Fall 12-2020

The Effects of Self-Regulated Learning Training on Teachers' Self-Regulated Learning, Self-Efficacy for Teaching, and Perceived Instructional Effectiveness in Computer-Supported Collaborative Learning Environments

Melissa Quackenbush
Old Dominion University, mquackenbush@mac.com

THE EFFECTS OF SELF-REGULATED LEARNING TRAINING ON TEACHERS' SELF-REGULATED LEARNING, SELF-EFFICACY FOR TEACHING, AND PERCEIVED INSTRUCTIONAL EFFECTIVENESS IN COMPUTER-SUPPORTED COLLABORATIVE LEARNING ENVIRONMENTS

by

Melissa Quackenbush
B.S. May 2007, Southeastern University, Florida
M.A. May 2009, University of South Florida
Ed.S. May 2012, Liberty University, Virginia

A Dissertation Submitted to the Faculty of
Old Dominion University in Partial Fulfillment of the
Requirements of the Degree of

DOCTOR OF PHILOSOPHY

EDUCATIONAL PSYCHOLOGY AND PROGRAM EVALUATION

OLD DOMINION UNIVERSITY
December 2020

Dissertation Committee:

Dr. Linda Bol (Chair)

Dr. Timothy Cleary (Member)

Dr. Joanna Garner (Member)

Dr. Tony Perez (Member)

ABSTRACT

THE EFFECTS OF SELF-REGULATED LEARNING TRAINING ON TEACHERS' SELF-REGULATED LEARNING, SELF-EFFICACY FOR TEACHING, AND PERCEIVED INSTRUCTIONAL EFFECTIVENESS IN COMPUTER-SUPPORTED COLLABORATIVE LEARNING ENVIRONMENTS

Melissa Quackenbush
Old Dominion University, 2020
Director: Dr. Linda Bol

The effects of training on teachers' self-regulated learning (SRL), self-efficacy for teaching, and perceived instructional effectiveness in computer-supported collaborative learning (CSCL) environments were investigated. Participants were 80 K-12 teachers who had recently transitioned to teaching in a CSCL environment when schools closed in response to the COVID-19 pandemic. The researcher also explored how teachers use SRL skills in their learning and instruction. Training consisted of weekly collaborative meetings addressing pedagogy and technology connections. Participants in the treatment group received explicit training in SRL and practice applying concepts to their learning and instruction. Participants in both group conditions engaged in activities fostering reflection, goal setting, planning, monitoring, and motivation for learning and teaching in a CSCL environment. The quantitative results revealed no group differences between teachers' SRL, self-efficacy for teaching, and perceived instructional effectiveness in CSCL. However, analyses of follow-up interviews and participants' weekly reflections throughout the training intervention showed teachers in the treatment group more frequently and with greater specificity described their SRL skills by comparison to the teachers who did not receive explicit SRL training. These findings suggest training in SRL in CSCL environments likely contributes to teachers' professional knowledge and skills as instructors in CSCL environments. Additionally, the granularity of measures likely impacts detection of SRL, self-efficacy for teaching, and perceived instructional effectiveness in CSCL environments.

For Myles and Emery. Your presence in my life is a gift of life-long learning. May you both pursue your passions whole-heartedly.

ACKNOWLEDGMENTS

This project would not have come to fruition without the incredible community of scholars and students at Old Dominion University. First and foremost, to Dr. Linda Bol, your grace and unwavering support of my growth as a student and professional is a gift I will forever cherish. I wish every doctoral candidate the fortune of working with a Chair as generous, intelligent, and dedicated as you are. Your wisdom and understanding have helped me achieve this accomplishment, but more importantly, you have impacted life. I am forever grateful for having you as my role model, mentor, and advisor during this journey.

To my incredible committee members, Dr. Tony Perez, Dr. Joanna Garner, and Dr. Timothy Cleary, your time and expertise elevated the quality of this project, and I look forward to future research where I may apply the lessons from your incredible feedback.

To Dr. Shana Pribesh, thank you for taking and returning my call. It made all the difference in recruiting me. To Ms. Deidre Hall, thank you for your logistical superpowers. To Mr. Michael Ruffin, thank you for being my hands and feet on campus. I literally would not have gotten to class without you.

To Ms. Arianna Levatich, Ms. Natalie Cruz, Ms. Wanda Brooks, Ms. Yuanyuan Yen, and Ms. Melissa Kuhn, you are a dream team, and I am forever grateful for your collective genius and collegiality.

To Dr. Julia Morris, your humor and insight illuminate every situation, and may your sparkle never tarnish. Thank you for being a bright star along this path. Forever grateful for eighties music and ab dollies.

To Dr. Meghan Madonna, your presence in my life during our boys' Pre-K year was no accident. Thank you for being a constant cheerleader and champion of working, nerdy moms.

To Dr. Dan Johnson & the Butler Bulldogs; Mr. Nicholas Cipriano & the Wood-Ridge Blue Devils; Dr. Angela Bender & the Ridgefield Park Scarlets; Mrs. Deb Ostrowski & the Saint Elizabeth Saints; Dr. Sue DeNobile & the Rochelle Park Lions; and Dr. Peter Hughes and the Haworth Hawks – without your vision and collaboration, this project would not have been possible. Thank you for your incredible leadership in K-12 education. While pursuing this path of learning has been a privilege, getting to know each of you and your amazing teachers is the best gift of all. May this work support future educators.

To my extraordinary writing team – Dr. Christine Tulley Ms. Janine Glase, and Mr. Chris Black. Thank you for your collaboration. Your talent amazes me, and I am so grateful this project brought our paths together.

To my incredible family – The Quackenbushs and the Overlys. Your belief in my abilities, support of my efforts, and love for our family enabled this achievement. I share this accomplishment with each of you, especially with my wonderful hubby, Dan. This is yours as much as it is mine. Thank you for giving me the support I needed to "itch this scratch."

Last, but not least, to the magnificent Ms. Mary Oates. You are a mentor, a mother, a friend, and an angel. For every minute gave me, every nugget of wisdom, and every emotion you weathered with me, I am forever grateful. I hope I become half the intelligent, generous, and gracious woman and educational leader you are.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

Introduction

In response to the global COVID-19 pandemic, brick and mortar schools in the United States abruptly moved to distance learning. While the amount of time and conditions for these closures varied (Nottingham, 2020), countless teachers and students faced a rapid transition to online instruction (Ebrahimji, 2020). This expectation came without sufficient time for educators to prepare and receive training in maintaining students' learning at a distance in a computer-supported collaborative learning (CSCL) environment. This rapid change was especially disconcerting for teachers, because the knowledge and skills utilized for instructional effectiveness in CSCL environments differed from the instructional and assessment strategies used in traditional classroom instruction (Strijbos et al., 2004). As a result of the rapid shift to online instruction, educators were faced with the unprecedented challenge of self-regulating learning (SRL) in different contexts, using new technologies, and adapting pedagogy while simultaneously supporting students' and frequently their parents' learning in a CSCL environment.

Educational programming is a necessity for social and economic stability (Mitra, 2011), especially during times of historic change. As such, pre- and in-service teacher training should prioritize knowledge and skills essential for teachers to keep pace with the 21st century's ever-changing educational landscape. Teaching in the 21st century necessitates the ability to adapt instruction and seamlessly transition among content delivery mediums (e.g., face-to-face or CSCL) (Triquet et al., 2017; Valtonen et al., 2017). Qualities of technological and pedagogical dexterity have been associated with characteristics of effective instruction (Kramarski & Michalsky, 2015; Wandler & Imbriale, 2017), and instructional effectiveness has been shown to

significantly impact student achievement (Basileo & Marzano, 2016; Durlak et al., 2011; Hattie, 2016; Strong et al., 2011). In order to support students' academic achievement and maintain social stability through educational structures, it is critical teacher training emphasizes the development and adaptability of teachers' technological and pedagogical knowledge and skills.

In the following sections of this chapter, I introduce the concepts of SRL and CSCL, as well as provide a brief overview of what is known and unknown about their applications within K-12 educational settings. These conceptual connections point toward the need for teacher SRL training in CSCL environments. This inquiry extends current understandings of SRL and CSCL research, teacher preparation and professional development, and instructional design and technology. Through these theoretical and conceptual lenses, I clarify the purpose and significance of this study and present the three research questions guiding this research project.

Self-Regulated Learning and K-12 Educational Settings

Prior educational research linked academic underachievement to deficits in students' SRL skills (Bol & Garner, 2010; Cleary & Zimmerman, 2004; Dembo & Eaton, 2000; DiPerna, 2006). Despite being a cornerstone of social-cognitive learning theory (Bandura, 1986), SRL skills have often been a missing, yet critical, component of formal education (Hacker & Bol, in press). SRL refers to "(meta)cognitive, motivational, and affective processes that learners use to systematically focus their thoughts, feelings, and actions on the attainment of their learning goals" (Schunk, 2016, p. 34). Therefore, if these skills are found to be missing from a students' academic repertoire, growth, achievement, and motivation for life-long learning may be irreparably stunted (Dweck, 2003; Zimmerman & Kitsantas, 2005).

A teacher's role in supporting students' SRL is critical. Students' academic self-efficacy has been shown to develop with support from social and environmental influences, such as a

teacher's explanation and modeling of self-regulatory strategies (Schunk, 2016). A growing body of research in SRL demonstrated teacher training in SRL strategies is an effective way of improving students' academic performance (Cleary & Platten, 2013; Cleary et al., 2008; Dignath & Büttner, 2008). Like other skills, students can be taught SRL skills and processes and become better self-regulated learners (Schunk, 2016). Unfortunately, research in SRL has shown few teachers possess the necessary knowledge and pedagogical skills to teach and promote the use of SRL in their classrooms (Spruce & Bol, 2015; Dignath-van Ewijk & van der Werf, 2012; Tillema & Kremer-Hayon, 2002; Wehmeyer et al., 2000).

The Need for Teacher Self-Regulated Learning Training

Research in SRL has investigated factors contributing to students' SRL development in both traditional instruction and CSCL environments, including the context of the classroom and the role of the teacher (Dignath & Büttner, 2018; Hadwin et al., 2018; Panadero et al., 2016; Perry et al., 2008). Notably, research showed that while K-12 teachers believe SRL is important, SRL strategies were often absent in their instruction (Spruce & Bol, 2015; Dignath-van Ewijk & van der Werf, 2012;). This discrepancy in K-12 teacher perception and practice has led to a limited number of studies examining the effects of teacher training in SRL (Buzza & Allinotte, 2013; Ganda & Boruchovitch, 2018; Kramarski & Michalsky, 2015; Peeters et al., 2014; Tillema & Kremer-Hayton, 2002). Implications from these studies pointed to the need for teachers to receive ongoing training in order to more effectively implement SRL strategies in their practice (Spruce & Bol, 2015; Allshouse, 2016; Dignath & Büttner, 2018; Perry et al., 2006; Butler et al., 2006). Teacher training has been shown to impact self-efficacy for teaching and instructional effectiveness (Karimi, 2011; Tschannen-Moran & McMaster, 2009). Since these are factors

interconnected with SRL processes, it is important they be included in investigations of the impact of teacher SRL training.

Computer-Supported Collaborative Learning in K-12 Educational Settings

Historically considered a progressive pedagogical approach (Koschmann, 2012), the field of CSCL has evolved with advancements in technology and pedagogy over the last thirty years (Resta & Laferrière, 2007). CSCL has been characterized by learning via social interactions using a computer connected to the Internet. CSCL can take place in face-to-face or online classroom environments, as well as synchronously or asynchronously (Stahl et al., 2006). While CSCL has been used ubiquitously in higher education and for training in healthcare, the military, and corporate industries, the field of K-12 education has been slow to implement CSCL pedagogy (Zhu, 2013). As a result, opportunities for teachers to develop their technological and pedagogical proficiencies and effectively contribute to students' life-long learning have been limited in K-12 education settings (Loyalka et al., 2019). These hinderances to teacher learning and professional development further limits teachers' opportunities to develop personal awareness of and use of SRL skills. Consequently, teachers' life-long learning and growth are potentially stunted. In academic settings, life-long learning is a value generally purported to be cultivated.

Teacher Self-Regulated Learning Training in Computer-Supported Collaborative Learning Environments

Central to the learning and growth process is SRL. SRL has been shown to involve being behaviorally, cognitively, metacognitively, and motivationally active in one's learning and performance (Schunk & Greene, 2018; Zimmerman, 2001). Research in CSCL has highlighted the centrality of SRL for knowledge construction and effective collaboration. Knowledge

construction and effective collaboration are enduring educational goals shared by educators and educational stakeholders (Reimann & Bannert, 2018). SRL has been examined in both traditional instruction and CSCL environments. In both contexts, SRL skills have been linked to achievement (Broadbent & Poon, 2015; Cleary & Kitsantas, 2017; Wolters & Hussain, 2015; Zimmerman, 2001), self-efficacy (Cho & Shen, 2013; Moos & Azevedo, 2008; Panadero et al., 2017), and instructional effectiveness (Järvelä et al., 2015; Muijs et al., 2014). Despite research identifying the positive impact of SRL skills in CSCL, teacher training opportunities in either SRL or CSCL have been shown to be limited on their own.

Additional limitations in K-12 education settings include resources of time and money; therefore, by combining SRL training with CSCL training, educational leaders may find a worthwhile solution in their search to support teachers' technological and pedagogical needs most effectively and efficiently. As teachers experience opportunities to apply new understandings and skills, their SRL awareness has the opportunity to develop. This personal growth will likely contribute to teachers' self-efficacy for teaching and instructional effectiveness. Teachers' self-efficacy for teaching and instructional effectiveness have been shown to contribute to students' academic success.

Purpose of the Study

Despite the corpus of research in the fields of SRL and CSCL, an investigation of the impact of K-12 teacher training focusing on SRL skills and CSCL pedagogy has yet to be explored. The purpose of this study was to examine the effects of instructional coaching on teachers' self-regulated learning, their self-efficacy for teaching, and perceived instructional effectiveness in CSCL environments. These are factors related to SRL theory. SRL contributes to

one's motivation and the commitment to grow professionally. Results of this study have the potential to extend what is presently known about SRL in CSCL environments.

An experiment was conducted to determine the impact of instructional coaching on teachers' self-regulation of learning, self-efficacy for teaching, and perceived instructional effectiveness in a CSCL environment when compared by training focus (e.g., CSCL pedagogy only versus CSCL and SRL pedagogies). By collecting both quantitative and qualitative data from a sample of K-12 teachers instructing students in CSCL environments, the results of this study aim to address the following three questions:

1. How does instructional coaching with and without SRL affect teachers' SRL, self-efficacy for teaching, and perception of their instructional effectiveness in computer-supported collaborative learning environments?
2. How do teachers in this study use SRL skills for their own learning and in their instruction with students?
3. How do teachers' who receive additional SRL training differ in how they use SRL in learning and in their instruction?

In the next chapter, I present the theoretical framework of SRL, and I synthesize the research in the fields of SRL and CSCL separately. Since research in SRL and CSCL in K-12 education settings is limited, the review of the existing literature provides the foundation for examining SRL in CSCL contexts.

CHAPTER 2

In Chapter One, I introduced the current, and increasingly critical issue of teacher training prioritizing self-regulated learning (SRL) skills in computer-supported collaborative learning (CSCL) environments. In order to understand how to most effectively support teachers in their development of SRL for instruction in CSCL environments, I conducted a review of literature in the areas of teacher SRL training, SRL in CSCL, CSCL strategies, and teachers' self-efficacy for teaching in CSCL environments. I focused my review on a small cross-section of research examining pre- and in-service teacher SRL training in CSCL environments. Trending issues from this research overview include: 1) the impact of SRL skills for academic success, 2) the influence of the teacher on students' SRL development, 3) teacher SRL development, 4) teacher CSCL pedagogy training in K-12 educational settings, and 5) tools and strategies supporting SRL in CSCL environments. The following literature review examines these issues and makes connections to inform the focus and methods for this study.

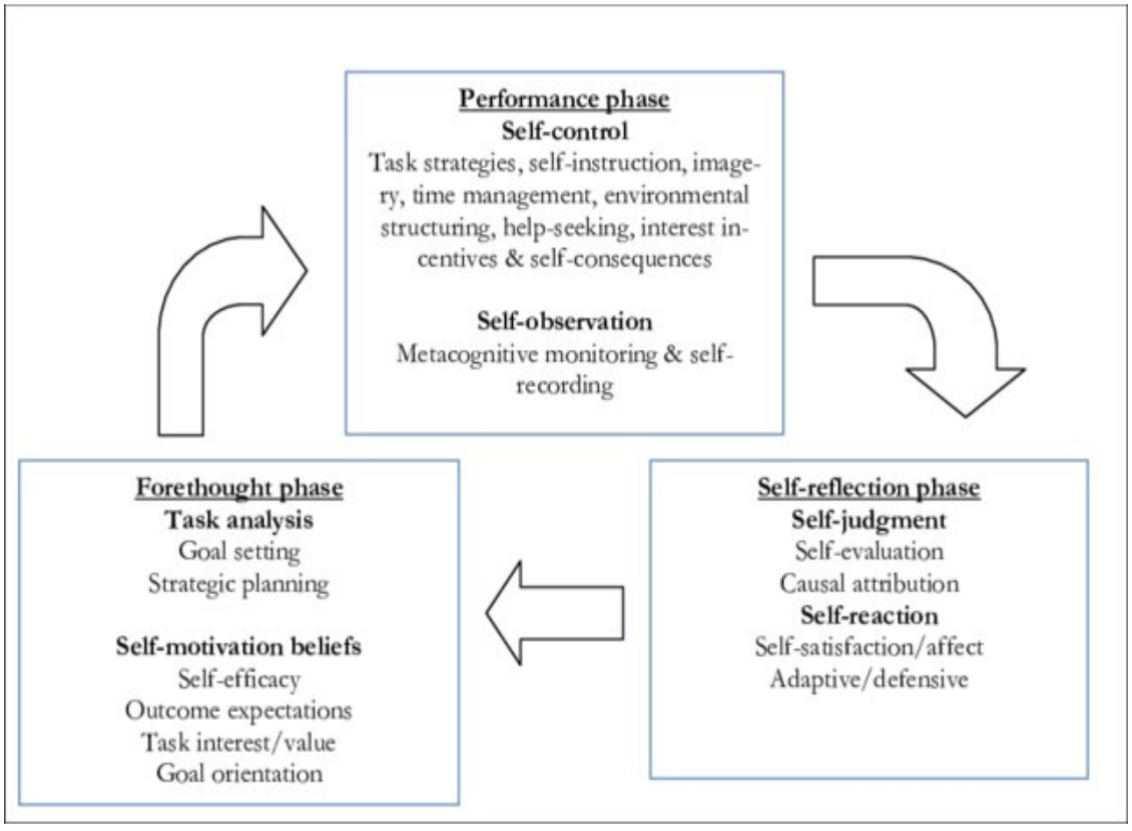
Self-Regulated Learning Theoretical Framework

In the last thirty years, research in the area of SRL has progressed because there is a desire to understand how individuals learn and how to best support the learning and growth process, especially when challenges arise. Historically, SRL theory has taken a broad view of human thinking, emotion, and behavior as a "continual process of moving toward and sometimes away from goals," and this process is fueled by feedback and self-corrective adjustments (Carver & Scheier, 2011, p. 134). In other words, as individuals identify goals, they strategically organize and control thoughts, feelings, and behaviors to achieve these goals (Schunk & Usher, 2013). Information from others or the environment provides feedback, allowing individuals to monitor their progress and adjust their thoughts, emotions, and behavior. This self-evaluation and

reflection advance the regulation cycle, and motivation for the goal is impacted. Zimmerman (2000) developed a three-phase model to capture this cyclical and dynamic phenomenon. While others have developed SRL models (Boekaerts, 1991, 1996; Efklides, 2011; Hadwin et al., 2011; Pintrich, 2000; Winne & Hadwin, 1998), this study used Zimmerman's model as the theoretical framework to conceptualize SRL. In keeping with the recommendations from the field to select the SRL model that most closely aligns to the line of inquiry (Panadero, 2017), I present Zimmerman's SRL model in Figure 1. The phases are shown to illustrate the nature of an individuals' cognitive, affective, and behavioral experiences before, during, and after a learning event. These phases are key components in this study's intervention framework and measurements.

Figure 1

Zimmerman's Model of SRL



Forethought Phase

The first phase in Zimmerman's (2000) model is called the forethought phase, during which individuals employ processes for the preparation of learning. Key concepts and features of the forethought phase are goal setting, motivation, and planning for learning events that occur during the second phase of the model.

Performance Phase

The second phase of the model is referred to as the performance phase. In this phase, individuals are engaged in the deployment and monitoring of strategies to regulate their thoughts, feelings, and behaviors toward the execution of academic tasks. Individuals use self-observation and self-control strategies, including metacognitive strategies, to monitor progress and maintain motivation during the performance phase.

Reflection Phase

The third phase in Zimmerman's SRL model (2000) is known as the reflection phase. During this phase an individual employs self-reflection to judge and evaluate their learning. It can include the learning processes, products or learning outcomes, and content or skills. While each phase of SRL is important, the self-reflection phase has been shown to influence future academic motivation and one's self-efficacy and academic achievement (Doménech-Betoret et al., 2017).

Theoretical Definitions of Variables

In addition to examining SRL, this study investigates two additional theoretical constructs – self-efficacy for teaching and perceptions of instructional effectiveness in CSCL environments. A teachers' sense of self-efficacy for teaching is a judgement of "his or her capabilities to bring about desired outcomes of student engagement and learning, even among

those students who may be difficult or unmotivated" (Doménech-Betoret et al., 2017, p. 783). Instructional effectiveness encompasses a teacher's ability to plan and prepare instruction, create a classroom environment conducive for learning, deliver instruction, and attend to professional responsibilities (Basileo & Marzano, 2016; Stronge, et al., 2011). A teacher's perception of their instructional effectiveness has been shown to be critical for reflection and professional growth (Wright & Grenier, 2007).

Summary

Zimmerman's conceptual understanding of SRL (2000) has provided researchers a myriad of avenues in which to examine the nature of individual learning and academic performance. Within the basic domains of SRL (e.g. social cognitive, cognition and metacognition, developmental trajectories, and co- and shared regulation), a growing interest in SRL research comes from the area of metacognition in motivation and affect. This branch of research within SRL examines relationships between learners' thinking and emotions. Previous research in this field showed "affective responses (i.e., positive or negative affect and discrete emotions) are present from the beginning to the end of an SRL event" (Efklides, et al., 2018, p. 185). Thus, an individual's self-efficacy and perception of his or her performance have theoretical significance in SRL research.

Another expanding area of SRL research involves incorporating SRL in CSCL contexts, in order to explore the combined role of technology, collaborative learning, and knowledge construction (Reimann & Bannert, 2018). With the historic transition of K-12 schools to distance learning as a result of the recent global health pandemic, the theoretical framework of SRL provides a solid foundation for an investigation of (meta)cognitive, affective, and behavioral changes in teaching and learning.

Self-Regulated Learning and K-12 Educational Settings

The context of focus for this research study is K-12 educational settings. SRL research in K-12 educational settings generally follow three trends: 1) research focusing on students and SRL's impact on learning outcomes, 2) research focusing on classroom contexts and teachers' pedagogical choices, and 3) research focusing on teachers' SRL beliefs, knowledge, and skills.

Self-Regulated Learning and Student Learning

Previous research focusing on students' SRL drew upon process data, think aloud strategies, and classroom observation of students engaged in learning tasks (Moos & Miller, 2015; Moos & Stewart, 2018) in order to identify the impact of SRL on students' learning outcomes. Often these studies utilized technology developed specifically to gather SRL data during learning events (Azevedo et al., 2015; Cloude et al., 2018; Malmberg et al., 2010; Winne & Hadwin, 2013). However, other studies relied upon observations of students involved in learning experiences within classroom settings (Spruce & Bol, 2015; Dignath & Büttner, 2008; Perry et al., 2015). A key finding based on this research was that student academic achievement and motivation is positively affected by effective regulation of learning (Moos, 2019). Implications from this research point toward student academic success can be developed through specific instructional strategies and classroom contexts, as well as by the role of the teacher.

Self-Regulated Learning and the Classroom

Research on SRL in the context of classroom practices has provided evidence that SRL processes are teachable (Dunlosky et al., 2013; Moore et al., 2012; Perry et al., 2015; Schunk & Greene, 2018; Sitzmann & Ely, 2011; Winne, 2018). In reviews of strategy interventions, explicit SRL instruction led to increases in students' academic performance and motivation (Greene et al., 2015). For example, the use of homework logs (Bembenutty et al., 2013) and self-

regulated strategy development (SRSD) (Harris & Graham, 2009) are instructional approaches identified in the literature as assisting students in learning, using, and adopting effective strategies. Additionally, research on contextual features of classrooms (e.g., balance of rigor and autonomy, challenge controlled through modified tasks, and the use of non-threatening evaluation practices) has supported the finding that students benefit from explicit instruction on how to learn (Brown, et al., 1984; Pintrich, 2004; Pressley, 1995). Clearly, research on classroom practices and instructional strategies reinforce that SRL is a key component of learning and performance.

