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Effects of Collaboration Between Speech-Language Pathologists and Third-Grade Teachers on Student Vocabulary Outcomes

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EFFECTS OF COLLABORATION BETWEEN SPEECH-LANGUAGE PATHOLOGISTS AND THIRD-GRADE TEACHERS ON STUDENT VOCABULARY OUTCOMES

by

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ABSTRACT

A persistent literacy crisis continues to be reflected in international (Organisation for Economic Co-operation and Development [OECD], 2013), national (National Center for Education Statistics [NCES], 2015), and local literacy outcome data. Educators, including speech-language pathologists (SLPs), are called upon to collaborate to support students who struggle with academic language/literacy. However, few studies have operationally defined collaboration and investigated the effects of collaboration on student achievement. As a result, there is insufficient guidance for educators about ways to design, implement, and assess the effectiveness of collaboration models, defined in terms of their effects on student outcomes.

There were two main objectives of this research. The first objective was to investigate whether literacy partnerships between SLPs and third-grade general education teachers, who used a systematic collaboration protocol, yielded better vocabulary outcomes for students than teachers instructing without collaborating with SLPs. The second objective of the study was to examine collaborators' progress toward adopting the collaboration protocol. The quasi-experimental design involved a collaboration treatment condition (n = 2 collaborative pairs; n = 34 students) and a comparison condition (n = 2 non-collaboration teachers; n = 34 students). In both conditions, similar versions of a specific vocabulary technique were implemented over seven weeks.

Students' vocabulary knowledge was measured at pretest and posttest using three researcher-created vocabulary assessments adapted from previous measures in vocabulary research. A two-factor split-plot analysis of variance (ANOVA) revealed a statistically significant interaction effect on the Words-in-Context measure. The significant effect from

pretest to posttest within the entire matched group changed as a result of condition; the group mean increase in the students' scores from pretest to posttest was higher in the collaboration condition than the comparison condition. Additional key findings were: (a) a statistically significant increase in group mean scores from pretest to posttest on all three measures within the entire matched group (n = 68) and (b) non-significant interactions between the collaboration and comparison groups on two of the vocabulary measures (Synonyms and Non-Examples). When Cohen's *d* effect sizes were calculated within each condition, there were large effects for all three tasks in the collaboration condition. In the comparison condition, there were large effects for the Synonyms task, and medium effects for the Words-in-Context and Non-Example tasks.

The findings of this study also revealed that collaborators achieved high fidelity of the collaboration protocol within a seven-week collaboration segment. Collaborators demonstrated Routine use of a specific collaboration protocol according to the tools of the Concerns Based Adoption Model (Hall & Hord, 2015); however, they expressed concerns around managing the task demands of the collaboration protocol. Taken as a whole, these findings are promising. Collaboration between SLPs and third-grade general education teachers using a systematic collaboration protocol with a specific vocabulary technique resulted in student vocabulary gains; on one measure, the gains were significantly larger than those made by students in classrooms where teachers did not collaborate with SLPs. The findings have potential to inform a research and practice agenda for SLPs and other educators in schools. Clinical implications and specific research directions are discussed.

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CHAPTER ONE: INTRODUCTION

This study investigated the effects of collaboration on students' vocabulary outcomes when speech-language pathologists (SLPs) and third-grade general education teachers implemented a systematic collaboration protocol. The vocabulary outcomes of students in the collaborating classrooms were compared with vocabulary outcomes of students where teachers did not collaborate with SLPs. Additionally, the study explored indicators of progress the collaborators demonstrated toward adopting the collaboration protocol in their practice. This chapter provides an overview of the research problem. It begins with an explanation of the problem and the purposes of the study. Next, a theoretical framework of the methods is explained. Following the theoretical framework, the research questions, hypotheses, and significance of the study are presented. The chapter concludes with assumptions, limitations, delimitations, and operational definitions.

Statement of the Problem

A troubling number of students in the United States struggle to achieve proficient academic literacy skills at their grade level (National Center for Education Statistics [NCES], 2012; NCES, 2015). Contributing factors to literacy proficiency include escalated literacy standards, the complex nature of literacy acquisition, the language learning environment, and learner characteristics. The Common Core State Standards (CCSS) are illustrative of escalated state standards in the U.S. in the current educational era (National Governors Association Center

[NGAC], 2010). The college- and career-readiness standards of the CCSS were designed to address the 21st century skills students are expected to acquire by the time they graduate from high school. The CCSS emphasize core cognitive processes within each subject area from a very young age (Zygouris-Coe, 2012). Examples of the cognitive processes include problem formulation, inquiry, interpretation, research, and communication. Moreover, language/literacy components of reading, writing, listening, and speaking are embedded throughout the standards within English Language Arts, History/Social Studies, Science, and Technical Subjects (Zygouris-Coe, 2012). Critical literacies require that students "read (print and digital) texts and multi-media in a manner that promotes deep understanding" (Zygouris-Coe, 2015, p. 10). In addition to deep understanding, other competencies expected in 21st century classrooms and workforces include critical thinking, problem solving, and using information in creative ways (Partnership for 21st Century Skills [P21], 2008).

Based on national achievement data, an overwhelming number of students are struggling to achieve proficiency levels in reading and writing (e.g., NCES 2012b; 2015). According to the classifications of proficiency levels used by the National Assessment of Educational Performance (NAEP), students who meet criteria for *Proficient* in a subject "demonstrate competency over challenging subject matter, including subject-matter knowledge, application of such knowledge to real world situations, and analytical skills appropriate to the subject matter" (NCES, 2012a, "Achievement Level Policy Definitions"). In contrast, students who fail to meet the criteria for *Proficient* tend to demonstrate "partial mastery of prerequisite knowledge and skills that are fundamental for proficient work at each grade" (NCES, 2012b). Students who fail to meet these literacy proficiency standards are at risk for academic underachievement.

Links between literacy achievement and vocabulary knowledge have been documented extensively in the literature. A large academic vocabulary is a critical component of becoming a skilled reader (Scarborough, 2001). Skilled reading requires students to understand how word meanings depend on context, how words relate to each other, and how words change forms to serve multiple parts of speech. Additionally, students must synthesize their vocabulary knowledge, decoding skills, fluency, and cognitive processes to comprehend increasingly complex text structures (American Speech-Language-Hearing Association [ASHA], 2001; Scarborough, 2001). Students with a reduced vocabulary repertoire are at a disadvantage in terms of developing into skilled readers, writers, and high academic achievers (Cunningham & Stanovich, 1997).

Many factors contribute to the size an individual's vocabulary repertoire. Such well-documented influencing factors include socio-economic status (e.g., Hart & Risely, 1995); early language experiences (Stanovich, 1986); academic growth trajectories (Huang, Moon, & Boren, 2014), including the Matthew Effect (Stanovich, 1986); and direct vocabulary instruction (Beck, McKeown, & Kucan, 2013). A growth trajectory explained by the Matthew Effect refers to the notion of the rich getting richer and the poor getting poorer (Stanovich, 1986). When applied to literacy acquisition, the Matthew Effect reflects the phenomenon where students with large vocabularies read more, and thereby learn more words, which in turn facilitates more skilled reading. On the other hand, students with reduced vocabularies read less, and there learn fewer words, which in turn hinders skilled reading (Stanovich, 1986). A recommended approach to help students develop into skilled readers is robust vocabulary instruction. Unfortunately, robust vocabulary instruction does not appear to be happening in schools as researchers continue to urge that it should be (Graves, 2016).

An explicit focus on robust vocabulary instruction is a recommended part of a comprehensive literacy program. Findings from multiple reviews conducted by the What Works Clearinghouse (WWC), along with the findings from the National Reading Panel (National Institute of Child Health and Human Development [NICHD], 2000) and the RAND Reading Study Group (RAND, 2002), have resulted in expert panel recommendations to teach vocabulary explicitly (e.g., Baker et al., 2014; Foorman et al., 2016; Gersten, et al., 2007). The recommendation for robust vocabulary instruction is based upon decades of research evidence. Correlational studies over time have revealed vocabulary as a predictor of reading comprehension (e.g., Anderson & Freebody, 1979; Cunningham & Stanovich, 1997; Stanovich, Cunningham, & Cramer, 1984; Stahl, 1983). Experimental studies involving robust vocabulary instruction have resulted in medium to large effects in vocabulary knowledge at the word, sentence, and passage levels (e.g., Stahl & Fairbanks, 1986; Elleman, Lindo, Morphy, & Compton, 2009). Moreover, there exists a theoretical basis of direct and indirect links between vocabulary and reading comprehension (Elleman et al., 2009).

Due to a strong evidence base, an explicit focus on robust vocabulary instruction is thus a recommended, reasonable, and evidence-based approach of intensifying literacy instruction for students who struggle with academic written and/or spoken language. Furthermore, intensifying instruction often requires educators to work together and share expertise (Idol, Nevin, & Paolucci-Whitcomb, 2000). Many school professionals have expertise to contribute to collaborations aimed at vocabulary instruction, as well as other literacy instructional approaches, especially for those students who need intensive literacy support. General education teachers, special education teachers, readings specialists, literacy coaches, teachers of English Learners (ELs), and SLPs possess knowledge about instructional procedures that support the acquisition

of academic literacy skills for all students. Therefore, educators are often called upon to collaborate when supporting the language/literacy needs of students (ASHA, 2010; Council for Exceptional Children [CEC], 2016; International Literacy Association [ILA], 2010; Pugach, Blanton, Correa, McLeskey, & Langley, 2009).

