(Rock et al., 2009)

To begin, I selected 25% of the studies used in the review (n=3) and double-coded with a postdoctoral research associate who has extensive experience in K-12 classrooms and was familiar with VMC. The objective of establishing interrater reliability was to verify that the data collected properly depicted the variables in the studies. The following formula was used to determine interrater coding reliability: (number of agreements/ (number of agreements + number of disagreements) x100). The rater agreement percentage resulted in 72%. Both parties met, discussed the inconsistencies, and reached a consensus which brought the agreement on the variable coding percentage to 100%. The matrix with the overview of the articles can be found in Table 1.

Additionally, a thematic analysis (Braun & Clarke, 2006) was conducted to analyze and report patterns found within the data. Chong et al. (2019) mentioned that Braun and Clarke's (2006) thematic analysis had been a popular approach in studying mentoring processes. I read the 11 articles to find meaning and possible themes in the data. Features from the articles were noted and coded in an Excel sheet, along with thoughts relating to them. Finally, the codings were placed into categories and organized into themes.

2.5 Results

The thematic analysis of the 11 articles on synchronous VMC interventions revealed the following themes: characteristics of synchronous VMC interventions, supplemental support, teacher impact, and reflection.

Characteristics of synchronous VMC interventions

Many of the studies identified included VMC used with teachers in special education settings (e.g., Ruble et al., 2013; Snyder, 2013; Wilczynski et al., 2017), core content areas (e.g.,

Bang, 2013; Kraft & Hill, 2020; Lee et al., 2018; Matsumura et al., 2019; Pianta et al., 2008; Vernon-Feagans et al., 2015), or teachers with an overlap of both (e.g., Garland & Dieker, 2019; Rock et al., 2009). Besides teachers in special education settings, teachers in elementary schools appear to be a common focus in the literature on synchronous VMC interventions as well (e.g., Bang, 2013; Kraft & Hill, 2020; Matsumura et al., 2019; Rock et al., 2009; Snyder, 2013; Vernon-Feagans et al., 2015). In addition, there were also studies conducted in pre-school (e.g., Pianta et al., 2008; Wilczynski et al., 2017) and secondary school settings (e.g., Garland & Dieker, 2019; Lee et al., 2018). Finally, although EBs were not the focus, two articles indicated teachers working with them (e.g., Kraft & Hill, 2020; Leighton, 2018).

The technology used throughout the different articles included webcams or electronic devices for videoconferencing (e.g., Bang, 2013; Garland & Dieker, 2019; Kraft & Hill, 2020; Lee et al., 2018; Pianta et al., 2008; Rock et al., 2009; Ruble et al., 2013; Snyder, 2013; Vernon-Feagans et al., 2015; Wilczynski et al., 2017), accounts in online portals (e.g., Bang, 2013; Lee et al., 2018; Matsumura et al., 2019; Pianta et al., 2008; Snyder, 2013; 2015; Wilczynski et al., 2017), Bluetooth headset (e.g., Garland & Dieker, 2019; Rock et al., 2009; Snyder, 2013), and phones for teleconferencing (e.g., Matsumura et al., 2019). Videoconferencing was the most common method used in the VMC interventions since all, but one of the studies, used it. The online portals used were also a standard feature found and were used to upload videos, access online material, and communicate with their mentor or coach.

The Bluetooth devices used in three studies were part of "bug-in-ear" (BIE) coaching. Using a BIE involves an earpiece, the mentor or coach observing, and immediate feedback to the mentee performing the task. Traditional BIE utilizes FM radio frequency with a limited range. Therefore, the mentor or coach must travel to the school site to observe the teacher. According to

Rock (2009), BIE began to appear in educational literature in 1971. Although several studies have been published since then (Coogle et al., 2015; Horn et al., 2020; Kahan, 2002), the ones included in this review used videoconferencing along with BIE. Additionally, BIE is popular among pre-service teachers, and the focus of this review is on in-service teachers.

At a minimum, instructional coaching cycles typically involve a mentor/coach and a teacher discussing the practices. Specifics such as pre- or post-conference expectations, frequency of sessions, structure, and methods of communication may vary (Gilbert, 2016). The coaching cycles in VMC for some of these studies included pre-conferences to set goals (Kraft & Hill, 2020; Matsumura et al., 2019) and make a plan (Bang, 2013; Kraft & Hill, 2020). Additionally, participants either submitted a recorded video of themselves teaching to an online portal (e.g., Bang, 2013; Kraft & Hill, 2020; Lee et al., 2018; Matsumura et al., 2019; Pianta et al., 2008; Ruble et al., 2013; Wilczynski et al., 2017) or were virtually observed in real-time (e.g., Garland & Dieker, 2019; Rock et al., 2009 Snyder, 2013; (Vernon-Feagans et al., 2015). In the end, the participants in the studies would either have the opportunity to reflect with their mentor or coach (e.g., Wilczynski et al., 2017; Lee et al., 2018; Pianta et al., 2008; Ruble et al., 2013; Matsumura et al., 2019; Snyder, 2013; Kraft & Hill, 2020), reflect independently (e.g., Bang, 2013), or just received lesson feedback (e.g., Vernon-Feagans et al., 2015; Garland & Dieker, 2019; Rock et al., 2009).

Supplemental Support

The use of technology in classroom observations is becoming increasingly common and can be an effective and inexpensive professional development tool (Rodgers et al., 2019). Pairing a technologically integrated program with the proper materials and support is necessary (Treacy

et al., 2002). It is important for participants to have fast access to some form of tech support to avoid issues with the intervention implementation.

Several of the teachers in the studies included had an opportunity to familiarize themselves with the technology before they began their VMC (e.g., Garland & Dieker, 2019; Lee et al., 2018; Rock et al., 2009; Snyder, 2013). Additionally, over half of the studies involved some form of an online portal for participants to either upload videos (e.g., Lee et al., 2018; Matsumura et al., 2019; Wilczynski et al., 2017), share reflections (e.g., Matsumura et al., 2019; Snyder, 2013), access online resources (e.g., Pianta et al., 2008; Snyder, 2013), or engage in modules through a VPD course (e.g., Matsumura et al., 2019; Wilczynski et al., 2017). Although the interventions were all virtual, some researchers included face-to-face (FTF) components in their program design. Some supported their participants through in-person introductory workshops (e.g., Kraft & Hill, 2020; Pianta et al., 2008) to discuss objectives and answer any questions they had. Another study mentioned providing teachers with FTF pre-training (e.g., Vernon-Feagans et al., 2015) that served as an orientation to the intervention and received ongoing FTF PD alongside the intervention.

Overall, this theme helps answer the first research question: What are some identified features of synchronous virtual mentoring and coaching that affected teachers' professional growth? Teachers experienced additional resources such as workshops, FTF interactions, and online resources, which were well received. Ensuring that educators have guidance and support is fundamental for PD success (Desimone & Garet, 2015).

Teacher Impact

This theme helps answer the second research question: How does synchronous virtual mentoring and coaching impact teachers' professional growth? Most of the teachers in the studies, all except one (e.g., Ruble et al., 2013), reported positive teacher outcomes. In the Ruble et al. (2013) study, the three groups were a placebo control group, a FTF coaching group, and a web-based coaching group of teachers. The researchers found no difference in the overall change between the FTF group and the web-based group. Ruble et al. (2013) suggest the lack of change could be because of the efficacy of VMC.

As previously mentioned, the rest of the articles used in this review indicated some form of beneficial growth for the teachers. Most of the improvements highlighted in the papers were improvements in their teaching practice (e.g., Garland & Dieker, 2019; Kraft & Hill, 2020; Lee et al., 2018; Matsumura et al., 2019; Rock et al., 2009; Snyder, 2013; Wilczynski et al., 2017), increased fidelity (e.g., Vernon-Feagans et al., 2015), and quality of teacher interactions with their students (e.g., Pianta et al., 2008). Also, teacher attitudes were positively impacted by the synchronous VMC, as reported in several studies. Teachers indicated higher engagement (e.g., Bang, 2013), efficacy (e.g., Matsumura et al., 2019; Vernon-Feagans et al., 2015), and confidence (e.g., Lee et al., 2018) after participating in their VMC intervention. Furthermore, teachers were able to increase their pedagogical knowledge (e.g., Wilczynski et al., 2017) and improve their instructional beliefs (e.g., Lee et al., 2018).

Reflection

Teachers engaging in reflection is critical to their professional development (Tonna et al., 2017). Shandomo (1996) has defined reflection as a "process of self-examination and self-

evaluation in which effective educators regularly engage to improve their professional practices" (p. 103). The teachers in most of the studies engaged in collaborative reflections with their coach or mentor (e.g., Wilczynski et al., 2017; Lee et al., 2018; Pianta et al., 2008; Ruble et al., 2013; Matsumura et al., 2019; Snyder, 2013; Kraft & Hill, 2020). Other teachers engaged in independent reflection (e.g., Bang, 2013; Rock et al., 2009) and a combination of both independent and collaborative reflection (e.g., Kraft & Hill, 2020; Matsumura et al., 2019; Snyder, 2013).

This theme also helps answer the first research question (what are some identified features of synchronous virtual mentoring and coaching that affected teachers' professional growth?). Although there were various models of reflection used, it was a prominent component throughout different studies. Goal setting (e.g., Lee et al., 2018) and teacher reflections with a coach or mentor were impactful features that afforded opportunities for conversations. Some studies had more natural discussions (e.g., Bang, 2013), while others had tighter structures with guidance, such as checklists (e.g., Ruble et al., 2013; Wilczynski et al., 2017).

2.6 Conclusion

This paper has reviewed synchronous virtual mentoring and coaching with in-service teachers in U.S. public schools. Favorable outcomes from VMC, such as improved teaching practices, confidence, and teacher knowledge, were consistently reported in the studies gathered for this review. Virtual mentoring and coaching should be considered a practical tool capable of impacting teacher knowledge and skills, as shown in the literature presented. Along with VMC, integrating supplementary resources such as workshops, meetings, or online resources can help tailor relevant PD for teachers.

Mentoring and coaching have been a popular option, especially for pre-service and novice teachers. As the public-school demographics in the United States continue transforming, in-service teachers may find themselves working with different types of special populations or in unfamiliar subject areas. Whether supporting novice or experienced teachers, VMC is a cost-efficient alternative to typical in-person mentoring and coaching. Not only can it help curve PD costs for administrators, but it can also be more time-efficient as well (e.g., Vernon-Feagans et al., 2015). In the study by Vernon-Feagans et al. (2015), in-person coaching sessions lasted from one to two hours, while webcam coaching lasted much shorter, lasting around 20-30 minutes. VMC can directly focus on the desired objective versus the non-intervention class interactions that naturally occur in classrooms, such as helping with additional students or engaging in other side-tracking activities.

Synchronous VMC is a realistic opportunity for those that wish to engage in real-time PD but may live in rural communities. A core contrast between synchronous and asynchronous VMC is the timing of feedback and the type of collaboration that occurs. Depending on the needs and goals of educators, these differences must be considered. This review focuses on synchronous VMC due to the real-time communication and collaboration components central to reflective practices and professional growth.

This review revealed a lack of research on mentoring/coaching with in-service teachers. As districts across the country change the method, they deliver PD from in-person to virtual, or a hybrid of both (Leibel et al., 2021); more research in this field is needed to help with the designing and implementation of effective VMC programs. Also, many of the researchers cited in this review focused on special education, so addressing teachers of other special populations

such as EBs is urgently needed. Finally, studying larger samples with numerous coaching sessions can also help paint a bigger picture of the impact of synchronous VMC.

2.7 Limitations

A challenge with carrying out a systematic literature review is ensuring the search syntax used can pinpoint as many articles that meet the criteria parameters as possible. The existing literature contains a variety of labels given to virtual PD, such as “online,” “web-based,” and “internet.” Due to the many possible combinations of that label and “mentor,” “coach,” e-mentoring,” and “teacher,” it is possible some studies were failed to be located in the search. In an attempt to combat this, several combinations were tried with those words in the title and abstract. Additionally, I conducted a thematic analysis; therefore, my interpretations may differ from patterns other researchers may identify.