Self-Regulated Learning and the Teacher

While SRL is a key component of student achievement and students' SRL can develop with instruction, "SRL is frustratingly difficult to support as a teacher" (Moos, 2019, np.). The challenge of supporting students' SRL is evidenced in the conflicting results from research focusing on the teachers' role in SRL development. For example, Winne (2004) found there is limited access or support for strategies and tactics in the classroom often as a result of hinderances from the teacher. Other studies show limited growth in teacher SRL knowledge and use of SRL strategies across multiple developmental groups (Barr & Askell-Williams, 2019; Schneider-Cline, 2017). Additional research demonstrated limited explicit teaching of SRL in classrooms by teachers (Spruce & Bol, 2015; Bjork et al., 2013; Dignath & Buttner, 2018; Cleary & Kitsantas, 2017)**.** Despite the well-established body of evidence supporting the positive impacts of SRL and evidence providing accessible strategies to support SRL, research exploring the relationship between SRL development and the classroom teacher remains ripe for further investigation.

Summary

Regulation of learning in K-12 educational settings is central to academic success. Prior research in these contexts consistently demonstrate the importance of understanding and applying SRL strategies at different levels of the environment – student, classroom, or teacher. This study examines how to best develop teachers' SRL and how these efforts impacted teachers' self-efficacy for teaching and instructional effectiveness in CSCL environments, a format gaining momentum in 21st century.

Teachers' Self-Regulated Learning

Teachers' SRL includes beliefs and knowledge about their learning and their instruction. This "dual role" of SRL is unique to teachers (Kramarski & Michalsky, 2009), and previous research has examined the factors that influence and shape teachers' SRL as learners and facilitators of students' learning (Spruce & Bol, 2015; Perry et al., 2008). The following sections outline the research investigated how teachers' SRL beliefs and knowledge impact their practices.

Teachers' Self-Regulated Learning Beliefs and Knowledge

Research examining teachers' SRL beliefs and knowledge provides an interesting perspective into the conflicts between teachers' values and the actions they take during instruction (Spruce & Bol, 2015; Hadewin et al., 2011; Moos & Pitton, 2014). A common finding among previous studies is that most teachers believed in the concept of supporting students to become self-regulated and life-long learners (Perry et al., 2008); however, they often lacked the pedagogical knowledge to make their implicit beliefs explicit to students during instruction (Spruce & Bol, 2015; Dignath-van Ewijk et al., 2013). Lawson et al. (2018) addressed the conflict between teacher beliefs and their behavior describing a commonly held

assumption that academic success reflects a sophisticated knowledge of how to learn. For example, in the United States, pre-service teachers typically meet high benchmarks throughout their undergraduate teacher training program. This achievement reflects a reality that teachers are typically self-regulated learners themselves. However, research on high performing undergraduates –such as pre-service teachers – has shown these students have limited awareness of effective SRL strategies and metacognitive awareness/control (Ganda & Boruchovitch, 2018; Kornell & Bjork, 2007; McCabe, 2011). Thus, K-12 classrooms are populated with teachers lacking fundamental SRL knowledge and skills to support students' learning processes despite what they say they believe about supporting students' life-long learning.

Teachers' Self-Regulated Learning Practices

Most teachers have been shown to be self-regulated learners themselves, and previous studies have examined how teachers self-regulate their learning. The results from research on teachers' SRL beliefs, knowledge, and practices, reveals that teachers' use of SRL is superficial and limited without SRL prompting (Moos & Miller, 2015). By using multiple group conditions, Moos and Olson (2016) identified that deep SRL does not occur until there is prompting across all three phases of SRL. The key finding from these studies is that in the absence of prompts or scaffolding, pre-service teachers engaged in limited SRL (Karpicke, 2009; Kornell & Bjork, 2007, Lopez et al., 2013; McCabe, 2011). Teachers cannot teach what they do not possess themselves. Therefore, teacher training needs to provide opportunities for teachers to develop awareness of SRL and practice SRL both personally and in their instructional planning and delivery to ensure students' academic needs are effectively supported.

Teachers' Self-Regulated Learning and Self-Efficacy for Teaching

Teachers' SRL has been shown to encompass motivation and affective domains in addition to (meta)cognition and behavior (Efklides et al., 2018). When SRL was examined through motivational orientations, self-efficacy played an important role (Dignath-van Ewijk, 2017). According to Tschannen-Moran and Woolfolk-Hoy (2001), teachers' sense of self-efficacy is a judgement of "his or her capabilities to bring about desired outcomes of student engagement and learning, even among those students who may be difficult or unmotivated" (p. 783). Teacher behavior is strongly influenced by their self-efficacy as evidenced in research demonstrating how teachers' self-efficacy for teaching is related to students' achievement (Mahmoee & Pirkamali, 2013), motivation (Mojavezi & Tamiz, 2012), and students' own sense of self-efficacy (Corkett et al., 2011). Other studies have shown how teachers' self-efficacy for teaching is related to their effort invested in teaching (Skaalvik & Skaalvik, 2007), level of aspiration for student learning (Mohamadi & Asadzadeh, 2012), and persistence in the face of challenges (Poellhuber et al., 2008).

Like SRL, self-efficacy impacts both students' and teachers' learning and performance. Additionally, teachers with a strong sense of efficacy tend to exhibit greater levels of SRL (e.g., planning and organization), and they "are more willing to experiment with new methods to meet the needs of their students" (Tschannen-Moran & Woolfolk-Hoy, 2001; p. 783). With regard to SRL use, Chatzistamatiou et al. (2014) found that teachers' self-reported strategies to enhance students' SRL in mathematics were predicted by their own self-efficacy beliefs. Furthermore, research has shown teachers' self-efficacy for teaching can be developed through training experiences, and confirm the finding that SRL can be taught and learned (Dunlosky et al., 2013; Moore et al., 2012; Schunk & Greene, 2018; Sitzmann & Ely, 2011; Perry et al., 2015; Winne,

2018). This combination of studies suggests teachers' SRL and self-efficacy positively impact teachers' overall instructional effectiveness, and training opportunities fostering SRL knowledge and application in practice will impact teachers' and students' learning and performance in K-12 educational settings.

Teachers' Self-Regulated Learning and Instructional Effectiveness

Teachers' SRL has been linked to instructional effectiveness (Astleitner, 2005; Astleitner & Pasuchin, 2007). Instructional effectiveness is among the key factors contributing to student academic achievement and teachers' motivation and commitment to educational excellence (Hattie, 2016). In a landmark study on student achievement, Stronge, Ward and Grant (2011) concluded, "The common denominator in school improvement and student success *is* the teacher" (p. 211). Illustrative of this point was data collected from teacher evaluation studies from eleven countries using *The Art and Science of Teaching* model. The results of this study indicated a positive and correlation between an effective teacher and student growth in an academic year (Basileo & Marzano, 2016). Furthermore, research examining over 250 factors contributing to student achievement identified teacher estimates of student achievement as the factor with the largest effect size ($d = 1.62$) (Durlak et al., 2011). Teacher estimates of student achievement is the accuracy of teachers' knowledge of their students and how that knowledge determines classroom instruction. The relationship between instructional effectiveness and teachers' SRL offers opportunity to identify professional development support for pre-service and in-service teachers.

To achieve strong instructional effectiveness ratings, teacher training has been found to support teachers' professional growth (Duffin et al., 2012). In addition to content knowledge and pedagogical skills, teachers need efficacy for teaching. Self-efficacy comes, in part, from

teachers' SRL. With the additional understanding of SRL, teachers' potential to develop as highly effective instructors has shown to increase, as they are more adept at helping students learn how to learn regardless of the content area or grade level (Moos, 2019). As previously discussed, research demonstrated a significant connection between SRL and student achievement (Winne, 2018). Student achievement is impacted by two leading factors - the empowerment of students' SRL skills and qualities pertaining to teacher effectiveness (Cleary, 2018; Stronge et al., 2011).

Summary

The line of research investigating connections between teachers' SRL beliefs, knowledge, and practice reveal contradictions about teachers' values and their actions in the classroom. By investigating teachers' SRL use during their own learning experiences, teacher training experiences and professional support structures may be designed to enhance educators' support and modeling of life-long learning skills for students' growth and development. Professional development experiences are already a common practice in the field of education, and research on improving these experiences to develop teachers' SRL beliefs, knowledge, and skills more effectively is invaluable compared to the loss of human potential if left unexamined.

Developing Teachers' Self-Regulated Learning through Training

Implications from the research on teachers' SRL beliefs, knowledge, and practices imply training programs need to support increasing SRL in K-12 educational settings. But how is this increase in SRL in K-12 educational settings achieved most effectively? Research has examined how to support pre- and in-service teachers through a variety of training formats, including coursework, computer-mediated supports, mentoring, traditional workshops, and instructional coaching. The goals of these training opportunities are focused on producing teachers with

characteristics of highly effective instruction, and a key finding from these studies is that ongoing teacher training (e.g., instructional coaching) is needed to fully support teachers' implementation of SRL in both their own learning and their instruction with students. The process of becoming fully regulated in one's learning takes time (Moos, 2019). Thus, a relationship with an instructional coach may offer the support needed to develop both the science and art of masterfully implementing SRL strategies in instructional practice.

Teacher SRL training aligned to Zimmerman's theoretical framework is necessary to support teachers' growth as self-regulated learners poised to support students' SRL (Allshouse, 2016; Butler et al., 2004). Teacher training in SRL should emphasize the importance of "learning how to learn" in the context of a teachers' grade level, content area, and specialization in order to underscore the contextual nature and personal process for all learners (Butler et al., 2004; Krecic & Grmek, 2010; Kramarski & Michalsky, 2009). Once these learning targets and knowledge goals are established, teachers can begin to develop personalized instructional approaches for themselves and their students. When presented with examples of effective practice, teachers will have the opportunity to discover individual teaching styles representative of SRL. Changes in teachers' instructional practice will likely contribute to alternative beliefs about supporting students' learning with SRL strategies (Krecic & Grmek, 2010; Tillema & Hayton, 2002).

Teacher training programs need to include explicit SRL instruction and support for SRL development (Perry et al., 2015; Moos, 2019). By designing teacher training emphasizing SRL, the seeds of strong relationships – with one's self and with others—are sown and nurtured throughout the educational system. Research on the qualities of highly effective teaching practices have identified that long-lasting relationships are critical to student achievement and instructional effectiveness (Klei Borrero, 2019). Prioritizing an individual's knowledge and skills

of how to learn, regardless of the context, is a step toward making educational programs reflect and address the needs of the teachers and students they teach in these K-12 educational spaces, including both face-to-face and online learning environments.

Pre- and In-Service Teacher Training Programs

Previous research has shown SRL currently plays a marginalized role in both pre- and in-service teacher training programs (Dunlosky et al., 2013). A fundamental misconception of teacher training approaches for K-12 teachers is that knowledge of SRL or being a self-regulated, motivated learner, as many teachers often are, leads to the application of SRL skills in one's classroom pedagogy (Allshouse, 2016; Buzza & Allinotte, 2013; Ganda & Boruchovitch, 2018). The belief that being "good" at school means one will be an effective teacher has been challenged by research showing both pre- and in-service teachers require training in SRL principles, targeted practice using SRL strategies for their own learning, and environments that challenge learners to undertake active learning processes in order to help students' development of SRL (Ganda & Boruchovitch, 2018; Kramarski & Michalsky, 2009). Buzza and Allinotte (2013) explained, "Teacher[s]'…academic and motivational strengths do not contribute to knowing how to support students' SRL and instructional connections and strategies must be made explicit during teacher training" (p. 61). Clearly, guidance is needed to help teachers recognize discrepancies within different conceptions of both their learning and students' learning (Krecic & Grmek, 2010; Tillema & Hayton, 2002).

Moos (2019) advocates for pre-service teacher training to address SRL development needs. Furthermore, research on the needs of in-service teachers found efforts with disengaged and unreflective learners produced worthwhile research on the positive impact of in-service teacher SRL training (PEEL; White, 1998). These results combined with previous studies'

findings suggest teacher SRL training efforts are beneficial. As a result of the impact of COVID-19 and the historic shift of K-12 education to distance learning settings, in-service teacher training opportunities are in demand.

Teacher Training Formats

Coursework. Many studies investigate pre-service teacher SRL development in the context of coursework interventions during university teacher preparation (Ganda & Boruchovitch, 2018; Perry, et al., 2008; Bembenutty et al., 2013). Anderton's study (2006) confirmed findings (Moos & Miller, 2015; Moos & Stewart, 2018) that using planning, monitoring, and reflection logs during pre-service teachers' coursework showed increases in pre-service teachers' knowledge and use of SRL strategies in their classroom teaching. These results imply SRL is teachable not only to students but to teachers as well. Other studies used self and peer assessment projects (e.g., preliminary self-assessment, project presentation, peer assessment and project revision final self-assessment) to examine changes in teachers' SRL knowledge and skills (Panadero et al., 2016). The results from this study confirm the value of teaching SRL strategies to teachers to impact their learning skills and instructional practice.

Computer-Mediated Support. Research has suggested there are interesting pathways to support teachers' SRL development and training, especially utilizing 21st century technology and collaborative tools (Bol & Garner, 2011). Computer-mediated SRL support through self-questioning models (e.g., "Did I recognize the goal of the task?" and "How can I assess my learning process?") was found to increase teachers' knowledge of technological and pedagogical constructs during online training interventions (Kramarski & Michalsky, 2009). Similarly, research comparing the use of specific verses generic prompts in computer-mediated training found bottom up, systemic prompts (e.g., "What do I notice about metacognition?") to be more

effective than top down, open ended prompts (e.g., “Think about the experience.”) (Kramarski & Kohen, 2017). Furthermore, studies focused on integrating teachers’ SRL challenges and successes in computer-mediated training during reflection opportunities produced increases in teachers’ SRL knowledge and self-efficacy for teaching (Michalsky & Schechter, 2013).

Mentoring. Research with pre-service teachers (Buzza & Allionette, 2013) has advocated for continued support between coursework and online learning experiences in order to help teachers’ transfer new knowledge into instructional practice with students in classroom settings. Some researchers have focused on the value of mentoring as a means of extending support in SRL development. Research on mentoring in SRL showed teachers using conversational scaffolds for discussions about SRL knowledge and practices develop deep-rooted concepts about personal and instructional SRL skills as compared to teachers who do not receive mentoring with scaffolded discussions (Perry et al., 2006; 2008). These findings are supported by research on instructional impact cycles (Knight, 2017) and effective conversations between novice and expert teachers (Knight, 2015). National professional development organizations, such as Learning Forward, offer educators resources on how to structure dialogue about instructional practice in order to develop teachers’ reflective thinking and challenge mindsets using strategies from the field of cognitive psychology (Dweck, 2003). Research demonstrated when these components are part of teacher training, SRL knowledge and transfer of skill occurs (Bembenutty et al., 2013).

Traditional Professional Development Workshops. A traditional professional development workshop approach is effective in establishing understanding and teaching important information relevant to student success; however, these training models are ineffective in supporting teachers’ application of new SRL skills and providing mastery experiences to

strengthen teachers' self-efficacy for SRL application (Allshouse, 2016; Butler et al., 2004; Cleary, 2018). Traditional professional development workshops typically lack opportunities for feedback or reflection, and professional growth requires on-going support and coaching consistent with SRL theory to apply new understandings in the classroom (Allshouse, 2016; Butler et al., 2004; Phillips, & Hutchinson, 2006).

Instructional Coaching. The balance of modeling in coursework, mentoring, and timely feedback throughout one's learning are necessary components to scaffold teacher professional growth and effectively promote "deep rooted" changes in teaching (Butler et al., 2004; Perry, et al., 2008). In prior studies, common themes of collaboration with experts, co-regulation with other teachers, and co-construction of new knowledge and skills in SRL are shown to be important components of effective teacher training consistent with SRL principles and social cognitive theory (Bandura, 1986; Butler et al., 2004; Kramarski & Michalsky, 2015). Exposure to models and opportunities to dialogue about SRL in context of a teachers' classroom culture have been identified as essential factors in promoting teachers' SRL knowledge and application of SRL strategies in their classroom instruction (Butler et al., 2004; Perry et al., 2006). Furthermore, the opportunities to utilize self-regulated strategy development (SRSD) in one's professional learning addresses the duality of SRL. This dual role in teachers' SRL serves as both a model to maximize learning and a mirror of what actually happens during one's learning process (Efklides et al., 2018). An instructional coach has the unique opportunity to both teach teachers about SRL and facilitate teachers' self-reflection to develop one's SRL acumen.

Summary

Because the process of becoming fully regulated in one's learning takes time (Moos, 2019), teachers' instructional effectiveness is likely supported with training experiences that

provide a lasting relationship with an instructional coach skilled at developing both the science and art of learning in the context SRL strategies. The goals of teacher training opportunities are focused on producing teachers with characteristics of highly effective instruction, and the research examining training formats reveals the impact instructional coaching has on teachers' self-regulated learning, sense of self-efficacy, and instructional effectiveness.

Computer-Supported Collaborative Learning Environments

Computer-supported collaborative learning (CSCL) is a pedagogical method used to engage individuals in shared knowledge construction and skill mastery using computers and the Internet (Stahl et al., 2006). Central to CSCL is connecting with others and the presence of interdependence for a shared goal. As such, CSCL has constructivist and social cognitive theoretical roots (Johnson et al., 2002). CSCL can be implemented in face-to-face classrooms to create blended learning experiences yet also supports distance learning either through synchronous or asynchronous connectivity. CSCL environments encompass a broad range of devices, platforms, and tools (e.g., digital applications and instructional strategies) individuals use to connect and work toward a shared purpose, a process of which produces learning outcomes.

Computer-Supported Collaborative Learning in K-12 Educational Settings

As a chalkboard is ubiquitous to a schoolhouse, so is CSCL to learning in the 21st century. While the implementation of CSCL pedagogy may appear different depending on the teacher, this method of learning is widespread. Survey results published in the Global Education Census Report shows the United States is the global leader in CSCL implementation in K-12 settings by a 25% margin (Cambridge, 2018). Similar to other instructional practices, educators are encouraged to use strategies to maximize effectiveness in CSCL environments. A review of

CSCL pedagogies in K-12 educational settings offer a variety of strategies. For example, collaborative writing and interactive whiteboards for supporting communication, idea generation, solutions-oriented thinking, feedback from authentic audiences, and outlining processes for task completion that have been found to be effective in promoting student engagement and mastery (Chen et al., 2018; Onrubia & Engel, 2009; Peterson & Roseth, 2016). With a variety of options literally at teachers' fingertips, it is vital for teachers' to focus attention on determining which strategies and tools are most effective for facilitating students' learning in CSCL environments.

A criticism of CSCL is an over-reliance on the method and thoughtless instructional design and delivery, especially when learning targets and developmental needs of students may be met more effectively using different and less tech-centric methods (Järvelä & Hadwin, 2013). Research on educational assessment methods has provided evidence that this is certainly an issue for some teachers in K-12 settings (Ross, 2020). However, when teachers possess sufficient knowledge and skill regarding instructional and assessment design, CSCL pedagogy has the potential to positively contribute to the teaching and learning process (Strijbos, 2004). These contradictory findings have led to other researchers exploring the issue of abundant access and use of CSCL strategies in K-12 educational settings. This line of inquiry has led to distinguishing between multiple effects on learning in CSCL contexts (Järvelä & Hadwin, 2013; Salomon & Almong, 1998). By looking at CSCL through the effects of the technology or the learning process, research on the impact of SRL in CSCL environments becomes clearer. While these lines of research are important for clarifying and deepening knowledge of the effects of CSCL pedagogy on teaching and learning, the ubiquitous presence of CSCL in K-12 environments suggest there is a need to examine how to utilize this method to most effectively support instruction (Cambrige, 2018).

Self-Regulated Learning in Computer-Supported Collaborative Learning Environments

There are a limited number of studies examining the impact of SRL skills employed in CSCL experiences in K-12 educational settings. Lazakidou and Retalis (2010) found that primary students increased their problem-solving skills in a relatively short period of time using CSCL strategies. These findings are confirmed by later studies showing the value of explicitly teaching problem-solving skills through the SRL framework (Dignath & Büttner, 2018). Wilson and Narayan (2016) studied undergraduate students' self-efficacy, task performance, and SRL in CSCL. Results implied SRL and self-efficacy are important predictors of task performance. These studies support the relationships between SRL skills and success in CSCL contexts. Chan (2012) advocated for more research in SRL and CoRL in CSCL environments in order to develop self- and group-awareness tools and supports for more productive collaboration. As the current K-12 education system in the United States relies upon CSCL for content delivery, teachers need support in understanding how SRL skills contribute to their instructional effectiveness and self-efficacy for teaching in CSCL environments.

Teacher Self-Regulated Learning Training in Computer-Supported Collaborative Learning Environments

Teachers are often required to change professional practice in response to students' needs and available resources, as well as evolving technology and learning theories (Dutler et al., 2004). Consequently, expectations for teachers to remain current with professional knowledge and integrate research-based best practices in the classroom tasks all teachers with the commitment to the profession and to develop life-long learning skills. In order to support teachers' professional development needs, advocates of SRL seek to increase the presence of SRL in K-12 educational settings through the promotion of 21st century learning practices,

including the adoption of CSCL structures (Häkkinen, et al., 2017; Triquet et al., 2017; Valtonen et al., 2017). Research in the field of CSCL supports the inclusion of SRL skills in CSCL contexts to meet teacher professional development needs and positively contribute to students' preparation and readiness for college and career (Yang et al., 2018). Some of these studies examine CSCL as a catalyst for teacher practice (Rest et al., 1999), and additional studies extend this belief to building teacher knowledge for improved practice by examining teacher training in CSCL pedagogy with pre- and in-service teachers (Chai et al., 2003; Lockhorst et al., 2010). These studies confirm the value in exploring how teacher training in CSCL pedagogy can enhance teachers' regulation of learning and improve instructional practice. Additionally, teacher training provides educators with opportunities to calibrate their self-efficacy beliefs, to maintain their concentration and motivation as professionals, to manage their time, and to better control their emotions throughout the learning process (Ganda & Boruchovitch, 2018). These are key components of SRL, especially in the context of CSCL.

Summary

Teacher training focusing on CSCL pedagogy and SRL skills has the potential to support teacher self-efficacy for teaching and instructional effectiveness in CSCL environments, and these are factors impacting student achievement. To help teachers talk about practices that reflect their tacit understandings of how to promote SRL in CSCL contexts, explicit scaffolding is needed (Butler et al., 2004; Perry et al., 2007; Perry et al., 2006). Questions following SRL strategies, including asking process and metacognitive questions, prompt transfer and promote discussion, reinforcement, and transfer of SRL skills (Perry et al., 2007; Tillema & Hayton, 2002). Teacher SRL skill training in CSCL environments requires learning and practice opportunities for autonomy, goal setting, metacognition, self-evaluation, and self-reflection

(Buzza & Allinotte, 2013; Ganda & Boruchovtich, 2018; Kramarski & Michalsky, 2015; Perry et al., 2006; Tillema & Hayton, 2002).

Current Gaps and Future Directions

Examination of the effectiveness and social acceptability of various coaching methods to support teachers' SRL skill development and mastery is needed (Allshouse, 2016; Butler et al., 2004; Perry et al., 2007). Teacher educators need to be aware of the SRL positions they hold with regard to aligning beliefs with behavior, as well as the possible alignment of their own learning with that of their student's learning (Krecic & Grmek, 2010; Tillema & Hayton, 2002). SRL research has the opportunity to both support teachers' professional knowledge and practice, as well as investigate how SRL training impacts teacher practice in CSCL contexts amidst K-12 schools' transition to alternative education settings as a result of the impacts of COVID-19. Methods utilized in previous studies exploring SRL skills in CSCL environments point to opportunities for this study to address current gaps theoretically and methodologically.

There are a limited number of studies examining the impact of teacher training in SRL in CSCL environments. Of the prior intervention studies conducted, the use of small samples, often without a comparison group, impacts the generalizability of results. To explore the impact of intervention programs, sufficiently powered studies are needed.

The majority of research on teacher SRL training uses pre-service teacher participants. Pre-service teachers are not representative of the population of teachers who currently find themselves in need of SRL skills in CSCL contexts. Therefore, a focus on in-service teacher training opportunities, including authentic skill applications in CSCL contexts will address a gap in the research literature.

While data collection should address teachers' SRL processes and changes over time, this study will utilize the remaining time in the current academic year. This timeline aligns with prior SRL intervention studies that found significant results with a short-term intervention (Cerezo & McWhirter, 2012; Smith, 2001). Additionally, the focus of this study is on the impact of support and on-going collaboration between experts and teachers and extends previous teacher SRL training research (Allshouse, 2016; Butler et al., 2004; Perry et al., 2007).

By investigating teachers' self-regulated learning, self-efficacy for teaching, and perceived instructional effectiveness in CSCL environments, this study addresses a gap in SRL research by linking teachers' SRL to CSCL environments. Teacher self-efficacy and instructional effectiveness are trends in educational research as they have theoretical and practical implications, and this study seeks to both extend current understanding about SRL skills in CSCL contexts, as well as offer educators strategies for improved practice in CSCL environments.