However, given the importance of educators working together to support children and adolescents acquire literacy proficiency, there is little empirical evidence indicating what an effective collaboration looks like. Insufficient guidance is available in the literature about how to design, implement, and assess the effectiveness of various collaboration models, when defined in terms of their effects on student outcomes (Goddard, Goddard, & Tschannen-Moran, 2007). The lack of a guiding evidence base is problematic for SLPs and teachers who work together with the intent of supporting the language/literacy gains of students who need more explicit instruction and scaffolding. Without an empirically tested model of a collaboration protocol, the active ingredients about what makes a collaboration effective are undefined. Lack of definition thwarts implementation fidelity. Additionally, collaborators may not have a way to monitor whether their use of a particular kind of collaboration results in student gains.

Investigations are needed that examine effective models of collaboration within literacy partnerships that are practical and doable. To this end, there is a need to define the active ingredients of an effective collaboration and to determine if high fidelity of implementation results in improved student outcomes. Furthermore, research is warranted to explore indicators of progress SLPs and teachers may make toward adopting a systematic collaboration protocol into practice.

Purpose of the Study

The primary purpose of this study was to investigate whether literacy partnerships between SLPs and teachers using a systematic collaboration protocol yielded better literacy outcomes, specifically in vocabulary, for third-grade students than conditions where teachers were not systematically collaborating with SLPs. The steps needed to achieve this purpose involved: (a) defining the key features of a specific collaboration protocol, (b) creating guiding steps for collaborators to achieve a high fidelity of the key features, and (c) investigating the effects of the implemented protocol on student outcomes. The second purpose of the study was to examine indicators about progress the SLPs and teachers made toward adopting the collaboration protocol in their practice. Progress indicators toward adoption have potential to inform the practicability of the collaboration protocol for teachers and SLPs in their settings.

Theoretical Framework

The design of the study was an integration of theoretical perspectives on vocabulary and comprehension, language scaffolding, collaboration, and the change process. Theoretical perspectives about the impact of vocabulary on comprehension and language scaffolding drove the design of the language-focused content of the collaboration. Theory on collaboration informed the design of the collaboration protocol. Theoretical perspectives about the change process influenced the methods used to assess collaborators' progress toward adopting the collaboration protocol in their practice.

Vocabulary and Comprehension

A rich vocabulary contributes to reading comprehension (Baumann 2009; RAND, 2002), critical thinking (Beck et al., 2013) and high-quality writing (Nelson, Bahr, & Van Meter, 2004). The more words students own, the more meaning-making resources they have available to use (Halliday, 1978; Fang & Schleppegrell, 2010). There were multiple theories underlying two versions of a vocabulary instructional technique used in the study. The instructional technique was the Vocabulary Scenario Technique (VST; Ehren, 2008; Ehren, Zadroga, & Proly, 2010; Spielvogel, 2011). One protocol of the VST, referred to as the VST-General Education 16 (VST-GE16), was designed as a technique to be implemented by general education teachers with a minimum of 16 encounters included for each word (e.g., Spielvogel, 2011). Another VST protocol, referred to as the VST-Teacher+SLP (VST-T+SLP), was designed by Mitchell, Ehren, and Spielvogel (2017) for the study from the VST-GE16 version of the technique. The VST-T+SLP was designed specifically for collaborative implementation by general education teachers and SLPs.

One set of theoretical perspectives underlying the vocabulary focus and techniques used in the study relates to links between vocabulary and comprehension. Five existing hypotheses have been presented to explain possible links (Elleman et al., 2009). The instrumentalist hypothesis proposes that there is a direct connection, and causal relationship, between vocabulary knowledge and comprehension (Anderson & Freebody, 1981). A second hypothesis is the knowledge hypothesis, which proposes that vocabulary knowledge is part of larger knowledge structures, such as verbal intelligence and metalinguistic awareness, that impact comprehension (e.g., Nagy, 2005; Sternberg & Powell, 1983). The access hypothesis (Mezynski,

1983) and verbal efficiency theory (Perfetti, 1985) are two related hypotheses that propose ways comprehension is influenced by accurate and efficient retrieval of the meanings of words encountered in text (Mezynski, 1983). A fifth hypothesis, the reciprocal hypothesis, proposes the significant growth of students' vocabulary repertoires is the result of incremental learning of words after multiple exposures of words across many contexts. Vocabulary and comprehension are thus viewed as having a reciprocal causal relationship (Elleman et al., 2009; Stanovich, 1986). This set of hypotheses is valuable in that each hypothesis provides a part of an explanation about the complex nature of vocabulary and comprehension. According to Elleman et al. (2009), "Understanding the relative contributions of each of these hypotheses is important if we are to design efficient vocabulary interventions that will impact children's comprehension" (p. 3).

A second set of theoretical perspectives underlying the vocabulary intervention relate to the connection between oral language and reading comprehension. One such perspective is the Simple View of Reading (SVR; Gough & Tunmer, 1986). According to the SVR, reading comprehension is influenced by decoding and listening comprehension. An alternative view of the connection between oral language and reading comprehension was presented by the RAND group (2002); reading comprehension was defined as "the process of simultaneously extracting and constructing meaning through interaction and involvement with written language" (p. iii). In other words, the RAND Group (2002) indicated that comprehension occurs within a sociocultural context and is impacted by reader characteristics, text characteristics, and activity characteristics. From these two perspectives of reading comprehension, oral language is a means by which students can engage in interactions to construct meaning from text.

The role of oral language and the need for students and teachers to interact around word meanings are repeated themes throughout vocabulary instruction literature. Evidence-based components of robust vocabulary instruction served as the theoretical foundations for the vocabulary intervention in this study. In the collaboration and comparison conditions, teachers implemented a specific vocabulary instructional technique that incorporated intentionally selected academic vocabulary words, student friendly definitional information, contextual information, multiple encounters with targeted words in different contexts, sustained use over time, and prompts for students requiring deep and active processing (Apthorp et al., 2012; Beck et al., 2013; Stahl & Fairbanks, 1986). In the collaboration condition, there was an added emphasis on highly scaffolded in-the-moment interactions and conceptual connections of taught words in generalized use, which was facilitated by the teachers and SLPs as part of the collaboration protocol. An assumption of the study was that the collaborating partners and the comparison teachers would incorporate robust vocabulary components, but that the collaborators' instruction would result in more explanations contingent upon student understanding about meaning and nuance, more exposures, and more opportunities for deep and active processing.

A third perspective underlying the instructional techniques used in both classrooms was Graves's (2016) four-part comprehensive vocabulary program. Graves began working on this model in the 1980s and has continued to refine it. The four components in the model include: (a) frequent, varied, and extensive language experiences; (b) teaching individual words; (c) teaching word-learning strategies; and (d) fostering word consciousness. The vocabulary technique used in both classrooms incorporated aspects of the four components proposed by Graves (2016).

In summary, theoretical perspectives about the impact of vocabulary on comprehension formed the basis of the language-focused content in the study. Vocabulary was chosen as an impactful literacy target because a rich academic vocabulary is central to reading comprehension, writing, speaking, and listening. Procedures used in the vocabulary instruction in both the collaboration and comparison conditions were based upon theories connecting vocabulary, oral language, and reading comprehension. The procedures in the collaboration condition emphasized a more highly-scaffolded language environment than in the comparison condition.

Language Scaffolding

The language scaffolding aspect of the study was grounded in two primary theoretical frameworks: systemic functional linguistics (SFL; Halliday, 1978, 1994) and social interactionism (Vygotsky, 1978). From the SFL social semiotic perspective, language is a resource for making meaning in context. The SFL perspective has informed pedagogy for language and literacy. One such approach is functional language analysis (Fang & Schleppegrell, 2010). Functional language analysis offers teachers tools for discussing the ways meaning is constructed in text (Fang & Schleppegrell, 2010). Another related approach is the multiliteracies pedagogy (New London Group [NLG], 1996). The NLG (1996) conceptualized a pedagogy of multiliteracies by explaining both the ‘what’ and ‘how’ of the pedagogical perspective. The ‘what’ refers to how meaning is constructed; teachers are the designers of learning environments engaged in active and dynamic interactions. The ‘how’ refers to engaging students in authentic learning tasks, making students aware of the learning goals and providing them with explicit information, facilitating students’ meaningful connections to social contexts, and supporting

students' generalized use of their learning to different contexts (NLG, 1996). The multiliteracies pedagogy and the functional language analysis approach (Fang & Schleppegrell, 2010) both call for the use of metalanguage in the classroom. A metalanguage provides a language for talking about languages, images, and texts with the purpose of thinking critically about texts and relating them to context (NLG, 1996). Metalanguage can be used to talk about why writers and speakers make particular language choices at the word, sentence, and discourse levels.