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CHAPTER III

EXPLORING THE =INFLUENCE OF VIRTUAL MENTORING AND COACHING ON IN-SERVICE TEACHERS

3.1 Introduction

The teaching profession has been described as demanding and as one that continues to evolve and, in turn, challenges instructors to grow to meet the varying needs of their students. It has also been described as one of the most stressful professions due to variables such as classroom, administrative, and personal-based issues (Brackenreed, 2008). Specifically, factors such as pressures from standardized exams, feeling unprepared, and having little to no resources have contributed to large teacher attrition and turnover rates across the United States for decades (Dove, 2004; McCreight, 2000). One has to especially consider the recent COVID-19 pandemic, which naturally escalated these stressors (Diliberti & Kaufman, 2020). Particularly, Diliberti et al. (2021) found that for some teachers, the pandemic intensified their stress by having to adjust to an unfamiliar remote or hybrid work environment. Essentially, by understanding the concerns of teachers, we can explore how to foster those that exit the profession due to a lack of support or preparation.

According to a recent survey by Carver-Thomas and Darling-Hammond (2017), lack of opportunities for professional development was one of the major reasons for teachers either leaving their school or the teaching profession altogether. Overall, the most recent report from NCES (National Center for Education Statistics, 2015) indicates that 16% of teachers either leave to another school or leave the profession altogether. Providing professional development opportunities is a variable that can help teachers feel secure and encouraged in their profession (Hester et al., 2020; Dixon et al., 2014).

Professional development is a tool that is meant to grow teachers as professionals while advancing their pedagogical knowledge and skills. Guskey (2002) mentions that "high-quality professional development is a central component in nearly every modern proposal for improving education (p.381)." This idea resonates through the Every Student Succeeds Act (ESSA) and the response of local education agencies. Desimone and Pak (2016) highlight that in the bill, there are multiple suggestions for local agencies to provide coaches to work with instructors to support them with interpreting student data, scaffolding instruction, and giving feedback, among other functions. The use of a mentor or a coach, sometimes a combination of both, has shown to positively impact teachers in their practice (Garland & Dieker, 2019; Kraft & Hill, 2020; Lee et al., 2018; Matsumura et al., 2019; Wilczynski et al., 2017). Having this type of individualized support available for teachers can be difficult due to obstacles such as the availability of personnel, time constraints, or geographical limitations. Allowing a virtual alternative for mentoring and coaching can serve as a feasible option to placate some of these challenges.

3.2 Literature Review

Mentoring and Coaching

Teachers taking part in professional development has been linked with impacting student achievement (Knight, 2008; Lee, 2018). Professional development sessions can vary in length, duration, providers, and content depending on the school budget and resources at their disposal. Soine and Lumpe (2014) mentioned that professional development "underscore the ongoing nature of teacher growth or improvement; professional development is not an event, but a process" (p.305). Mentoring and coaching in-service teachers can serve as a powerful professional development tool that nurtures their evolution. Virtual mentoring and coaching (VMC) can be depicted as a type of professional development in which a teacher receives real-

time support without having to physically be in the same room as their mentor. The definition of VMC that will be used in this paper is a "method which involves having the mentor/coach present at the time of a teaching session (teacher is the mentee/coachee)" (Irby, 2015, p.183) through a virtual platform. In the study of this paper, the teacher participants engaged with their mentor virtually through video-conferencing in a synchronous fashion. Additionally, the participants were in-service teachers seeking ESL or bilingual certification.

The terms mentoring and coaching are often used interchangeably in educational contexts as their primary purpose is to support teachers in a range of capacities. The role of a mentor or coach depends on which definition is being used to characterize their responsibilities. In education, mentors are typically those assigned to novice teachers for at least their first year of teaching to guide them through specifics such as their new duties. Murphy et al. (2005) express mentoring relationships as a "one-on-one relationship between an expert and a novice in which the expert guides the novice" (p. 344). Mentors are usually assigned to those that are beginning a new role of some sort and are not just limited to new teachers. They can be instrumental to those changing grade levels, content areas, or moving into a different role such as administration. Goldrick (2016) has mentioned that 29 states require some sort of mentoring for these novice teachers, and only 20 states require support for first-year administrators. Ensuring educators receive support as they navigate through unfamiliar domains could help their self-confidence and influence their future in the field (Zugelder, 2019).

Although coaches share some attributes with mentors, they particularly support teachers by making "meaning through deep pedagogical interactions based on real-world application in their unique classroom contexts (Zugelder, 2019, p. 182)." Coaches take more of an active role in which they help teachers reach specific goals. The coaching relationship has also been

described as a “performance-oriented relationship” where there are expectations for specific behavioral changes (Stokes et al., 2020, p. 147). In the school setting, coaching is usually carried out by someone in a leadership role, such as an instructional coach or skill specialist, while a mentor is normally another fellow teacher.

Despite differences noted in mentoring and coaching processes by researchers, Stokes et al. (2020) suggest that both are interconnected in practice and difficult to completely detach from one another. Additionally, they argue that it is crucial to understand the contexts of the situations that arise when deciding what approach, mentoring or coaching, would be the best fit. Further, Irby (2012) highlights that although mentors can engage in coaching practices, coaches rarely exercise mentoring methods. When characterizing the relationships between the dyads, mentoring relationships are typically shaped to last a lengthy period of time, whereas coaching relationships typically conclude once the goals are reached (Irby, 2018). Being aware of the various distinctions between the two roles when designing and implementing mentoring and coaching PD is necessary so that expectations and goals are clearly communicated to the parties involved.

Quality Professional Development

Quality instruction can occur when teachers are provided with quality professional learning experiences along with opportunities to reflect and monitor their implementation of the knowledge they have gained from said learning experiences. Researchers in the field have reported that the quality of teachers is the most instrumental factor in the achievement of their students (Didion et al., 2019; Lee, 2018). As students in classrooms across the United States continue to diversify in language and special education contexts (NCES, 2021a; NCES, 2021b), ensuring that teachers are adequately prepared to serve them is critical. Specifically, quality

instruction related to special populations, such as Emergent Bilinguals (EBs), stems from components that converge in the classroom and result in student achievement and success. In Calderón et al.'s (2011) study, the researchers confirmed that addressing EBs' learning and achievement requires more than supporting their needs through curriculum, learning experiences, and assessments, but also increasing efforts to improve school structures, professional development, and teacher support measures.

Identifying effective professional development is not a simple task considering the focus could be placed on student achievement, teacher perception, or researcher considerations. Although scholars have established a connection between teacher self-efficacy and student achievement (Knight, 2008), verifying professional development as a direct influence can be challenging. Song et al. (2017) deemed professional development as effective if they indicated to improve teacher practice and student achievement. They also discussed key characteristics of quality PD, such as active and collaborative learning. Having an opportunity to engage in dynamic learning sessions can include observation sessions, reviewing student sample work, and then leading into discussions while constructing their professional knowledge and skills.

Additionally, collaborative learning in PD allows teachers to "have the opportunity to critically examine their classroom instruction as they work together to revise current practices (Song et al., 2017, p. 957)." Since Virtual Mentoring and Coaching (VMC) encourages personalized learning, engaging teachers in rich discussions and space for a professional learning community, then it poses promise as an effective professional development tool.

3.3 Theoretical Background

Constructivist Learning Theory

Constructivist learning is an important theory that is based on learners constructing knowledge for themselves. At its core, this pedagogical approach is student-centered and encourages students to be active members while they construct their knowledge in a collaborative setting. According to Bada (2015), the constructivist theory has documented roots in work by Dewey (1929), Bruner (1961), Vygotsky (1962), and Piaget (1980). There have been various perspectives of constructivism that have shaped different categories, such as radical constructivism and social constructivism. In the current study, the latter is the underlying theory supporting VMC.

Social constructivism theory focuses on the learner and promotes collaboration, active participation, and opportunities for reflection as guiding principles (Vygotsky, 1978). This view of education places importance on the social context of the experience. A primary focus is a collaborative aspect where the learner interacts with others, such as peers or instructors, and in this case, a mentor. Huang (2002) highlights that most of the strategy of collaborative problem-solving stems from Vygotsky's work on the zone of proximal development (ZPD). Mentors work alongside their mentees through various situations, with some requiring critical thinking skills. The mentor should consider many factors for the mentoring process, such as teacher experience, resources available, and pedagogical knowledge, among others.

Adult Learning Theory

Understanding that adult learners have unique needs and special characteristics when compared to children and adolescents is fundamental for the designing and implementation of student learning opportunities (Huang, 2002). Although there is not a singular learning theory

that applies to all adults, there is a variety of models and theories that furthers the understanding of adult learning. Andragogy refers to the methods of teaching adult learners. Malcolm Knowles introduced the concept of andragogy in the 1980s with the assumption that adults are self-directed learners, contribute an array of experiences, ready to learn, problem-centered in their learning, and are internally motivated (Knowles, 1970). More specifically, their prior experiences influence their learning style and shape their self-identity (Huang, 2002). Ensuring that special attention is given to teachers and their background is key to helping support them through their mentoring journey.

Adult learners are a diverse group made up of a variety of unique experiences and ambitions (Arghode et al., 2017). Instructors becoming familiar with the backgrounds of the learners serve as guides in facilitating learning and supporting their construction of new knowledge. As they navigate unfamiliar learning environments, they may naturally be anxious while juggling employment and other adult commitments (Huang, 2002). Correspondingly, motivation becomes increasingly integral in ensuring adult learners succeed (Brady & Fowler, 1988).

3.4 Purpose of Study

The data analyzed in this paper are derived from a five-year federal research project that provided in-service teachers seeking their Bilingual or English as a Second Language (ESL) certification with virtual professional development (VPD) courses (Lara-Alecio, Irby, & Tong, 2016; Project Empowering Teachers of English Language Learners [ETELL], Grant Number T365Z160229). Project (ETELL) is a federally-funded randomized controlled trial (RCT) study. All participants were required to submit pre- and post-observation videos and complete a VPD component and treatment participants were randomly assigned to receive mentorship. In this

study, I focused on the participants randomized to treatment that received virtual mentoring/coaching (VMC) as an intervention. By focusing on the treatment group, I was able to narrow my focus, data collection, and interpretation to the treatment group that received VMC. The purpose of this study was to examine the influence of VMC on treatment teachers' perceptions and instructional practices. Through surveys, teachers in this sample indicated they were either already working with EBs to some extent (85%) or hardly ever (15%). Therefore, not all teachers had experience with EBs, and this helped shape the wording of the research questions and be more representative of the sample. The following research questions guided this study:

3.5 Research Questions

1. What influence did VMC have on teacher participants' professional growth over the six weeks as reflected by their instructional practices (e.g., ESL strategy, language content)?
2. How did teacher participants perceive their VMC experience?

3.6 Methodology

Context and Participants

These data are part of a large randomized controlled trial study focused on providing mainstream in-service teachers with VMC to support their understanding of EBs as they prepare for their ESL certification exam and classroom. Through partnerships with districts and schools across Texas, teachers were able to participate in the more extensive study. I selected all participants in the treatment condition from the project's second year who met the following criteria: completed the virtual professional development (VPD) course, all VMC sessions, and the mentoring survey (distributed at the end of the intervention) to better understand their growth over time and their experiences and perceptions of the VMC sessions. The sample included 148

in-service teachers, of which 86% were female, 51% were White/non-Hispanic teachers, 45% had 0-5 years of teaching experience, and 55% taught at the secondary level (see Table 2).