Research Questions

The aim of this study is to contribute to the literature about how to develop effective teacher training opportunities that support the positive impacts by K-12 educational programs. Relying upon quantitative and qualitative methods, this study addressed three primary objectives. First, a quasi-experimental design using two group conditions –comparison and treatment – aimed to evaluate the impact of instructional coaching on teachers' self-regulated learning, self-efficacy for teaching, and perceived instructional effectiveness in CSCL environments by comparing training focus (e.g., CSCL pedagogy only versus CSCL pedagogy and SRL skills). Second, follow-up interviews with a purposive sample of participants from both group conditions addressed teachers' use of SRL skills in CSCL contexts both for their learning and

their instruction with students. The following research questions and hypothesis were examined in this research:

Quantitative Research Question

Research Question 1. How does instructional coaching with and without SRL affect teachers' SRL, self-efficacy for teaching, and perception of their instructional effectiveness in computer-supported collaborative learning environments?

Hypothesis 1. Participants' who received the additional SRL training will report higher SRL skills, self-efficacy for teaching, and perceived instructional effectiveness in CSCL environments as compared to participants who do not receive additional SRL training.

Qualitative Research Questions

Research Question 2. How do teachers in this study use SRL skills for their own learning and in their instruction with students?

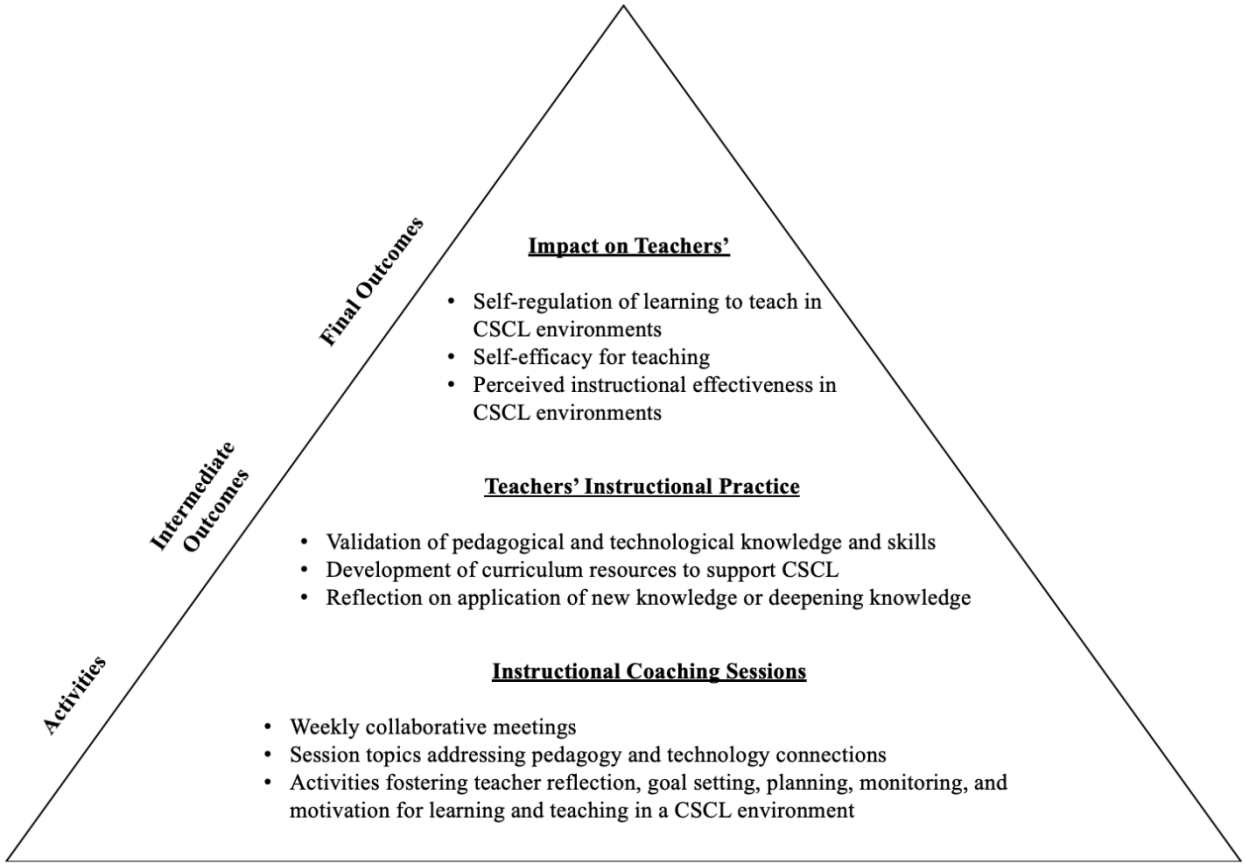
Research Question 3. How do teachers' who receive additional SRL training differ in how they use SRL in learning and in their instruction?

The second and third research questions are exploratory; therefore, there are no hypotheses. However, based on intervention studies, it is expected that teachers in the treatment group will use SRL skills differently than teachers in the comparison group as a result of receiving explicit SRL skill training during instructional coaching.

Theory of Change. This study investigated the impact of instructional coaching on teachers' SRL, self-efficacy for teaching, and perceived instructional effectiveness in a CSCL environment. Figure 2 illustrates the intended theory of change throughout the study's intervention for all participants.

Figure 2

Theory of Change



Summary. In Chapter Three, I present the study's quasi-experimental design and describe the mixed methods used to investigate the impact instructional coaching on teachers' self-regulated learning, self-efficacy for teaching, and perceived instructional effectiveness in CSCL.

CHAPTER 3

In this chapter, I present the methodology for this study, including the research design, participants, measures, intervention materials, an overview of research procedures, and the analytic approach. The aim of this study was to examine the effects of instructional coaching on teachers' self-regulated learning (SRL), self-efficacy for teaching, and perceived instructional effectiveness in a computer-supported collaborative learning (CSCL) environment. The following research questions guided this investigation:

1. How does instructional coaching with and without SRL affect teachers' SRL, self-efficacy for teaching, and perception of their instructional effectiveness in computer-supported collaborative learning environments?
2. How do teachers in this study use SRL skills for their own learning and in their instruction with students?
3. How do teachers' who receive additional SRL training differ in how they use SRL in learning and in their instruction?

Research Design

To address these research questions, I employed a quasi-experimental, mixed-methods design. More specifically, a sequential explanatory design was chosen in order to use the qualitative results to inform and enrich the interpretation of the quantitative findings (Creswell, 2003). I administered a three-week instructional coaching intervention to teachers working in K-12 settings across the Northeastern United States via synchronous meetings using Zoom. In the first phase of the study, participants were randomly assigned to a group condition —comparison or treatment — until each group reached at least 30 total participants.

Study Flow, Survey Response Rates, and Composition of Analytic Sample

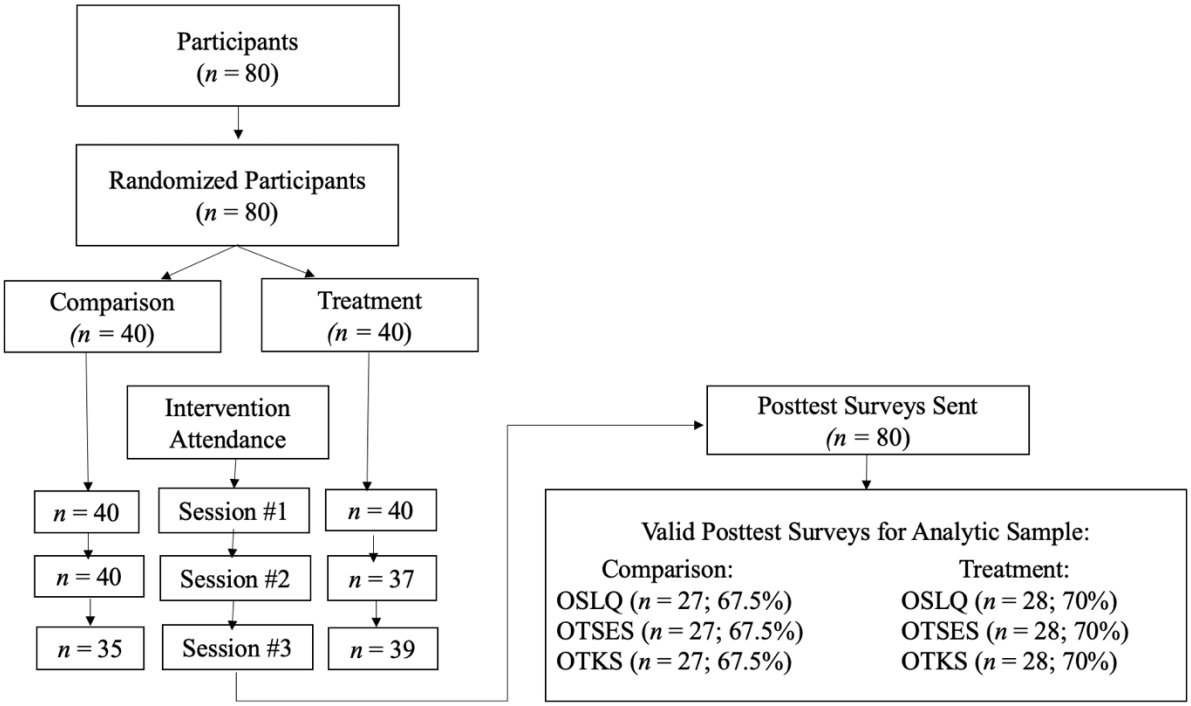
Eighty K-12 teachers were invited to participate in this study. At the beginning of the study, each participant completed a demographic survey collecting background information related to their teaching experience and school setting. Participants were randomly assigned to a group condition (e.g., comparison (n = 40) or treatment (n = 40)) for weekly, one-hour instructional coaching sessions delivered over the course of three weeks using Zoom. Participants logged their attendance for each of the three coaching sessions. Participants in the treatment group received instructional coaching in CSCL concepts and skills and explicit instruction in SRL theory and strategies; whereas, participants in the comparison group received coaching in CSCL concepts and skills only.

At the end of the intervention, posttest surveys were disseminated to all 80 participants in both group conditions. The survey included the following scales: 1) The Online Self-Regulated Learning Questionnaire (OSLQ), 2) the Online Teachers' Sense of Self-Efficacy Scale (OTSES), and 3) the K-12 Online Teachers' Instructional Knowledge Survey (OTIKS). These surveys measure, respectively, teachers' SRL, teachers' self-efficacy for online teaching, and teachers' perceived instructional effectiveness in a CSCL environment.

Twenty-seven (67.5%) surveys were completed by participants in the comparison group, and twenty-eight (70%) surveys were completed by participants in the treatment group. The final analytic sample of completed posttest surveys for both groups were 55. Figure 3 illustrates the study flow, survey response rates, and composition of the analytic sample.

Figure 3

Study Flow, Survey Response Rates, and Composition of Analytic Sample



Participants and Recruitment

Based on power analysis using G*Power and a review of literature on SRL training interventions (Ganda & Borouvitch, 2018; Allshouse, 2016), I aimed to recruit at least 60 teachers working in a K-12 education settings from across New Jersey, New York, and Pennsylvania to participate in this study for a medium effect size. Participants were recruited through professional and social media networks, such as LinkedIn, Instagram, Facebook, and Twitter. The professional and social media posting can be found in Appendix A.

In exchange for participating in the instructional coaching intervention, participants received a professional development certificate that helped teachers reach their requirement of 20 hours of annual professional development. Teachers also received access to curriculum resources delineating instructional strategies for supporting students in CSCL environments. The notification letter for participants is provided in Appendix B.

In the second phase of the study, I sought volunteers for a 30-40 minute follow-up interview. The last item on the demographic questionnaire asked participants if they would volunteer for the follow-up interview. From the pool of interview participants, I selected a subset of teachers using a purposeful sampling procedure (Leedy & Ormrod, 2019) to obtain a diverse sample in terms of gender, years teaching, grade level, school setting, and group condition. Each interview participant received a $10 Amazon gift card for their participation.

Descriptive Statistics

Descriptive statistics on demographic data were calculated to report frequencies and percentages for categorical variables, and the mean and standard deviation for continuous variables (Table 5). The majority of the participants were on average 42 years of age (SD 10.16), female (82%), and had earned a master's degree (54%) (Table 1). Participants had been teaching for an average of 15 years (SD 8.32). Half of the participants taught in an elementary school (50%), within a suburban (86%) public school system with a moderate socioeconomic status (81%). Socioeconomic status was defined by the presence of a schoolwide or targeted assistance Title I program within the school.

Table 1

Participant Demographics and School Setting Characteristics

Variable	*M*	SD	*n*	SE_M	*Min*	*Max*
Age	42.00	10.16	66	1.25	25.00	61.00
Years Teaching	15.44	8.32	66	1.02	1.00	34.00
Variable			*n*	%		
Gender				-		
Female			54	81.82		
Male			11	16.67		
Prefer not to disclose			1	1.52		
Education						

Bachelors	27	40.91
Masters	36	54.54
Education Specialist	2	3.03
Doctorate	1	1.52
Grade Level		
Elementary (Pre-K-5)	33	50.00
Middle School (6-8)	10	15.15
High School (9-12)	23	34.84
K-12 Setting		
Public School	57	86.36
Private School	9	13.64
Community Type		
Urban	2	3.03
Suburban	63	95.45
Rural	1	1.52
SES		
High	6	9.09
Moderate	54	81.82
Low	6	9.09

Note. Due to rounding, percentages may not equal 100%

Measures

This study relied upon survey measures, interviews, and weekly reflections collected during the instructional coaching intervention to investigate the relationships between teachers' SRL, self-efficacy for teaching, and perceived instructional effectiveness in a CSCL environment. Each of these measures are described in the subsequent sections.

Demographic Survey

The demographic survey was used to describe the sample and estimate its representativeness of the sample of K-12 teachers in the region (Mills & Gay, 2016). The

demographic survey included 22 items about the teachers' school setting (e.g., public/private, urban/rural, etc.), identifying characteristics (e.g., gender, age, and race/ethnicity), and teaching background (e.g., years of teaching experience, grade level(s) and content area(s) taught, current instructional effectiveness rating, etc.). In addition, a review of the literature related to SRL and CSCL suggested these factors might contribute to participants' self-efficacy for teaching and perceived instructional effectiveness in CSCL environments. The last item on the survey identified volunteers to participate in a follow-up interview. Response types included dichotomous (e.g., yes/no), multiple-choice, or short answer response formats. The demographic survey is presented in Appendix C.

The Online Self-Regulated Learning Questionnaire

To measure teachers' SRL skills in CSCL contexts, the Online Self-Regulated Learning Questionnaire (OSLQ) was used (Lan et al., 2004; Barnard et al., 2008). The OSLQ was developed from an 86-item pool. Items are examined for their internal consistency and exploratory factor analyses were used to construct scales. Higher scores on the overall scale indicate better self-regulation in online learning. The OSLQ consists of six subscale constructs including: environment structuring; goal setting; time management; help-seeking; task strategies; and self-evaluation. The OSLQ consists of 24-items rated on a 5-point Likert-type response format. Scale values range from *strongly disagree* (1) to *strongly agree* (5). I slightly modified the items for use with K-12 teachers working in CSCL environments by including reference to working online. The Cronbach's alpha reliability coefficient for the OSLQ overall is .92. A copy of the instrument appears in Appendix D.

The Online Teachers' Sense of Self-Efficacy Scale

Teacher self-efficacy in CSCL contexts was measured using an adapted version of the

Teachers' Sense of Self-Efficacy Scale for use with online instruction (TSES) (Tschannen-Moran & Woolfolk Hoy, 2001). The Online Teachers' Sense of Self-Efficacy Scale (OTSES) is considered a reliable and valid instrument using 24-items to measure teachers' evaluations of their own likely success in teaching (Duffin et al., 2012; Klassen et al., 2009). These items are grouped into three subscales: 1) efficacy for student engagement, 2) efficacy for instructional strategies, and 3) efficacy for classroom management. Each of the questions used a Likert-type rating scale with values ranging from 1 (*nothing at all*) to 5 (*a great deal*). Higher scores on this scale indicates stronger self-efficacy for teaching online. Construct validity was established through three pilot studies, performing a series of confirmatory factor analyses, and assessing correlations with other existing measures of teacher efficacy (Tschannen-Moran & Woolfolk Hoy, 2001). The Cronbach's alpha reliability coefficient for the OTSES scale overall is .94. The 24-item OTSES can be found in Appendix E.

The K-12 Online Teachers' Instructional Knowledge Survey

To measure teachers' instructional effectiveness in CSCL environments, the K-12 Online Teachers' Instructional Knowledge Survey was used (K-12 OTIKS) (Archambault & Crippen, 2009). The K-12 OTIKS is considered a reliable and valid instrument using 24-items developed from the guiding framework of technology, pedagogy, and content knowledge (TPACK) (Koehler & Mishra, 2005). The TPACK framework outlines the knowledge and skills K-12 online teachers should employ for instructional effectiveness in CSCL environments. After conducting a pilot study with three educators, the survey items were modified slightly to highlight the instructional knowledge and skills for online teaching and learning as to demonstrate how knowledge and skills for online instruction are different than self-efficacy for teaching in a CSCL environment. Responses are given in the form of a 5-point Likert-type scale

(1 = *terrible*; 5 = *excellent*). Items are grouped by the following seven subscales: 1) pedagogical knowledge, 2) technological knowledge, 3) content knowledge, 4) technological content knowledge, 5) pedagogical content knowledge, 6) technological pedagogical knowledge, and 7) technological pedagogical content knowledge. Higher scores on this scale indicate greater instructional knowledge and effectiveness in CSCL contexts. The K-12 OTIKS scores for the seven subscales and the total scale have been found to be internally consistent in previous research where construct validity was established using pilot studies (Archambault & Crippen, 2009). The reliability of the scale overall is .98 (Çetin & Erdoğan, 2018). The full K-12 OTIKS can be found in Appendix F.

Pearson Correlation Analysis and Variance Inflation Factors

A Pearson correlation analysis was conducted among OSLQ, OTSES, and OTIKS. Cohen's standard was used to evaluate the strength of the relationships, where coefficients between .10 and .29 represent a small effect size, coefficients between .30 and .49 represent a moderate effect size, and coefficients above .50 indicate a large effect size (Cohen, 1988).

The result of the correlations was examined using Holm corrections to adjust for multiple comparisons based on an alpha value of 0.05. A significant positive correlation was observed between OSLQ and OTSES ($r_p = 0.55$, $p < .001$, 95% CI [0.31, 0.72]). The correlation coefficient between OSLQ and OTSES was 0.55, indicating a large effect size. This correlation indicates that as OSLQ increases, OTSES tends to increase. A significant positive correlation was observed between OSLQ and OTIKS ($r_p = 0.46$, $p = .001$, 95% CI [0.20, 0.65]). The correlation coefficient between OSLQ and OTIKS was 0.46, indicating a moderate effect size. This correlation indicates that as OSLQ increases, OTIKS tends to increase. A significant positive correlation was observed between OTSES and OTIKS ($r_p = 0.83$, $p < .001$, 95% CI

[0.71, 0.90]). The correlation coefficient between OTSES and OTIKS was 0.83, indicating a large effect size. This correlation indicates that as OTSES increases, OTIKS tends to increase. Table 2 presents the results of the correlations.

Table 2

Pearson Correlation Results Among OSLQ, OTSES, and OTIKS

Combination	r_p	95% CI	*p*
OSLQ-OTSES	0.55	[0.31, 0.72]	< .001
OSLQ-OTIKS	0.46	[0.20, 0.65]	.001
OTSES-OTIKS	0.83	[0.71, 0.90]	< .001

Note. $n = 55$. Holm corrections used to adjust *p*-values.

Variance Inflation Factors (VIFs) were calculated to detect the presence of multicollinearity between predictors. High VIFs indicate increased effects of multicollinearity in the model. VIFs greater than 5 are cause for concern, whereas VIFs of 10 should be considered the maximum upper limit (Menard, 2009). All predictors in the regression model have VIFs less than 10. Table 3 presents the VIF for each predictor in the model.

Table 3

Variance Inflation Factors for OTIKS and OTSES

Variable	VIF
OTIKS	2.07
OTSES	2.07

Interview

The interview included 20 questions about teachers' SRL skills and how they support students' SRL skills in a CSCL environment, not including probes and follow-ups. Adapted from Spruce & Bol's (2015) interview protocol measuring teachers' knowledge and application of SRL, the interview questions were designed in concurrence with the three phases of Zimmerman's SRL model (2008). Questions are grouped by SRL phases (e.g.,

forethought/planning, performance/monitoring, self-reflection/evaluation) for teacher's SRL and teachers' perception of their SRL implementation in their practice. Additionally, teachers were asked questions about their self-efficacy and perceived instructional effectiveness in a CSCL environment. The interview format was semi-structured allowing for follow up to standard questions with one or more individually tailored probes to get clarification or probe a participant's reasoning (e.g., elaboration, examples, etc.) (Leedy & Ormrod, 2019). The interview protocol can be found in Appendix G and the interview questions can be found in Appendix H.

Weekly Reflections

All participants were expected to submit weekly reflections relating to the instructional coaching intervention topics and objectives. Topics of reflections focused on lesson plans, assessment methods, examples of feedback from students or parents, summaries of collaboration with colleagues, and/or responses to supplemental reading. Weekly reflections were submitted via a Google Form link provided to participants in each group condition during their weekly coaching session.

Procedure

Upon receiving written approval from the University's Human Subjects Institutional Review Board (IRB), participant recruitment commenced via professional and social media networks and email communication with K-12 superintendents, principals, and directors. The sample size of 60 K-12 teachers was based both on a review of literature on SRL and CSCL intervention studies and a power analysis (Ganda & Borouvitch, 2018; Allshouse, 2016). Cooperating organizations forwarded the participant notification letter and a Qualtrics link to the demographic questionnaire to their participating teachers. The demographic questionnaire took

approximately 10 minutes to complete and submit online. Table 4 outlines the research schedule.

Table 4

Research Schedule

Research Phase	Objectives	Timeframe
Participant recruitment	Invitation & notification	May 11 – May 15
Pretest data collection	Demographic survey	May 18 – May 22
Intervention	Sessions 1 – 3 (weekly)	May 25 – June 15
Posttest data collection	OSLQ, OTSES, & OTIKS surveys and weekly reflections	June 16 – 19
Interviews	Follow-up with subset of participants	June 22 – 26

From the pool of teachers who completed the demographic questionnaires, participants were randomly assigned to a group condition —comparison or treatment — until each group reached at least 30 total participants. Random assignment guarded against non-equivalent groups.

SRL and CSCL Instructional Coaching Intervention

Based on a review of literature on teacher SRL training (Bol et al., 2016; Leidinger & Perels, 2012; Ness & Middleton, 2012), a three-week instructional coaching experience was developed for all participants to receive weekly training in a CSCL environment for approximately one hour via Zoom (Dignath & Büttner, 2018; Perry et al., 2008; Willems et al., 2019). Instructional coaching sessions were organized based on teacher availability, and teachers were provided time to participate by their school leaders. I facilitated all the coaching sessions.

Participants in the treatment group received instructional coaching in CSCL pedagogy

and SRL skills through explicit teaching of SRL concepts and applications of SRL skills throughout the training. This three-session instructional coaching intervention was adapted from two SRL professional development workshop frameworks —a face-to-face workshop and an online training module (Allshouse, 2016; Cleary, 2018; Willems et al., 2017). Both instructional resources align with Zimmerman's (2008) SRL model. Each session of the instructional coaching focused on a topic related to instruction and assessment in CSCL contexts, and participants were provided resources and tools to support instructional planning, monitoring student learning, assessing mastery, and communicating expectations in CSCL environments. The SRL-infused coaching treatment included objectives and concepts focusing on learners' self-efficacy, planning processes, monitoring strategies, self-satisfaction, and self-evaluation of learning. Participants in the comparison group received instructional coaching about CSCL pedagogy and environments without explicit SRL skill training or application of SRL strategies. An outline of the instructional coaching intervention for both group conditions can be found in Appendix I.

During the last instructional coaching session, all participants were asked to complete the OSLQ, OTSES, and K-12 OTIKS surveys using Qualtrics links embedded in an email message sent to all participants at the conclusion of the third and final coaching session. Participants were not able to see each other's contact information in the email message.

In the final phase of the study, semi-structured interviews were conducted with a subset of participants from both group conditions to identify how teachers use SRL skills in CSCL contexts after the instructional coaching intervention (Edwards & Holland, 2013). The last item on the demographic questionnaire invited participants to volunteer to be interviewed via Zoom. Volunteers were contacted to schedule a date and time. Interviews took approximately 30-40

minutes, and I conducted a total of eight interviews – four with participants from the comparison group and four with participants from the treatment group.

Human Subjects Protections

Approval from the Human Subjects Institutional Review Board (IRB) of the university was obtained prior to initiating the study. All participants were adult K-12 teachers working in K-12 public or private educational settings. If any demographic information could potentially identify a participant, it was omitted.

The demographic questionnaire and three surveys were anonymous. No identifying information was collected. When delivered via e-mail, the address was be disassociated from the completed questionnaires. The questionnaire data was stored on secure ODU servers during the study. A cover letter served as a notification letter and informed participants of the purpose, requirements, potential benefits or risks, the voluntary nature of the study, and anonymity assurances.

The interviews were confidential. The final item on the demographic questionnaire asked participants if they were willing to engage in a follow-up interview via Zoom. If participants agreed to participate in the interview, they were asked to provide an e-mail address in order to schedule the interview. Once the interview was conducted, any identifying information was replaced by researcher generated ID numbers. Participants were asked to provide a pseudonym for ease of expression when reporting results.