The second guiding theoretical perspective guiding the procedures for the vocabulary instruction techniques used in the study was social interactionism (Vygotsky, 1978). According to social interactionism, language is learned when self-directed learners internalize language from scaffolded interactions with more mature language users in meaningful contexts (Ukrainetz, 2006; Vygotsky, 1978). Social interactionists are constructivists who assert that scaffolding is "the social interaction among students and teachers that precedes internalization of the knowledge, skills and dispositions deemed valuable and useful for the learners" (Roehler & Cantlon, 1997, p. 9). Students who struggle with literacy, regardless of the reason academic language challenges them, need more language-scaffolded interactions within their classroom language environments. Additionally, those with language learning disabilities (LLD) often require therapy from SLPs, who employ a more intensive approach (Ehren, 2000). Ukrainetz (2006) used the social interactionism framework to explain the therapeutic components of the language learning process for learners who need intensive language interventions. The therapeutic components she described are represented by the acronym RISE and include "*r*epeated opportunities for *i*ntense interaction with *s*ystematic support of *e*xplicitly targeted skills" (p. 1).

Further, there is a growing body of research revealing effects of classroom language environments on reading comprehension. Evidence suggests a link between teachers' own language use and the development of reading comprehension (Gamez & Lesaux, 2015). Thus, the classroom language environment, as affected by collaboration between SLPs and third-grade teachers, was a targeted focus of study. The SFL (Halliday, 1994) and social interactionism (Vygotsky, 1978) theories informed the built-in scaffolds of the vocabulary instruction technique used in the collaboration condition and the comparison condition. The theories were also used to develop the more intensive language-scaffolding procedures that were incorporated in the collaboration condition. The procedures in the collaboration condition were developed so that SLPs had opportunities to model and implement scaffolds they planned according to students' observed confusion, as well as in-the-moment scaffolds they constructed when students experienced difficulty.

Collaboration

Theoretical perspectives and professional literature on collaboration guided the development of the collaboration protocol used in the study. Theoretical perspectives involving the process of collaboration include shared creation (Schrage, 1995) and supported collaborative inquiry (Nelson & Slavit, 2008). A key conceptual framework for collaboration is shared creation, as defined by Schrage (1995). This notion of shared creation means that true collaborators co-construct a solution to a problem that neither one would have formulated on her own. Shared creation includes a shared goal, shared spaces, and shared resources. According to Schrage (1995), within a true collaboration, partners desire to solve problems, create, and discover; moreover, they do so through mutual respect, tolerance, and trust. Collaborative

partners are aware of clear lines of responsibility, communicate in formal and informal environments, and call upon support from outsiders for additional insights (Schrage, 1995). As opposed to working together as a team led by a coach, Schrage (1995) argued for the team mentality to be replaced by a perspective of shared creation.

A second theoretical framework, supported collaborative inquiry, was proposed by Nelson and Slavit (2008). The framework presents a cycle for teacher inquiry that involves collaborative problem solving, or a systematic approach that includes conceptualizing and identifying a problem, analyzing factors contributing to the problem, designing interventions, implementing strategies, and evaluating the effectiveness of the implemented strategies (Allen & Graden, 2002). Examples of the steps in the cycle include developing a common vision for teaching and learning, formulating an inquiry question, agreeing upon strategies to adopt, developing and implementing a data collection plan, analyzing the data, determining implications for practice, and disseminating the findings. The supported collaborative inquiry theoretical framework by Nelson and Slavit (2008) provides professional learning communities with a problem-solving culture to sustain change.

The Change Process

The Concerns Based Adoption Model (CBAM; Hall & Hord, 1987, 2015) is a research-based framework rooted in change principles, focusing on the human side of change. A key principle of the CBAM model is that change is a process, not an event. In other words, implementing change takes time; users of an innovation (i.e., the targeted change) need to be supported thorough the change process. CBAM provides a way for change facilitators (and researchers) to clearly define an innovation and measure change in specific aspects of

implementers' thoughts and behaviors around the use of an innovation. Defining an innovation, or new educational practice, is the first step. Without clearly defining what it is educators are supposed to implement, there is no way to track if they are using the innovation as it was designed. The Innovation Configuration Map (IC Map) is the tool whereby designers of an innovation define the key features of an innovation and describe the different configurations of those key features. Fidelity of an innovation can be determined by implementers' adherence to the elements of the IC Map. The Levels of Use (LoU) scale provides a way to distinguish users of an innovation from nonusers and to further differentiate between different types of users. The Stages of Concern (SoC) profiles provide a means of identifying the thoughts, perceptions, and feelings users have about implementing an innovation. By assessing users' attitudes about an innovation, change facilitators can provide them with tailored supports throughout the adoption process. All three CBAM tools were used in the study to define the collaboration protocol, assess the collaborators' thoughts and perspectives about using it, and determine use of the collaboration protocol based on the behavioral changes made. Indicators that the collaborators were making progress toward adopting the collaboration protocol provided valuable insight into the social validity of the collaboration protocol.

Research Questions and Hypotheses

1. When SLPs and teachers implement a vocabulary instructional technique using a systematic collaboration protocol (treatment condition), is there a significant difference in third-grade students' vocabulary scores on a synonyms task when compared with the scores of students in classrooms where non-collaborating teachers implement a similar technique (comparison condition)? *Hypothesis:* There will be a significant interaction

effect between time and condition. The mean vocabulary word scores based on time will increase for both groups. There will be larger effects in the collaboration condition classrooms.

2. When SLPs and teachers implement a vocabulary instructional technique using a systematic collaboration protocol (treatment condition), is there a significant difference in third-grade students' vocabulary scores on a words-in-context task when compared with the scores of students in classrooms where non-collaborating teachers implement a similar technique (comparison condition)? *Hypothesis:* There will be a significant interaction effect between time and condition. The mean vocabulary scores based on time will increase for both groups. There will be larger effects in the collaboration condition.
3. When SLPs and teachers implement a vocabulary instructional technique using a systematic collaboration protocol (treatment condition), is there a statistically significant difference in third-grade students' vocabulary and morpho-syntax judgment scores on a non-examples task when compared with the scores of students in classrooms where non-collaborating teachers implement a similar technique (comparison condition)? *Hypothesis:* There will be a significant interaction effect between time and condition. The mean vocabulary and morpho-syntax judgment scores based on time will increase for both groups. There will be larger effects in the collaboration condition.
4. Do CBAM tools indicate that SLPs and teachers are making progress toward adopting the collaboration protocol? *Hypothesis:* Regarding their use of the collaboration protocol, the collaborating teachers and SLPs will achieved a minimum of 80% fidelity as measured by the IC Map. They will also establish Routine use of the protocol by the end of the seven-week collaboration as defined by the Levels of Use scale. Regarding their

perceptions of the collaboration protocol, the collaborating teachers and SLPs will express high concerns about management on the Stages of Concern Questionnaire. However, if they can achieve fidelity using the protocol and determine the benefits outweigh the costs, teachers and SLPs may express interest about using the protocol in their practice.

Significance

There is practical need for a collaboration research agenda involving SLPs and teachers in authentic school settings. Without a body of research demonstrating effects of collaborations on student outcomes, collaborators do not have evidence to guide them in determining what an effective collaboration looks like. Moreover, collaborators may be left with questions about what steps they need to take in order to implement an effective collaboration with fidelity. In terms of the process of collaboration, the study addressed this need by contributing to an existing small body of research involving SLPs in literacy partnerships in a new way. The study contributed a specific collaboration protocol that included both a blueprint of the key features (or active ingredients) and guiding steps to help SLPs and teachers achieve a high fidelity of the key features. The protocol was designed to be used flexibly at different grade levels and with a variety of language-focused content. The study also explored whether the collaboration protocol, when implemented with high fidelity, resulted in students' vocabulary knowledge gains. This is important because if a high fidelity of the protocol was not achieved, no further inferences could be drawn about the effectiveness of the protocol. A functional relation between a high fidelity of the collaboration protocol and student gains would have important practical implications for use of the protocol in school settings.

Regarding the language-focused content of the collaboration, the study contributed findings about effects on students' vocabulary learning when a specific vocabulary instructional technique was implemented collaboratively by SLPs and teachers. The protocol used for the vocabulary technique, the VST-T+SLP, was a new variation of the VST, of which there are multiple protocols that have proven effective in previous studies (e.g., Ehren, 2008; Ehren et al., 2010; Spielvogel, 2011). The VST-T+SLP incorporated a variety of planned scaffolds as well as unplanned in-the-moment scaffolds. Part of the SLP's contribution was related to engaging in, and modeling, in-the-moment scaffolds during co-teaching sessions. Ecological validity was ensured in the study, as the intervention was implemented by the teacher and SLP participants in their authentic settings.