Table 2

Teacher Characteristics

Variable	*n*	%
Gender		
Male	21	14
Female	127	86
Ethnicity		
White/non-Hispanic	75	51
Hispanic	33	22
Black/African American	30	20
Asian	6	4
Two or more races	4	3
Teaching Experience		
0-5 years	66	45
6-10 years	29	19.5
11-15 years	26	17.5
16 or more years	27	18
Grade-level		
PK,K, EC	18	12
Elementary (1-5)	49	33
Secondary (6-12)	81	55

Virtual Mentoring and Coaching Intervention

In the research project, teachers randomized to the treatment condition received individualized support through three VMC sessions that lasted for at least 30 minutes each over a six-week period. The VMC sessions were presented by former ESL and bilingual teachers seeking a Ph.D. in Bilingual/ESL Education and Curriculum and Instruction. The participants were asked to submit a 15-20 minute recording of themselves providing instruction to either a whole group, small group, or conference with their students. Next, they would upload the video to a secure server for the mentor to review.

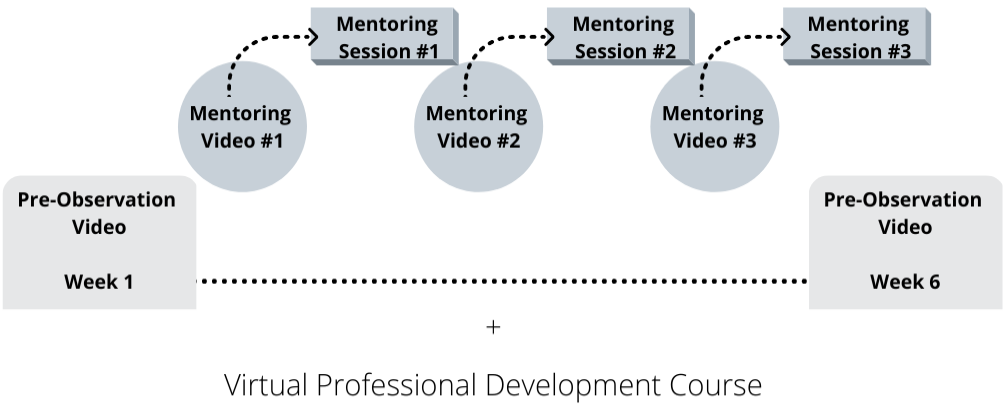
An observe-assess-mentor sequence was followed, where mentors observed the pre-recorded classroom observations, analyzed the video, and then met with the mentee to provide guidance and feedback. The mentor would make general notes regarding the video while using the guide: *Virtual Mentoring and Coaching Notes- Based on the TExES Competencies for ESL/BIL Teachers*, developed by the project. The guide allowed for discussion points regarding the competencies present in their certification exam as well as elements from the observation itself. Mentors assessed teachers' understanding and application of strategies to support students' content, linguistic, and cultural needs while using the rubric aligned to Texas state certification standards. Detailed and specific written feedback was available during each VMC session, and teachers could follow along with the mentor through a share-screen capability made available through the videoconferencing application. This style of feedback presented mentors and mentees time to engage in discourse that would construct their understanding of EBs while exposing them further to the state certification standards.

Following the mentoring session, the mentor would finalize the notes and then send the participant a copy to keep. After receiving feedback in their VMC session, the participant would

then record an additional video, and the process would repeat until completing a total of three mentoring sessions. Figure 3 depicts the 6-week intervention model implemented by course instructors and mentors of Project ETELL.

Figure 3

Project ETELL Intervention Model



Instrument

Two instruments were used to capture teachers' instructional quality related to EBs and perceptions of their experiences of the VMC intervention. A classroom observation instrument was utilized to observe teachers' instruction, and a mentoring survey post-session was provided to understand teachers' perceptions of VMC.

Classroom Observation Instrument

The participants in the project, both treatment, and control, were required to submit a pre- and post-observation video to be analyzed using the Transitional Bilingual Observation Protocol (TBOP; Lara-Alecio & Parker, 1994). Since treatment participants would undergo a mentoring process, they needed to record three additional videos for the mentoring sessions. The pre-and

post-observation videos had the same stipulations as the mentoring videos-- at least 15 minutes in length of them teaching students.

TBOP was based on the four-dimensional bilingual pedagogical theory (Lara-Alecio et al., 2013, p. 1129). This validated classroom observation instrument was designed to observe different elements of instruction in bilingual classrooms based on different theoretical perspectives. Although Lara-Alecio and Parker (1994) originally designed the instrument for transitional bilingual classrooms, TBOP has been applied and validated in varying classrooms working with EBs (Tong et al., 2017). In the current study, graduate students were trained to use TBOP to analyze varying elements of teachers' instruction, such as ESL pedagogical practices, pedagogical behaviors (e.g., observe, lecture), student communication mode (e.g., aural), and language content (e.g., light, dense) implemented by in-service teachers. Language content was coded as either social, academic, light, or dense cognitive language. See Table 3 below for their descriptions. Considering there were multiple coders, establishing inter-rater reliability (IRR) was essential. Training and recurrent meetings helped establish and sustain inter-rater agreements (Tong et al., 2020). For this study, I focused on the data resulting from the treatment teachers that underwent the collaborative mentoring process.

Table 3

TBOP Descriptors- Language Content

	Code	Description
Social Language	1	Social exchanges and conversation.
Academic Language	2	Preparing for recess, returning books, learning strategies, handing in assignments, structuring homework
Light Cognitive Language	3	Current events, discussion of the school fiesta, multicultural education issues, repetitive drill or skills practice, reviewing content already introduced.
Dense Cognitive Language	4	New content-area information, conceptually loaded communication with specialized vocabulary and procedures.

Mentoring Survey

After completing the VMC sessions, teachers were provided with a post-mentoring survey designed to collect data from mentored participants and gain information regarding their experiences and perspectives. Although the survey consisted of questions on the Likert scale and open-ended questions, the focus was on the latter. The open-ended questions were framed to understand teachers' VMC experiences and perceptions. The mentees underwent a dynamic process with their mentor and had opportunities to construct new knowledge together. The mentoring survey served as a way for researchers in the project to gauge various participant perspectives.

Data Collection and Analysis

Data were collected from two sources, classroom observations and mentoring surveys, from the project's second year from participants in the treatment condition only. Graduate

students coded the classroom observations after establishing interrater reliability of 63%. Three paired-samples *t*-tests were conducted to analyze teachers' instructional quality (i.e., ESL strategy, light, and dense language content) before and after the VMC intervention. For effect sizes, Cohen's (1988) *d* guidelines were utilized to interpret effect size. To understand teachers' perceptions of the VMC, mentoring surveys were collected from all treatment teachers who had completed the VMC sessions. The open-ended questions were analyzed to understand the participants' perceptions. The survey questions included: (a) what was the best part of the virtual mentoring? (b) what is the most important thing that you learned? and (c) do you have any suggestions for improving the virtual mentoring? A thematic analysis was utilized to capture recurring themes that showed teachers' perceptions of the VMC.

3.7 Results

I analyzed our raw data to ensure all assumption requirements for the paired-samples *t*-test (continuous dependent variable, independent observations, normal distribution, outliers) were met. When analyzing the ESL strategy, outliers were removed, and a less conservative *p*-value of .05 was used to ensure all assumptions were met. When analyzing light and dense language content, outliers were removed, and the *p*-value of .05 was also used to ensure all assumptions were met.

Research Question 1

To answer Research Question 1, I ran three paired-samples *t*-tests. For ESL strategy, there was not a significant difference in teachers' implementation of ESL strategies from pre-observation (M= .46, SD = .31) to post-observation (M= .49, SD=.29); $t(129) = -.996$, $p = .321$. Cohen's effect size value ($d = .08$) suggested no practical significance. For light language content, there was not a significant difference in teachers' implementation of light language

content from pre-observation (M= .42, SD = .35) to post-observation (M= .40, SD=.36); $t(132)= .708$, $p = .480$. Cohen's effect size value ($d = .06$) suggested no practical significance. For dense language content, there was a significant difference in teachers' implementation of dense language content from pre-observation (M= .39, SD = .35) to post-observation (M= .50, SD=.36); $t(132)= -2.63$, $p = .009$. Cohen's effect size value ($d = .23$) suggested low practical significance. Meaning, that teachers increased their use of dense language content significantly with a small effect size. Overall, this suggests that although there was no statistically significant difference for ESL strategy, teachers displayed to increase rigor of language content in the post-observation video when compared to the pre-observation video.

Research Question 2

Upon completion of the six-week VPD course and VMC component, treatment participants received a mentoring survey focusing on their perceptions of their VMC experience. I administered a thematic analysis to respond to this research question.

Professional Growth

Various participants attributed professional growth to the self-reflection experienced through the VMC sessions. Speaking to a mentor and receiving real-time feedback was instrumental for their self-improvement. Treatment teachers also highlighted that feedback granted them self-validation and increased their self-awareness.

> *"The discussion of the observation. That allow me to reflect in my own teaching and make correction to monotonous and repetitive teaching styles."*

Since active learning is an important characteristic of professional development, providing feedback to teachers based on their own teaching can be a meaningful way to engage teachers in reflective practices (Rodgers et al., 2019). During the VMC, teachers had

opportunities to view snippets of their videos while receiving mentor feedback and engaging in discussion. This helped to provide clear and instant feedback. Brock and Carter (2016) found that performance feedback was linked with a higher fidelity of target instructional strategies.

Mentoring Benefits

Surveyed participants reported expressions of gratitude for the feedback received by their mentors. Additionally, they mentioned that the tailored feedback from their observation videos helped them improve their classroom instruction. Mentees also expressed their appreciation for their knowledgeable mentors.

> *"Having a knowledgeable resource who could give unbiased feedback regarding my classroom instruction and how it correlates to ELL students."*

Recent literature has connected VMC with improving teacher attitudes (Lee et al., 2018; Matsumura et al., 2019; Vernon-Feagans et al., 2015) as well as improving their instructional practice (Garland & Dieker, 2019; Kraft & Hill, 2020; Lee et al., 2018; Matsumura et al., 2019; Rock et al., 2009; Wilczynski et al., 2017). Similar to the VMC in this study, these researchers also utilized instant feedback from their participants. VMC interventions have been shown to positively impact teachers and, in turn, their students.

Emergent Bilinguals

Mentored teachers had opportunities to discuss knowledge and skills related to EBs with mentors that had experience teaching in ESL and bilingual classroom settings. Several mentees indicated developing a deeper understanding of EBs and best practices after the VMC sessions.

> *"I've learned that it's okay not to know where to start but start with building a rapport with your ELL students to help them lower their affective filter and feel comfortable in their new learning environment."*

Considering the increase of EBs across the country, educating the instructors who serve them on best practices is vital. The literature on using VMC to advance teacher knowledge on EBs is scarce. Tang et al. (2020) found that teachers working with EBs that received VMC displayed an improvement in practices. Mentoring discussions encouraged opportunities for professional collaboration between the mentors and mentees and to build on topics such as cultural awareness, strategies to lower affective filters, and building their linguistic awareness.

Recommendations from Participants

The surveyed teachers expressed a generally positive experience with the VMC sessions. In addition to positive responses, suggestions for improving the course were also noted. For example, a few participants mentioned that some of the sessions were longer in duration than they would prefer. Additionally, other teachers asked for an increased number of required videos in order to receive more feedback. Finally, technical difficulties with the device and software were also reported.

3.8 Discussion

The first question in this study focused on understanding treatment teachers' professional growth after receiving VMC. I found that although the observation videos did not indicate a significant improvement in their ESL strategies, they did report positive experiences overall through the surveys. Another important finding was that teachers diminished their use of light language content and increased their use of dense language content with students. A possible explanation for this might be that during the VMC, mentors and mentees discussed the importance of developing students' dense language skills, and the participants wanted to showcase it on the video observation recordings. Along with the mentoring intervention, participants also had access to knowledge on best practices through the virtual professional

development course. Since the course was aligned with state standards and competencies and had a range of resources available for them, it could have possibly played a role in their perception of their professional growth.