Quantitative and Qualitative Data Analysis

In keeping with prior research, this study anticipated a medium effect within and between groups (Ganda & Borouvitch, 2018; Allshouse, 2016). Power analysis was conducted in G*Power. Running a power analysis on a two-tailed independent samples *t*-tests with a power of

0.95, an alpha level of 0.05, a correlation of 0.5, and a medium effect size ($t = 0.50$) (Faul et al., 2013), the required sample size is 54. To account for attrition, the study was powered higher, and recruitment aimed for at least 60 participants.

The dataset was screened for missing and outlier data. To minimize missing survey data, participants received the Qualitrics survey link after the last instructional coaching session. If more than 5% of data were missing in the dataset, I used multiple imputation in SPSS.

Calculation of frequencies, percentages, means, and standard deviations were computed for each demographics variable to describe the composition of the sample. These procedures were carried out in addition to two-tailed independent samples *t*-tests and checking for assumptions for inferential procedures. Cronbach's alpha was be employed to estimate the internal consistency of the scales overall.

Research Question 1

How does instructional coaching with and without SRL affect teachers' SRL, self-efficacy for teaching, and perception of their instructional effectiveness in computer-supported collaborative learning environments?

To examine this research question, two-tailed independent samples *t*-tests were conducted to assess if differences existed on teachers' self-regulated learning, self-efficacy for teaching, and perceived instructional effectiveness in a CSCL environment between group conditions (e.g., comparison or treatment).

The assumptions of normality and homogeneity of variance were assessed. The normality assumption assumes that the scores are normally distributed (bell-shaped) and were assessed using the one-sample Shapiro-Wilk test (Razali & Wah, 2011). Homogeneity of variance assumes that both groups have equal variances and were assessed using Levene's test for

equality of variances (Levene, 1960). If the Levene's test for equal variance indicated that equal variances could not be assumed ($p < 0.05$), a Mann-Whitney *U* test was used (Conover & Iman, 1981). The Mann-Whitney *U* test compares the number of times a score from one sample is ranked higher than a score from another sample. A significance level of 0.05 was used to determine if there are significant differences on the dependent variable between the levels of the independent variable.

Research Questions 2 and 3

How do teachers in this study use SRL skills for their own learning and in their instruction with students? How do teachers' who receive additional SRL training differ in how they use SRL in learning and in their instruction?

To address the second and third research question in this study, interviews were conducted, and weekly reflections developed by participants during instructional coaching sessions were collected. Interview transcripts and weekly reflections were blindly coded by two independent researchers using a descriptive, inductive method (Saldana, 2012). Specifically, grounded theory methodology (Glaser & Strauss, 1967) was used, because it allows participants to share details pertaining to their subjective experiences and researchers develop a theory based on their responses (Hill et al., 2015).

After recording the interviews and collecting participants' weekly reflections from coaching sessions, transcripts of data were reviewed using "code mapping" (Knodel, 1993). Code-mapping involves reviewing transcripts line by line and generating labels on initial possible categories of significance. Following the initial data analysis, preliminary categories for each data collection method were set up in matrices to help organize the coded data for each emergent theme by groups of interview questions. A second reading was used to produce initial

categories of words, phrases, and sentences. Cyclical reading and coding continued to refine themes from the data. Final matrices using thematic categories aligned with SRL theory were established.

The Role of the Researcher. During this study, I took the role of a co-performer (Madison, 2011) by engaging in dialogic performance (Conquergood, 1986). A critical aspect to the learning process is experiencing trust and rapport with others; therefore, I modeled and facilitated collaborative learning and perspective-taking during coaching sessions as both an educator and life-long learner through dialogue and transparency with all participants. As the researcher, I tried to minimize the impact of bias by employing strategies to enhance credibility and trustworthiness.

Trustworthiness and Triangulation. To enhance the trustworthiness of findings, a co-rater and I coded two interviews and two reflections from coaching sessions independently. After meeting to discuss themes and categories, the co-rater and I rated an additional interview and weekly reflection to ensure fidelity of data collected. Inter-rater reliability was .93 for the 30% of data collected and calibrated during coding. In addition, I was blind to condition when coding of all interview and weekly reflection data.

Participants were asked to review the interview transcripts (Hays and Singh, 2012; Patton, 2012). Asking participants to review a portion of the final report assisted in checking the authenticity of the work (Bellin, 2015). Researcher field notes from all coaching sessions and interviews enhanced the trustworthiness of the findings. “Thick” description and quotations from participants or descriptions of observations of participants’ behaviors were used to support the general statements regarding results.

Triangulating data sources across multiple reliable and valid quantitative measures (e.g., three survey results), interviews with participants from both group conditions, and participants' reflections supported this study's investigation of the effects of SRL training on teachers' developing self-efficacy for teaching and perceived instructional effectiveness in a CSCL environment (Creswell, 1998).

CHAPTER 4

In the present study, I investigated the effects instructional coaching on K-12 teachers' self-regulated learning (SRL), self-efficacy for teaching, and perceived instructional effectiveness in a computer-supported collaborative (CSCL) environment by comparing training focus (e.g., CSCL pedagogy versus CSCL pedagogy and SRL skills). The results of this study are organized chronologically by the three research questions posed in Chapter 1. In the next section, I report the results of the three surveys measuring: 1) teachers' SRL, 2) teachers' self-efficacy for online teaching, and 3) teachers' perceived instructional effectiveness in a CSCL environment between group conditions (e.g., comparison or treatment) at posttest. Secondly, the results from follow-up interviews and reflections from the instructional coaching intervention are presented to examine how teachers in this study use SRL skills in their learning and in their instruction.

Results from Quantitative Measures

Research Question 1

How does instructional coaching with and without SRL affect teachers' SRL, self-efficacy for teaching, and perception of their instructional effectiveness in computer-supported collaborative learning environments?

To examine this question, two-tailed independent samples *t*-tests were conducted to assess if mean differences by group condition (e.g., comparison and treatment) on the three surveys. Significance was set at alpha level 0.05. Assumptions of normality and variance were checked using the Shapiro-Wilk test (Razali & Wah, 2011) and Levene's test (Levene, 1960). If a violation in the assumption of normality occurred, a two-tailed Mann-Whitney two-sample rank-sum test was conducted instead.

The Online Self-Regulated Learning Questionnaire. The Online Self-Regulated Learning Questionnaire (OSLQ) measures participants' self-regulation of learning skills. Higher scores on the survey, from a range of 1-5, indicate stronger presence of self-regulated learning skills. The Cronbach's alpha coefficient was evaluated using the guidelines suggested by George and Mallery (2016) where > .9 excellent, > .8 good, > .7 acceptable, > .6 questionable, > .5 poor, and ≤ .5 unacceptable. The items for the OSLQ overall had a Cronbach's alpha coefficient of 0.91, indicating excellent reliability, which aligns with prior studies' reliability as described in Chapter 3 (Barnard et al., 2009).

The Online Self-Regulated Learning Questionnaire: Group Conditions Analysis. The OSLQ mean comparison group (n = 27) posttest score was 4.11 (SD 0.55), and the mean treatment group (n = 28) posttest score was 4.17 (SD 0.49). The assumption of normality was violated, as the Shapiro Wilk test for the comparison group was significant (p = .004), but the result for the treatment group (p = .103) was not significant. Levene's test results show variances were equal in both groups (p = .980).

Instead of running a two-tailed independent sample t-test, a two-tailed Mann-Whitney two-sample rank-sum test was conducted to examine whether there were significant differences in the group conditions at posttest. The two-tailed Mann-Whitney two-sample rank-sum test is an alternative to the independent samples t-test when the assumption of normality is violated (Conover & Iman, 1981). The result of the two-tailed Mann-Whitney U test was not significant (p = .879). The mean rank for the comparison group was 27.00 and the mean rank for the treatment group was 28.31. This suggests that the distribution of the OSLQ for the comparison group (Mdn = 4.21) was not significantly different from the distribution of the OSLQ for the

treatment group (*Mdn* = 4.04); thus, the hypothesis was not supported. Table 5 presents the result of the two-tailed Mann-Whitney *U* test.

Table 5

Two-Tailed Mann-Whitney U Test for the Online Self-Regulated Learning Questionnaire by Group Conditions at Posttest

	Mean Rank				
Variable	Comparison	Treatment	*U*	z	*p*
OSLQ	27.65	28.31	368.00	-0.15	.879

The Online Teachers' Sense of Self-Efficacy Scale. The Online Teachers' Sense of Self-Efficacy Scale (OTSES) measures teachers' sense of self-efficacy for teaching online. Higher scores on the survey, ranging from 1-5, indicate stronger self-efficacy for teaching in a CSCL environment. The Cronbach's alpha coefficient was evaluated using the guidelines suggested by George and Mallery (2016). The items for the OTSES overall had a Cronbach's alpha coefficient of 0.94, indicating excellent reliability.

The Online Teachers' Sense of Self-Efficacy Scale: Group Conditions Analysis. The OTSES mean comparison group (*n* = 27) posttest score was 3.97 (SD 0.58), and the mean treatment group (*n* = 28) was 4.02 (SD 0.49). Comparison (*p* = .174) and treatment group (*p* = .109) OTSES scores were normally distributed and variances were equal (*p* = .266). The result of the two-tailed independent samples *t*-test was not significant (*p* = .844), indicating the mean of the OTSES was not significantly different between the group conditions at posttest. Furthermore, the effect size is quite small (*d* = 0.05) suggesting clinical significance is not achieved either and the hypothesis was not supported. Table 6 presents the results.

Table 6

Two-Tailed Independent Samples t-Test for the Online Teachers' Sense of Self-Efficacy Scale by Group Conditions at Posttest

	Comparison		Treatment				
Variable	*M*	*SD*	*M*	*SD*	*t*	*p*	*d*
OTSES	3.97	0.58	4.02	0.49	-0.33	.745	0.09

Note. N = 55. Degrees of Freedom for the *t*-statistic = 53. *d* represents Cohen's *d.*

The K-12 Online Teachers' Instructional Knowledge Survey. The K-12 Online Teachers' Instructional Knowledge Survey measures teachers' perceived instructional effectiveness in CSCL environments. Higher scores on the survey, with a range of 1-5, indicate stronger perceptions of instructional efficacy for teaching in CSCL environments. The items for the OTIKS overall had a Cronbach's alpha coefficient of 0.96, indicating excellent reliability (George & Mallery, 2016). This finding aligned with previous studies (Archambault & Crippen, 2009) as described in Chapter 3.

The K-12 Online Teachers' Instructional Knowledge Survey: Group Conditions Analysis. The OTIKS mean comparison group (n = 27) posttest score was 3.75 (SD 0.68), and the mean treatment group (n = 28) was 3.85 (SD 0.69). Assumptions of normality (comparison, p = .546 and treatment, p = .255) and homogeneity (p = .378) were checked and met. While the treatment group's mean scores at posttest were numerically higher than the comparison group, the result of the two-tailed independent samples t-test was not significant (, p = .606), indicating the OTIKS was not significantly different between group conditions. The effect size (d = 0.14) suggests clinical significance is small, and these results do not support the hypothesis. Table 7 presents the results.

Table 7

Two-Tailed Independent Samples t-Test for the K-12 Online Teachers' Instructional Knowledge Survey by Group Conditions at Posttest

	Comparison		Treatment				
Variable	*M*	*SD*	*M*	*SD*	*t*	*p*	*d*
OTIKS	3.75	0.68	3.85	0.69	-0.52	.606	0.14

Note. N = 55. Degrees of Freedom for the *t*-statistic = 53. *d* represents Cohen's *d.*

Results from Qualitative Measures

Research Questions 2 and 3

How do teachers in this study use SRL skills for their learning and in their instruction with students? How do teachers' who receive additional SRL training differ in how they use SRL in learning and in their instruction?

To augment the quantitative results, this study's second research question examines how teachers use SRL skills in their learning and in their instruction with students. Data addressing this question were gathered from follow-up interviews and reflections submitted by participants during the instructional coaching sessions.

Interview Participants. Follow-up interviews were conducted with 10% of all participants (n = 8) the week after the third and last instructional coaching session. From the pool of interview participant volunteers (n = 42), a total of eight teachers from both group conditions (e.g., comparison (n = 4) and treatment (n = 4)) were selected based on their gender, years' teaching, grade level, and K-12 school type for an individual follow-up interview. Half of the interview participants were 35-45 years old (50%) with at least 20 years of teaching experience (50%) at the elementary level (50%). The majority were female (75%) teachers at public schools (75%). Table 8 presents the demographics and school setting characteristics for the interview participants.

Table 8

Interview Participants' Demographic and School Setting Characteristics

	Comparison		Treatment	
Variable	*n*	%	*n*	%
Age				
25-35	1	0.25	1	0.25
35-45	2	0.50	2	0.50
45 and over	1	0.25	1	0.25
Gender				
Female	3	0.75	3	0.75
Male	1	0.25	1	0.25
Years Teaching				
0-10	1	0.25	1	0.25
11-20	1	0.25	1	0.25
20 and over	2	0.50	2	0.50
Grade Level				
Elementary (Pre-K-5)	2	0.50	2	0.50
Middle School (6-8)	1	0.25	1	0.25
High School (9-12)	1	0.25	1	0.25
K-12 Setting				
Public School	3	0.75	3	0.75
Private School	1	0.25	1	0.25

Interviews. The interview protocol included 20 questions addressing teachers' goal setting, planning, motivation, monitoring, and evaluation of their learning, as well as how they support students' learning in a CSCL environment. Based on interview used in Spruce and Bol (2015), interview participants' responses were analyzed inductively. Initial codes were collapsed into categories. These categories were aligned with the themes from Zimmerman's SRL

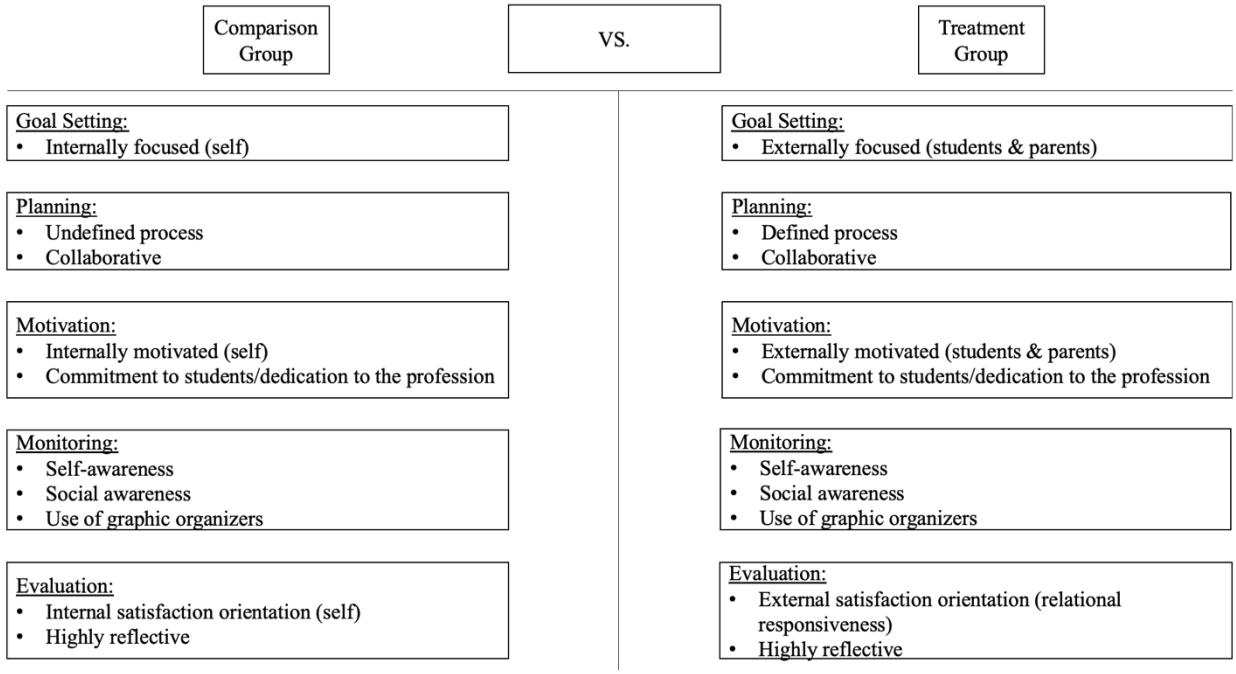
theoretical model (2000). Appendices J and K present the matrices of codes, categories, and themes that emerged during the qualitative analyses of the interviews.

It is important to note that interviews were conducted after teachers participated in the instructional coaching sessions. Teachers in the treatment group condition received explicit training in SRL skills in addition to the CSCL pedagogy training while teachers in the comparison group condition received training in CSCL pedagogy only. The emerging themes from interviewees from both groups are presented in order to juxtapose the results and identify similarities and differences among teachers' use of SRL in both their learning and in their instruction as impacted by the instructional coaching conditions.

How Teachers Use SRL Skills for Their Learning. Figure 4 presents the emerging themes from the interviews as teachers described how they use SRL skills in their learning, especially in learning how to teach in a CSCL environment. The emerging themes are underlined, and the most frequently occurring categories from the interview participants' responses are presented in bulleted lists.

Figure 4

How Teachers Use SRL Skills for Their Learning: Emergent Themes by Group Condition



Goal Setting. Teachers in the comparison group described their goal setting process in relation to their personal needs; whereas, teachers in the treatment group described their goal setting in terms externally focused and responsive to students' and/or parents' needs. For example, Interviewee 4 was in the comparison group and stated, "[My goals are] based on things I don't know how to do perfect[ly]…like Zoom, so I have to figure that out right away so I know what I'm doing." Similarly, Interviewee 5 was also in the comparison group, and they explained their goal setting as, "Just for myself; it's just to learn as much as I can, because I feel overwhelmed most of the time, especially now teaching online." All interviews with participants from the comparison group identified their goal setting in terms central to personal needs, survival, and/or aiming for work/life balance.

These results differ from the teachers in the treatment group who more frequently and with specificity described their goal setting in relation to their students' or parents' needs.

Interviewee 1 was in the treatment group and described their goal setting process as, “Once students start, I tweak [my goals] to work best for them and the way they need it to; as well as to fit what the parents need from us.” Additionally, Interviewee 3 from the treatment group explained:

> [My goals] revolve around what I am trying to achieve or what I’m doing with the kids…what is the end goal? And then I figure out all the stuff they will need to do…what will work for them.

The impact of instructional coaching group conditions (e.g., CSCL pedagogy only or CSCL pedagogy and SRL skills) may impact these differences in the sophistication of interview participants’ responses about their goal setting.

Planning. When teachers were asked about planning processes for their learning, all teachers in both conditions described their process as collaborative. For example, Interviewee 7 from the comparison group described relying on a professional learning network “found on Twitter and joining free EdCamps to network with other teachers around the country.” Interviewee 1 from the treatment group said, “[I plan] with my co-teacher. Like we worked so well together. It was great. We would plan ahead.” While all the interview participants described a collaborative planning process, teachers in the comparison group more frequently described an undefined planning process. For example, Interviewee 8 stated, “When I can find time, I just go from there,” to describe their planning of learning. The lack of specificity and organization in comparison group participants’ responses highlights a difference between the training group conditions.

By comparison, teachers in the treatment group more frequently used descriptive terms and sequences of steps to explain their planning processes for their learning. Interviewee 2 from the comparison group explained:

> There's no structure that you were used to, and that gives you the cue of, okay, well it's Thursday, and you've got to hand in the lesson plans on Friday. You have to be very self-motivated, very self-directed, and I remember learning that when I was in graduate school. Now I bring that level of planning to my grade level team meetings. We took inventory of what we had, and we used a calendar to figure out our timeline. Then we all divided up the tasks. We have a whole library of video lessons for our second graders if we ever have to do this again.

This quote is illustrative of the specificity of terms and processes teachers in the treatment group used to describe their planning to learn, especially for their teaching in CSCL environments. This was a striking difference from teachers' responses in the comparison group regarding planning for learning.

Motivation. The results from teachers' responses about their motivation for learning generally point to a commitment to students and dedication to the profession. All eight interviewees described their motivation as a learner comes from a desire to support their students' learning and/or students' social/emotional needs, especially during the challenges of distance learning brought on by COVID-19. Interviewee 7 from the comparison group explained, "My students' success drives my motivation to do well and be a good teacher. I feel responsible to care for my students." Interviewee 2 was in the treatment group, and their statement echoes this sentiment, "It's about having a servant's heart and not just doing a job. I don't want any

students feeling alone or isolated." Teachers in this study share a motivation to learn in order to best support their students.

However, upon further analysis, different motivational premises emerged from participants' responses to the set of questions about motivation. Participants in the comparison group more frequently described their motivation to learn as stemming from their personal learning needs or desires; whereas, participants in the treatment group more frequently described their motivation in relation to what their students' or parents' needed. Interviewee 5 from the comparison group said:

> I don't like it when I don't understand things. It bothers me, so I want to close that gap. I don't like to be dependent on other people when I don't understand something, so I want to have that skill in my toolbox…[that] motivates me to grow and learn.

Additionally, Interviewee 4 from the comparison group described their motivation to learn as "survival…[I am] mentally and physically challenged right now." These results reveal an internally focused motivation toward learning that contrasts results from the treatment group participants' descriptions of their motivation to learn. For example, Interviewee 6 from the treatment group stated:

> I want to be an administrator one day, and I am already a leader on my grade level team right now. I feel motivated to learn so I can help my colleagues and be a supportive administrator in the future.

Similarly, Interviewee 3 from the treatment group explained, "I have to get the feeling of it working for the kids. So it's more I'm motivated in a way that I know this is going to work for my kids." This externally focused motivation premise was more frequently expressed by teachers in the treatment group than the comparison group. While participants in both group conditions

share a commitment to students and dedication for the profession, their motivation premise diverge focusing on either self (e.g., internal focus) or their students/parents (e.g., external focus).

Monitoring. Of all the SRL themes, interview participants' responses to questions about monitoring their learning were the most similar across groups. Teachers from the comparison and treatment groups frequently described emotions and energy levels during their learning to teach in CSCL environments. Interviewee 7 from the comparison group explained:

> I had to pay attention to my expectations of my productivity and growth, because I wanted to change everything so quickly. But it doesn't work like that; it's incremental. That's easy to say, but hard to do in the middle of all the stress.

Additionally, Interviewee 1, who participated in the treatment group, stated:

> I was often like, 'I can't do anything fun until this gets done'…like I wouldn't have dinner or something because I have to get through my email. My husband would be like, 'It's 9:00. Are we going to eat yet?' And I'd just say, 'You can eat. I'm not done yet. I knew I needed a break, but I was so afraid that if I took one, I wouldn't come back to the work. So I just worked until I was completely done.

These descriptions of self-awareness were often followed up by statements about "student engagement," "parental support," and "concern for my colleagues," which illustrate teachers' intuitive social awareness when monitoring their learning. When asked to describe how they monitor their learning, all eight teachers described using some form of graphic organizer, such as "note-taking," "list-making," "sticky notes," "highlighting text," "schedules," "checklists," "calendars," and "reminders." The similarities among interview participants' responses for monitoring their learning were the most frequent of all the SRL themes, indicating

teachers' awareness of the strategies they employ in their learning, especially in CSCL environments.

Evaluation. Teachers in both group conditions frequently described reflective thinking and practices in their responses to the questions about how they use SRL skills in their learning. However, participants from the comparison group more frequently described a sense of satisfaction stemming from an internal focus. For example, Interviewee 4 stated:

> I used to feel validated by my evaluation score, but then I decided it didn't accurately reflect the commitment and effort I give to my learning and my work. Now I focus on my personal satisfaction, and I adjust my practice to align with my personal high expectations.

Interviewee 5 is a teacher from the comparison group, and they explained:

> I feel proud that I've learned how to make a video for my students and create online newsletters for my parents with a variety of links for their children to explore while they are learning from home. These have been challenges for me, and I feel satisfied that I've succeeded despite my anxieties using technology.

These responses were indicative of those provided by other participants in the comparison group.

In contrast to descriptions participants in the treatment group provided about their reflective thinking and practices, participants in the treatment group frequently used terms associated with either their students', parents', or colleagues' success as measures of satisfaction and evaluation in their learning. For example, Interviewee 1 from the treatment group stated:

> [It's all about] how the children do, because to me if there's a few students that aren't getting it, it's not them, it's the way I presented it and I might need to find a new way to present it.

Similarly, Interviewee 6 said:

> I keep a lesson plan binder, and I am always making notes about what worked or didn't work for my students. So the next time I approach that learning goal or unit, I can look back and see my reflections.