Additionally, the study investigated indicators of collaborators' adoption of the protocol in practice. The findings of this inquiry were important from a social validity perspective. It is not enough to determine the effectiveness of the collaboration protocol in terms of student gains. The goal is to develop a systematic collaboration protocol that is effective, perceived as doable by SLPs and teachers, and adoptable in practice. Collaborators' affective and behavioral data will provide a way to analyze change they experienced over the course of implementing the collaboration innovation. Findings have potential to inform what types of supports literacy partners may need through the process of adopting a collaboration innovation. Thus, the study contributed findings not only about effectiveness of the collaboration protocol, but also findings about SLPs' and teachers' considerations about adopting the use of the protocol in their practice.

Finally, the study contributed outcome data in the field of communication sciences and disorders. The field of communication sciences and disorders is seeking ways to demonstrate the effectiveness of SLPs on student outcomes. Currently, there are few systems in which to gather

such data (R. Mullen, personal correspondence, October 27, 2014). The issue is important because the field is being called to, among many strategic objectives, “expand data available for quality improvement and demonstration of value” (ASHA, 2017, p. 1). A research agenda involving investigations of SLPs within literacy collaborations may provide a foundation for a system to gather such data. The methods used in this study could be a starting point for future studies in this area.

Limitations

There are several limitations that threaten internal and external validity worth noting in the study design.

1. One trade-off of the design was to allow teacher participants the choice to assign themselves to the collaboration condition or the comparison condition. The purpose of this decision was directly related to the definition of collaboration as a process within which partners wanted to establish a partnership. As a result, students in the classrooms were not randomly assigned to condition, which affected the statistical assumption of independence and generalizability.
2. The sample size of third graders in the collaboration condition (n = 34) and comparison condition (n = 34) was small. Although the groups were large enough to achieve high power on the within-group factor of the two-factor split-plot ANOVA, low power resulted on the between-group factor and interaction factors.
3. There were some instances of missing pretest and posttest data for the total number of students in the matched group (N = 68). The amount of missing data was minimal and was not viewed as problematic when analyzing the data.

4. The study did not include a large number of students with language learning disabilities (LLD) or English Learners (ELs). As a result, it was not possible to generalize how these subgroups responded to the intervention in either condition.
5. Researcher-created instruments were used for the student outcome measures. Standardized measures of vocabulary were not used. However, research has shown that such measures are not sensitive enough to detect change in words specifically taught in instruction (NICHD, 2000). None of the measures were tested for reliability or content validity, although they were reviewed for face validity by an expert in the field. Similar types of researcher created measures are used in vocabulary research (e.g., Lesaux, Kieffer, Faller, & Kelley, 2010; Read, 2000; Stahl & Fairbanks, 1986). The Synonyms and Words-in-Context measures were used in Spielvogel (2011) and in a study underway (Rosa-Lugo, Ehren, & Peterson, 2017).
6. After attempting to recruit multiple prospective school districts, only one school district approved and participated in the research. Within the district, there were only two SLP and teacher collaboration pairs who agreed to participate.

Delimitations

The delimitations of the study were defined parameters that were under the control of the researcher.

1. The decision to study literacy partnerships between SLPs and general education teachers was based upon the researcher's own experience as a school-based SLP and her continued involvement with school-based SLPs and district stakeholders. The

researcher's questions about effective service delivery models and SLPs' roles within Response to Intervention (RTI) models have guided the research focus.

2. The researcher's decision to incorporate an instructional focus on a word study intervention was chosen because of the high impact of vocabulary on building academic literacy skills. Additionally, the researcher had access to personnel resources who had carried out investigations using the different versions of the VST.
3. The decision for targeting third-grade teachers stemmed from discussions with district administrators regarding a Kindergarten through third-grade (K-3) literacy initiative in a district where the researcher had been involved with a professional learning community of SLPs and program administrators.
4. To meet inclusion criteria for the collaboration condition, SLPs and third-grade general education teachers had to express a desire to be in the collaboration condition and agree to implement the VST-T+SLP according to the research plan. To meet criteria for the comparison condition, third-grade general education teachers had to agree to implement the VST-GE16 according to the research plan.
5. All the students who attended class in the participants' classrooms were included in the intervention and data analysis, as opposed to only students with language learning disabilities. The researcher included all students because she wanted to investigate how students with a wide range of instructional needs responded to the collaboration intervention. This is important because collaboration resulting in improved outcomes for a small subset of students would not likely be palatable to general educators.
6. The typical classroom setting was used because the researcher wanted to investigate the use of the intervention in authentic practice contexts.

Assumptions

The study is guided by the following assumptions, which are based upon findings of existing research on SLP literacy partnerships, theoretical perspectives, and personal experience.

1. Collaborating SLPs and teachers will design word study instruction, scaffold academic language, and intensify instruction differently as part of a process of shared creation than individual educators would do alone.
2. Students who struggle with literacy have fewer Tier Two (Beck et al., 2013) words in their academic vocabulary lexicon.
3. The word study instruction and language scaffolding within the collaboration intervention will support students' ability to make meaning from, and use, academic vocabulary words when reading, writing, speaking, and listening (Beck et al., 2013).
4. Students have more available designs for making meaning when they know more academic vocabulary words and have skills to glean meaning from word structure and content (NLG, 1996).
5. Building an academic vocabulary will serve as a foundation for acquiring new vocabulary knowledge and word study skills (Lane & Allen, 2010).

Operational Definitions

1. *Collaboration*- "The process of *shared creation*: two or more individuals with complementary skills interacting to create a shared understanding that none had previously possessed or could have come to on their own" (Schrage, 1995, p. 29).

a) For the purposes of this study, the definition of collaboration built upon Schrage's (1995) essence of shared creation. The shared creation in the study related to the interaction between the SLP and teacher characterized by features identified in the SLP/Teacher Collaboration IC Map (Mitchell, Ehren, & Towson, 2016; Appendix F).

2. *COLLAB Protocol*- The COLLAB Protocol refers to the SLP/Teacher Collaboration IC Map and the accompanying COLLAB Guiding Steps. The IC Map (Appendix F) defined the key features of the collaboration process. The Guiding Steps (Appendix G) facilitated implementers' high fidelity of the collaboration process as measured by the IC Map. Key features of the IC Map include: (a) choosing a collaborative partner, (b) engaging in pre-intervention professional learning activities, (c) setting agreed upon parameters regarding time and scheduling, (d) jointly agreeing upon impactful targets according to desired student outcomes, (e) jointly identifying trouble spots from a language standpoint, (f) identifying and implementing language scaffolding techniques to address trouble spots, (g) implementing the agreed upon plan during class-time activities, (h) engaging in the agreed beyond class-time activities, and (i) planning, gathering, and analyzing student outcome data.

3. *Concerns Based Adoption Model (CBAM; Hall & Hord, 2015) and associated terms*
   a) *Adopter*- an individual who is learning to implement a new practice; in this study, the terms *implementer* and *collaborator* were used.
   b) *Adoption*- the process of implementing a new practice consistently over time.
   c) *Concerns*- an individual's composite thoughts, feelings, and considerations about a given practice, or innovation.

d) *Concerns Based Adoption Model*- an empirically-based theoretical model with research-validated tools to evaluate aspects of a change adoption process; first developed by Hall and Hord based on educational change research in the 1970s and 1980s.

e) *Innovation*- a practice requiring that individuals undergo change (Hall & Hord, 2015). The new practice for the participants was the systematic collaboration protocol.

f) *Innovation Configuration Map (IC Map)*- A CBAM tool used as a blueprint that allows adopters and change facilitators to visualize and assess variations likely to be found for an innovation.

g) *Levels of Use (LoU)*- A CBAM construct of eight behavioral profiles of how adopters act in relation to the implementation of an innovation. The eight behavioral profiles are organized into the categories of nonusers and users. The LoU are explained in more detail in Chapter 3.

h) *Stages of Concern (SoC)*- A CBAM construct of seven specific categories of concerns about an innovation (Unconcerned, Informational, Personal, Management, Consequence, Collaboration, and Refocusing). The seven categories are organized as Unrelated concerns, Self concerns, Task concerns, and Impact concerns. The SoC are explained in more detail in Chapter 3.

4. *Language scaffolding – Scaffolding* is "a process that enables a child or novice to solve a problem, carry out a task or achieve a goal that would be beyond his unassisted efforts (Wood, Bruner, & Ross, 1976, p. 90)." *Language scaffolding* is a dynamic scaffolding approach that involves strategic questioning, contingent responses, and feedback with the goal of problem-solving meaning (Nelson et al., 2004; Ukrainetz, 2006).

a) For the purposes of this study, a *highly-scaffolded language environment* refers to a classroom language environment where educators provide linguistic input to students that facilitates students' academic language acquisition (Gamez & Lesaux, 2015) and engage in highly interactive academic discourse with students around language and meaning. *Planned scaffolds* were built into the vocabulary instruction routine, and as prompts for collaborators in the COLLAB Guiding Steps, to initiate teachers' and SLPs' strategic questions to students. *In-the-moment scaffolds* were the contingent responses and highly interactive conversations with students that occurred in real time.