With respect to the second research question, it was found that teachers were able to engage in self-reflection due to the positive mentor-mentee relationship. The collaborative nature of the sessions provided opportunities for dynamic discussions and for the participants to enjoy the process while furthering their knowledge of EBs. Suggestions given from participants for VMC improvement focused on logistics and technicalities that could be improved to maximize teachers' learning. In all, quantitative findings showed that teachers improved their professional growth and had positive perceptions of the VMC related to EBs.

3.9 Limitations and future research

In this study, I investigated the possible influence of VMC on instructional practices as well as teacher perception. This is an important area that is only gaining popularity as technology continues to evolve in education. With that being said, it is important to recognize the several limitations of this study. To begin, the length of the intervention was six weeks. The amount of time may not be enough to observe for enough of an impact to occur. Data might be more revealing if participants received VMC for a longer period of time, as lengthier VMC interventions have shown (Bang, 2021; Pianta et al., 2008; Vernon-Feagans et al., 2015). Furthermore, the data for this study was derived from one of the years of the five-year project. Once all the data is collected from all five years, a larger sample size can help present a more comprehensive picture.

Additionally, specifically with the TBOP instrument, teachers were not instructed to submit videos with homogenous characteristics. For example, the videos teachers submitted for

their pre-observation could be a reading conference with one student, while the post-observation could be writing instruction to the whole class, depending on the subjects they were responsible for. Although teaching strategies can be incorporated into different subjects, this could make it difficult to compare fully. Teachers were given the autonomy to choose what they wanted to share with their mentors. Imposing strict guidelines regarding the type of instruction to record can be challenging since, although teachers have a plan for the curriculum they will teach, their day-to-day instruction can change depending on school interruptions, student reception, and other general adjustments needing to be made. To summarize, although methodological limitations have been identified, the present study positively contributes to the literature on teacher perception of VMC.

3.10 Practical Implications

The favorable results from the survey can serve as support for those designing and implementing VMC opportunities for educators. Mentorship should not be limited to first-year teachers or focus primarily on adjusting to a new role. The participants that underwent the VMC intervention indicated that the experience helped them with professional growth and self-awareness. Just as professional development can be on a range of topics and durations in length, further research on VMC is necessary to explore its effects, especially for those working with vulnerable populations such as EBs and special education students. Additionally, there were few participants who mentioned technological difficulties with either accessing the VPD, the recording device provided by the project, or the application used for VMC. The participants in this study had access to instructional PowerPoints and pre-recorded videos to walk them through the tasks (i.e., how to upload a video to the server). Also, they had access to their mentors along the way to answer any questions they may have. Presenting participants with various ways to

troubleshoot issues, or having resources readily available to try and avoid them, can help in providing a smooth VMC experience. Finally, I found that teachers highlighted an appreciation for real-time feedback in their survey responses. The synchronous nature of the encounters allowed for in-depth discussions and instant feedback as the mentor and mentee reviewed the observation along with the certification standards.

3.11 Conclusion

This study was conducted to identify the possible influence VMC had on teachers' instructional practices and perceptions of the VMC itself. Virtual mentoring and coaching can serve as a viable option for traditional or face-to-face mentoring or coaching when challenges such as location, time, or resources are present. More importantly, identifying the qualities that make PDs effective through teacher feedback is key to the improvement of professional development programs. Providing professional development tools, such as access to VMC, has promising potential to support teachers at different points in their careers and in a variety of areas.

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CHAPTER IV

EXPLORING INTERACTIONS BETWEEN IN-SERVICE TEACHERS AND THEIR MENTORS DURING VIRTUAL MENTORING AND COACHING SESSIONS

4.1 Introduction

Teachers have been regarded to be the most influential factor when it comes to student achievement (Didion et al., 2019; Stronge, 2013; Wright et al., 1997). Ensuring teachers continue improving their craft is typically fueled through a continuous effort from instructional leaders such as administrators, instructional coaches, and mentors. An instrumental way these stakeholders support teachers in their career growth is through providing professional development (PD) opportunities. Professional development supports teachers with ways to improve their knowledge and skills to elevate student performance (Darling-Hammond et al., 2009). They can vary in duration, frequency, and type to distinctively meet the needs of educators through approaches such as workshops, seminars, and observation, among others.

The use of classroom observation is a popular method where instructional leaders observe teachers and provide feedback to enhance teaching and learning (Shaha et al., 2015). Since the feedback is specific to their own practice in their classroom, it can be a powerful way to engage and provide teachers with relevant input. Providing instructors with feedback has been found to be influential in their development as professionals (Scheeler et al., 2004). Feedback is a central component for mentors and coaches supporting teachers. Due to current demands for technology integration into various areas of education, virtual professional development (VPD) has become a popular option for supporting educators. Specifically, most research on virtual mentoring and coaching (VMC) focuses on novice or pre-service teachers. This study focuses on mentoring in-service teachers with a range of experiences attempting to grow as professionals.

4.2 Literature Review

Mentoring and coaching

Professional development has been proven to improve teacher instruction (Postholm, 2012) and positively affect student achievement (Chung et al., 2010). There have been local, state, and national requirements surrounding developing instructional coaching and mentoring support for teachers (Coburn & Woulfin, 2012; Goldrick, 2016). Mentoring and coaching are prime examples of support that can help teachers in various ways. Fundamentally, it is essential to clarify the characteristics that describe mentoring and coaching to better understand their expected role among teachers. Although the two terms are often used interchangeably, specific characteristics have been historically associated with them.

Mentors are generally used where either pre-service or novice teachers are paired with a more experienced individual. A classic definition of mentoring offered by Heikkinen et al. (2012) is, "mentoring is a professional guidance relationship in which an experienced, intellectually and socially valued mentor acts as an adviser for a less experienced employee and helps this 'mentee' develop her/his work" (p.13). Mentoring is not a new process by any means. The idea of mentoring emerged as early as the 8th century through the infamous body of work, The Odyssey (Awaya et al., 2003). A significant theme between two of the characters in the poem, Mentor and Telemachus, emerged: exemplifying behavior is vital in mentoring. Throughout history, various mentor figures have provided advice and guidance to an understudy ranging in contexts from Socrates and Plato to Shazam in "Captain Marvel" comics (Odell, 1990). In the field of education, mentoring began gaining popularity during the 1970s through formal mentoring programs that began to take shape (Ganser & Koskela, 1996; Wallin & Boggan, 2015).

After collecting and synthesizing various definitions of coaching, Hamlin et al. (2008) described coaching as "the explicit and implicit intention of helping individuals to improve their performance in various domains, and to enhance their personal effectiveness, personal development, and personal growth" (p.291). The concept of "coaching" was first introduced in the context of "helping" through the novel Pendennis written by Thackeray, in 1849 (Gray et al., 2016). Since then, coaching has found a place in diverse fields such as sports, science, and education. The main thread weaved throughout these areas was to help improve the performance in a specific activity. In the education field, a coach is often a full-time designated employee tasked with providing on-site support to teachers. Coaching started to be used as a type of PD for teachers in the 1980s through peer-coaching models proposed by Beverly Showers and Bruce Joyce (Ali et al., 2018). They found that coaching sessions increased the implementation of the content, whether they were taught by experts or other teacher participants (Showers & Joyce, 1996). Peer coaching has evolved since then to provide personalized support through literacy, math, and general instructional coaches (Kraft & Blazar, 2018; Mraz et al., 2016).

Coaching processes can be used in a variety of contexts. Ali et al. (2018) describe coaching as a spectrum where at one end, there is an expert coach who is much more knowledgeable than the coachee as they primarily supply guidance and essential knowledge. On the other hand, the process can be described as a collaborative one where peers give support as they construct knowledge together. With that being said, Showers and Joyce (1996) have highlighted that despite multiple types of coaching models emerging, they are not designed to evaluate teachers in any capacity. The primary objectives of coaching teachers include targeting specific skills for improvement, developing new ones, and working towards precise goals (Cox

et al., 2018). Furthermore, an essential facet of coaching is that it is continuous and not limited to just one session or workshop (Ali et al., 2018).

Similarly, teacher mentoring programs have a wide range of formats and objectives. Typically, mentoring is used to support pre-service teachers in their practicum, novice in-service teachers during their first years of teaching, or those returning to teaching after a break of more than three years (Zembytska, 2015). As of 2019, thirty-one states required some form of mentoring support for new teachers (Education Commission of the States, 2019). Further, twenty-seven states require mentoring programs for the duration of at least one year. Quality mentoring programs help develop novice teachers, strengthen job contentment, and lessen teacher turnover (Spooner-Lane, 2016). Rather than focusing on the typical profile that fits the mentee role, such as a novice teacher, focusing on the possible effects of mentoring can help normalize supporting a more comprehensive range of educators through mentorship.

Despite the two terms differing in some areas, depending on the evolving contexts they are used in, they have also been described as being "both deeply rooted in practice and cannot easily be disentangled from each other" (Stokes et al., 2020, p. 151). This idea has been echoed by previous researchers such as Knight (2004), who mentioned that coaches frequently perform mentoring duties with teachers. In a similar fashion where the two concepts intertwine, Irby (2012) has shared that mentors typically engage in coaching practices and then further shared that coaches rarely exhibit mentoring practices. Aligning with these views, for consistency purposes, the term used in this paper to describe the individual providing support to the teachers will be *mentor,* even though the individual may be drawing from both of what has been historically considered mentoring and coaching concepts.

Virtual Mentoring and Coaching

In the literature, technology paired with mentoring and coaching has been labeled as web-based mentoring/coaching, e-mentoring/coaching, online mentoring/coaching, and what will be used in this paper, virtual mentoring and coaching. Virtual Mentoring and Coaching (VMC) is a fairly new term similar to the concepts of online mentoring and e-mentoring (Irby, 2015). Uniquely, the concept of VMC incorporates both mentoring and coaching types of methods via a virtual platform (Abdelrahman et al., 2021). Integrating technology into academic areas has been in crucial demand due to educational policies and the COVID pandemic. In 2010, the U.S. Department of Education (DOE) released the National Education Technology Plan, which was titled "Transforming American Education: Learning Powered by Technology," where approaches to use more technology in schools was presented (United States Department of Education, 2010). More recently, the DOE released an updated plan that mentioned that technology could help support teachers when paired with coaching (U.S. Department of Education, 2017). Using technology with professional development provides opportunities for essential components in the coaching process, such as self-reflection and feedback. Virtual Professional Development (VPD) can be described as asynchronous, synchronous, or hybrid in nature (Elliot, 2017). Asynchronous approaches include communication through methods such as email and discussion posts, while synchronous learning uses chat rooms and video conferencing. In this paper, teachers met their mentor in real-time through a video conferencing application to receive feedback, which is considered synchronous VMC.

Through the years, there have been various ways in which teachers have been supported in their instruction through the use of technology. One of the most popular approaches is "bug-in-ear" (BIE) coaching. Although its origins used FM radio frequency and an earpiece for the

mentor to communicate with the teacher during the 1970s (Rock, 2009), it has evolved into the use of sophisticated Bluetooth devices and even video conferencing (Garland & Dieker, 2019). The earpiece allows teachers to receive guidance and feedback in a discrete manner as they teach in real-time. Typically, the mentor would meet with the teacher afterward to unpack and discuss the lesson. Besides using video conferencing to support teachers, other researchers have paired it with online portals and access to additional resources (Bang, 2013; Lee et al., 2018).

VMC offers the potential to deliver cost-efficient professional development to teachers in a personalized manner. In addition, meshing mentoring and coaching with technology can have a higher reach for educators in remote locations or with restrictive schedules. In the context of the United States public school system, VMC has been shown to improve teaching practice (Matsumura et al., 2019; Snyder, 2013; Wilczynski et al., 2017) as well as increase their pedagogical knowledge (Wilczynski et al., 2017). Since it has been well established that teachers are the most influential factor when it comes to student achievement, ensuring teachers are properly supported is crucial (Didion et al., 2019; Lee et al., 2018). VMC also allows teachers to engage in reflective practices either independently (Bang, 2013; Rock et al., 2009) or in collaboration with their mentors (Kraft & Hill, 2020; Matsumura et al., 2019; Snyder, 2013). Mathew et al. (2017) emphasize that teachers reflecting on their practice play a leading role in their PD. Reviewing their performance and experiences allows teachers to improve as professionals.