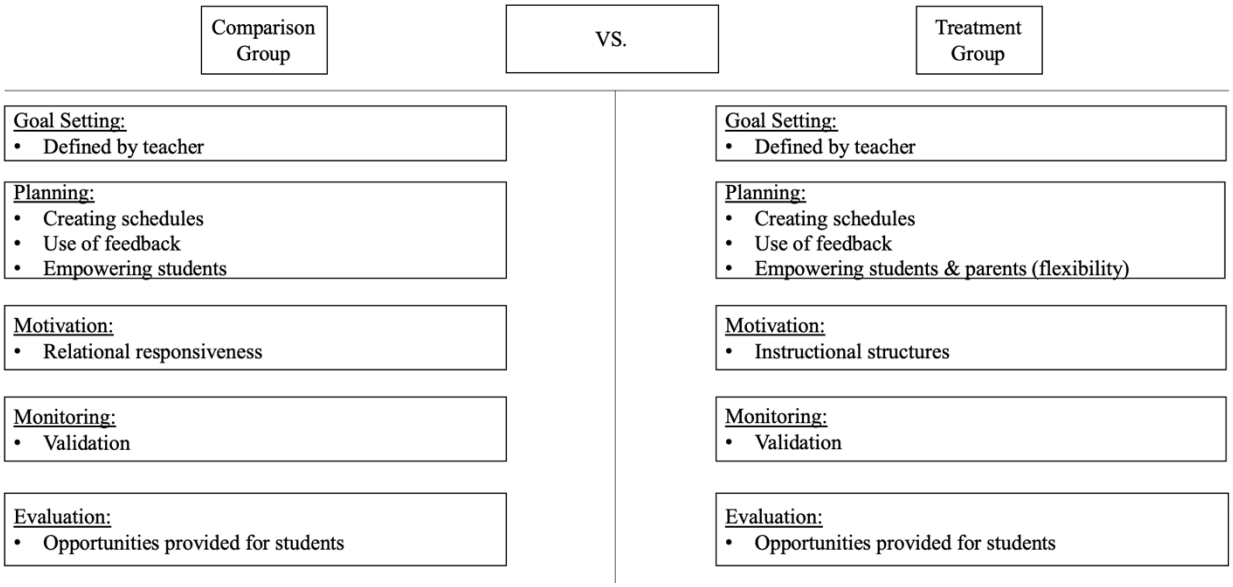
The external focus of reflective thinking and practice from participants in the treatment group offer another example of how teachers in this study use SRL skills and how the context of their instructional coaching may impact the results.

Summary. Differences emerged between group conditions on four out of five SRL phase themes. Interview participants in the treatment group more frequently and with greater specificity described sophisticated goals for their learning, a defined planning process, and a focus on "others" related to their motivation and evaluation of learning. While these differences are likely the impact of instructional coaching with SRL applications, an interesting similarity between the groups occurred at the monitoring phase. When asked to describe how they monitor their learning, interview participants described the use of a variety of graphic organizers, collaboration with others, and personal check-ins during learning events. Overall, interview participants' responses regarding how teachers use SRL skills in their learning differed between group conditions.

How Teachers Use SRL Skills in Their Instruction. Figure 5 presents the emerging themes from the interviews as teachers described how they use SRL skills in their instruction to support students in CSCL environments. By comparing the similarities and differences between interview participants' responses by group conditions, the results highlight contextual factors impacting how teachers in this study use SRL skills. The emerging themes are underlined in Figure 5, and the most frequently occurring categories are presented as bullets.

Figure 5

How Teachers Use SRL Skills in Their Instruction: Emergent Themes by Group Condition



Goal Setting. Teachers in the comparison and treatment groups described their use of goal setting in their instruction as teacher defined goals at the beginning of a lesson. Interviewee 8 from the comparison group described their goal setting activities as being "simple, concise, and easy to follow for student success." Additionally, Interviewee 3 from the treatment group described their goal setting for students as:

> Being something that I do every day on my 'agenda' slide. I include the lesson objective and the plan for the lesson. I keep it short, because the students already had a ton of stuff thrown at them by the time I met with them for class.

These descriptions are representative of the overall responses teachers in both group conditions gave when asked to explain how they use goal setting in their instruction to support students' learning in a CSCL environment.

Planning. Interview participants' responses to the questions about supporting students' planning for learning included three common categories. Teachers' described creating schedules

for students. These descriptions included “weekly planning checklists” and “establishing due dates” for participation both within a single lesson and over the course of a week (e.g., assignment submission or assessment). Similarly, participants in both group conditions frequently described various feedback sources to support students’ planning skills. Feedback sources included “data from assessments,” “conversations with students,” and “communication with parents” or “with colleagues.” Emphasis on empowering students’ ability to plan their learning while engaging in CSCL experiences was evident in statements like this one from Interviewee 2:

> We used lots of different assessments, especially varying by modality, because we wanted to know how to best support the students. [Students and parents] were having to figure out how to keep focus and pace themselves through schoolwork while distracted at home by all of their toys and favorite shows.

Additionally, Interviewee 6 explained, “I was so focused on helping students take ownership of their learning at home and that drove me to make my lessons as engaging and interesting as possible.” Overall, teachers in both group conditions described using planning strategies to support students’ learning in CSCL contexts using similar terms and concepts.

While the two group conditions shared three common categories on the SRL theme for planning, participants in the treatment group described “sensitivity to parents’ needs” and “students’ home situations” more frequently than participants in the comparison group when describing planning processes that empower students and parents. Interviewee 6 stated, “Communication with students’ parents is really important, because so many of them are overloaded right now.” Also, Interviewee 3 explains their approach is to use “…consistent deadlines so parents and students don’t have to manage so many different dates and times.” With

these descriptions, interview participants in the treatment group emphasized the need to remain flexible with planning was essential for success more so than participants in the comparison group.

Motivation. Interview participants' descriptions of supporting students' motivation for learning was the only theme that clearly differed by group. Teachers in the comparison group more frequently described supporting students' motivation for learning in terms of being relationally responsive. In this context, relational responsiveness encompasses teachers' descriptions of how they address students' social, emotional, and relational needs. Relational responsiveness differs from instructional strategies. For example, Interviewee 5 in the comparison group said they supported students' motivation for learning by:

> …creating videos, because parents said that when their child saw me, that's when they were most engaged in their learning. Kids are social by nature, so I buckled down and taught myself how to make videos to help my students.

Interviewee 7 from the comparison group said, "I had to model a positive attitude a lot. I would let my students talk about their feeling and frustrations, and then I would empathize and validate their experiences." These examples are indicative of the statements teachers in the comparison gave about how they supported students' motivation for learning in CSCL environments

These are different from the responses participants in the treatment group shared during the interviews. Teachers in the treatment group described supporting students' motivation for learning in terms focused on instructional structures. Instructional strategies describe the structures, routines, and behaviors teachers model for students' learning and academic support. Interviewee 2 from the treatment group explained, "I used classroom routines and traditions from

our face-to-face lessons as often as I could in the online lessons, so students experienced a little bit of normalcy." Interviewee 3 stated:

> I followed up with my students just like I would when we met in person, so they knew I wasn't going to let them get away with not turning in work. I kept a list of students missing work, and I would just stay on them until they turned it in.

The different approaches toward supporting students' motivation for learning in CSCL contexts is striking as participants in the comparison group generally described strategies at the relational level, but participants in the treatment group explained using instructional strategies to motivate students.

Monitoring. When teachers were asked about how they supported students' monitoring of learning in their instruction, all eight interview participants used terms to describe validating students' effort and achievement. Interviewee 1 described:

> …[I] had to remind students of challenges they faced in their learning when we were together in the classroom and how they overcame those challenges in order to help them figure out how to apply their strategies in the online learning. There was a lot of encouragement and focus on perseverance, especially with my inclusion students.

Similarly, Interviewee 8 explained:

> I had to help my students make connections to the real world and their own lives when we were in the classroom, and I found myself doing the same things when we were all online. The same kids who struggled in the classroom, struggled online and vice versa. So the strategies were the same, but I spent more time following up with students individually.

Teachers' responses about how they support students' monitoring of learning in CSCL environments were similar in both group conditions, indicating teachers' similar use of SRL skills in their instruction.

Evaluation. Results from both group conditions show teachers support students' SRL skills in CSCL environments by providing opportunities for students to reflect on and evaluate their learning. The results from teachers' responses about how they supported students' evaluation of learning included terms such as "formative assessments," "check-ins," and "conferences with students," which collapsed into a category called "opportunities provided for students." Interviewee 1 from the treatment group described "providing students time to share their take-aways from the week with each other using Flipgrid videos," and "encouraging students to leave each other feedback about their work." Interviewee 7 acknowledges the "challenges to incorporate student reflection and evaluation of learning," but said, "It's really important students have the time to think about their work and be supportive of each other, so I am figuring out how to use gallery walks." These statements are representative of those expressed by all eight interview participants about how they support students' evaluation and reflection on learning in CSCL environments.

Summary. Teachers shared more similarities in their descriptions of how they use SRL in instruction as compared to responses about how they use SRL skills in their learning. The only theme that emerged as a group difference was in regard to their motivation. Teachers in the comparison group described their motivation in terms related to concern about the quality of relationships with their students. Teachers in the comparison group frequently described relying upon rapport with students, frequent communication, and relational responsive strategies to support students' motivation for learning in CSCL environments. In the treatment group,

teachers described their motivation for using SRL in instruction to enhance their instructional strategy use and offer academic supports to students most effectively.

Summary of Interview Results. Overall, interview participants' descriptions of their SRL skill use for their learning resulted in more differences between comparison and treatment group participants than when interviewees were asked to describe how they use SRL skills in their instruction to support students' learning, especially in CSCL environments. Teachers' descriptions of their SRL use in their learning emerged as either being focused on "self" or on "others," especially in response to questions about teachers' goal setting, motivation, and self-evaluation. Despite these differences, teachers in both groups described a commitment to their students as a motivation for their regulation of learning. Additionally, teachers in both groups described collaboration in responses to questions about planning their learning, but teachers in the comparison group described an undefined learning process. Whereas, teachers in the treatment group articulated clearly defined plans for their learning. In terms of monitoring their learning, teachers in both groups described awareness of self and others, and the theme of reflection emerged from teachers' responses in both groups. Interview participants in the treatment group more frequently and with greater specificity described their SRL skills in their learning and instruction, suggesting the SRL-infused instructional coaching impacted teachers' ability to describe their SRL-related practices when compared with teachers who did not receive the SRL training.

Weekly Reflections

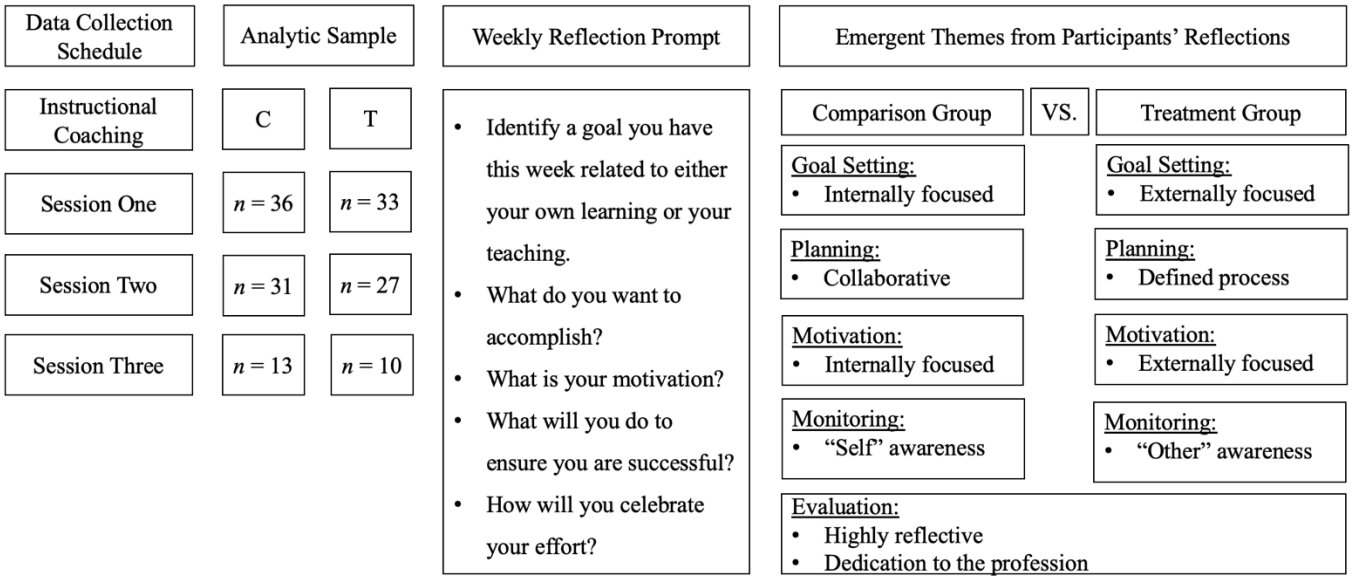
Participants in both group conditions were asked to submit weekly reflections as follow-up activities during the instructional coaching sessions. The prompts were not different by group condition. Reflections prompted teachers to identify a goal related to their learning to teach in a

CSCL environment for the upcoming week and reflect on their motivation and plan for reaching this goal. There were no word count requirements for the responses, and the length of teachers' written responses varied. Over the course of the three-week intervention, a total of 150 reflections were submitted. Participants' responses on these reflections were coded inductively, and the initial codes collapsed into categories that were aligned with the themes from Zimmerman's SRL theoretical model (2000). Appendix L presents a matrix of codes, categories, and themes that emerged during data analysis of the reflections collected from teachers participating in the instructional coaching intervention.

Figure 6 illustrates the data collection schedule, analytic sample, reflection prompt, and emergent themes and categories from the weekly reflections by groups. The emerging themes are underlined, and the most frequently occurring categories from participants' reflections are presented in bulleted lists.

Figure 6

Instructional Coaching Weekly Reflections and Emergent Themes by Group Condition



Goal Setting. Differences emerged between group conditions in teachers' weekly reflections on the theme of goal setting. Teachers in the comparison group described their goal setting with a focus on meeting personal or internally focused objectives. For example, reflections from teachers in the comparison group stated, "I want to become more confident," and "…validation of my time and all my work." This focus on "self" contrasts teachers' reflections from the treatment group.

Teachers in the treatment group described their goal setting in terms externally focused and related to their instruction. These teachers identified goals focusing on learning instructional strategies both for their learning and professional growth, as well as a means to support students and parents struggling with navigating CSCL environments. Instructional strategies included descriptions of teachers' goals to support all students' mastery of curricular concepts and skills; strategies specific to content areas or grade levels; and developing rapport and engagement with students in a CSCL environment. "A goal I have for this week is to figure out how to develop a

scope and sequence for virtual PE," is an example of a goal submitted by a teacher in the treatment group, and this statement reflects the types of goals teachers in the treatment group identified throughout the three-week coaching intervention. These results are consistent with results from teachers' interview responses about how they use SRL skills in their learning. Differences emerged with either an internal or external focus by group condition.

Planning. Teachers were asked to explain how they would ensure their success in reaching their goal. Responses frequently focused on managing time, especially time spent collaborating with others. A typical response included, "I need to set aside a regular uninterrupted block of time to achieve this." Similarly, "…collaborate with like-minded colleagues and share best practices for effective distance learning." While many responses often did not address a specific plan, those that did frequently identified the need to set boundaries, structure time, and collaborate with others.

When teachers in the comparison group were asked to describe their plans for achieving their goals, these responses more frequently focused on using support networks and colleagues. "I will set aside time to meet with my grade-level colleagues to organize our time for the upcoming week." Additional examples include, "…consistency in my communication with my co-workers," and "…finding my support." Consistent with the results from the interviews, differences emerged between groups on the SRL theme of planning.

Teachers in the treatment group frequently and specifically described clearly defined plans for achieving their goals. For example, reflections from these participants described using specific technologies and strategies to support changes in their instructional practices for the upcoming week. "I am starting to use EdPuzzle. It helped me engage some of my struggling students who are missing work. I need more practice with the tool, but I see how it helps my

kids." Additionally, "My instruction is becoming more interesting to students now that I'm using the tools we are learning. My students are starting to turn on their cameras during class now." These responses are indicative of the descriptions of planning processes in weekly reflections. These differences support results from teachers' interviews where teachers in the treatment group provided descriptions with greater sophistication than teachers in the comparison group, suggesting instructional coaching conditions impacted the results.

Motivation. Results from teachers' responses about their motivation for their goal differed by focus - internal or external, reflecting the differences found in interviewees' responses from the comparison and treatment groups. The presence of multiple motivation premises highlights nuances in teachers' motivation for their learning and in their instruction.

Many responses from the teachers in the comparison group touched on the challenge of learning how to teach online in a short period of time and a desire to experience greater work/life balance.

> I would like to be validated as a distance teacher. The number of hours I have spent creating meaningful lessons and assessments has been tremendous. As a district, I cannot even imagine if we added those hours up.

Additionally, another teacher submitted:

> My goal for this week is to spend less time working and more time with my family. I am intentionally going to make dinner one night this week and enjoy time with my kids. Even though I'm at the dining room table all time, my attention has not been on my family for weeks.

These responses are typical of the focus on "self" as the motivation for goal attainment during the instructional coaching session reflections from teachers in the comparison group.

Similar to interview responses about motivation, the most frequent reflection responses from teachers in the treatment group focused on instructional effectiveness for student benefit, which represents an external focus. For example, “My motivation for this goal is to help my special education students;” “…students who need extra help;” “…to help my students who don’t have access to technology or internet at home;” or “I want to be the best teacher I can be for my students.” In addition to responses about instructional effectiveness, teachers in the treatment group also wrote about a desire to continue learning and growing as a professional. One teacher submitted, “I want to keep up to date with the most effective approaches to best scaffold my students in their learning.” Similarly, another teacher wrote, “In the beginning I wasn’t that interested, but now I’m really interested in learning more about teaching online.” Teachers’ responses regarding their motivation each week represented both internally and externally focused premises, which is consistent with results from interviews.

Monitoring. Similar to responses from interview results about how SRL skills are used in teachers’ instruction, differences emerged between group conditions for monitoring. When asked to describe how their goal would be achieved, teachers in the comparison group frequently wrote about lessening stress levels. For example, a teacher wrote, “…to feel less stressed, manage my time, and manage my students’ frustration levels when they are in my class.” Another example about students’ engagement in class focused on a teachers’ frustration with “the black square.” They wrote:

> I am so frustrated when students won’t turn on their cameras for class. The district doesn’t have a policy, so I can’t make them. But I have no idea if they are paying attention or not. Also, it’s not any fun for me, because it’s like I’m just talking to myself.

Responses to weekly reflections about monitoring frequently focused on either teachers' emotions or energy levels, as well as students' participation in CSCL experiences.

In contrast, teachers in the treatment group frequently described their monitoring behaviors in relation to observing students' engagement in their classes increase. One teacher submitted, "When my students have those aha moments, I will know I did what I intended to do." Additionally,

> I will have met my goal when I can reach as many students as possible. I would love to feel like I have taught them a new skill and have been able to assist them in nearly the same level as I could when we were physically in the classroom.

Teachers' monitoring of learning and monitoring of students' learning in CSCL contexts reflect an internal (e.g., the teacher) or external (e.g., the students' and/or parents' needs) focus. This dual perspective is observed in interview participants' responses as well (Kramarski & Michalsky; 2015).

Evaluation. Of all the emergent SRL themes in teachers' weekly reflections, the phase of evaluation was the only area of similarity between teachers in both groups. By submitting the weekly reflection, teachers engaged in self-evaluation of their learning and their instruction in a CSCL environment. Weekly reflections prompted teachers to identify how they would celebrate goal attainment, and the responses frequently described non-work and low-tech activities. Many responses identified "taking walks," "hiking," "going to the beach," or "working out," as ways of celebrating accomplishments. Furthermore, by session three, which coincided with the end of the academic year, teachers wrote about using time during summer break to revise their curriculum and practice using new technology they learned about during the intervention. "I plan on using two weeks to decompress from this school year. Then I will start figuring out how I will begin a

new school year as an online teacher," reflects many responses centered on the theme of evaluation.

Similarly, teachers' reflections frequently focused on feelings of confidence, risk-taking, and self-efficacy for teaching in a CSCL environment. It is possible teachers' self-efficacy increased as they began utilizing the weekly reflection activities to self-regulate their learning in CSCL contexts. Additionally, the learning targets in instructional coaching sessions likely contributed to increasing teachers' knowledge of instructional strategies and technological strategies for effective CSCL conditions.

A category related to teachers' goal setting that did not change from session one to session three was collaboration with others. For example, a participant wrote: "I would like to share ideas with others who may be having problems and also find out some new ideas and tech to try in the future." Additionally, "As we wrap up the school year, I will stay connected to my co-teacher, so we can plan for the opening of school in September, which will likely include a virtual or hybrid situation." Statements like these were frequently submitted in the weekly reflections, and they exemplify teachers' value of collaboration for their learning and in their instruction to support students' learning.

Summary of Weekly Reflections Results. Teachers' weekly reflections provided an opportunity for participants to describe their SRL skills in relation to both their learning and their instruction in CSCL environments. Differences emerged between group conditions on all of the SRL phase themes – goal setting, planning, motivation, and monitoring. The only exception was the phase of evaluation. Reflections from teachers in the comparison group focused on "self" and meeting internal needs. This focus is consistent with results from interview responses. Reflections from teachers in the treatment group were also consistent with interview results.

These teachers frequently described their SRL with specificity and sophistication. The range of differences in weekly reflections suggests SRL-infused instructional coaching contributed to teachers' responses, and the instructional coaching activities impacted all teachers' ability to self-regulate their learning as descriptions of self-efficacy and collaboration were consistent between groups.

CHAPTER 5

The purpose of this study was to examine the impact of instructional coaching on teachers' self-regulated learning (SRL), self-efficacy for teaching, and perceived instructional effectiveness in a computer-supported collaborative learning (CSCL) environment by comparing training focus (e.g., CSCL pedagogy only versus CSCL pedagogy and SRL skills). Additionally, this study explored how teachers use SRL skills in their learning and in their instruction. An examination of K-12 teachers' SRL, self-efficacy for teaching, and perceived instructional effectiveness in the context of CSCL environments extends the current knowledge base about how teachers use SRL skills in CSCL contexts, and how to support teachers' SRL development for their learning and in their instruction.

In this chapter, I present a summary and interpretation of this study's findings in chronological order of the research questions posed in Chapter 1. To place these findings in theoretical and practical contexts, the implications of this research are presented in relation to prior research. Lastly, an evaluation of this study is provided to inform recommendations for future research in the fields of SRL and CSCL.

Summary and Interpretation of Findings

The results from the survey data collected after the instructional coaching intervention revealed nonsignificant results across the quantitative variables under investigation in this study. The results from the interviews and instructional coaching reflections reveal important similarities and differences in teachers' descriptions using SRL skills in their learning and in their instruction. These findings inform future directions in the fields of SRL and CSCL, particularly within K-12 school settings (Hayes & Singh, 2012).

Research Question 1

Our first research question was whether instructional coaching with and without SRL affect teachers' SRL, self-efficacy for teaching, and perception of their instructional effectiveness in computer-supported collaborative learning environments differed by group. The nonsignificant differences between group conditions (e.g., teachers receiving coaching focused on either CSCL pedagogy only or teachers receiving coaching focused on CSCL pedagogy and SRL skills) was unexpected. Moreover, the small effects between group conditions on teachers' self-efficacy for teaching (.05) and perceived instructional effectiveness in a CSCL environment (.21) indicate clinical significance was small.

These unexpected results are likely due to a confluence of factors. The granularity of measures likely affected the results. The questionnaires on the SRL, self-efficacy and perceived instructional effectiveness would be considered gross measures of psychological constructs that were not sensitive enough to reveal group differences. Other researchers have argued that measures to detect differences in constructs like self-regulated learning should be more fine-grained and molecular (Cleary et al., 2012; DiBenedetto & Zimmerman, 2010). In other words, the questionnaire measures did not capture more subtle changes in teachers' perspectives. It is recommended that more sensitive measures like think-alouds, trace-data, and qualitative indices may be more precise. To address this call for more fine-grained measures, we collected qualitative interview data and weekly reflection responses.

Another factor is that the study was conducted in the midst of a pandemic. Ecological validity was compromised due to history related to COVID. As such, low statistical power became an issue. While participant recruitment well exceeded the target of 60 teachers (N=80), the response rate for posttest surveys was lower. The low response rates are likely the result of

competing priorities at the close of the 2020 academic year. While this study capitalized on the timing of teachers' learning to teach in CSCL environments, the study's intervention took place during the second half of the last quarter of the school year. In addition to finalizing students' grades, teachers were responsible for packing up classrooms amidst social distancing guidelines, creating a sense of closure, and preparing for the uncertainties of the upcoming school year. Teachers' time and attention were diverted to other responsibilities. From this perspective, the unexpected findings between group conditions could be prevented in future studies using either a larger sample of participants and/or matched pairs during data collection (Maxwell, 1998).

Also, diffusion of treatment is another possible explanation of no group differences. The weekly reflection prompts may have served as SRL prompts experienced by participants in both conditions.

Lastly, the length and complexity of the instructional coaching intervention likely contributed to the results. The intervention may not have been long enough to see effects given the complexity of the intervention in the SRL conditions. Other studies with short interventions were less complex (Bol et al., 2016; Cerezo & McWhirter, 2012; Smith, 2001). A related point is that participants in the comparison group received more CSCL coaching interventions while the treatment group received more SRL focused coaching.

Research Questions 2 and 3

Research question two examined how teachers in this study use SRL skills for their learning and in their instruction with students? Resarch question three explored how teachers who received the additional SRL training differed in their use SRL in learning and in their instruction?

Finding 1. Results from the follow-up interviews provides insight into how SRL-infused instructional coaching impacted how teachers use SRL skills in their learning. Group differences

emerged on the SRL themes of goal setting, planning, motivation, and evaluation phases from interview participants' responses when asked to describe how they use SRL skills in their learning. Teachers in the comparison group described using SRL skills with an internal (e.g., self) focus, but teachers in the treatment group described an external (e.g., students and parents) focus for their SRL skill use.