5. *Vocabulary instruction terms*

a) *Integrated model of vocabulary instruction*- A model offered by Graves (2016) includes an integration of four approaches. The first approach is providing rich and varied language experiences. The second approach is teaching individual words. The third approach is teaching strategies for learning words independently. The fourth approach is fostering word consciousness.

b) *Robust vocabulary instruction*- Components of vocabulary instruction include student friendly definitional information, contextual information, multiple encounters with targeted words in different contexts, sustained use over time, and interactions with words that involve deep and active processing (Apthorp et al., 2012; Beck et al., 2013; Stahl & Fairbanks, 1986). Robust vocabulary instruction also includes intentionally selecting academic vocabulary words and facilitating conceptual connections of taught words in generalized use (Beck et al., 2013). These components can be integrated into many types of instructional approaches for teaching

vocabulary. For the purposes of this study, all the components of robust vocabulary instruction were incorporated between planned scaffolds that were built into the vocabulary instructional routine and in-the-moment interaction scaffolds that occurred as part of teachers' and SLPs' interactions with students.

c) *Tiers of vocabulary*- The three-tiers vocabulary framework (Beck, McKeown, & Omanson, 1987) is a classification framework for vocabulary words. Tier One words are basic words common in conversational language, Tier Two words are high-use words for mature language users and are found across subject domains, and Tier Three words are low frequency words that are specialized to subject domains. Many scholars argue that educators should target Tier Two words because rich knowledge of Tier Two words can play a powerful role in advancing verbal functioning and comprehension (e.g., Beck et al., 2013).

d) *Vocabulary Scenario Technique (VST; Ehren, 2008)*- The VST is an instructional approach to teaching vocabulary that incorporates explicit language instruction and scaffolding of Tier Two words. In this highly interactive context, a set number of word encounters is reached through reading, writing, listening, and speaking. In this study, two versions of the VST were used. In the collaboration condition, the partners used the protocol called the VST-Teacher+SLP (VST-T+SLP; Mitchell et al., 2017). In the comparison condition, the teachers used the protocol called the VST-General Education 16 (VST-GE16; Spielvogel, 2011). The number 16 refers to a minimum of 16 word encounters that are built in for each word on the introduction days. The introduction day routines were the same for both conditions; the review day routines

were somewhat different. Language scaffolding habits were also assumed to be different between the conditions.

6. *Vocabulary outcome terms*- Vocabulary scores refer to the number of vocabulary items students answered correctly on three researcher-created vocabulary measures. The first task was the Synonyms (SYN) measure. In the SYN task, students were asked to circle a synonym of the stimulus target word. The purpose of the SYN measure was to assess students' knowledge of vocabulary word meanings in the absence of sentence stimuli. The second task was the Words-in-Context (WIC) measure. On the WIC task, students decided which word from a word bank best completed stimulus sentences. The purpose of the WIC measure was to assess students' knowledge of word meanings and word form variations in the context of sentences. The third task was the Non-Examples (NON-EX) measure. Students had to indicate which sentence using the target word, or a word family variation of the target word, did not make sense. The purpose of the NON-EX measure was to assess students' judgements of correct versus incorrect meanings and usage in sentences.

Chapter Summary

The study was an investigation of the effects of SLPs and third-grade general education teachers using a systematic collaboration protocol on students' literacy outcomes, specifically vocabulary. The study also explored indicators about progress collaborators made toward adopting the collaboration protocol. This chapter began with a rationale and two purposes of the study. The chapter then introduced theoretical perspectives, the research questions, and the

research hypotheses. The significance of the study was explained, as were limitations, delimitations, assumptions, and operational definitions.

CHAPTER TWO: LITERATURE REVIEW

In reviewing related literature, this chapter presents a rationale for investigating the effectiveness and practicability of a collaboration model involving SLPs and third-grade general education teachers. In the first section of this chapter, an overview of escalated literacy standards and student literacy performance will be presented. The next sections are organized into *who* has expertise in literacy instruction to support students' literacy development, *how* school professionals with literacy expertise can effectively support literacy achievement within a collaboration model (based on available evidence), and *what* language-focused content would be worthwhile for collaborators to target in a literacy partnership. In reviewing the literature about *how* partners might begin to design effective partnerships, the review will synthesize and critique the literature on collaboration research. Definitions of collaboration, gaps in collaboration research, and findings from previous studies of literacy partnerships involving SLPs in elementary schools will be presented. The chapter will conclude with a synthesis of vocabulary research, the *what* of a worthwhile target for a literacy collaboration.

Literacy Standards and Performance

Every student deserves opportunities to develop critical literacy skills needed to meet 21st century academic demands. Critical literacy skills include the following abilities: reading, writing, listening, speaking, viewing, presenting; locating, evaluating, using and communicating information using multiple media (e.g., text, visual, audio, and video sources); and using language, content, and reasoning in ways that are appropriate for particular situations and

disciplines (e.g., Langer, 2000; Lankshear & Knobel, 2007). Revisions to many state standards were made after 2010 as part of the CCSS initiative to standardize expectations regarding proficiency in content areas such that high school graduates are college- and career-ready (CCSS, 2010), whether or not states actually adopted the corpus of standards called CCSS. Themes of the CCSS include: (a) literacy within the disciplines from PreK-12, (b) a greater focus on informational text, (c) evidence-based responses, (d) exposure to complex text, (e) knowledge of academic vocabulary, (f) and engagement in academic discourse through reading, writing, listening, speaking, and collaborating (Parks, 2012). With regard to complex text, educators are expected to expose students to text from a wide variety of genres, text with academic vocabulary, and text with complex sentence structures (CCSS, 2010).

Students who do not meet grade level literacy proficiency standards struggle to engage in meaning-making and critical thinking, as well as the ability to participate fully in classroom discourse. Academic reading, writing, speaking, and listening is particularly challenging because the language of schools is characterized by specialized and complex words, grammar, and discourses (Zwiers, 2008). The language of school has been analyzed by educational linguists as consisting of registers, or lexical and grammatical constellations, that students must produce and understand to "engage in synchronous interaction with the teacher that further develops their language skills" (Schleppegrell, 2001, p. 433).

Students who are underperforming in literacy across the country are in the majority. Based on the most recent National Assessment of Educational Performance (NAEP) reading assessments only 36%, 34%, and 37% of fourth, eighth, and twelfth graders respectively demonstrated "at or above proficiency" levels in reading (NCES, 2015). Regarding the most recent NAEP writing assessment (NCES, 2012b), only 27% of both eighth graders and twelfth

graders achieved at or above proficient levels in writing. Similar results were reported in 2007 and 2002 (Salahu-Din, Persky, & Miller, 2008). In fact, for all subjects assessed by the NAEP (i.e., civics, economics, geography, mathematics, reading, science, U.S. History, and writing), the highest percentage of students achieving at/above proficiency in any subject by twelfth graders was economics (42%) followed next by reading (37%).

Furthermore, data from the Programme for International Student Assessment (PISA), as well as reports from businesses and colleges, have revealed that a troubling number of adolescents in the U.S. are not demonstrating the literacy skills they need to be ready for college the workplace (Organisation for Economic Co-operation and Development [OECD], 2013; NCES, 2015; Biancarosa & Snow, 2006; Graham & Perin, 2007). According to the PISA (OECD, 2013), the U.S. remains in the middle of the rankings. Among the 34 OECD countries, the U.S. performed below average in mathematics and around the average in reading and science in the 2012 PISA assessment of 15-year-olds. There has been no significant change in this performance over time (OECD, 2013). This is a troubling statistic for a nation that prides itself on being a world leader.

Students who struggle to meet rigorous academic demands need intensive supports from their educators. Schools often have a variety of language/literacy experts who are equipped to provide a range of supports of varying intensity to all students, especially those who struggle with reading, writing, listening, and or speaking. For example, schools may have SLPs, literacy coaches, and EL teachers who share responsibility for high quality instruction to all students. This shared responsibility is necessary, because no school professional alone can provide all the supports students need in diverse classroom settings. For instance, students identified as needing support beyond their core instruction often receive interventions from multiple school

professionals. Students with disabilities require specialized instruction from specialists and often require accommodations in their general education classroom. Moreover, students with disabilities have a federally mandated right to a free and appropriate public education (FAPE), which often requires collaboration among school professionals (Nevin, Thousand, & Villa, 2009). Educators from various disciplines have expertise to support the literacy acquisition of students who struggle.

Educators with Literacy Instruction Expertise

The professional standards of educators from different disciplines reflect the expertise teachers and language/literacy specialists possess. General education teachers have expertise in the subjects they teach, curriculum, pedagogy, and management and monitoring of student learning (National Board for Professional Teaching Standards [NBPTS], 2016). An example of Middle Childhood Generalist Standards states that accomplished general education teachers "incorporate reading strategies that build on students' strengths and meet their needs to construct meaning. These programs may include careful use of skills and strategies for word identification, vocabulary building, comprehension, critical thinking, and fluency" (NBPTS, 2012, p. 31).