On the other hand, some teachers may struggle to adapt to using new technology and software or may simply prefer face-to-face interactions (McConnell et al., 2012). As far as the literature in the states, Ruble et al. (2013) reported that in their study, there was not a significant difference in the overall change between the face-to-face group and the web-based coaching

group. Echoing these results, Pianta et al. (2008) and (Kraft & Blazar, 2018) also reported a lack of statistical differences between the effects of face-to-face coaching and VMC participants. The researchers attributed these results to VMC having a comparable influence on teachers as face-to-face mentoring. When synthesizing research in the United States regarding comparisons between VMC and face-to-face coaching, there were none indicating negative effects. However, In South Africa, Cilliers et al. (2022) found that on-site coaching indicated greater positive effects than VMC. Further, they describe an unintended negative effect on the home language literacy of the students. The researchers used implementation and data surveys to theorize that rather than thinking of the technology as a hindrance to the intervention implementation, the in-person intervention itself simply allowed for a higher level of accountability and advocacy. Accountability would be a beneficial area to research closer to learn how it can potentially play a role when offering virtual interventions to teachers.

Although VMC is relatively new, the virtual shift forced by the COVID-19 pandemic has increased the number of virtual educational sessions conducted across many states (Ippolito et al., 2021). As educators are unexpectedly forced to become increasingly familiar with the integration of technology in their daily lives, VMC has the potential to be a natural shift from the typical face-to-face coaching they have experienced.

4.3 Conceptual and Theoretical Framework

The sessions between the mentors and teachers in this paper were studied through the lens of situated learning. Situated learning theory refers to the belief that “knowledge is contextually situated and is fundamentally influenced by the activity, context, and culture in which it is used” (McLellan, 1996, p.6). This means that learning is socially constructed inherently through purposeful activities (Abdallah, 2015). Key components of the situated

learning model, as seen in the VMC sessions in this study, include collaboration, reflection, and coaching (McLellan, 1996). Mentors in the study use a mentoring guide based on the state certification standards and the video observations submitted by the teachers. Together, teachers and mentors reflect on video instruction, and mentors share guidance and suggestions based on the captured teacher-student interactions.

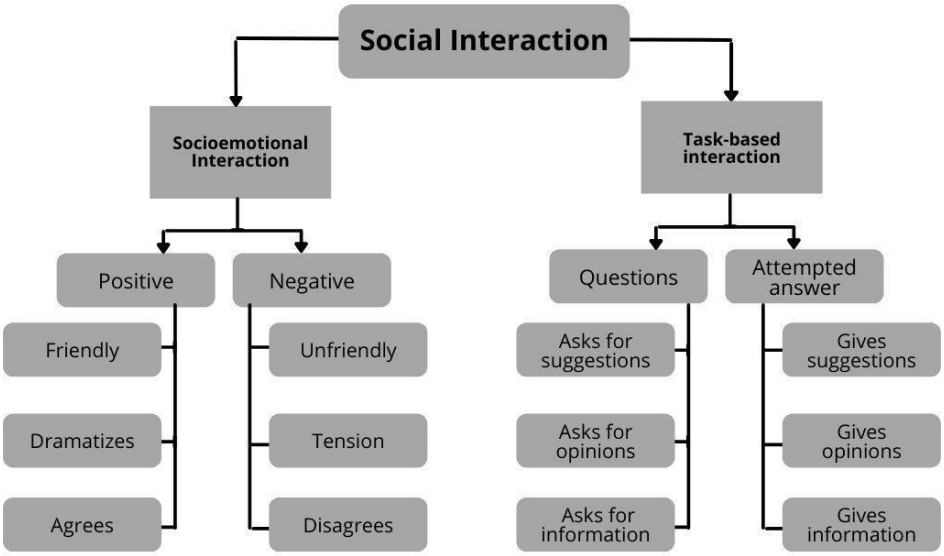
The situated learning perspective assumes that knowledge, contexts, and activities are fused together. Therefore, in this study, teacher knowledge, public school context, and VMC activities are considered inseparable. Further, situated learning assumes that interacting with another person typically results in new knowledge being formed and that conceptualization is a continuous process (Bell et al., 2013). This lens provides implications for the interpretation of the interactions in the VMC sessions as well as their development. Ensuring teachers are offered reflective and collaborative experiences through authentic activities is instrumental in constructing new knowledge.

Studying the VMC sessions through the interactions between teachers and their mentors offers a way to analyze the nature of the discussion and the context. Interaction Process Analysis (IPA; Bales, 1950) provides researchers with a framework to explore interaction processes during face-to-face interactions. Bales (1950) has also shared that IPA was designed as a general purpose tool in the sense that it can be used in nearly any group or meeting context to identify the nature of interactions rather than the content. Bales has defined a "unit" of interaction as a single simple sentence or "sequence of a few words conveying a single thought" (Weldon et al., 1991, p. 559). Each unit is then coded as a single "act" under either a task or socioemotional activity. There are 12 codes to label these interactions (see Figure 4 for the complete list), with six corresponding to socioemotional behaviors and the remaining six to task-oriented behaviors

(Levine & Hogg, 2010). I used IPA (Bales, 1950) as a conceptual framework for this study to explore the types of interactions captured during the VMC meetings.

Figure 4

Bales (1950) interaction process analysis (IPA) categories



4.4 Purpose

As VMC continues to become a popular option due to a higher demand for technology integration in the education field, it is necessary to investigate the interactions and content of meetings between teachers and mentors to learn more about the process. The more we learn, the further our understanding of how to focus future research on VMC and aim to make it more effective. Until recently, there has been scarce research on the interactions between in-service teachers and their mentors. I will compare the types and frequencies of interactions as well as the content observed and discuss the practical implications. This study aimed to research sessions among mentors and teachers that indicated positive session experiences through surveys. The following research questions guided this study:

1. What are the types and frequencies of interactions between in-service teachers and their mentors during the VMC sessions?
2. What themes are present during VMC sessions between in-service teachers and their mentors?

4.5 Methodology

Research Context

The participants in this study were in-service teachers in a randomized controlled trial (RCT) research project: Empowering Teachers of English Language Learners (ETELL, Grant Number T365Z160229) and their mentors. This federally-funded five-year project aimed to prepare in-service teachers in Texas to obtain their bilingual and English as a Second Language (ESL) certification and investigate the effectiveness of VMC support based on virtual observations. Teachers in the project participated in a 6-week virtual professional development (VPD) and submitted a pre- and post-observation video. Teachers in the treatment group were randomly selected and assigned a mentor to receive the mentoring and coaching component. These participants were asked to submit additional observation videos of them teaching to the secure online portal. An observe-assess-mentor sequence was used. The cycle would begin with their mentoring video #1 submission, followed by the mentor reviewing the video, then scheduling a meeting to provide feedback as well as make connections with the state certification standards. Then, the teacher would submit their mentoring video #2 and follow the same pattern until submitting a total of 3 mentoring videos. In total, the treatment teachers would submit a total of five videos (pre-observation, mentoring video #1, mentoring video #2, mentoring video #3, and post-observation video). When the teachers met with their mentors for their VMC sessions, they were recorded through a videoconferencing platform, GoToMeeting.

The two mentors in this study were former public school teachers with years of experience in bilingual and ESL settings. They were also graduate research assistants in the project. At the time of the study, one mentor was seeking a Ph.D. in educational psychology with a concentration in bilingual/ESL education, and the other mentor was in the process of obtaining their Ed.D. in curriculum and instruction.

Virtual Mentoring and Coaching (VMC) Sessions

The VMC sessions in the larger project were designed to last from thirty minutes to an hour to discuss feedback from the video observation and, depending on the teacher's certification goal, connections to the ESL or bilingual certification competencies. The mentor would use the *Virtual Mentoring and Coaching Notes- Based on the TExES Competencies for ESL/BIL Teachers* to take notes while watching the video observation and prepare before the VMC session. The mentor would also display these notes to the teacher during their virtual meeting through a share-screen feature of GoToMeeting and continue to take notes while progressing through their time together. Afterward, the teacher received a copy of the detailed notes shortly after their meeting. This approach to feedback offered both parties the time to engage in reflective practices and collaboration to develop the teacher's understanding of Emergent Bilinguals (EBs) and familiarize them with the state certification standards.

As previously mentioned, the mentors from the randomly selected VMC sessions were two graduate students seeking a doctoral degree at the university where the project was housed in. Additionally, they had prior experience as elementary teachers, held valid ESL and bilingual certifications, and worked with diverse populations. The mentees from the VMC sessions had classroom experience, including novice (0-5 years) and experienced (11-15 years), as shown in Table 4. The VMC sessions varied in duration and ranged from 26 to 45 minutes. Overall, all but

one of the mentees (n=4) reported they had some type of experience teaching EBs. The single participant that reported "Rarely" working with EBs also had the longest VMC session length of 45 minutes. Overall, the type of district setting was diversely composed of rural (n=3), suburban (n=1), and urban (n=1).

Table 4

Summary of VMC Sessions and Mentee Characteristics

VMC session	VMC session length	Teaching experience	Type of District	Grades	Race/ethnicity	Self-reported frequency of teaching EBs
Session A	29:35	0-5	Rural	5	White	All the time
Session B	37:13	0-5	Suburban	7	White	All the time
Session C	30:37	11-15	Rural	12	White	Sometimes
Session D	26:28	0-5	Urban	9,10	Latino/Hispanic	All the time
Session E	45:27	11-15	Rural	7,8	White	Rarely

Data Collection

Multiple sources of data were gathered to explore the types of interactions and themes present in VMC sessions between mentors and their mentees. The five recorded mentoring sessions selected for this study were from the Fall 2020 Cohort.

Mentoring Survey

All participants in the treatment condition from Project ETELL received a researcher-developed mentoring survey at the end of their VMC experience. From these surveys all of the responses indicated "agree" and "strongly agree" to the following statements: (a) I was able to improve my instruction as a result of the virtual mentoring, and (b) The virtual mentoring met my expectations overall. There were no responses from any participants indicating "disagree" or "undecided" to those questions from this cohort. From the participants selected, their third VMC

session (final session) was then chosen for analysis purposes. Additional responses from this survey were compiled to help create a comprehensive picture of the VMC sessions analyzed.

VMC Session Transcripts

The transcripts from the sessions were automatically transcribed by the GoToMeeting videoconferencing software used in Project ETELL. I cross-checked the transcripts with the videos to ensure accuracy between the two data sources, which required multiple viewings to ensure the highest accuracy. Once they were proofed, they were uploaded to ATLAS.ti to be analyzed.

Data Analysis

The transcriptions were analyzed using Bales' (1950) interaction process analysis (IPA) to respond to the first research question, "What are the types and frequencies of interactions between in-service teachers and their mentors during the VMC sessions?" Five videos were selected, transcribed, and coded. The recorded sessions ranged from 26 to 45 minutes, with an average of 33 minutes. Before using Bales' Interaction Process Analysis (IPA;1950) to code each of the VMC session transcripts, I separated interactions into "units." A thought "unit" is described as the communication of a complete thought. These were then coded with corresponding interaction processes (see Table 5 below) using the ATLAS.ti software designed for qualitative data analysis. A total of 4,472 "units" were identified from the five video-recorded sessions. As discussed by Bales, a "unit" is a sentence or "segment of verbal behavior" (Bales, 1950, p.37). Two coders with research experience on Project ETELL independently coded a video session transcript, separate from the five pre-selected, and coded accordingly using the process codes. We established a 78% intercoder agreement after this first round of coding. Then

we met to review the disagreements and made final decisions on the debated coding of the thought units. Finally, I proceeded to code the transcripts from the VMC sessions and tabulated the results.