Further substantiating the impact of SRL-instructional coaching, results from teachers' weekly reflections of their learning in CSCL environments revealed several differences in the five SRL themes focused on how teachers use SRL skills in their learning. Themes from teachers' weekly reflections emerged with the internal and external foci on the SRL themes of goal setting, planning, motivation, and monitoring, indicating the instructional coaching group condition likely impacted teachers' use of SRL skills in their learning, as demonstrated in previous SRL training research (Matthews et al., 2014).

According to Peeters et al. (2014), self-regulated teachers attune their instructional approach to their own SRL skills, providing insight into the findings in this study. Those teachers who participated in the SRL skills training, described their SRL skills use more frequently and with more specificity than the teachers who did not receive SRL skills training. The difference in teachers' descriptions may further be interpreted through the lens of surface and deep learning (Hattie, 2016). During surface learning, individuals utilize working memory functions, and knowledge or skills do not transfer to deep learning until the learner has an opportunity to integrate new knowledge and skills with former thinking and behavior patterns. Therefore, the differences in teachers' descriptions of their SRL use may be impacted by the limited opportunity to transfer surface SRL knowledge and skills to deeper learning.

Finding 2. In contrast to how participants described how they use SRL skills in their learning, participants' in both group conditions described using SRL in their instruction similarly. Most notably, teachers' descriptions of SRL skill use in their instruction were the same in four (e.g., goal setting, planning, monitoring, and evaluation) out of five SRL themes. Teachers described setting goals for students' learning and planning learning activities using schedules, feedback, and empowerment of students' growth. Goal setting has been demonstrated to positively impact student achievement and self-efficacy (Perels et al., 2009; Schunk, 1990) as it impacts the feedback cycle of instruction (Khamis & Selamat, 2019; Wiliam, 2011).

Additionally, teachers described the importance of validating students' experiences during learning – celebrating successes and acknowledging challenges when they occur within the planning and monitoring phases of instruction. Teachers' emphasis on validating students' effort and achievement was consistent in both group conditions for monitoring students' learning. Planning and monitoring of instruction have been found to significantly impact students engagement in learning, especially when prompted by teachers (Quackenbush & Bol, in press). Furthermore, Isaacson and Fujita (2006) found a relationship among students metacognitive monitoring to self-regulated learning and academic success.

Furthermore, teachers in both group conditions described providing students a variety of opportunities to reflect and evaluate their learning. The use of self and peer feedback during instruction is an encouraged practice in schools (Stiggins, 2005). Research demonstrates the significant impact on student achievement and self-efficacy when reflection and evaluation is integrated in lesson planning and delivery (Baggetun, & Wasson, 2006; Panadero & Alonso-Tapia, 2014).

These similarities between group participants' responses indicate teachers use SRL skills in their instruction to support students' SRL as demonstrated in prior research (Buzza & Allinotte, 2013; Perry et al., 2008). Kramarski and Michalsky discuss teachers' "dual role" of SRL, and previous research has examined the factors that influence and shape teachers' SRL as learners and facilitators of students' learning (Spruce & Bol, 2015; Perry et al., 2008). This dual role in teachers' SRL serves as both a model to maximize learning and a mirror of what actually happens during one's learning process (Efklides et al., 2018). Instructional coaching likely impacted teachers' facilitation of SRL skills in their instruction.

Considering teachers in the treatment group described using SRL skills in their instruction with greater frequency and specificity than teachers in the comparison group, instructional coaching in CSCL pedagogy and SRL skills likely impacted teachers' ability to accurately describe instructional strategies for motivating students to learning in CSCL environments. In their study investigating pre-service teachers' SRL skill implementation in literacy instruction, Perry, Hutchinson, and Thauberger (2007) observed teachers' increased application of SRL skills in their instruction after participating in mentoring (Lombardi, 2019). Similarly, research with pre-service teachers demonstrated an increase in their SRL activities after participating in programs that emphasize teachers' SRL and students' SRL (e.g., dual learning programs) (Endedijk et al., 2012). This finding suggests instructional coaching in SRL impacts teachers' ability to describe how they use SRL skills in their instruction.

Implications

Theoretical. Research demonstrates successful navigation in CSCL environments is related to SRL skills (Winters et al., 2008). SRL encompasses one's motivation and behavior employed for successful navigation in academic settings or situations of learning (Schunk &

Greene, 2018; Zimmerman, 2001). Related to SRL is the concept of self-efficacy. Self-efficacy is defined as teachers' judgement of their ability to achieve a particular outcome (Doménech-Betoret et al., 2017). In this study, teachers' self-efficacy for teaching was situated in the context of rapidly learning to teach in a CSCL environment, and the immediacy of teachers' new learning impacted their perception of instructional effectiveness (Bray-Clark & Bates; 2003).

Teachers' perceptions of their instructional effectiveness in a CSCL environment has been shown to be critical for reflection and professional growth (Wright & Grenier, 2007). This evaluation of professional knowledge and skills aligns with Zimmerman's SRL model (2000). While interconnected, these constructs represent different psychological aspects that contribute to supporting a teacher's ability to regulate their learning and adapt instruction for a CSCL environment.

Practical. Educational leaders should prioritize the process of embedding SRL structures into professional development. It is well documented that instructional coaching positively impacts teachers' self-efficacy for teaching and learning in CSCL environments (Roberts et al., 2019; Yoo, 2016; Zee et al., 2016). Furthermore, studies examining the impact of instructional coaching on teachers' classroom practices have demonstrated a variety of positive effects on student achievement, school/district performance, and teacher collective efficacy (Barry, 2012; Bümen, 2009; Tschannen-Moran & Barr, 2004; Wheeler, 2014). The findings from this study contribute to these previous studies and support the inclusion of instructional coaching as a structure within a school's professional development programs (Knight, 2017).

Furthermore, this study's qualitative results support imbedding SRL structures in curriculum design to provide teachers opportunities to become more aware of their SRL skills and explicitly teach students SRL skills during instruction (Cimer et al., 2013; Cleary, 2018).

Teacher evaluation frameworks frequently prioritize teachers' instructional planning and curriculum development when determining teacher effectiveness (Basileo & Marzano, 2016; Danielson, 2007; Stronge, 2011). However, the majority of these evaluation frameworks were designed for face-to-face instruction instead of instruction in CSCL environments. As teachers develop instructional plans and design instruction, especially in CSCL environments, the repetition and practice of SRL skills aids both teachers' SRL use and how they support students' successful regulation during instruction. Prior research demonstrates the necessity of SRL skills in CSCL environments (Järvelä & Hadwin, 2013; Winters et al., 2008). Therefore, as K-12 teachers prepare to deliver instruction in CSCL environments, educational leaders should take advantage of the practice of instructional design and curriculum development to support teachers' SRL and promote their self-efficacy for teaching and perceived instructional effectiveness in CSCL environments.

Limitations

To design the present study, I drew upon frequently employed methods from research in teacher SRL training (Allshouse, 2016; Butler et al., 2004; Buzza & Allinotte, 2013; Ganda & Boruchovitch, 2018; Kramarski & Michalsky, 2015, 2009; Krecic & Grmek, 2010). Ecological validity is strengthened by conducting this investigation in a in CSCL context; however, while there are attempts to control confounding variables using random assignment, limitations are present. Data collection in the midst of a global pandemic introduced additional confounds, as well as provided a unique opportunity to study teachers in this context.

This study used a quasi-experimental design over three weeks during the second half of the last quarter of the 2020 academic year. The results of the study may be limited by both the length of the research timeline and short dosages of the SRL training (e.g., one hour per week).

Participants may not have been exposed to the SRL training for a sufficient amount of time and/or with sufficient repetition of SRL concepts for statistical effects to manifest. Additionally, teachers' learning curve was steep, and they were overwhelmed by the rapid transition to teaching in a CSCL environment. The SRL skills training was likely too much new information to take in, process, and apply during teachers' already steep learning curve (Moos, 2014).

As noted in the discussion of findings related to the first research question, the questionnaires may not have captured the more fine-grained changes in teachers' SRL, self-efficacy for teaching, and perceived instructional effectiveness. For an intervention of this duration and complexity, other measures may have been more sensitive in identifying these psychological changes.

Another limitation is the self-report survey measures. The use of self-report questionnaires increased the chance of participants' responding with certain bias and social desirability (Holtgraves, 2004). Also, the use of the same pretest/posttest measures may have created testing effects.

Furthermore, teacher reflection is a key factor in professional growth (Cimer et al., 2013). In this study, the opportunity for teachers to reflect, apply new knowledge, and change their practice was limited by both time and a tremendous learning curve from the rapid transition to instruction in CSCL environments. Teacher growth and effectiveness is impacted by reflection (Basileo & Marzano, 2016; Hattie, 2016), and future studies examining the long-term impacts of instructional coaching will likely discover how teachers' deep learning of SRL for their learning and instruction develops.

Attrition is also a naturally occurring limitation. To account for attrition, this study was powered 10% higher and recruitment was continued until the minimum sample size was reached.

However, responses to the posttest surveys did not reach the number needed to measure statistical significance for group differences.

Diffusion of treatment emerged as a limitation in two ways. First, the weekly reflection prompted all participants to engage in SRL application. Secondly, while group conditions were randomly assigned, the probability of teachers knowing one another may be high within the sample as a result of participant recruitment and consent to participate. To mitigate diffusion of treatment, participants were blind to their group condition; however, local discussion between teachers from the same school likely occurred and may have potentially impacted the results and limited the generalizability of the study.

Recommendations for Future Research

Future research should focus on increasing the number of participants in order to investigate statistical and clinical significance of an SRL skills intervention for teachers working in a CSCL environment.

Additionally, instructional coaching could be ongoing throughout the year in order to support teachers' deep learning of SRL for their learning and instruction in CSCL environments (Basileo & Marzano, 2016; Hattie, 2016). Longitudinal studies examining the effects of instructional coaching that provides intentional, consistent, and repetitive application of SRL skills in CSCL environments may reveal the structures that most effectively support teachers' professional growth. These structures should be in place proactively and part of the educational environment instead of reactive to circumstances (e.g., pandemic, snow days, etc.).

Furthermore, by focusing on teachers' SRL development at other times of the school year will likely provide insights regarding how time of year impacts teachers' growth and sense of efficacy and effectiveness. For example, teachers' focus at the end of the school year is on

wrapping up instruction and not generally focused on taking in new information to apply in practice (Boyle et al., 2005). Seeing students' growth as a result of instructional changes is not likely as the summer break prevents observation of effects. This focus is important in order to better understand how to transfer SRL knowledge to instructional practices that positively impact teachers' self-efficacy for teaching and perceived instructional effectiveness.

An obvious direction in future studies is to increase external validity by using larger and more diverse samples. Ecological validity was strong in computer-supported collaborative learning environments, but future researchers may want to apply this intervention in face-to-face classrooms.

Conclusion

The global COVID-19 pandemic accelerated K-12 teachers' transition to teaching in a CSCL environments (Vegas, 2020). In order to maintain students' academic growth and educational engagement, teachers' rapidly learned new instructional strategies and technological skills during this unprecedented historical event (Ebrahimji, 2020). Globally, education programs shifted from face-to-face learning to CSCL environments; however, the transition of effective instruction and student learning likely varied with teacher expertise and student access to reliable technology and motivation to engage in CSCL contexts (Reiners et al., 2020).

This study investigated the impact of instructional coaching on teachers' SRL, self-efficacy for teaching, and perceived instructional effectiveness in a CSCL environment, as well as explored how teachers' use SRL skills in their learning and in their instruction. While we did not find significance from quantitative measures, the findings from this study suggest training in SRL in CSCL environments likely contributes to teachers' professional knowledge and skills as instructors in CSCL environments. Additionally, the granularity of measures likely impacts

detection of SRL, self-efficacy for teaching, and perceived instructional effectiveness in CSCL environments. Future research in the area of SRL skills in CSCL environments should prioritize investigations with in-service teachers in authentic K-12 settings, especially in the context of CSCL.

REFERENCES

Allshouse, A. (2016). *Professional development in self-regulated learning: Effects of a workshop on teacher knowledge, skills, and self-efficacy, and the development of a coaching framework* (Doctoral dissertation, Rutgers University-Graduate School of Applied and Professional Psychology).

Anderton, B. (2006). Using the online course to promote self-regulated learning strategies in pre-service teachers. *Journal of Interactive Online Learning, 5*(2), 156-177.

Archambault, L. M., & Crippen, K. J. (2009). Examining TPACK Among K-12 Online Distance Educators in the United States. *Contemporary Issues in Technology and Teacher Education, 9*(1), 71-88.

Astleitner, H. (2005). Principles of effective instruction: General standards for teachers and instructional designers. *Journal of Instructional Psychology*, *32*(1).

Astleitner, H., & Pasuchin, I. (2007). Increasing effectiveness of instruction and reducing pressure for teachers by self-regulated learning. In *Task-and standard-based learning. An instructional psychology perspective*. Lang.

Azevedo, R., Martin, S. A., Taub, M., Mudrick, N. V., Millar, G. C., & Grafsgaard, J. F. (2015, June). Are pedagogical agents' external regulation effective in fostering learning with intelligent tutoring systems? In *International Conference on Intelligent Tutoring Systems* (pp. 197-207). Springer.

Baggetun, R., & Wasson, B. (2006). Self-regulated learning and open writing. *European Journal of Education*, *41*(3-4), 453-472.

Bandura, A., (1986). *Social foundations of thought and action: A social cognitive theory.* Englewood Cliffs, NJ: Prentice-Hall, Inc.

Barnard, L., Paton, V. O., & Lan, W. Y. (2008). Online self-regulatory learning behaviors as a mediator in the relationship between online course perceptions with achievement. *International Review of Research in Open and Distance Learning, 9*(2), 1-11.

Barr, S., & Askell-Williams, H. (2019). Changes in teachers' epistemic cognition about self–regulated learning as they engaged in a researcher-facilitated professional learning community. *Asia-Pacific Journal of Teacher Education*, *48*(2), 1-26.

Barry, P. K. (2012). *The impact of instructional coaching on teaching practices*. ProQuest LLC. 789 East Eisenhower Parkway, PO Box 1346, Ann Arbor, MI 48106.

Basileo, L. D., & Marzano, R. J. (2016, June 16-17). *The Marzano model: How does it really matter?* Session presented at the Building Expertise Conference, Orlando, FL.

Bellin, M. H., Oktay, J., Scarvalone, S., Appling, S., & Helzlsouer, K. (2015). A qualitative description of a family intervention for breast cancer survivors experiencing fatigue. *Journal of Psychosocial Oncology*, *33*(4), 395-413.

Bembenutty, H., White, M., & Vélez, M. (2015). *Developing self-regulation of learning and teaching skills among teacher candidates*. SpringerBriefs in Education. doi: 10.1007/978-94-017-9950-8_4.

Bjork, R. A., Dunlosky, J., & Kornell, N. (2013). Self-regulated learning: Beliefs, techniques, and illusions. *Annual Review of Psychology*, *64*, 417-444.

Boekaerts, M. (1991). Subjective competence, appraisals and self-assessment. *Journal of Learning and Instruction*. 1, 1–17. doi: 10.1016/0959-4752(91)90016-2.

Boekaerts, M. (1996). Self-regulated learning at the junction of cognition and motivation. *European Journal of Psychology*. 2, 100–112. doi: 10.1027/1016-9040.1.2.100.

Bol, L., Campbell, K. D., Perez, T., & Yen, C. J. (2016). The effects of self-regulated learning

training on community college students' metacognition and achievement in developmental math courses. *Community College Journal of Research and Practice*, *40*(6), 480-495.

Bol, L., & Garner, J. (2011). The challenges of supporting self-regulation in distance education environments. *Journal of Computing in Higher Education,23 (2-3), 104-123.*

Boyle, B., Lamprianou, I., & Boyle, T. (2005). A longitudinal study of teacher change: What makes professional development effective? Report of the second year of the study. *School effectiveness and school improvement*, *16*(1), 1-27.

Bray-Clark, N., & Bates, R. (2003). Self-efficacy beliefs and teacher effectiveness: Implications for professional development. *Professional Educator*, *26*(1), 13-22.

Broadbent, J., & Poon, W. L. (2015). Self-regulated learning strategies and academic achievement in online higher education learning environments: A systematic review. *The Internet and Higher Education*, *27*, 1-13.

Broglio, S. P., Ferrara, M. S., Macciocchi, S. N., Baumgartner, T. A., & Elliott, R. (2007). Test-retest reliability of computerized concussion assessment programs. *Journal of athletic training*, *42*(4), 509.

Brown, A. L., Palincsar, A. S., & Armbruster, B. B. (1984). Instructing comprehension-fostering activities in interactive learning situations. *Learning and Comprehension of Text*, 255-286.

Bümen, N. T. (2009). Possible effects of professional development on Turkish teachers' self-efficacy and classroom practice. *Professional Development in Education*, *35*(2), 261-278.

Butler, D. L., Lauscher, H. N., Jarvis-Selinger, S., & Beckingham, B. (2004). Collaboration and self-regulation in teachers' professional development. *Teaching and Teacher Education*, *20*(5), 435-455.

Butler, D. L., Schnellert, L., Cartier, S. C., Gagnon, F., Higginson, S., Giammarino, M., & Tang, I. (2006). Relating teacher professional development processes to students' engagement in learning: An integrative research project.

Buzza, D., & Allinotte, T. (2013). Pre-service teachers' self-regulated learning and their developing concepts of SRL. *Brock Education: A Journal of Educational Research and Practice*, *23*(1).

Carver & Scheier, (2016). Title of chapter. In Vohs, K. D., & Baumeister, R. F. (Eds.). (2016). *Handbook of self-regulation: Research, theory, and applications*. Guilford Publications.

Cerezo, A., & McWhirter, B. (2012). A brief intervention designed to improve social awareness and skills to improve Latino college student retention. *College Student Journal*, *46*(4), 867-879.

Çetin, İ., & Erdoğan, A. (2018). Development, validity and reliability study of technological pedagogical content knowledge (TPACK) efficiency scale for mathematics teacher candidates. *International Journal of Contemporary Educational Research*, *5*(1), 50-62.

Chai, C. S., Tan, S. C., & Hung, W. L. (2003, July). Fostering knowledge building communities (KBC) through computer-supported collaborative learning (CSCL). In *Refereed Conference Proceedings of HERDSA, Christchurch, New Zealand* (pp. 6-9).

Charter, R. A. (2003). A breakdown of reliability coefficients by test type and reliability method, and the clinical implications of low reliability. *The Journal of General Psychology*, *130*(3), 290-304.

Chatzistamatiou, M., Dermitzaki, I., & Bagiatis, V. (2014). Self-regulatory teaching in

mathematics: Relations to teachers' motivation, affect and professional commitment. *European Journal of Psychology of Education, 29*, 295-310.

Chen, J., Wang, M., Kirschner, P. A., & Tsai, C. C. (2018). The role of collaboration, computer use, learning environments, and supporting strategies in CSCL: A meta-analysis. *Review of Educational Research*, *88*(6), 799-843.

Cho, M. H., & Shen, D. (2013). Self-regulation in online learning. *Distance Education*, *34*(3), 290-301.

Çimer, A., Çimer, S. O., & Vekli, G. S. (2013). How does reflection help teachers to become effective teachers. *International Journal of Educational Research*, *1*(4), 133-149.

Cleary, T. J. (2018). *The self-regulated learning guide: Teaching students to think in the language of strategies*. New York, NY: Routledge.

Cleary, T. J., Callan, G. L., & Zimmerman, B. J. (2012). Assessing self-regulation as a cyclical, context-specific phenomenon: Overview and analysis of SRL microanalytic protocols. *Education Research International*, *2012*.

Cleary, T. J., & Kitsantas, A. (2017). Motivation and self-regulated learning influences on middle school mathematics achievement. *School Psychology Review*, *46*(1), 88-107.

Cleary, T. J., Platten, P., & Nelson, A. (2008). Effectiveness of the self-regulation empowerment program with urban high school students. *Journal of Advanced Academics, 20(1)*, 70-107.

Cleary, T. J., & Zimmerman, B. J. (2004). Self-regulation empowerment program: A school-based program to enhance self-regulated and self-motivated cycles of student learning. *Psychology in the Schools, 41*(5), 537-550.

Cloude, E. B., Taub, M., & Azevedo, R. (2018, June). Investigating the role of goal orientation:

metacognitive and cognitive strategy use and learning with intelligent tutoring systems. In *International Conference on Intelligent Tutoring Systems* (pp. 44-53). Springer, Cham.

Cohen, J. (1988). *Statistical power analysis for the behavior sciences* (2nd ed.). West Publishing Company.

Conover, W. J. & Iman, R. L. (1981). Rank transformations as a bridge between parametric and nonparametric statistics. *The American Statistician, 35*(3), 124-129.

Conquergood, D. (1986). Performing cultures: Ethnography, epistemology, and ethics. *Miteinander sprechen und handeln: Festschrift fur Hellmut Geissner/ed. E. Slembek. Frankfurt: Scriptor.–P*, 55-66.

Corkett, J., Hatt, B., & Benevides, T. (2011). Student and teacher self-efficacy and the connection to reading and writing. *Canadian Journal of Education*, *34*(1), 65-98.

Creswell, J. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA: Sage.

Danielson, C. (2007). *Enhancing professional practice: A framework for teaching*. ASCD.

Dembo, M. H., & Eaton, M. J. (2000). Self-regulation of academic learning in middle-level schools. *The Elementary School Journal, 100*, 473-490.

Desimone, L. M., & Pak, K. (2017). Instructional coaching as high-quality professional development. *Theory Into Practice*, *56*(1), 3-12.

DiBenedetto, M. K., & Zimmerman, B. J. (2010). Differences in self-regulatory processes among students studying science: A microanalytic investigation. *The International Journal of Educational and Psychological Assessment*, *5*(1), 2-24.

Dignath-van Ewijk, C. (2017). Which components of teacher competence determine whether

teachers enhance self-regulated learning? Predicting teachers' self-reported promotion of self-regulated learning by means of teacher beliefs, knowledge, and self-efficacy. *Frontline Learning Research*, *4*(5), 83-105.

Dignath, C., & Bütter, G. (2008). Components of fostering self-regulated learning among students: A meta-analysis on intervention studies at primary and secondary school level. *Metacognition Learning, 3,* 231-264.

Dignath, C., & Büttner, G. (2018). Teachers' direct and indirect promotion of self-regulated learning in primary and secondary school mathematics classes–insights from video-based classroom observations and teacher interviews. *Metacognition and Learning*, *13*(2), 127-157.

Dignath-van Ewijk, C. & van der Werf, G. (2012). What teachers think about self-regulated learning: Investigating teacher beliefs and teacher behavior of enhancing students' self-regulation. *Educational Research International*, 1-10.

Dignath-van Ewijk, C., Dickhäuser, O., & Büttner, G. (2013). Assessing how teachers enhance self-regulated learning: A multiperspective approach. *Journal of Cognitive Education and Psychology, 12(3),* 338-358.

Dignath-van Ewijk, C., & van der Werf, G. (2012). What teachers think about self-regulated learning: Investigating teacher beliefs and teacher behavior of enhancing students' self-regulation. *Education Research International.*

DiPerna, J. C. (2006). Academic enablers and student achievement: Implications for assessment and intervention services in the schools. *Psychology in the Schools, 43(1)*, 7-17.

Doménech-Betoret, F., Abellán-Roselló, L., & Gómez-Artiga, A. (2017). Self-efficacy,

satisfaction, and academic achievement: The mediator role of students' expectancy-value beliefs. *Frontiers in Psychology, 8*, 1193.

Duffin, L. C., French, B. F., & Patrick, H. (2012). The teachers' sense of efficacy scale: Confirming the factor structure with beginning pre-service teachers. *Teaching and Teacher Education*, *28*(6), 827-834.

Dunlosky, J., Rawson, K. A., Marsh, E. J., Nathan, M. J., & Willingham, D. T. (2013). Improving students' learning with effective learning techniques: Promising directions from cognitive and educational psychology. *Psychological Science in the Public Interest, 14*(1), 4-58.

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development*, *82*(1), 405-432.

Dweck, C. S. (2003). Ability conceptions, motivation and development. *British Journal of Educational Psychology, 13*(27), 13-27.

Ebrahimji, A. (2020, March 24). Students navigate uncharted territory as pandemic forces education online. *CNN*. https://www.cnn.com/2020/03/16/us/online-school-coronavirus-trnd/index.html.

Edwards, R., & Holland, J. (2013). *What is qualitative interviewing?* Bloomsbury Academic. pp. 2–3. ISBN 9781849668095.

Efklides, A. (2011). Interactions of metacognition with motivation and affect in self-regulated learning: the MASRL model. *Journal of Educational Psychology*. 46, 6–25. doi: 10.1080/00461520.2011.538645.

Efklides, A., Schwartz, B. L., & Brown, V. (2018). Motivation and affect in self-regulated

learning: Does metacognition play a role? In D. H. Schunk & J. A. Greene (Eds.), *Handbook of self-regulation of learning and performance* (2nd ed., pp. 285-303). Routledge.

Endedijk, Maaike D., Jan D. Vermunt, Nico Verloop, and Mieke Brekelmans. "The nature of student teachers' regulation of learning in teacher education." *British Journal of Educational Psychology* 82, no. 3 (2012): 469-491.