SLPs are specialists who have expertise about the language underpinnings of written and spoken language, assessment of language disorders, and evidence-based language/literacy interventions (ASHA, 2010). Examples of school-based SLPs' roles and responsibilities in literacy include: (a) preventing written language problems by fostering language acquisition and emergent literacy, (b) identifying children at risk for reading and writing problems, (c) assessing reading and writing, (d) providing intervention and documenting outcomes for reading and writing, (e) assuming other roles (e.g., assisting teachers, advocating for effective literacy

practices), and (f) supporting the instructional program in collaboration with teachers, specialists, and other school professionals (ASHA, 2001; ASHA, 2010).

Literacy specialists and reading coaches have expertise in foundational knowledge of reading and writing process, curriculum and instruction, evaluation, diversity, and professional learning (ILA, 2010). Examples of standards for reading specialists and literacy coaches include designing comprehensive and balanced curriculum; explaining assessment frameworks, proficiency standards, and student benchmarks; assisting teachers in developing culturally responsive reading and writing instruction; creating literate environments in classrooms and schoolwide; and contributing to schoolwide professional development around research-based practices.

Special education teachers have a depth of knowledge around exceptionalities, development and learning, knowledge of general and specialized curricula, and multiple methods of assessment (CEC, 2016). Professional practice standards require that special educators individualize instruction to maximize learning outcomes of students with exceptionalities, use evidence-based practices most effective for meeting the needs of students with exceptionalities, administer periodic assessments, and create learning environments that contribute to stimulation of learning and positive self-concepts (CEC, 2011).

EL teachers have knowledge of second language acquisition and assessing English language proficiency. They specialize in providing tailored and sheltered instruction for students at different grades and with different proficiency levels in English (Teachers of English to Speakers of Other Languages International Association [TESOL-IA], 2010). Professional standards require that teachers of EL students apply knowledge of second language acquisition to ELs in order to develop content area language and literacy, apply theory and research of cultural

groups to supporting learning environments for ELs, teach strategies to develop and integrate language skills, and use standards-based assessment procedures with ELs. Furthermore, standards of all these disciplines require that professionals have knowledge of evidence-based instructional strategies, engage in continuous professional learning, implement culturally responsive practices, and collaborate with other school professionals.

The range of literacy-related roles and responsibilities of school-based SLPs warrants focus throughout the review, as collaboration involving SLPs is central to the study. The roles and responsibilities of SLPs have been set forth by the American Speech-Language-Hearing Association (ASHA, 2001; 2010). ASHA is the governing body that determines the standards for the scope of practice for SLPs and audiologists who practice in a variety of settings. The roles and responsibilities of SLPs in schools are based upon educational reform, legal mandates, and evolving professional practices (ASHA, 2010).

Four main categories of SLPs' roles as defined by ASHA's Roles and Responsibilities of SLPs in Schools (ASHA, 2010) include Critical Roles, Range of Responsibilities, Collaboration, and Leadership. The critical roles of SLPs provide a basis for speech-language services to promote "efficient and effective outcomes" for students (ASHA, 2010). Critical roles include working across all levels (i.e., PreK-12), serving a full range of communication disorders, ensuring educational relevance, providing unique contributions to the curriculum, highlighting language/literacy, and providing culturally competence services (ASHA, 2010). The range of responsibilities related to highlighting literacy include the prevention and identification of literacy problems, assessment of spoken and written language, and implementation of developmentally appropriate literacy instruction (ASHA, 2001). In ASHA's Roles and Responsibilities of SLPs in Schools, collaboration involves a range of partnership types,

including partnerships with general education teachers, special education teachers, literacy specialists/coaches, occupational therapists, physical therapists, audiologists, counselors, social workers, and district administrators (ASHA, 2010). Regarding leadership, SLPs ensure delivery of appropriate services in a variety of ways. Two examples include advocating for services and designing professional learning experiences.

Graduate experiences in communication sciences and disorders programs, as well as participation in continuing education experiences, provide SLPs with the clinical preparation they need to fulfill the range of roles and responsibilities in school settings. For graduate programs in speech-language pathology to meet accreditation standards by ASHA's Council of Academic Accreditation (CAA), the curriculum must provide students a minimum of 400 supervised clinical education hours across a variety of clinical education settings and variety of different populations. Moreover, the program must provide opportunities for graduate students to demonstrate knowledge of speech, language, hearing, and communication disorders and differences. In the areas of receptive and expressive language, programs must provide opportunities for students to demonstrate proficiency with identifying and treating disorders in phonology, morphology, syntax, semantics, and pragmatics in the modalities of speaking, listening, reading, and writing (CAA, 2014). After graduate students successfully meet the requirements to graduate from an accredited program in speech-language pathology, they must also successfully complete a supervised clinical fellowship year before earning their Certificate of Clinical Competence in Speech-Language Pathology (i.e., CCC-SLP). Once SLPs receive their CCC-SLP, they must meet continuing eligibility requirements to maintain it. SLPs are required to stay abreast of, and implement, evidence-based practices.

Given the scope of SLPs' knowledge of the language underpinnings of literacy, and responsibilities to support students in all language modalities, it should be clear that SLPs have much to offer literacy reform efforts. With their expertise in the language underpinnings of literacy, SLPs are equipped to contribute to literacy collaborations. Despite their expertise, SLPs' roles in supporting the spoken and written language of students who struggle are often misunderstood (e.g., Wilson, McNeill, & Gillon, 2015). The under-recognition of any professional's skill set involving literacy is problematic because students struggling to meet proficient levels of reading and writing need high quality instruction by their community of educators.

Collaboration to Support Literacy Achievement

For all students to be provided with opportunities to develop critical literacies, many scholars have emphasized the importance of collaborations among educators (Ehren, 2006; Joffe & Nippold, 2012; Nevin et al., 2009; Paul, Blosser, & Jakubowitz, 2006; Squires, Gillam, & Reutzel, 2013; Wallach & Ehren, 2004). When educators collaborate, they are afforded opportunities to problem solve, tailor instruction to students, and build knowledge-creating learning communities (Pugach, et al., 2009; Waters, 2007). Much of what is known about collaboration as a recommended practice has been gleaned from theoretical and philosophical perspectives (e.g., Blosser, 2016; Paul et al., 2006; Wallach & Ehren, 2004), research on effective schools (Levine & Lezotte, 1990), qualitative research on components of successful collaborations (e.g., Mattessich, Murray-Close, & Monsey, 2001) and professional standards (e.g., ASHA, 2010; ILA, 2010; NBPTS, 2004).

Although this body of literature provides evidence about the potential benefits of collaboration as a practice, there is very little evidence about what effective collaboration practices look like. In other words, it is not clear to school professionals how to make the best use of the unique skill sets and expertise of general educators, special educators, and specialists to intensify literacy instruction (Fuchs, Fuchs, & Stecker, 2010). One reason for this lack of evidence is rooted in a fundamental issue of defining collaboration in such a way that treatment fidelity can be measured. This is a basic principle in research yet few have highlighted the lack of definable and measurable key features of collaboration as a specific problem that needs to be addressed. A second reason for a lack of evidence about the features of effective collaboration is a neglected focus on student achievement outcomes as a basis for determining effectiveness. The body of research that has identified promising features and barriers to collaborative practices is valuable. Of equal or greater value, however, is whether the collaboration works as evidenced by student gains in literacy skills.

Definitions

The key features being used to define and measure collaboration in the study have been synthesized from multiple definitions of collaboration from within, and beyond, the field of education. The essence of collaboration as it is being defined in the study is reflected in Schrage's (1995) definition:

> "Collaboration is a *purposive* relationship. At the very heart of collaboration is a desire or a need to solve a problem, create, or discover something within a set of constraints…collaboration is the process of *shared creation*: two or more individuals

with complementary sills interacting to create a shared understanding that none had previously possessed or could have come to on their own" (p. 29)."

The essence of collaboration is also reflected in meaningful differences between related, but distinct, constructs of cooperation and coordination. Based on a qualitative review of successful organization collaborations, the differences between the constructs have important practical implications regarding vision, relationships, structure, responsibilities, accountability, resources, and rewards (Mattessich et al., 2001). The definitions of the three constructs used by Mattessich et al. (2001) in their qualitative review of factors contributing to successful organizational partnerships are as follows:

> "Collaboration is a mutually, beneficial and well-defined relationship entered into by two or more organizations to achieve common goals. The relationship includes a commitment to mutual relationships and goals; a jointly developed structure and shared responsibility; mutual authority and accountable for success; and sharing of resources and rewards" (p. 4-5).

The researchers emphasized contrasting features among collaboration, cooperation, and coordination. *Cooperation* refers to informal relationships lacking a defined mission and *coordination* has some degree of planning and role divisions (Mattessich et al., 2001).

Similarly, Idol et al. (2000) described distinctions among collaboration, consultation, and cooperation. They proposed that collaboration "implies equally valued knowledge and skills distributed among equally skilled participants (e.g. Lanier, 1980). This results in a mutual exchange of knowledge and skills as outcomes are developed together" (p. 9). As a separate but related construct, consultation is used to describe the relationship between a consultant and

partner working together for the benefit of a referred case; consultation often involves sharing resources and responsibility.