Table 5

Function and Process Codes for Bales' Interaction Process Analysis (1950)

Function Code	Process Code	Examples from VMC Sessions
Socioemotional Interaction: Positive Reactions	Friendly: offers solidarity, compliments, smiles	"You were very effective."
	Dramatizes: Laughs, makes jokes	"...I was like, shame on me! [laughs]"
	Agrees: Understand, concur, confirm	"Yes, exactly that."
Task Area: Task Questions	Asks for suggestions: requesting direction	"Am I just asking yes or no questions at this point?"
	Asks for opinions: seeks belief, value, feelings	"What do you feel are the strengths of the lesson?"
	Asks for information: requests factual details, repetition, or clarification	"What was the date that I uploaded it?"
Task Area: Attempted Answers	Gives suggestions: provides direction	"You may provide them verbally."
	Gives opinions: provides belief, value, feelings	"I think it's really important in math."
	Gives information: provides factual details, repetition, or clarification	"We've discussed that before."
Socioemotional Interaction: Negative Reactions	Unfriendly: shows antagonism, negative, defensive attitude	none
	Tension: indicated anxiety, withdrawal	none
	Disagrees: shows passive rejection	none

Note. Adapted from "The Influential Role of Relational Messages in Group Interaction" by Keyton, J. and Beck, S. J. (2009), *Group Dynamics: Theory, Research, and Practice*, *13*(1), 14–30. ttps://doi.org/10.1037/a0013495

Additionally, the thematic analysis method from Braun and Clarke (2006) was adopted to address the second research question, "What themes are found in the interactions between in-service teachers and their mentors during the VMC sessions?" The six-phase method includes

becoming familiar with the data, initial code generation, looking for themes, reviewing themes, defining and naming themes, and generating the report (Braun & Clarke, 2006). This inductive thematic analysis approach helped with the validity of the study findings due to its data-driven approach (Boyatzis, 1998). Each transcript was repeatedly reviewed to identify, define, and name emergent themes until no change was reflected in the data. When generating the report, I used direct quotes from participants to help understand the generated themes, as seen in Table 4 (King, 2004). King (2004) asserts that including transcript excerpts helps add a richer dimension to the reported data.

Trustworthiness

Trustworthiness is a key feature in qualitative research (Morrow, 2005). This study aimed to minimize potential validity threats with the data collection and analysis. Triangulation by data source (multiple participants) and by method (mentoring sessions, surveys) were utilized to strengthen this research (Meijer et al., 2002; Twining et al., 2017). Two independent researchers familiar with the research project and VMC topics reviewed the codings and established interrater reliability. Finally, member checks were performed by the mentors on their interview transcripts, and emergent themes were found to help ensure the accuracy of the data. Any corrections or additional input were integrated into the data to fortify credibility.

Positionality and Reflexivity

Reflexivity allows "an opportunity for the researcher to understand how her or his own experiences and understandings of the world affect the research process" (Morrow, 2005, p. 253). Regarding my professional experience, I am a former public-school teacher who taught bilingual students in low-socioeconomic schools for five years. I was also a district literacy coach, where I focused on mentoring and modeling for multiple teachers. Aside from holding a

bilingual education certification, I was also a bilingual student when I attended elementary school. At the time of the study, I worked with Project ETELL for three years as a graduate research assistant pursuing a Ph.D. in educational psychology with an emphasis on bilingual/ESL education. I was familiar with the goals and overall process of VMC through my experience with the project paired with my prior experience with mentoring and coaching teachers in the field. For this study, I filtered out VMC participants that I worked with to try and reduce bias. Further, I used various processes, such as a researcher diary, to store memos after the coding of each session and after conversations with colleagues about the study. The entries helped me organize and track my ideas relating to the VMC sessions over time.

4.6 Results

In this section, I will reveal the types and frequencies of interactions that I identified as well as emergent themes from the VMC sessions. The four major themes discovered were: Emergent Bilingual (EB) topics, COVID impact, VMC mentee reflections, and the fostering of positive mentor-mentee relationships.

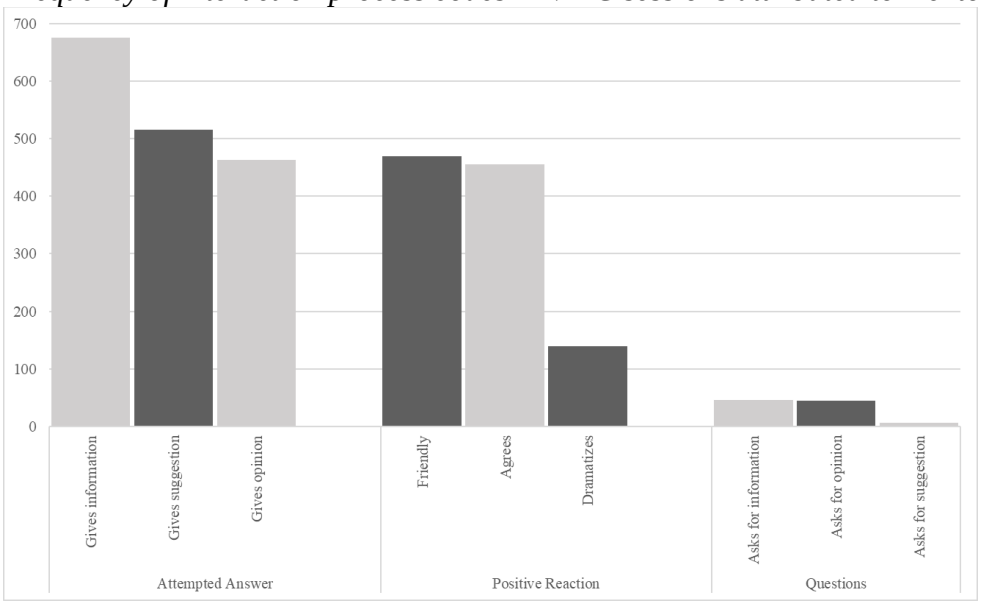
Interactions

After coding the five video transcriptions, 4,472 codes were identified and labeled under an interaction function. Overall, out of the total functions distinguished from all mentors and mentees, 63% (n=2,815) were attributed to the mentors, and 37% (n=1,657) were attributed to the mentees. The majority of interactions originating from the mentor were attempted answers followed by positive reactions and asking questions, as seen in Figure 5 below. The code Attempted Answer encompassed providing suggestions, opinions, or some type of information, while the code Positive Reaction included demonstrating agreeance, friendliness, and tension release (joking, laughing), as explained in Table 4 in the previous section. Most of the

observation category processes under the Attempted Answer function involved the mentor *giving information*. When focusing on the Positive Reaction function, the category processes involved were nearly equally distributed between the mentor engaging in *agreeance* and *friendly* interactions.

Figure 5

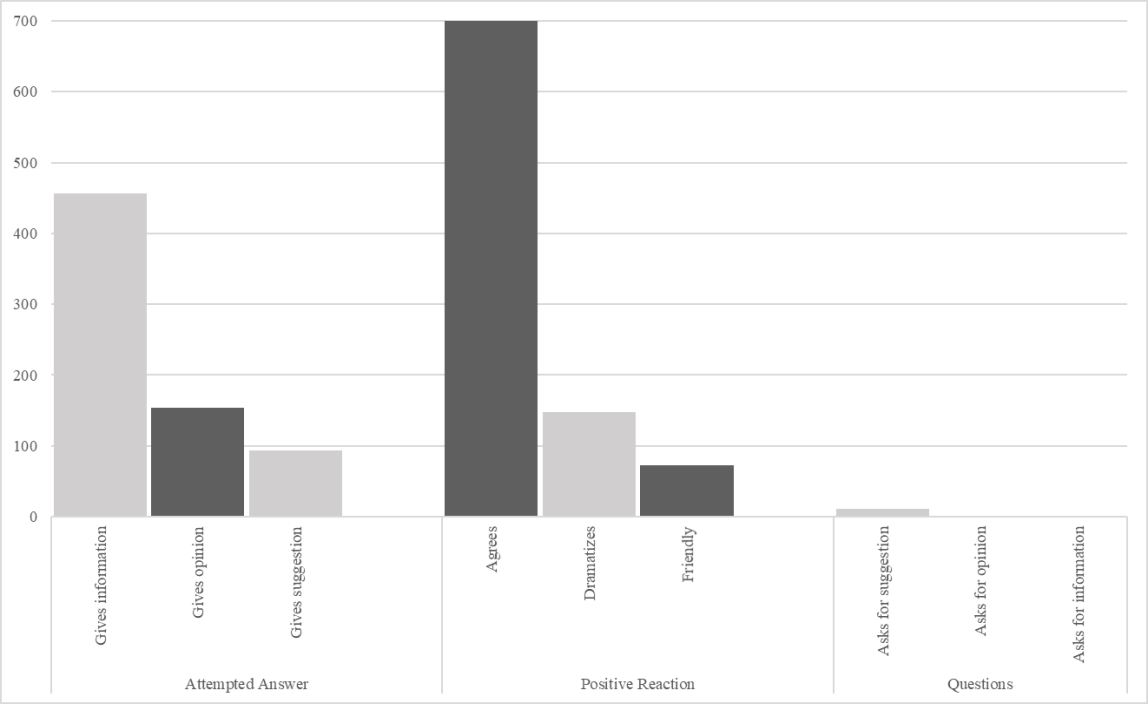
Frequency of interaction process codes in VMC sessions attributed to mentors



Unlike mentors, the mentees displayed positive interactions as the most common, followed by providing answers and asking very few questions, as seen in Figure 6 below. Descriptively, the Mentee-Positive Reaction interaction function was designated to 21% of the entire process codes, followed by Attempted Answer with 15.5%. Specifically, under the Positive Reaction process code, the mentee's interaction was predominantly coded under *agrees* when interacting with their mentors. Additionally, when focusing on the Attempted Answer process code, the mentees' interactions were typically classified as *giving information*.

Figure 6

Frequency of interaction process codes in VMC sessions attributed to mentees



Emerging Themes

The five VMC session transcripts were utilized to search for themes inductively. There were four emergent themes: Emergent Bilingual (EB) topics, COVID impact, VMC mentee reflections, and the fostering of positive mentor-mentee relationships. Table 6 showcases the multiple themes identified, along with examples of supporting quotes.

Table 6

Thematic Analysis and Illustrative Quotes Pertaining to Themes

Themes	Supporting quotes	Analysis
Emergent Bilinguals (EBs)	"It's a language thing with him. He's brilliant when it comes to the math…"	Mentees shared personal examples with EBs in their classrooms, and mentors helped with information and suggestions.
	"That will help you in advocating for them, you know with their family members…"	
	"How do we ensure these students are using the cognitive academic vocabulary?"	They trusted their mentors with general and specific questions regarding their EBs and policies.
	"When is that appropriate?" "The Home Language Survey is, when an English learner comes into the education system…"	
COVID impact	"…having parent-teacher conferences virtually, as you've already probably stated or have done."	Mentees shared personal experiences on how COVID has notably impacted their classroom lessons, student relationships, and technology use.
	"They need to practice their writing, because we don't do it a lot…with technologies, a lot of drag and drop"	
	"They're actually not getting their students to speak at all during these virtual lessons"	
VMC reflections	"I thought it [the lesson] was, it was good."	Mentees placed focus on questions aiming to improve classroom instruction. Mentees engaged in self-reflection to help them grow in a professional manner.
	"I don't feel like they understood that there was a proportional relationship between shapes that were similar."	
Mentor-Mentee Relationships	**Mentee:** "Because this is the first week in a long time that I haven't had any grad school work." *laughs* **Mentor:** That's amazing, because aren't you done already?	Mentors use conversations (personal and professional) from previous sessions to foster relationships.
	"What I'm getting my master's degree in is, I've got a specialization in ABA."	
	"He's a difficult nut to crack. Let me tell you. [laughs]"	Mentor and mentees engaged in pleasantries (jokes, laughing, greetings) to help have positive interactions.
	"So, there's an understanding of that [EB strategy], and you definitely integrate it."	Compliments were provided by the mentors to highlight positive observations and help mentees be more receptive to suggestions.
	"You're a phenomenal teacher."	