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2013). G*Power Version 3.1.9.4 [computer software]. Uiversität Kiel, Germany. Retrieved from http://www.psychologie.hhu.de/arbeitsgruppen/allgemeine-psychologie-und-arbeitspsychologie/gpower.html.

Ganda, D. R., & Boruchovitch, E. (2019). Intervention in self-regulation of learning with higher education students: Analysis of scientific production. *Interdisciplinary Studies in Psychology*, *10*(3), 3-25.

George, D. & Mallery, P. (2016). *SPSS for Windows step by step: A simple guide and reference, 11.0 update* (14th ed.) Allyn and Bacon.

Glaser, B. G. & Strauss, A. (1967). *The discovery of grounded theory: Strategies for qualitative research.* Chicago: Aldine.

Greene, J. A., Bolick, C. M., Jackson, W. P., Caprino, A. M., Oswald, C., & McVea, M. (2015). Domain-specificity of self-regulated learning processing in science and history. *Contemporary Educational Psychology*, *42*, 111-128.

Grubbs, F. E. (1950). Sample criteria for testing outlying observations. *The Annals of Mathematical Statistics*, *21*(1), 27–58. https://doi.org/10.1214/aoms/1177729885.

Grubbs, F. E. (1969). Procedures for detecting outlying observations in samples. *Technometrics*,

11(1), 1–21. https://doi.org/10.1080/00401706.1969.10490657.

Hacker, D. J., & Bol, L. (in press). Calibration and self-regulated learning: Making the connections. In J. Dunlosky & K. A. Rawson (Eds.), *The Cambridge handbook of cognition and education* (p. 647–677). Cambridge University Press.

Hadwin, A. F., Järvelä, S., & Miller, M. (2011). Self-regulated, co-regulated, and socially shared regulation of learning. *Handbook of self-regulation of learning and performance*, *30*, 65-84.

Hadwin, A., Järvelä, S., & Miller, M. (2018). Self-regulation, co-regulation, and shared regulation in collaborative learning environments. In D. H. Schunk & J. A. Greene (Eds.), *Handbook of self-regulation of learning and performance* (2nd ed., pp. 83-106). Routledge.

Häkkinen, P., Järvelä, S., Mäkitalo-Siegl, K., Ahonen, A., Näykki, P., & Valtonen, T. (2017). Preparing teacher-students for twenty-first century learning practices (PREP21): A framework for enhancing collaborative problem-solving and strategic learning skills. *Teachers and Teaching: Theory and Practice, 23*(1), 25-41. doi: 10.1080/13540602.2016.1203772.

Harris, K. R., & Graham, S. (2009). Self-regulated strategy development in writing: Premises, evolution, and the future. In *BJEP Monograph Series II, Number 6-Teaching and Learning Writing.* British Psychological Society, *113*(135), 113-135).

Hattie, J. (2016). Know thy impact. *On formative assessment: Readings from educational leadership (EL Essentials), 36.*

Hayes, D. G., & Singh, A. A. (2012). *Qualitative inquiry in clinical and educational settings*. New York, NY: The Guilford Press.

Holtgraves, T. (2004). Social desirability and self-reports: Testing models of socially desirable responding. *Personality and Social Psychology Bulletin*, *30*(2), 161-172.

Hill, C. E. (2015). Consensual qualitative research (CQR): Methods for conducting psychotherapy research. In *Psychotherapy research* (pp. 485-499). Springer, Vienna.

Isaacson, R., & Fujita, F. (2006). Metacognitive knowledge monitoring and self-regulated learning. *Journal of the Scholarship of Teaching and Learning*, 39-55.

Järvelä, S., & Hadwin, A. F. (2013). New frontiers: Regulating learning in CSCL. *Educational Psychologist*, *48*(1), 25-39.

Järvelä, S., Kirschner, P. A., Panadero, E., Malmberg, J., Phielix, C., Jaspers, J., ... & Järvenoja, H. (2015). Enhancing socially shared regulation in collaborative learning groups: designing for CSCL regulation tools. *Educational Technology Research and Development*, *63*(1), 125-142.

Johnson, D., Johnson, R., & Holubec, E. (2002). Circles of learning: Cooperation in the classroom. Edina, MN: Interaction Book Company, p. 95-118, ISBN 0-939603-12-8.

Karimi, M. N. (2011). The effects of professional development initiatives on EFL teachers' degree of self-efficacy. *Australian Journal of Teacher Education, 36*, 50-62.

Karpicke, J. D., Butler, A. C., & Roediger III, H. L. (2009). Metacognitive strategies in student learning: Do students practice retrieval when they study on their own? *Memory*, *17*(4), 471-479.

Khamis, S., & Selamat, A. (2019). The use of feedback in the classroom assessment: A case study. International Journal of Academic Research in Progressive Education and Development, *8*(3), 325– 334.

Klassen, R. M., Bong, M., Usher, E. L., Chong, W. H., Huan, V. S., Wong, I. Y. F., et al. (2009).

Exploring the validity of a teachers' self-efficacy scale in five countries. *Contemporary Educational Psychology*, 34, 67e76. doi:10.1016/ j.cedpsych.2008.08.001.

Klei Borrero, K. (2019). *Every student, every day: A no-nonsense nurturer approach to reaching all learners*. Solution Tree Press.

Knight, J. (2015). *Better conversations: Coaching ourselves and each other to be more credible, caring, and connected*. Corwin Press.

Knight, J. (2017). *The impact cycle: What instructional coaches should do to foster powerful improvements in teaching*. Corwin Press.

Knodel, J. (1993). The design and analysis of focus group studies: A practical approach. *Successful focus groups: Advancing the state of the art*, *1*, 35-50.

Knowles, M. S., Holton, E. F. and Swanson, R. F. (2014). *The adult learner: The definitive classic in adult education and human resource development*. London: Routledge.

Koehler, M., & Mishra, P. (2005). What happens when teachers design educational technology? The development of technological pedagogical content knowledge. *Journal of Educational Computing Research, 32*(2), 131-152.

Kornell, N., & Bjork, R. A. (2007). The promise and perils of self-regulated study. *Psychonomic Bulletin & Review*, *14*(2), 219-224.

Koschmann, T. (2012). *CSCL: Theory and practice of an emerging paradigm*. Routledge.

Kramarski, B., & Kohen, Z. (2017). Promoting preservice teachers' dual self-regulation roles as learners and as teachers: Effects of generic vs. specific prompts. *Metacognition and Learning*, *12*(2), 157-191.

Kramarski, B., & Michalsky, T. (2009). Investigating preservice teachers' professional growth in self-regulated learning environments. *Journal of Educational Psychology*, *101*(1), 161.

Kramarski, B., & Michalsky, T. (2010). Preparing preservice teachers for self-regulated learning in the context of technological pedagogical content knowledge. *Learning and Instruction*, *20*(5), 434-447.

Kramarski, B., & Michalsky, T. (2015). Effect of a TPCK-SRL model on teachers' pedagogical beliefs, self-efficacy, and technology-based lesson design. In *Technological pedagogical content knowledge* (pp. 89-112). Springer.

Kramarski, B., & Revach, T. (2009). The challenge of self-regulated learning in mathematics teachers' professional training. *Educational Studies in Mathematics*, *72*(3), 379-399.

Krečič, M. J., & Grmek, M. I. (2010). Teachers' conceptions of self-regulated learning: A comparative study by level of professional development. *Odgojne Znanosti*, *12*(2), 399-412.

Lan, W. Y., Bremer, R., Stevens, T., & Mullen, G. (2004, April). *Self-regulated learning in the online environment.* Paper presented at the annual meeting American Educational Research Association, San Diego, California.

Lawson, M. J., Vosniadou, S., Van Deur, P., Wyra, M., & Jeffries, D. (2019). Teachers' and students' belief systems about the self-regulation of learning. *Educational Psychology Review*, *31*(1), 223-251.

Lazakidou, G., & Retalis, S. (2010). Using computer supported collaborative learning strategies for helping students acquire self-regulated problem-solving skills in mathematics. *Computers & Education*, *54*(1), 3-13.

Leedy, P. D., & Ormrod, J. E. (2019). *Practical research: Planning and design* (12th ed). Pearson.

Leidinger, M., & Perels, F. (2012). Training self-regulated learning in the classroom: Development and evaluation of learning materials to train self-regulated learning during regular mathematics lessons at primary school. *Education Research International*, *2012*.

Levene, H. (1960). Contributions to probability and statistics. *Essays in honor of Harold Hotelling,* 278-292.

Lockhorst, D., Admiraal, W., & Pilot, A. (2010). CSCL in teacher training: what learning tasks lead to collaboration?. *Technology, Pedagogy and Education*, *19*(1), 63-78.

Lombardi, P. (2019). Instructional methods, strategies, and technologies to meet the needs of all learners. Retrieved from https://granite.pressbooks.pub/teachingdiverselearners/

Lopez, E. J., Nandagopal, K., Shavelson, R. J., Szu, E., & Penn, J. (2013). Self-regulated learning study strategies and academic performance in undergraduate organic chemistry: An investigation examining ethnically diverse students. *Journal of Research in Science Teaching*, *50*(6), 660-676.

Loyalka, P., Popova, A., Li, G., & Shi, Z. (2019). Does teacher training actually work? Evidence from a large-scale randomized evaluation of a national teacher training programs. *American Economic Journal: Applied Economics*, *11*(3), 128-54.

Madison, D. S. (2011). *Critical ethnography: Method, ethics, and performance*. Sage publications.

Mahmoee, H. M., & Pirkamali, A. (2013). Teacher Self-Efficacy and Students' Achievement: A Theoretical Overview. *The Social Sciences*, *8*(2), 196-202.

Malmberg, J., Järvenoja, H., & Järvelä, S. (2010). Tracing elementary school students' study tactic use in gStudy by examining a strategic and self-regulated learning. *Computers in Human Behavior*, *26*(5), 1034-1042.

Matthews, J. S., Banerjee, M., & Lauermann, F. (2014). Academic identity formation and motivation among ethnic minority adolescents: The role of the "self" between internal and external perceptions of identity. *Child development*, *85*(6), 2355-2373.

Maxwell, S. E. (1998). Longitudinal designs in randomized group comparisons: When will intermediate observations increase statistical power?. *Psychological Methods*, *3*(3), 275.

McCabe, J. (2011). Metacognitive awareness of learning strategies in undergraduates. *Memory & Cognition*, *39*(3), 462-476.

Menard, S. (2009). *Logistic regression: From introductory to advanced concepts and applications.* Sage Publications. https://doi.org/10.4135/9781483348964

Michalsky, T., & Schechter, C. (2013). Preservice teachers' capacity to teach self-regulated learning: Integrating learning from problems and learning from successes. *Teaching and Teacher Education*, *30*, 60-73.

Mills, G. E., & Gay, L. R. (2016). *Educational research: Competencies for analysis and application* (11th ed.). Pearson.

Mitra, D. (2011). The social and economic benefits of public education. *Pennsylvania State University*. Education Law Center. https://www.elc-pa.org/resource/pennsylvanias-best-investment-the-social-and-economic-benefits-of-public-education/

Mohamadi, F. S., & Asadzadeh, H. (2012). Testing the mediating role of teachers' self-efficacy beliefs in the relationship between sources of efficacy information and students achievement. *Asia Pacific Education Review*, *13*(3), 427-433.

Mojavezi, A., & Tamiz, M. P. (2012). The Impact of Teacher Self-efficacy on the Students' Motivation and Achievement. *Theory & Practice in Language Studies*, *2*(3).

Moos, D. C. (2019, April 8-12). The teacher as learner: The missing ingredient in a self-regulated learning classroom [Conference session]. American Educational Research Association, Toronto, Ontario, Canada. https://www.youtube.com/watch?v=M6IC6Cvex8x.

Moos, D. C., & Azevedo, R. (2008). Monitoring, planning, and self-efficacy during learning with hypermedia: The impact of conceptual scaffolds. *Computers in Human Behavior*, *24*(4), 1686-1706.

Moos, D. C., & Miller, A. (2015). The cyclical nature of self-regulated learning phases: Stable between learning tasks?. *Journal of Cognitive Education and Psychology*, *14*(2), 199-218.

Moos, D. C., & Pitton, D. (2014). Student teacher challenges: Using the cognitive load theory as an explanatory lens. *Teaching Education*, *25*(2), 127-141.

Moos, D. C., & Stewart, C. A. (2018). Technology uses in instruction. In *Connecting Self-regulated Learning and Performance with Instruction Across High School Content Areas* (pp. 417-440). Springer, Cham.

Moore, A., Conlan, O., & Macarthur, V. (2012, July). SRL tasks and activities as a model of cognitive behavior within ETTHOS. In *2012 IEEE 12th International Conference on Advanced Learning Technologies* (pp. 708-709). IEEE.

Muijs, D., Kyriakides, L., Van der Werf, G., Creemers, B., Timperley, H., & Earl, L. (2014). State of the art–teacher effectiveness and professional learning. *School effectiveness and school improvement*, *25*(2), 231-256.

Ness, B. M., & Middleton, M. J. (2012). A framework for implementing individualized self-regulated learning strategies in the classroom. *Intervention in School and Clinic*, *47*(5), 267-275.

Neuman, S. B., & Cunningham, L. (2009). The impact of professional development and coaching on early language and literacy instructional practices. *American Educational Research Journal*, *46*(2), 532-566.

Nottingham, S. (2020, March 15). 29 states announce school closures amid coronavirus. *CNN*. https://www.cnn.com/world/live-news/coronavirus-outbreak-2-03-15-20-intl-hnk/h_cb43d175eb1bc46d6f53eef202868c22.

Onrubia, J., & Engel, A. (2009). Strategies for collaborative writing and phases of knowledge construction in CSCL environments. *Computers & Education*, *53*(4), 1256-1265.

Panadero, E. (2017). A review of self-regulated learning: Six models and four directions for research. *Frontiers in Psychology*, *8*, 422.

Panadero, E., & Alonso-Tapia, J. (2014). How do students self-regulate? Review of Zimmerman's cyclical model of self-regulated learning. *Anales de psicologia*, *30*(2), 450-462.

Panadero, E., Jonsson, A., & Botella, J. (2017). Effects of self-assessment on self-regulated learning and self-efficacy: Four meta-analyses. *Educational Research Review*, *22*, 74-98.

Panadero, E., Jonsson, A., & Strijbos, J. W. (2016). Scaffolding self-regulated learning through self-assessment and peer assessment: Guidelines for classroom implementation. In D. Laveault & L. Allal (Eds.), *Assessment for Learning: Meeting the Challenge of Implementation.*

Parkay, F. W. (2015). *Becoming a teacher* (10th ed.). Boston: Pearson College Division.

Patton, M. Q. (2002). *Qualtative research and evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage.

Peeters, J., De Backer, F., Reina, V. R., Kindekens, A., Buffel, T., & Lombaerts, K. (2014). The role of teachers' self-regulatory capacities in the implementation of self-regulated learning practices. *Procedia-Social and Behavioral Sciences*, *116*, 1963-1970.

Perels, F., Dignath, C., & Schmitz, B. (2009). Is it possible to improve mathematical

achievement by means of self-regulation strategies? Evaluation of an intervention in regular math classes. *European Journal of Psychology of Education*, *24*(1), 17.

Perry, N. E., Hutchinson, L., & Thauberger, C. (2007). Mentoring student teachers to design and implement literacy tasks that support self-regulated reading and writing. *Reading & Writing Quarterly*, *23*(1), 27-50.

Perry, N. E., Hutchinson, L., & Thauberger, C. (2008). Talking about teaching self-regulated learning: Scaffolding student teachers' development and use of practices that promote self-regulated learning. *International Journal of Educational Research*, *47*(2), 97-108.

Perry, N. E., Phillips, L., & Hutchinson, L. (2006). Mentoring student teachers to support self-regulated learning. *The Elementary School Journal*, *106*(3), 237-254.

Perry, N. E. (2015). Understanding classroom processes that support children's self-regulation of learning. In *BJEP Monograph Series II, Number 10-Self-Regulation and Dialogue in Primary C* (Vol. 45, No. 67, pp. 45-67). British Psychological Society.

Peterson, A. T., & Roseth, C. J. (2016). Effects of four CSCL strategies for enhancing online discussion forums: Social interdependence, summarizing, scripts, and synchronicity. *International Journal of Educational Research*, *76*, 147-161.

Pintrich, P. R. (2000). The role of goal orientation in self-regulated learning. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.) *Handbook of Self-Regulation*, (pp. 452-502). Academic Press.

Pintrich, P. R. (2004). A conceptual framework for assessing motivation and self-regulated learning in college students. *Educational Psychology Review*, *16*(4), 385-407.

Poellhuber, B., Chomienne, M., & Karsenti, T. (2008). The effect of peer collaboration and

collaborative learning on self-efficacy and persistence in a learner-paced continuous intake model. *Journal of Distance Education*, *22*(3), 41-62.

Pressley, M. (1995). More about the development of self-regulation: Complex, long-term, and thoroughly social. *Educational Psychologist*, *30*(4), 207-212.

Quackenbush, M. & Bol, L. (in press). *Teacher support of co- and socially-shared regulation of learning in middle school mathematics classrooms*. Frontiers in Education.

Razali, N. M. & Wah, Y. B. (2011). Power comparisons of Shapiro-Wilk, Kolmogorov-Smirnov, Lilliefors and Anderson-Darling tests. *Journal of Statistical Modeling and Analytics, 2*(1), 21-33.

Reimann, P., & Bannert, M. (2018). Self-regulation of learning and performance in computer-supported collaborative learning environments. In D. H. Schunk & J. A. Greene (Eds.), *Handbook of self-regulation of learning and performance* (2nd ed., pp. 285-303). Routledge.

Reimers, F., Schleicher, A., Saavedra, J., & Tuominen, S. (2020, April 27). Supporting the continuation of teaching and learning during the COVID-19 pandemic: Annotated resources for online learning. *OECD*. https://www.oecd.org/education/Supporting-the-continuation-of-teaching-and-learning-during-the-COVID-19-pandemic.pdf

Resta, P., Christal, M., Ferneding, K., & Puthoff, A. K. (1999, December). CSCL as a catalyst for changing teacher practice. In *Proceedings of the 1999 conference on Computer support for collaborative learning* (p. 60). International Society of the Learning Sciences.

Resta, P., & Laferrière, T. (2007). Technology in support of collaborative learning. *Educational Psychology Review*, 19, 65–83. doi:10.1007/s10648-007-9042-7.

Roberts, A. M., LoCasale-Crouch, J., Hamre, B. K., & Jamil, F. M. (2019). Preschool teachers'

self-efficacy, burnout, and stress in online professional development: a mixed methods approach to understand change. *Journal of Early Childhood Teacher Education*, 1-22.

Ross, S. M. (2020). Technology infusion in K-12 classrooms: a retrospective look at three decades of challenges and advancements in research and practice. *Educational Technology Research and Development*, 1-18.

Saldana, J. (2012). *The coding manual for qualitative researchers*. Thousand Oaks, CA: Sage.

Salomon, G., & Almog, T. (1998). Educational psychology and technology: A matter of reciprocal relations. *Teachers College Record*, *100*, 222-241.

Schneider-Cline, W. (2017). Developing graduate students' self-regulation and critical thinking during a clinical writing workshop. *Teaching and Learning in Communication Sciences & Disorders*, *1*(1), 3.

Schunk, D. H. (1990). Goal setting and self-efficacy during self-regulated learning. *Educational psychologist*, *25*(1), 71-86.

Schunk, D. H. (2016). *Learning theories: An educational perspective*, 7th Edition. Upper Saddle River, New Jersey: Prentice Hall.

Schunk, D. H., & Greene, J. A. (2018). Historical, contemporary, and future perspectives on self-regulated learning and performance. In D. H. Schunk & J. A. Greene (Eds.), *Handbook of self-regulation of learning and performance* (2nd ed., pp. 1-15). Routledge.

Schunk, D. H., & Usher, E. L. (2013). Barry J. Zimmerman's theory of self-regulated learning. In H. Bembenutty, T. J. Cleary, & A. Kitsantas (Eds.), *Applications of self-regulated learning across diverse disciplines: A tribute to Barry J. Zimmerman* (pp. 1-28). Charlotte, NC: Information Age Publishing.

Sitzmann, T., & Ely, K. (2011). A meta-analysis of self-regulated learning in work-

related training and educational attainment: What we know and where we need to go. *Psychological Bulletin*, 137(3), 421-42. Web.

Skaalvik, E. M., & Skaalvik, S. (2007). Dimensions of teacher self-efficacy and relations with strain factors, perceived collective teacher efficacy, and teacher burnout. *Journal of Educational Psychology*, *99*(3), 611.

Smith, L. (2001). Evaluation of an educational intervention to increase cultural competence among registered nurses. *Journal of Cultural Diversity*, *8*(2), 50.

Spruce, R., & Bol, L. (2015). Teacher beliefs, knowledge, and practice of self-regulated learning. *Metacognition & Learning*, 10, 245-277. doi: 10.007//s11409-014-9124-0.

Stahl, G., Koschmann, T., & Suthers, D. (2006). Computer-supported collaborative learning: An historical perspective. In R. K. Sawyer (Ed.), Cambridge handbook of the learning sciences (pp. 409-426). Cambridge University Press.

Strijbos, J. W., Kirschner, P.A., & Martens, R. L. (2004). What we know about CSCL. In J. W. Strijbos, P. A. Kirschner, & R. L. Martens (Eds.), *What we know about CSCL: And implementing it in higher education* (pp. 245-259). Springer.

Stronge, J. H., Ward, T. J., & Grant, L. W. (2011). What makes good teachers good? A cross-case analysis of the connection between teacher effectiveness and student achievement. *Journal of Teacher Education, 62*(4), 339-355.

Teemant, A., Wink, J., & Tyra, S. (2011). Effects of coaching on teacher use of sociocultural instructional practices. *Teaching and Teacher Education*, *27*(4), 683-693.

Tillema, H. H., & Kremer-Hayton, L. (2002). "Practising what we preach"—teacher educators' dilemmas in promoting self-regulated learning: a cross case comparison. *Teaching and Teacher Education*, *18*(5), 593-607.

Triquet, K., Peeters, J., & Lombaerts, K. (2017). *Self-regulated learning online: Empirical foundations, promotion & evaluation for teacher professional development*. Contributing to SRL Part to TeachUP. A policy experimentation co-funded by Erasmus+. Deliverable D1.1: Gaps in ITE and CPD provision report. Department of Educational Sciences, Vrije Universiteit Brussel.

Tschannen-Moran, M., & Barr, M. (2004). Fostering student learning: The relationship of collective teacher efficacy and student achievement. *Leadership and policy in schools*, *3*(3), 189-209.

Tschannen-Moran, M., & McMaster, P. (2009). Sources of self-efficacy: Four professional development formats and their relationship to self-efficacy and implementation of a new reading strategy. *The Elementary School Journal, 110*(2), 228-245.

Tschannen-Moran, M., & Woolfolk Hoy, A. (2001). Teacher efficacy: capturing an elusive construct. *Teaching and Teacher Education*, 17, 783e805.

Valtonen, T., Sointu, E. T., Kukkonen, J., Häkkinen, P., Järvelä, S., Ahonen, A., Näykki, P., Pöysä-Tarhonen, J., Mäkitalo-Siegl, K. (2017). Insights into Finnish first-year pre-service teachers' twenty-first century skills. *Education and Information Technologies, 22*(5), 2055-2069. doi: 10.1007/s10639-016-9529-2.

Vegas, E. (2020, April 9). What can COVID-19 tell us about strengthening education systems? *Brookings*. https://www.brookings.edu/blog/education-plus-development/2020/04/09/what-can-covid-19-teach-us-about-strengthening-education-systems/

Wandler, J. B., & Imbriale, W. J. (2017). Promoting undergraduate student self-regulation in online learning environments. *Online Learning*, 21(2). Doi: 10.24059/olj.v21i2.881.

Wehmeyer, M. L., Agran, M., & Hughes, C. (2000). A national survey of teachers' promotion of self-determination and student-directed learning. *The Journal of Special Education, 34(2),* 58-68.

Wheeler, D. O. (2014). *The impact of instructional coaching on student achievement* (Doctoral dissertation, Walden University).

White, R. T. (1998). Research, theories of learning, principles of teaching and classroom practice: Examples and issues, *31*(1), 55-70.

Wiliam, D. (2011). What is assessment for learning? *Studies in educational evaluation*, *37*(1), 3-14.

Willems, C., Toshalis, E., & Baker-Wright, T. (2019). *Motivation, engagement, and student voice: Professional development series – Self-regulated learning module.* Students at the Center. https://studentsatthecenterhub.org/resource/self-regulation-professional-development-module/.

Wilson, K., & Narayan, A. (2016). Relationships among individual task self-efficacy, self-regulated learning strategy use and academic performance in a computer-supported collaborative learning environment. *Educational Psychology*, *36*(2), 236-253.

Winne, P. H. (2004). Students' calibration of knowledge and learning processes: Implications for designing powerful software learning environments. *International Journal of Educational Research*, *41*(6), 466-488.

Winne, P. H. (2018). Theorizing and researching levels of processing in self-regulated learning. *British Journal of Educational Psychology, 88*(1), 9-20.