Idol et al. (2000) described a model combining collaboration and consultation. The collaborative consultation model is characterized by "an interactive process that enables groups of people with diverse expertise to generate creative solutions to mutually defined problems. The outcome is enhanced and altered from original solutions that group members tend to produce independently" (Idol et al., 2000, p. 1). The collaborative consultation process is a sequence of six decision-making steps. Basic elements include: (a) group members agree to view all members, including learners, as possessing unique and needed expertise; (b) they engage in frequent face-to-face interactions, (c) they distribute leadership responsibilities and hold each other accountable for agreed-on commitments, (d) they understand the importance of reciprocity and emphasize task or relationship actions based on such variables as the extent to which other members support or have the skill to promote the group goal, and (e) they agree to consciously practice and increase their social interaction and/or task achievement skills through the process of consensus building. In contrast, when group members cooperate, they work toward the same goals, but they are separate and autonomous and need information from each other to improve programs (Hord, 1986). It is important to distinguish among the different constructs in order to define key features of literacy partnerships and to measure implementation fidelity.

Another term that refers to collaboration in the medical field, and to some extent in education, is *interprofessional collaborative practice (IPP).* ASHA adapted the definition of IPP from the World Health Organization's (2010) definition. The construct of IPP was defined in the ASHA 2016 Schools Survey as "two or more professionals from different disciplines working together to provide comprehensive, integrated services in a school environment" (ASHA, 2016b,

p. 2). Examples of comprehensive, integrated services include developing and implementing a treatment plan collaboratively.

Within the field of education, Friend and Cook's (2012) characteristics of collaboration have informed much of the literature on co-teaching. Friend and Cook (2012) defined the following characteristics of collaborations: (a) voluntary participation, (b) parity among participants, (c) mutual goals, (d) shared responsibility for participation and decision making, (e) shared resources, and (f) shared accountability for outcomes. Co-teaching may be part of a collaboration; however, by itself, co-teaching does not necessarily imply that the key features defined in this study as collaboration have been met.

Friend and Cook's (2012) characteristics have also been used as guiding principles for literacy partnership models. Paul et al. (2006) provided the following guiding actions within a collaborative model for literacy partners: (a) select key individuals for the literacy partnership, (b) select appropriate goals and priorities for literacy instruction, (c) identify specific instructional strategies, (d) engage in mutual problem solving and shared responsibility for literacy outcomes, and (e) establish common goals and priorities for students on the basis of literacy strengths and needs. In fact, Blosser (2016) incorporated these actions into a six-stage collaboration process, which more closely approximates definable key features. However, Blosser's (2016) model does not offer a way to define the key features in a measurable way and has not yet been empirically tested. The guiding principles for literacy partnerships provide a starting point for designing a collaboration protocol. Still, research is needed to investigate whether a collaboration protocol using these principles results in student gains. Research is also needed to provide evidence about the optimal delivery of the language/literacy content (e.g., explicit teaching, dosage/intensity, and scaffolding) for students who struggle with literacy.

Evidence Gaps Outside of Education

An overview of goals, methods, and findings of collaboration in non-education sectors will be described to highlight conclusions and limitations that may inform collaboration research in education. Most studies have employed case study and qualitative designs with a focus on collaborations among organizations. (Austin, 2000; Mattessich et al., 2001). Austin (2000) reviewed 15 case studies incorporating structured interviews to describe a conceptual framework of cross-sector collaborations. Austin (2000) reported findings pertaining to strong and sustainable collaborations. Before either partner commits to the alliance, both sides must develop an understanding of all the benefits and costs for both sides and determine the cost-benefit ratio as best they can. In addition to the value being defined at the outset, Austin (2000) emphasized that value creation, balance, and renewal must continue during the entire alliance. Given the dynamic nature of relationships, the value needs of the partners will likely change over time and successful collaborations are able to adjust to protect the benefits of the partners.

Using what Austin (2000) referred to as the collaboration continuum, practitioners and researchers can identify the kind of partnership they have and adjustments needed (e.g., resources, processes, and attitudes) to move along the continuum to the desired goal. The collaboration value construct (CVC) was a critical component of Austin's (2000) cross-sector framework, in that it facilitated analysis of the vision, creation, and renewal of the value of the partnership. The CVC is a construct that seems relevant to any partnership. Austin (2000) concluded that the cross-sector collaboration continuum framework has potential to be a practical tool for practitioners and researchers. The CVC framework informed the development of the specific collaboration protocol in the current study.

Mattessich and colleagues (2001) conducted a systematic review (N = 40 studies) to investigate which factors influence the success of collaborative efforts among organizations in the human services, government, and other non-profit fields. As case studies are the primary designs in existing collaboration research, quantifiable data could not be analyzed. Rather, success factors were identified based on specific factors that the case study researchers reported as influencing the success of the collaborating groups. A summary of factors found to influence the success of collaboration were organized into the categories of environment, membership characteristics, process and structure, communication, purpose, and resources. The researchers further described a total of 20 success factors within the six categories. The Mattessich et al. (2001) review contributes a definition of collaboration and qualitative evidence to inform empirical educational research on collaboration among organizations.

An important limitation worth noting was the missing element of how to measure collaboration implementation fidelity even when a definition is offered. To illustrate, Kahn, Maltz, and Mentzer (2006) employed a group design experiment to investigate the effects of demand collaboration on knowledge, creation, relationships, and supply chain performance. The researchers defined demand collaboration as cooperative, joint decision-making behavior between companies that represents a voluntary willingness to engage in interactions between organizations (Crum & Pahnatier, 2004; Xu & Dong 2004). Kahn et al. (2006) then delineated aspects of demand collaboration according to a relational continuum and an information technology continuum. Despite providing specific definitions to their business context, there was no report of collaboration fidelity between organizations.

Evidence Gaps Within Educational Research

The lack of strong evidence from research investigating the effectiveness of collaborations is also evident in the field of education (Burns, Vanderwood, & Ruby; 2005; Murawski & Swanson, 2001). Thus, there is a need for investigations to be conducted to generate strong, or at least possible evidence, of the effectiveness of educator collaborations. According to the U.S. Department of Education (2003), *strong evidence* requires (a) high quality randomized control trials as well as (b) multiple trials showing effectiveness in authentic school settings. *Possible evidence* of effectiveness includes randomized control trials do not meet strong evidence criteria and/or studies involving comparison groups where the intervention and comparisons groups are closely matched.

The research on co-teaching was reviewed for evidence of collaboration effects on student achievement, as some co-teaching models involve collaboration. Currently, the state of co-teaching research has stagnated for over a decade since Murawski and Swanson (2001) conducted a meta-analysis of co-teaching studies. The researchers located only six studies that provided sufficient quantitative information to calculate an effect size. Dependent measures on student outcomes included grades (2 studies; $d = .32$), math achievement (3 studies; $d = .45$), and reading/language arts achievement (3 studies; $d = 1.59$). Other dependent measures included social outcomes, attitudinal outcomes, absences, and referrals. Limitations of the body of research that persist included general educators' and special educators' dissimilar definitions of co-teaching and collaboration, reports of changes in outcomes as qualitative statements rather than as definitive quantitative changes, and a lack of a description of special educator's actions during co-teaching (Murawski & Swanson, 2001).

Based on a meta-synthesis of 32 qualitative studies investigating co-teaching, positive change in teaching practices were presumed to indirectly contribute to students' academic growth (e.g., Scruggs, Mastropieri, & McDuffie, 2007). Benefits were reported for teachers, students without disabilities, and students with disabilities. Teachers reported benefits associated with professional growth. Benefits for students without disabilities were reported more in terms of social benefits (e.g., increased cooperation, more attention from teachers) than academic benefits. Themes in the body of research also emphasized benefits for students with disabilities, including increased motivation and students receiving more support from teachers when needed.

Although there is a dearth of empirical evidence of the effectiveness of collaboration on student outcomes, discussion around collaboration in education has been particularly prevalent in the last twenty-five years. To illustrate, a search on ProQuest Dissertations & Theses Global with the search terms collaboration AND education yielded the number of dissertations produced each decade, beginning in 1970. Between the decades of 1980-89, there were around 15, 600 sources; in the years 2010-17 there have been 148,000 sources. The topics of these studies vary greatly (e.g., collaborative professional development, collaborations between service providers and families, peer collaborations, preparing preservice educators to collaborate in their graduate programs, etc.). Despite the discussions about collaboration, these studies provide little empirical evidence about the effects of collaboration on student achievement outcomes.

Literacy Partnerships Involving SLPs in Elementary Settings

Multiple sources were located to identify common practices and tested models of literacy partnerships involving SLPs in elementary settings. A search of the literature on literacy partnerships involving SLPs yielded an abundance of literature describing suggested models and

strategies to guide SLPs and teachers with principles and challenges of literacy partnerships (e.g., Paul et al., 2006; Silliman & Wilkinson, 2004). For example, a search on ERIC with the search terms collaboration AND speech-language AND elementary, produced 71 sources. Many of the sources were descriptive in that they featured topics such as needs of teachers and SLPs, attitudes toward interdisciplinary inclusion methods, suggested models, and explanations of roles. There were few empirical studies involving investigations of the effects of SLP and teachers collaboration in preschool settings (Paul-Brown, 1988; Paul-Brown, 1992; Rice & Wilcox, 1995; Roberts, Prizant, & McWilliam, 1995; Valdez & Montgomery, 1997; Wilcox, Kouri, & Caswell, 1991), elementary settings (explained in the sections that follow), and secondary settings (Starling, Munro, Togher, & Arciuli, 2012).