The first theme of Emergent Bilingual (EB) topics encompassed a range of subtopics such as language policy, personal experiences with EBs, best practices, and second language acquisition theories. Most teachers, 4 out of the 5, expressed having experience working with EBs in their classrooms. All mentees participated in the research project to receive support for becoming ESL certified, so this theme was a common thread throughout all of the sessions. For example, during the VMC Session D, the mentor and mentee spent time addressing phonology:

Excerpt 1

> **Mentor:** Just make sure you understand, you know, what phonology means
>
> **Mentee:** *[writes notes]*
>
> **Mentor:** What morphology, you know, as we prepare to be, to work with English learners, which you already do in this case, But, it's important that we know how the English language is composed and the structure so that if a student is having some difficulties with a specific concept, then we can address it.
>
> **Mentee:** mhmm

The second theme identified was the impact COVID had in their classrooms. The VMC sessions analyzed in this study were from the fall 2020 semester--the first semester back since the beginning of the pandemic. All of the VMC sessions addressed the effects of the changes brought upon by COVID by some means. When the pandemic was addressed by name, the mentors were the source with phrases such as: “I can only imagine…especially during COVID” and “especially with the changing environments as, for example, with COVID.” Besides this, words such as “virtual,” “technology,” and “online” were used by both parties when addressing classroom lessons, suggestions, and struggles they were experiencing in the field of education and the change they experienced towards a more virtual environment.

Third, VMC mentee reflections were a prevalent theme throughout the sessions. Mentors encouraged reflection by asking questions such as, “What do you feel are the strengths of the lesson?” and “So would you say now that you kind of feel more comfortable in using the vocabulary?” Mentees would also initiate self-reflection through comments such as, “I feel there's still a lot more work to do with that student” and “It kinda makes me feel better about myself” when sharing their instructional experiences.

Finally, the fourth theme identified was cultivating dynamic mentor-mentee relationships. Mentors provided compliments, positive feedback, and used specific examples from their instruction as exemplars when discussing the state certification ESL competencies. These were also paired with small talk, humor, and positive facial expressions. The mentoring dyads had met at least twice before the interactions analyzed in this VMC video. They interacted using different observation videos each time and through other forms of communication such as email and phone calls if necessary. Teachers were encouraged to reach out for any questions they may have throughout the course. The mentors also doubled as their point of contact for any questions on the virtual professional development (VPD) course they were taking alongside these VMC sessions. These roles allowed for many possible points of interaction to help shape the mentor-mentee relationships.

4.7 Discussion

As noted earlier, the goal of this chapter was to explore the interactions and themes during VMC sessions between mentors and mentees that are seeking an ESL or Bilingual certification. This section offers interpretations of the findings to better answer the following research questions:

1. What are the types and frequencies of interactions between in-service teachers and their mentors during the VMC sessions?
2. What themes are present in the interactions between in-service teachers and their mentors during the VMC sessions?

Research Question 1: What are the types and frequencies of interactions between in-service teachers and their mentors during the VMC sessions?

The frequencies of interactions between the teachers and their mentors during the VMC sessions indicated that mentors dominated the encounters. This falls in line with previous research that suggests interactions between mentors and their mentees are disproportionate (Keogh, 2010; Vásquez & Reppen, 2007). The uneven interactions between mentors and mentees could be attributed to the differences in power between the two roles (Vásquez, 2004). Alternatively, in the study conducted by Reese (2017), mentors and mentees displayed a similar number of interactions (through the coded thought units) and noted that mentees used fewer words when expressing themselves. For example, a positive coding interaction from a mentor could be a phrase (i.e., “you are a great teacher!”), while a mentee's positive coding interaction could be non-verbal or minimal words (i.e., nodding or “yes”). Similar to the Reese (2017) study, the mentees in this paper responded with a large number of passive agreement interactions (i.e., nodding) as well as tension relief (i.e., laughter). Overall, mentors spent most of their time under the Attempted Answer category (i.e., giving information, suggestions, and opinions) and mentees spent it under the Positive Reaction category (i.e., agreeing, dramatizing), which was also seen in the Keogh (2010) study as well.

Despite the mentors dominating the interactions, the mentees all self-reported the VMC sessions as meeting their expectations and improving their overall classroom instruction through

the post-mentoring surveys collected. Compliments played a prominent role in mentor-mentee interactions. Furthermore, based on the five mentoring sessions used in this study, no negative reactions were identified. Although this was their third mentoring session, it may not have been enough for both parties to feel comfortable with negative feedback. Conveying a difference of opinion or introducing complex topics requires a certain amount of trust that may be hard to reach in the short amount of time the pairs spent together. Transparency and trust can help strengthen mentoring relationships (Fries-Britt & Snider, 2015).

The mentors in this study focused on specific compliments from the observation videos while they connected them to the state certification competencies. If there was a question on whether a particular practice was being used, the mentors delicately approached these situations. When they asked a question, they tried to provide a built-in reason to avoid negative interactions. For example, in one instance, the mentor highlighted the importance of peer collaboration to help develop EBs' language skills. The mentor asked if they provided opportunities for peer collaboration. Rather than leaving the question open-ended and creating potential tension, they elaborate and mention the possible safety practices implemented due to the COVID pandemic or that it may not have been captured in this specific lesson since it is just a "small snippet" of their day. Although an assumption cannot be made on whether these were why the strategy of peer collaboration was not evident in the videos or applied in their classroom, the mentee was provided with options on how to respond and save face. Saving face comes from a dramaturgic perspective (Goffman, 1959), focusing on self-expressions in social interactions. Goffman describes *face* as the "positive self-image you seek to establish in social interactions, or the positive social value a person effectively claims for himself" (1967, p. 5). From the videos

analyzed, mentors focused primarily on creating a light and positive environment through compliments and suggestions.

When looking at the VMC sessions individually, the longer sessions showed a similar distribution of interactions between mentor-mentee. These teachers provided more information than the other participants. Additionally, when looking closer at their demographics, the veteran teachers (n=2) were in the longer session duration range when compared to the rest of the teachers. The longer sessions may be due to their experience allowing for richer discussions and a heightened sense of confidence to engage in conversations about their practice.

Research Question 2: What themes are present in the interactions between in-service teachers and their mentors during the VMC sessions?

The VMC sessions were structured in a way where the mentor would use the state certification competencies to guide their sessions while drawing from the observation videos as well. The rate of EBs in public schools has been increasing nationwide for decades and even more rapidly in the state of Texas (NCES, 2022). As of 2019, The National Center for Education Statistics (NCES) reported that close to 1 in 5 students in Texas public schools were classified as EBs. In order to service these students in the classroom, teachers are asked to obtain appropriate teacher certification through state policy and encouraged to participate in relevant professional development. In this study, mentees were preparing to take their ESL certification exam, and therefore EB topics were commonly discussed in all sessions. Out of the five mentees, four self-reported having experience teaching EBs, and all mentees discussed EB topics with their mentors. Historically, teachers have struggled with the complexities of teaching EBs. Research has shown that they may feel unprepared, which poses challenges in meeting their needs (Nutta

et al., 2012; Russakoff, 2011). Providing opportunities to discuss these critical topics, such as VMC sessions, is imperative for the teacher's growth.

The COVID pandemic affected the daily living of many, including the way schools functioned, originating in spring 2020. The data analyzed in this study was just a couple of months after, during the fall of 2020. As teachers adjusted to a new normal and to changing protocols of how teaching and learning took place, challenges naturally emerged. The teachers in this study alluded to difficulties stemming from virtual instruction and worried about its future effects. According to the National Center of Education Statistics (NCES; 2019), only 21% of public schools offered exclusive online courses in the 2017-2018 school year. However, during the school year following the pandemic, which began in August 2020, around 93% of homes in the United States with school-aged children reported some type of virtual instruction taking place in their households (McElrath, 2020). Teachers have been forced to adapt to these new changes while juggling the many tasks that exist with teaching. In this study, the major concern was student achievement. Teachers expressed uneasiness with students lacking social interaction, writing practice, and verbal language skills. Mentors were generally empathetic and were also equipped to share virtual resources for the mentees to consider.

Reflections from authentic teaching experiences have been demonstrated to be a crucial component of teacher growth (Gutierez, 2015). The act of reflecting has been described as "taking a conscious look at emotions, experiences, actions, and responses, and using that information to add to his or her existing knowledge base and reach a higher level of understanding" (p. 127). Mentors paying attention to specific observed instructional practices help tailor feedback and offer the opportunity for meaningful conversations with their mentees. Beyond reflection, using video observations in teacher mentoring has proven effective in many

studies (Mathew et al., 2017). Gifting teachers the opportunity to observe their own teaching is a powerful tool and a solid way to initiate conversations to improve their practice. The mentors in this study alluded to the observation videos when discussing important topics, providing suggestions, or when asking questions. The mentees in this study were all asked in some form how they thought their lesson went. This question typically initiated each session and catapulted into other talking points. Most of the teachers shared feelings that their lessons went well and would add something they wanted to improve. Allowing teachers to share their opinions and share their thoughts is an integral part of their professional growth. These talking points were prepared by the mentor beforehand through the use of a mentoring guide developed by the project. Providing structure to the mentoring sessions can help contribute a focus for the meetings and improve the knowledge and skills of the mentee (Irby & Pugliese, 2020).

Lastly, the VMC sessions showcased a variety of ways that positive relationships were cultivated. In mentoring relationships, engaging in positive interactions is imperative for the sake of creating trust and having a successful partnership (Hudson, 2016). Generally, the VMC sessions included pleasant interactions, lighthearted jokes, and comforting exchanges. Positive interactions were standard with the mentors and did not vary greatly, as seen by the IPA used to analyze them. Mentors have a responsibility to not only initiate the sessions on an enthusiastic note but to maintain that level of engagement throughout the experience. One of the teachers in the sessions had the lowest "Positive Reaction" interactions in the group and did not have any "Friendly" interactions labeled in her session. Specifically, they did not showcase any negative interactions and were fairly neutral throughout the session. The mentee also went on to rate the experience as "highly effective" in the post-mentoring survey and shared that "The best part [of the virtual mentoring] was getting advised of how to help my students." Ultimately, despite the

mentee seeming relatively impartial throughout the session, the mentor maintained a standard level of politeness, and the mentee indicated the VMC experience as effective. Ensuring mentors are not only experienced but adequately trained is fundamental. Preparing them so that they are able to properly respond to mentees in a variety of circumstances can help them with relationship building and coming across as being well-informed in their field. Mentees in this study shared feeling like their mentors were "highly knowledgeable" and that they provided helpful and constructive feedback through their post-mentoring surveys. Being able to provide feedback in a tactful manner is a necessary quality of a mentor and coach. Tschannen-Moran and Carter (2016) found that an important part of coaching, emotional intelligence (i.e. self-awareness, self-regulation, motivation, empathy, and social skills), can be improved through training. When developing VMC interventions, the component of mentor training calls for attention as well.

4.8 Implications

The practical implications of these findings for VMC sessions with teachers are considerable. In the last few years, technology has become an integral part of the everyday classroom (Winter et al., 2021). In addition, national demographic trends suggest that EBs are the fastest-growing student population in the country (Calderón et al., 2011). These two important particulars will heavily influence the content and approach that teachers will receive support in the coming years. Equipping teachers with some form of professional development, such as mentorship, is a strong way to support their growth. Providing it in a virtual manner is an efficient way to do so. Packard (2003) has mentioned that many of the benefits of face-to-face mentorship (i.e. personalized attention, feedback, encouragement) can also be produced by virtual mentorship. Virtual mentoring and coaching can offer more reach across a broad range of populations. Due to geographical constraints, some districts may not be equipped with personnel

knowledgeable about special populations such as EBs. Further research on the number of sessions and their impact on teachers is needed to better investigate a possible link between them. Since these are virtual encounters, perhaps involving numerous meetings could have a positive effect on the mentor-mentee relationships or their interactions.