Winne, P. H., and Hadwin, A. F. (1998). Studying as self-regulated engagement in learning. In

D. Hacker, J. Dunlosky, & A. Graesser (Eds.), *Metacognition in Educational Theory and Practice* (pp. 277–304). Erlbaum.

Winne, P. H., & Hadwin, A. F. (2013). nStudy: Tracing and supporting self-regulated learning in the Internet. In *International Handbook of Metacognition and Learning Technologies* (pp. 293-308). Springer.

Winters, F.I., Greene, J.A., & Costich, C.M. (2008). Self-regulation of learning within computer-based learning environments: A critical analysis. *Educational Psychologist Review*, 429–444. https://doi.org/10.1007/s10648-008-9080-9

Wolters, C. A., & Hussain, M. (2015). Investigating grit and its relations with college students' self-regulated learning and academic achievement. *Metacognition and Learning*, *10*(3), 293-311.

Wright, S., & Grenier, M. (2007). Teacher reflection and professional development. *Journal of International Council for Health and Physical Education Recreation Sport and Dance*, 43(3), 14.

Yang, N., Ghislandi, P., & Dellantonio, S. (2018). Online collaboration in a large university class supports quality teaching. *Education Tech Research & Development,* 66(3): 671-69. doi: 10.1007/s11423-017-9564-8.

Yoo, J. H. (2016). The effect of professional development on teacher efficacy and teachers' self-analysis of their efficacy change. *Journal of Teacher Education for Sustainability*, *18*(1), 84-94.

Zee, M., & Koomen, H. M. (2016). Teacher self-efficacy and its effects on classroom processes, student academic adjustment, and teacher well-being: A synthesis of 40 years of research. *Review of Educational research*, *86*(4), 981-1015.

Zhu, C. (2013). The effect of cultural and school factors on the implementation of CSCL. *British Journal of Educational Technology*, *44*(3), 484-501. doi: 10.1111/j.1467-8535.2012.01333.x.

Zimmerman, B. J. (2000). Attaining self-regulation: A social-cognitive perspective. In M. Boekaerts, P. Pintrich, & M. Seidner (Eds.), *Self-regulation: Theory, research, and applications* (pp. 13-39). Orlando, FL: Academic Press.

Zimmerman, B. J. (2001). Theories of self-regulated learning and academic achievement: An overview and analysis. In B. J. Zimmerman & D. H. Schunk (Eds.), *Self-regulated learning and academic achievement: Theoretical perspectives* (2nd ed., pp. 1-38). Erlbaum.

Zimmerman, B. J. (2008). Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *American Educational Research Journal, 45*(1), 166-183.

Zimmerman B. J., Kitsantas A. (2005). The hidden dimension of personal competence: Self-regulated learning and practice. In A. J. Elliot & C. S., Dweck (Eds). *Handbook of Competence and Motivation* (pp. 509–526). New York, NY: Guilford Press.

Zimmerman, B. J., and Schunk, D. H. (1989). *Self-regulated learning and academic achievement: Theory, research, and practice*. New York, NY: Springer-Verlag.

APPENDIX A

Professional and Social Media Network Posting

APPENDIX B

Notification Letter for Participants

Dear Participant,

As a doctoral candidate concerned about the impact of COVID-19 on K-12 educational practices, I am inviting you to participate in a research study. This study focuses on K-12 teachers' transitions from face-to-face instruction to computer-supported collaborative learning (CSCL). More specifically, I am examining K-12 grade teachers' confidence teaching online and one's perceived instructional effectiveness in a CSCL environment after participating in weekly online instructional coaching for three weeks (approximately one hour per week). If you decide to participate, you will join a study of other teachers who are participating and contributing to the development of teacher training (e.g., pre-service and in-service) programing and instructional design practices in CSCL contexts.

Before and after the three-week instructional coaching cycle, you will be asked to submit responses to three online surveys, which should take approximately 10-15 minutes to complete. Responses to the surveys are anonymous. No identifying information will be collected. At the conclusion of the instructional coaching cycle, you may be selected for a 30-40 minute follow-up interview via Zoom should you self-select as a volunteer on one of the surveys. Information from the interviews will be kept confidential and secure.

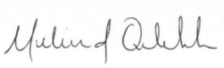
Participation in the study is voluntary, and you can decline or withdraw at any time. Potential benefits of participation include:

1. Professional development and tailored support throughout the instructional coaching.
2. Professional development hours and a certificate for participation in the instructional coaching.
3. Curriculum resources delineating instructional strategies for supporting students' learning online.
4. The chance to receive a $10 Amazon gift card for participation in the follow-up interview.
5. Contributing valuable information about how to improve teacher training programs and instructional design practices in CSCL environments.
6. There are no known risks for participating in the study.

The findings in the aggregate may be presented at academic conferences or published in a scholarly journal. In addition, the cooperating organization that put us in touch with you will receive an Infogram highlighting the most important findings that they will make available to their constituents.

If you have any questions or concerns about this study, feel free to contact me at 551-427-9921 or mquac001@odu.edu. You may also contact Dr. Linda Bol at 757-683-4584 or lbol@odu.edu, or Laura Chezan, Institutional Research Board for the Darden College of Education and Professional Studies at Old Dominion University. Her phone number is 757-683-7055, and her e-mail address is lchezan@odu.edu.

Sincerely,



Melissa Quackenbush, Ed.S.
Ph.D. Candidate | Bol Graduate Research Assistant
Educational Psychology & Program Evaluation
Department of Educational Foundations & Leadership
Old Dominion University

APPENDIX C

Demographic Survey

1. Are you a teacher in a K-12 educational setting?
    a. Yes
    b. No

School Setting Items:

2. Identify the state where you are employed as a K-12 teacher:
    a. Dropdown (all states)

3. What type of K-12 setting do you work in?
    a. Public school
    b. Private school
    c. Other: (identify type of school setting)

4. What type of community best describes your school setting?
    a. Rural
    b. Suburban
    c. Urban

5. What type of SES best describes your school setting?
    a. Low
    b. Medium
    c. High

Teacher Demographic Items:

6. What is your gender?
    a. Female
    b. Male
    c. Other:
    d. Prefer not to disclose

7. What is your age?
    a. Fill in:
    b. Prefer not to disclose

8. What is your race/ethnicity?
    a. Fill in:
    b. Prefer not to disclose

Teaching Background Items:

9. How many years have you worked as a teacher?
    a. Fill in:

10. What is the highest level of education you have obtained?
    a. High School Diploma
    b. Associate's Degree
    c. Bachelor's Degree
    d. Master's Degree
    e. Specialist's Degree
    f. Doctoral Degree

11. Have you ever taken an online course?
    a. Yes
    b. No

12. Have you ever worked with an instructional coach?
    a. Yes
    b. No

13. Have you ever participated in a training program on the regulation of learning?
    a. Yes
    b. No

14. Do you hold a state teaching certificate?
    a. Yes
    b. No

15. What grade level do you *primarily* teach?
    a. Elementary (grades 3-5)
    b. Middle School (grades 6-8)

16. What is your *primary* content area assignment?
    a. Generalist (Elementary)
    b. English/Language Arts
    c. Math
    d. Science
    e. Social Studies
    f. World Language
    g. PE/Health
    h. Visual/Performing Arts
    i. Business/Career
    j. Technology
    k. Guidance
    l. Special Education
    m. Media Specialist

n. Child Study Team

17. On average, how many students are in your class(es)?
    a. Fill in:

18. What is your most recent instructional effectiveness rating per your last observation/evaluation?
    a. Highly Effective (3.6-4.0)
    b. Effective (2.66-3.5)
    c. Partially Effective (1.86-2.65)
    d. Ineffective (1.0-1.85)

19. Computer-supported learning tools are devices, platforms, and/or applications that allow students to engage, collaborate, and demonstrate mastery of learning targets in digital or online learning environments. With this definition in mind, please select the choice which best describes your use of tools for computer-supported learning:
    a. I do not use tools for computer-supported learning (0% of instructional time)
    b. I rarely use tools for computer-supported learning (20-40% of instructional time)
    c. I sometimes use tools for computer-supported learning (40-60% of instructional time)
    d. I frequently use tools for computer-supported learning (60-80% of instructional time)
    e. I use tools for computer-supported learning all the time (100% of instructional time)

20. If you use tools for computer-supported collaborative learning, please identify the types of devices, platforms, or applications you use most frequently to support your instruction: (short answer)

Interview Volunteer Self-Identification Item:

21. Are you willing to participate in a 30-40 minute follow-up interview via Zoom about your experiences in the instructional coaching cycle? Participants will receive a $10 Amazon gift card.
    a. Yes
    b. No

22. If you answered yes, will you please provide your email address for follow-up and to schedule the interview?
    a. Fill in:

Thank you for your time and submission!

APPENDIX D

Online Self-Regulated Learning Questionnaire (OSLQ)

Item	Subscale
1. I set standards for my work online.	Goal setting
2. I set short-term (daily or weekly) goals as well as long-term goals (monthly).	
3. I keep a high standard for my professional learning as it relates to my work online.	
4. I set goals to help manage time for my online work.	
5. I do not compromise the quality of my work because it is online.	
6. I choose the location where I work online to avoid too much distraction.	Environment structuring
7. I find a comfortable location to work online.	
8. I choose a location where I can most efficiently work online.	
9. I choose a time with few distractions for working online.	
10. I try to take thorough notes for my online work.	Task strategies
11. I read aloud instructional materials posted online to fight against distractions.	
12. I prepare my questions before joining in a chat or discussion online.	
13. I practice new skills to master changes in my knowledge and abilities for working online.	
14. I allocate additional time for my online work because I know it is time-consuming.	Time management
15. I try to schedule the same time everyday or every week to work on my online tasks, and I observe the schedule.	
16. Although I may not have to attend daily to work online, I still try to distribute my online work time evenly across days.	

17. I find someone who is knowledgeable so that I can consult with him or her when I need help.	Help seeking
18. I share my problems with my online work with my colleagues, so we know what we are struggling with and how to solve our problems.	
19. If needed, I try to connect with my colleagues.	
20. I am persistent in getting help from my employer through e-mail.	
21. I summarize my learning in online work to examine my understanding of what I have learned.	Self-evaluation
22. I ask myself a lot of questions about new skills when working online.	
23. I communicate with my colleagues to find out how I am doing in my online work.	
24. I communicate with my colleagues to find out what I am learning that is different from what they are learning.	

APPENDIX E

The Online Teachers' Sense of Efficacy Scale (OTSES)

Item	Subscale
1. To what extent can you use a variety of assessment strategies with your students online?	Efficacy for instructional strategies
2. To what extent can you provide an alternative explanation or example when students are confused online?	
3. To what extent can you craft good questions for your students online?	
4. How well can you implement alternative strategies in your online class(es)?	
5. How well can you respond to difficult questions from your students online?	
6. How much can you do to adjust your lessons to the proper level for individual students online?	
7. To what extent can you gauge student comprehension of what you have taught online?	
8. How well can you provide appropriate challenges for very capable students online?	
9. How much can you do to control disruptive behavior in online classes?	Efficacy for classroom management
10. How much can you do to get children to follow guidelines for appropriate online interaction?	
11. How much can you do to calm a student who is disruptive or noisy online?	
12. How well can you establish a class management system with groups of online students?	
13. How well can you keep a few problem students from ruining an entire online lesson?	
14. How well can you respond to defiant students online?	
15. To what extent can you make your expectations clear about	

students' online behavior?	
16. How well can you establish routines online to keep activities running smoothly?	
17. How much can you do to get students to believe they can do well in online schoolwork?	Efficacy for student engagement
18. How much can you do to help your students value learning online?	
19. How much can you do to motivate students who show low interest in online schoolwork?	
20. How much can you assist families in helping their children do well in online school?	
21. How much can you do to improve the understanding of a student who is failing in online school?	
22. How much can you do to help your students think critically in online learning?	
23. How much can you do to foster student creativity in online learning?	
24. How much can you do to get through to the most difficult students online?	

APPENDIX F

K-12 Online Teachers' Instructional Knowledge Survey (K-12 OTIKS)

Question Stem: How would you rate your own application of the following tasks associated with teaching in a distance education setting?	
Item	Subscale
1. Determining a particular strategy best suited to teach a specific concept.	Pedagogical Knowledge
2. Using a variety of teaching strategies to relate various concepts to students.	
3. Adjusting teaching methodology based on student performance/feedback (e.g., formative and/or summative).	
4. Troubleshooting technical problems associated with hardware (e.g., network connections).	Technological Knowledge
5. Addressing various computer issues related to software (e.g., downloading appropriate plug-ins, installing programs).	
6. Assisting students with troubleshooting technical problems with their personal computers.	
7. Creating materials that map to specific district/state standards.	Content Knowledge
8. Deciding on the scope of concepts taught within my class.	
9. Planning the sequence of concepts taught within my class.	
10. Using technological representations (i.e., multimedia, visual demonstrations, etc.) to demonstrate specific concepts in my content area).	Technological Content Knowledge
11. Implementing district curriculum in an online environment.	
12. Using various courseware programs to deliver instruction (e.g. Google Classroom, Schoology, Canvas, etc.)	
13. Distinguishing between correct and incorrect problem-solving attempts by students.	Pedagogical Content Knowledge
14. Anticipating likely student misconceptions within a particular	

topic.	
15. Producing lesson plans with an appreciation for the topic.	
16. Assisting students in noticing connections between various concepts in a curriculum.	
17. Creating an online environment which allows students to build new knowledge and skills.	Technological Pedagogical Knowledge
18. Implementing different methods of teaching online.	
19. Moderating online interactivity among students.	
20. Encouraging online interactivity among students.	
21. Using online student assessment to modify instruction.	Technological Pedagogical Content Knowledge
22. Using technology to predict students' skill/understanding of a particular topic.	
23. Using technology to create effective representations of content that depart from textbook knowledge.	
24. Meeting the overall demands of online teaching.	

APPENDIX G

Interview Protocol

To start:

- Good morning (afternoon). Thank you for joining me today. I will be recording our conversation. Is that okay with you? I can also take notes instead. ___ Yes ___ No

- You received a copy of the notification letter. Is there anything you would like to review or discuss? Do you have any questions about the study before we begin?

To end:

- Thank you so much for your valuable time and responses! Do you have any questions or concerns before we sign off?
- As a token of my appreciation, you will receive an Amazon gift card via email a few days from today.

APPENDIX H

Interview Questions

Teachers' SRL Use in CSCL Environments:

Forethought/Planning Phase:

1. How do you set goals for your learning in CSCL?
2. How do you plan for your learning in CSCL?
3. How do you use self-motivational beliefs in your learning in CSCL?

    Probe: Self-efficacy
    Probe: Outcome expectations
    Probe: Task interest
    Probe: Goal orientation

Performance/Monitoring Phase:

4. In what ways do you monitor or control your learning (assert self-control) in CSCL?

    Probe: Using self-instruction
    Probe: Using imagery
    Probe: Using attention focusing
    Probe: Using specific task strategies

5. What methods do you use to monitor your metacognition (e.g., "thinking about your thinking") while engaged in learning tasks in CSCL?
6. What techniques do you use to track your progress through a learning task in CSCL?

Reflection/Evaluation Phase:

7. How do you evaluate your learning after completing a learning task in CSCL?

    Probe: Self-evaluation
    Probe: Causal attribution

8. How do you determine your satisfaction with a learning outcome after you complete a learning task in CSCL?

Students' SRL Use in CSCL Environments:

Forethought/Planning Phase:

9. How do you support students' goal setting in CSCL?
10. How do you support students' planning in CSCL?
11. How do you support students' self-motivational beliefs in CSCL?

Performance/Monitoring Phase:

12. In what ways do you support students' monitoring and control of learning in CSCL?
13. What methods do you use to support students' metacognition (e.g., "thinking about your thinking") while engaged in learning tasks in CSCL?
14. What techniques do you use to support students' tracking their progress through a learning task in CSCL?

Reflection/Evaluation Phase:

15. How do you support students' evaluation of learning after completing a learning task in CSCL?
16. How do you support students' determination of satisfaction with a learning outcome after completing a learning task in CSCL?

Teacher Perception Items:

17. Self-efficacy is a personal judgment of how well one can execute behaviors necessary to produce specific performance attainments. Based on this definition, describe your self-efficacy for SRL in CSCL.
18. How confident are you about supporting students' SRL in CSCL environments?
19. In your opinion, what would you your instructional effectiveness rating be for your online instruction and CSCL?
20. Is there anything else you would like to add or believe is important to note regarding SRL skills in CSCL?

APPENDIX I

Instructional Coaching Scope and Sequence

Overview of Instructional Coaching Content, Goals, and Activities Targeted in the Treatment Group (CSCL pedagogy and SRL skills training)

Content	Goals	Activities	Follow-Up
Session 1: - Overview of coaching - Pretest data collection - Communicating learning goals - Tracking student progress - Celebrating successes - Habits of a self-regulated learner	- To present coaching overview - To collect pretest data - To connect pedagogical knowledge with technology strategies for promoting students' SRL in CSCL	1. Participants set an intention for the coaching session by submitting a response to a reflection prompt 2. Participants contribute to a Google Doc linking pedagogical concepts with technologies that facilitate learning 3. Read an article about SRL 4. Participants submit pretest survey responses	1. Participants identify a take-away from the coaching session to apply in their work over the course of the week and be prepared to share during the next coaching session 2. Identify how SRL can support students in your classes
Session 2: - Review of SRL concepts - Interacting with new knowledge - Practicing knowledge - Deepening knowledge - Strategies for supporting students' SRL in CSCL	- To identify central ideas of SRL - To identify low self-regulated learners - To identify strategies to support low SRLers in CSCL - To identify instructional strategies that engage students at various points of a curriculum	1.Participants set an intention for the coaching session by submitting a response to a reflection prompt 2. Participants review last week's Group Share doc and contribute to a new Google doc linking pedagogical concepts with technologies that facilitate learning 3. Discuss takeaways from last week's coaching and discuss challenges taken 4. Review SRL and discuss specific students who would likely benefit from SRL support in CSCL environments	1. Participants identify a take-away from the coaching session to apply in their work over the course of the week and be prepared to share during the next coaching session 2. Identify one SRL strategy (e.g., self-appraisal, goal setting, reciprocal teaching, self-instruction) to apply during the upcoming week with struggling students
Session 3: - Review of SRL strategies - Engaging students - Assessment of learning - Posttest data collection - Coaching wrap up	- To evaluate the effectiveness of SRL strategies in supporting struggling students - To present strategies for student engagement and assessment of learning - To collect posttest data - To conclude coaching experience	1.Participants set an intention for the coaching session by submitting a response to a reflection prompt 2. Participants review last week's Group Share doc and contribute to a new Google doc linking pedagogical concepts with technologies that facilitate learning 3. Participants submit posttest survey responses	1. Participants establish plans for wrapping up their school year and establishing a plan for organizing student learning for the fall, including SRL strategies

Overview of Instructional Coaching Content, Goals, and Activities Targeted in the Comparison Group (CSCL pedagogy training only)

Content	Goals	Activities	Follow-Up
Session 1: - Overview of coaching - Pretest data collection - Communicating learning goals - Tracking student progress - Celebrating successes	- To present coaching overview - To collect pretest data - To connect pedagogical knowledge with technology strategies	1. Participants set an intention for the coaching session by submitting a response to a reflection prompt 2. Participants contribute to a Google Doc linking pedagogical concepts with technologies that facilitate learning 3. Participants submit pretest survey responses	1. Participants identify a take-away from the coaching session to apply in their work over the course of the week and be prepared to share during the next coaching session
Session 2: - Interacting with new knowledge - Practicing knowledge - Deepening knowledge	- To identify instructional strategies that engage students at various points of a curriculum	1.Participants set an intention for the coaching session by submitting a response to a reflection prompt 2. Participants review last week's Group Share doc and contribute to a new Google doc linking pedagogical concepts with technologies that facilitate learning 3. Discuss takeaways from last week's coaching and discuss challenges taken	1. Participants identify a take-away from the coaching session to apply in their work over the course of the week and be prepared to share during the next coaching session
Session 3: - Engaging students - Assessment of learning - Posttest data collection - Coaching wrap up	- To present strategies for student engagement and assessment of learning - To collect posttest data - To conclude coaching experience	1.Participants set an intention for the coaching session by submitting a response to a reflection prompt 2. Participants review last week's Group Share doc and contribute to a new Google doc linking pedagogical concepts with technologies that facilitate learning 3. Participants submit posttest survey responses	1. Participants establish plans for wrapping up their school year and establishing a plan for organizing student learning for the fall

APPENDIX J

Qualitative Data Analysis Matrix for How Teachers Use SRL Skills for Their Learning

Codes	Categories	Themes
Survival	Internally focused goals (self)	Goal Setting
Work/life balance		
Commitment to students	Externally focused goals (students & parents)	
Feedback from parents		
Responsive to directives	Professional objectives	
Dedication to profession; Responsibility as a teacher		
Prior experience in CSCL	Recognition of different skills	
Leadership orientation on grade level team/department		
Emotional responses	Undefined process	Planning
Vague understanding		
Identifies priorities	Defined process	
Takes inventory		
Relies on colleagues or supervisors	Collaborative	
Values research and learning communities/networks of support		
Completion of tasks	Survival oriented	Motivation
Reactive to stressors		
Concerns about students' well being	Motivated by commitment to students and dedication to the profession	
Concerns about school/district success		
Describes rewards related to self	Internally motivated	
Describes consequences related to self		
Describes rewards related to grade level/team goals	Externally motivated	
Describes consequences related to grade level/team goals		
Energy levels	Self-awareness	Monitoring

Emotions		
Describes needs of students & parents	Social awareness	
Describes needs of family & colleagues		
Checklists	Graphic organizers	
Note-taking (written & voice)		
Schedules (daily, weekly)	Time Management	
Calendars & breaks		
Blogs, podcasts, videos	Research skills	
EdCamps & professional networks		
Describes reflective thinking	Highly reflective	Evaluation
Describes reflective actions		
Pursuit of resources to learn more	High expectations	
General feeling of "never enough"		
Describes "good enough for now"	Internal satisfaction	
Strikes work/life balance		
Describes needing to see student growth	External satisfaction	
Describes needing positive feedback from relationships (e.g., students, parents, colleagues, etc.)		

APPENDIX K

Qualitative Data Analysis Matrix for How Teachers Use SRL Skills in Their Instruction

Codes	Categories	Themes
Sensitivity to parents' feedback	Defined by teacher	Goal Setting
Daily goals reviewed with students		
Daily goals developed with students' input	Defined by teacher with students' input	
Goals written as "I can" statements		
General statements of expectations	Undefined	
No goals used		
Weekly planning	Creating schedules	Planning
Establishing due dates		
Communication with students and parents	Providing flexibility	
Sensitive to access/connectivity issues		
Daily formative assessments	Use of feedback	
Planning meetings with colleagues		
Student self-pacing	Empowering students	
Interest surveys		
Praise & encouragement	Verbal	Motivation
Positive narration		
Pacing guides	Instructional structures	
Lesson structures		
Brain breaks	Breaks & Rewards	
Academic games		
Communication with students and parents	Relational responsiveness	
Empathy and compassion		
Examples of student work	Celebrating success	Monitoring
Use of tools for connectivity		
Mindfulness	Deep breathing	
Meditation moments		

Acknowledging students' experience	Validation	
Normalizing experiences		
Choice boards	Student choice	
Differentiated menus		
Checklists & note-taking	Graphic organizers	
Timers & calendars		
Daily (do now or exit tickets)	Opportunities for students provided	Evaluation
Weekly or periodic		
Student evaluation missing	Limited or no opportunities for students provided	
Student satisfaction missing		

APPENDIX L

Qualitative Data Analysis Matrix for Instructional Coaching Weekly Reflections

Codes	Categories	Themes
Content & grade level strategies	Instructional strategies	Goal Setting
Differentiation/special ed.		
Feelings of confidence	Increased self-efficacy for teaching	
Belief in success		
Colleagues	Collaboration	
PLNs		
Schedules	Time management	Planning
Boundaries		
Colleagues	Collaboration	
Family		
Knowledge of teaching	Instructional effectiveness	Motivation
Confidence with students		
Attention	Work/life balance	
Competing priorities		
Opportunities to learn	Life-long learning	
Growth mindset		
Emotion	Stress level	Monitoring
Energy level		
Frustration	Student engagement	
Success		
Focused on present	Highly reflective	Evaluation
Focused on future		

VITA

Melissa Quackenbush

EDUCATION

Ph.D. Educational Psychology & Program Evaluation 2020
Old Dominion University, Norfolk, VA

Ed.S. Curriculum & Instruction 2013
Liberty University, Lynchburg, VA

M.A. Reading Education (K-12) 2009
University of South Florida, Tampa, FL

B.S. Secondary English Education (6-12) 2007
Southeastern University, Lakeland, FL

PROFESSIONAL EXPERIENCE

Educational Consultant 2018 - Present
Engage Momentum LLC, Wyckoff, NJ

Director of Curriculum, Instruction, Assessment & Technology (Pre-K-12) 2015-2018
Midland Park Public Schools, Midland Park, NJ

Supervisor of Curriculum & Instruction (Pre-K-8) 2014-2015
Hillsdale Public Schools, NJ

Instructional Technology Coach and Media Supervisor (Pre-K-12) 2012-2014
Park Ridge Public Schools, Park Ridge, NJ

ACADEMIC AWARDS

Outstanding Graduate Student, Educational Psychology & Program Evaluation Department,
Old Dominion University 2020

PROFESSIONAL MEMBERSHIP

American Education Research Association 2018 - Present