Teacher turnover has been a significant problem for decades across the country, and the COVID pandemic has only amplified it. One of the reasons teachers leave the workforce is due to not receiving adequate support or training from their schools (Carver-Thomas & Darling-Hammond, 2017). Consequently, there will be a considerable amount of novice teachers arriving in the workforce who will require guidance. As seen in this study, VMC sessions offered mentees not only resources, but instructional feedback, and solidarity as well. Further research is needed on the different types of teachers ranging from novice to veteran, and the impact VMC has on them. Exploring how different types of teachers engage in these VMC sessions could also help in tailoring specific characteristics into them to support them better.

4.9 Conclusion

Over the past few years, professional development has been a crucial topic demanding the attention of various stakeholders. Due to changes such as evolving student demographics and unprecedented events such as a global pandemic, effective ways to support teachers is imperative. Technology offers a way to capably bridge the gap between teachers needing to learn about various subtopics and educators with the knowledge and skills to share with them. Virtual mentorship allows mentors to have a broad reach while placating potential issues such as geographic, monetary, and time constraints. The present study studied the interactions between mentors and their mentees to better understand the dynamics in virtual mentoring and coaching sessions. Through the use of IPA and thematic analysis, the VMC sessions indicated mentors

proficiently supporting teachers through instructional feedback, discussions on relevant topics, and establishing professional relationships.

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CHAPTER V

CONCLUSION

5.1 Summary of Study Significance and Key Findings

Educators come with a range of experiences and work in diverse settings; therefore, they need to have contextually relevant and accessible PD available for them. Advances in technology have offered valuable support in education and have become an increasing necessity over the last couple of years. This dissertation included studies exploring the influence of VMC on in-service teachers and their classroom instruction, perceptions, and overall professional growth. The first chapter arranged a general overview of the three-article format dissertation. The second chapter offered a systematic review on the topic of synchronous VMC and in-service teachers. The third chapter presented findings on the effects VMC had on in-service teachers' instructional practices and perceptions. The fourth chapter explored the recorded interactions between in-service teachers and their mentors during their VMC sessions. Finally, this fifth chapter provides a synthesis of all of the studies and shares the connections between the results.

Chapter I shared the research questions and general overview of the three journal-style manuscript chapters: Chapters II, III, and IV. Chapter II provided an extensive literature review that pulled research related to synchronous VMC over the last decades. This systematic approach allowed me to identify the most relevant research on this specific subject using a precise method and which helped provide a comprehensive background to the studies found in Chapters III and IV. Collecting and analyzing the existing literature led to guiding the research questions and study in Chapter III. In this third chapter, I used the TBOP instrument to measure the professional growth of in-service teachers that took part in VMC sessions and survey responses to identify their perceptions of the entire experience. The systematic literature review also helped

shape the study in Chapter IV since this study analyzed the types, frequencies, and themes of interactions between in-service teachers and their mentors during the recorded VMC sessions.

In the systematic review from Chapter II, I used an orderly approach to search across five databases with particular inclusion and exclusion criteria, which resulted in 11 articles appropriate for the systematic review analysis. I developed a matrix to help me organize and compare information such as sample size, context, duration, mentoring arrangement, and key findings. Across the studies, the virtual mentoring and coaching interventions indicated supporting the mentees' professional development. All except one reported positive teacher outcomes. Ruble et al. (2013) revealed no differences between the treatment and control groups but attributed that to the intervention of mentored participants being comparable and as effective as the in-person mentoring received by the control group. Overall standard practices throughout the studies included reflective practices, additional online resources, hybrid PD (face-to-face interactions), and both structured and unstructured discussions. Most of the studies were in special education and reading settings, and none stated teachers that worked with EBs. Considering the growing EB population, research on VMC in this area is urgently needed. The gap found is what heavily influenced the studies in Chapters III and IV.

In Chapter III, I used data from Project ETELL, which was a five-year federal research project designed to provide in-service teachers from Texas support in obtaining either their bilingual or ESL certification. Staying true to the focus of my dissertation (i.e., VMC), I focused on the treatment group of this larger RCT study. By concentrating my attention on this specific group, I was able to formulate questions and shape my Chapter IV study which looked deeper into mentoring sessions. In Chapter III, I used the TBOP instrument and paid particular attention to the domains of ESL strategy and language content in pre- and post-observation videos

submitted by participants. I found that from the observation videos, there was not a significant change in the use of ESL strategies over the course of the six weeks, but when looking at language content, teachers appeared to increase the rigor of language used. Academic language was a large focus in the VPD course and VMC discussions. Focusing on the findings of ESL strategies, although there was no significant difference in pre- and post-observation videos, specific descriptive characteristics were gathered. Overall, ESL strategies were used half of the time at the beginning and end of the six weeks. From the strategies used, Visual Scaffolding was the most commonly used, followed by Academic Language Scaffolding. Further, although there were no significant changes in strategies used by participants, they did report an overall positive VMC experience. Participants indicated that the VMC intervention helped them with professional growth, self-awareness, and that they appreciated the real-time feedback. Further research with longer interventions or follow-ups past the six weeks could be beneficial to see if more time is needed to observe a change in teacher practices. In the systematic literature from Chapter II, out of the 11 articles found, only one had a similar time frame of six weeks. The rest of the articles indicated longer coaching cycles, with the longest lasting one whole school year. Duration of interventions is an important area to research further when it comes to VMC effectiveness in instructional practices.

In Chapter IV, I used the recorded VMC sessions between mentors and mentees from Project ETELL to examine their interactions and better understand participant experiences from the previous chapter. In Chapter III, teachers indicated positive experiences with the VMC sessions through post-mentoring surveys, and in Chapter IV, I was able to explore the actual interactions between the mentoring dyads. The results from Chapter IV added a different dimension to the data found in the chapters that came before and allowed for a deeper

understanding further discussed in Chapter V. The goal of this chapter is to connect the results from the various chapters, contribute to the growing body of literature on VMC, and provide recommendations for future research.

5.2 Implications and Recommendations

Based on the systematic literature review research from Chapter II, there are many gaps identified. To begin, there were not many empirical studies on synchronous virtual mentoring/coaching identified in public schools in the United States. Of this small number of studies, four were carried out in SPED contexts, and none of them indicated a focus on EBs. Further research on special populations and synchronous VMC can ultimately help effectively tailor interventions for educators and benefit these students. Investigating what supplemental resources were helpful or what specific characteristics had significant impacts can especially help improve mentoring and coaching programs. Specifically, focusing on synchronous virtual interventions is important since these types of interactions offer a more personalized experience than asynchronous interactions (e-mails, texts). Exploring the differences between the two styles, synchronous and asynchronous, is important as well to investigate if there is a large difference in impact on teacher perception and practice.

Additionally, participants from studies in Chapters III and IV indicated having positive experiences and perceived professional growth due to the VMC sessions. These participants never met their mentors face-to-face but found the intervention beneficial for their professional development. In just a few sessions, at least three separate interactions, positive professional rapport was described in post-surveys by participants. Even though there was no significant change in ESL strategies from the study in Chapter III, surveys from Chapters III and IV and coded interactions from Chapter IV indicated positive experiences from teachers. Teacher self-

perception is important since it has been documented to influence drive and effective classroom instruction (Zee & Koomen, 2016). The post-mentoring surveys used in Chapters III and IV were sent to participants after completing the program and were finished with mentor interactions. Therefore, participants would not be influenced in their responses by having to see or interact with their mentor again. The positive experiences reported by teachers suggest a potential for PD developers to provide similar support and be successful in a virtual setting in terms of teacher perception. Although the six weeks may not have been enough to show a change in ESL strategy implementation, it was enough time to help teachers feel as though they grew in a professional manner. Which, in time, can lead to change in their instructional practices.

Finally, the mentors in the studies from Chapters III and IV had prior experience as teachers of EBs and knowledge in the field of second language acquisition due to their educational degrees and certifications. They were also unfamiliar with their mentees, who came from districts all over Texas, ranging from urban, suburban, and rural areas. Pairing the knowledge that the mentors had along with being unfamiliar with the teachers and their schools were characteristics present in the studies carried out in Chapters III and IV. Further research can be done in this area of virtual mentors and how being familiar or unfamiliar with teachers can influence their mentoring interactions and instructional practice. The results I found suggest that PD creators can implement well-received VMC and VPD with three mentoring sessions across a six-week time frame. Current districts may struggle to staff a mentor or coach in each school, so allowing them to deliver support in a virtual manner can help with maximizing resources and reaching more educators.

Findings from this dissertation help better describe and understand the VMC process and contribute to this growing body of research. Based on the findings, I have developed three

recommendations to support the development and implementation of future VMC programs for in-service teachers:

1. Training mentors on mentoring and coaching strategies can help ensure mentors are consistently interacting with mentees in a positive manner and therefore create positive teacher experiences. As seen in Chapter IV, some teachers may not display positive reactions (friendly cues, joking), but may still be engaged and internalizing information. Mentors have an obligation to remain consistent and provide encouraging support during their sessions.
2. The mentee should have knowledge and experience in the area they will be providing VMC on. Having this background sparks relevant discussions between the two led by the mentor and can provide relevant guidance. Considering there are more and more novice teachers entering the profession as vacancies grow, a knowledgeable mentor is essential to nurture them.
3. VMC sessions should be organized and have clear goals understood by both parties. For example, the goal of the VMC interventions of these studies was to further teacher understanding of EBs and get them to become ESL-certified teachers. Therefore, the mentors centered their discussion points and feedback around these subjects while also allowing flexibility if these conversations branched off into other topics. Having clear objectives can also encourage teachers to ask questions centered around the established topics.

Conducting further research on VMC with different contexts such as duration, types of teachers (novice vs. experienced), and length of sessions can provide further information on the effective characteristics of these interventions. As previously mentioned, many of the studies

analyzed in Chapter II included various durations of the interventions. The amount of time some school districts can invest in a PD like VMC can largely depend on their resources and funds, so research on the effects of different-length programs can help guide future intervention developments. In looking at the duration of the sessions themselves, in Chapter IV, I noticed the veteran teachers (10+ years of experience) seemed to have more extended discussions with the mentors when compared to the novice teachers. Since the duration of sessions can also vary depending on the experience of the mentee, further exploration can help provide more information if this is the case with a larger sample.

Considering recent events, such as COVID-19, as well as the evolution that technology has had on mentoring and coaching throughout the years, additional research on VMC can undoubtedly benefit the future of education. The findings from the different chapters in this dissertation suggest that VMC has the potential to influence teacher perceptions and instructional practices. Future research focusing on synchronous VMC will help further promote flexible ways to help support not only teachers working in a variety of contexts but also the students in their classrooms.

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APPENDIX A

I used the following syntax regarding my initial search: (AB (“virtual mentor*” OR “online mentor*” OR e-mentor*) AND DE (beginning teachers OR experienced teachers OR teachers OR elementary school teachers OR middle school teachers OR secondary school teachers) AND TI (“in-service teacher*” OR “beginning teachers” OR “experienced teacher” OR "teacher*").

To ensure a thorough search, a second search using the following syntax was also used: (TI ("mentor*" OR "coach*" OR "e-mentor*") AND (TI (“virtual*” OR "online" OR "web-based"))) OR AB ("mentor*" OR "coach*" OR "e-mentor*")) AND (DE (beginning teachers OR experienced teachers OR teachers OR elementary school teachers OR middle school teachers OR secondary school teachers) AND TI (“in-service teacher*” OR “beginning teachers” OR “experienced teacher” OR "teacher*") OR AB (“in-service teacher*” OR “beginning teachers” OR “experienced teacher” OR "teacher*"))