To meet inclusion criteria for this portion of the literature review, studies had to involve collaborative service delivery between SLPs and elementary teachers (K-5) and language interventions using any of the following designs: surveys, systematic reviews, qualitative designs, case studies or action research, or experimental (or quasi-experimental) designs. Articles were excluded if they were descriptive only in nature, did not involve SLPs and elementary teachers (Kindergarten through fifth grade) collaborating, or were documents related to technical assistance, such as handbooks and guides for writing individualized education plans. Additionally, the search was restricted to include only studies from 1997 to 2017. The date of 1997 was chosen because it overlapped with the previous reviews (Cirrin & Gillam, 2008; Cirrin et al., 2010; Idol et al., 2000; McGinty & Justice, 2006) and extended through changes in education legislation and policies, including No Child Left Behind (NCLB), the initiation of the CCSS, and the most recent federal education law, the Every Student Succeeds Act (ESSA, 2015).

Databases that publish much of the research in the fields of speech-language pathology and education were searched. These databases included ERIC, CINAHL Plus with Full Text, PsychInfo, LLBA, Cochrane Database of Systematic Reviews, PubMed, Science Direct, Medline, and ProQuest Theses and Dissertations. The ASHAWire literature base was also searched (http://pubs.asha.org/). The following search terms were used: “language intervention” AND collaboration; “service delivery” AND literacy AND collab*; language AND “classroom intervention” AND collab*; “language impairment” AND classroom; “language intervention” AND collaboration AND elementary; Speech-language pathologists AND (collaboration OR partnerships) AND (literacy OR vocabulary). A hand search was also conducted by identifying studies referenced in the literature.

Table 1: *Articles Meeting Inclusion Criteria*

Research Category	Author(s)
Survey research	Beck & Dennis (1997) Brandel & Loeb (2011) Brandel & Loeb (2012)- In reference to Brandel & Loeb (2011) DePaepe & Wood (2001) Katz, Maag, Fallon, Blenkarn, & Smith (2010) Pershey (2003) Sanger, Mohling, & Stremlau (2012) Shaughnessy & Sanger (2005) Simmerman (2013) Wright & Graham (1997) Wright & Kersner (1999)
Interviews and focus groups	Buhler (2005) Lovat (2015)
Reviews	Cirrin & Gillam (2008) Cirrin et al. (2010)
Retroactive evaluations	Cohen-Mimran, Reznik-Nevit, & Korona-Gaon (2016) Thomas & Lance (2014)
Case studies or action research	Calvert, Kocher, Paul, Throneburg, & Davidson (2003) Falk-Ross (2000) Kohler (2016) Nelson & Van Meter (2006) Swenson (2000)
Experiments	Farber & Klein (1999) Hadley, Simmerman, Long, & Luna (2000) Throneburg, Calvert, Sturm, Paramboukas, & Paul (2000)

Survey research.

Although survey research has been conducted over the past twenty years in relation to school-based SLP service delivery practices, only the most recent findings about collaborative treatment will be reported here to reflect current trends. Survey research of school-based SLP

practices is routinely conducted by ASHA and findings reported by ASHA are thus included in this review. According to the national ASHA 2016 Schools Survey (N = 1,894), more than 70% of SLPs reported having engaged in interprofessional collaborative practice (IPP) in the twelve months leading up their participation in the survey (ASHA, 2016b). The most frequently occurring IPP activity was reported as treatment. Engagement in treatment was reported as a daily IPP activity by 12% of SLPs. The least frequently occurring was documentation. Other types of IPP activities included assessment, IPP team meetings, and student/family meetings (ASHA, 2016b).

Other recent surveys have revealed types of service delivery models school-based SLPs typically use, of which collaboration (or IPP) is one. One example of a prevalent service delivery model is SLPs providing individualized treatment in settings outside the regular or special education classroom (Cirrin et al., 2010). Alternative models include classroom-based models, consultation, and other indirect activities. Although there are various options SLPs can employ, national surveys have consistently revealed a lack of variation in the services that are provided (ASHA, 2016a; Brandel & Loeb, 2011; Mullen & Schooling, 2010). Respondents of the national ASHA 2016 Schools Survey reported spending 19 hours per week, on average, using a traditional model of providing services outside the classroom setting (ASHA 2016a). Similarly, Brandel and Loeb (2011) reported 30-mintue sessions once or twice weekly is typical practice (N = 1,897 school based SLPs nationally). Likewise, Mullen and Schooling (2010) found speech and language intervention consisted of group treatment sessions outside of the classroom for 91% of the students who received speech-language services, as reported by 179 SLPs nationally.

Survey findings reveal that although some SLPs use collaborative service models for treatment and engage in various IPP activities, a traditional model of providing services outside the classroom setting is still prevalent. SLP's concerns about caseload management, as addressed by Katz et al. (2010), appeared to be a contributing factor. In a survey conducted by Katz et al. (2010), 634 SLPs from 49 states provided information about factors that contribute to feelings of caseload manageability (Katz et al., 2010). A main finding was that SLPs who reported high levels of collaboration and co-teaching perceived their caseloads to be less manageable.

Interviews and focus groups.

Three qualitative studies were identified that involved interviews and focus groups related to literacy partnerships between SLPs and general education teachers. Buhler (2005) conducted a qualitative study to examine teachers' and students' perceptions of a collaborative communication skills program that was collaboratively implemented by a first-grade general education teacher and SLP. The SLP interviewed the classroom teacher and first graders ($N = 20$) three times over a fifteen-week period. The researcher analyzed the interviews as well as video recordings of students' interactions for indicators of change in communication vocabulary, changes in teacher communication, voice levels, and problem solving. Buher (2005) reported many students exhibited an awareness of reciprocal communication features, voice levels, and approaches to verbal problem solving that reflected language used in the communication skills program by the last interview. Additionally, the teacher acknowledged changes in her own communication vocabulary that she used to prompt for listening and productive classroom communication.

In a more recent set of investigations, Lovat (2015) conducted two studies involving focus groups with nine teachers across of variety of grades in two schools in Australia. In both studies, teachers were involved in the focus groups as part of a larger study with the intention of determining ways SLPs can be more involved in literacy instruction teams. Interviews in both studies were transcribed and analyzed for themes. In Study 1, the aim was to investigate teachers' definitions of literacy, confidence teaching literacy, and their beliefs about factors impacting literacy development. The following themes were identified: (a) literacy is a complex and multifaceted skill; (b) teachers are confident teaching literacy, but view it as a constant learning process; and (c) many external factors impact literacy development, including involvement of parents and exposure to language. The purpose of Study 2 was to investigate teachers' perceptions of factors influencing change in literacy instruction and assessment. Lovat (2015) identified the following two change-drivers in literacy reform from a systems perspective: (a) top-down changes are imposed and (b) bottom-up changes are influenced by individuals. The researcher concluded the ongoing change in literacy instruction and assessment results in innovative practices. Lovat (2015) developed a model based on the findings called the Perceptions for Partnership (PfP). The intention of the model is to provide SLPs with an understanding of the challenges teachers face in an environment of constant change, so that they are informed when attempting to enter partnerships.

Recently, a third qualitative study was conducted by Kohler (2016). The purpose of the action research study was to explore first and second-grade teachers' understanding of oral language development and about collaborative interventions with SLPs. Participants included first and second-grade teachers (N = 9). The teachers participated in five cycles comprising five sessions. In Cycle 1, teachers completed a survey on language and literacy development. In

Cycle 2, the researcher shared results of the survey. In Cycle 3, the researcher provided information to teachers about typical language development and a screening tool to help identify students who could benefit from oral language interventions. In Cycle 4, the researcher provided information about language interventions teachers could use in the classroom as part of Response to Intervention (RTI). In Cycle 5, the researcher assessed teachers' perceptions about collaborating with an SLP and on their overall learning throughout the sessions. Kohler (2016) concluded from the findings that teachers benefited from the trainings in oral language development. Moreover, the participants expressed a desire to see more examples of modeled best practice and voiced an interest in having the SLP provide mini-lessons in their classrooms. Kohler (2016) reported, "the speech pathologist believed this would be a great asset to not only the teacher, but the students as well" (p. 98). As previously stated, there is a need for a research agenda to empirically test this assumption. An accumulation of intervention studies will provide evidence to practitioners about collaboration effectiveness as measured by student outcomes.

Literature reviews.

Four literature reviews were identified that provided information about quantitative effects of tested models of language interventions with school-age children/adolescents. Three of the reviews were not specifically related to collaboratively implemented interventions (Cirrin & Gillam, 2008; Cirrin et al., 2010; McGinty & Justice, 2006). Studies included in the Cirrin and Gillam (2008) review were experimental designs of language interventions with school-age children since 1985 (N = 21). In the review conducted by Cirrin et al. (2010), studies were included if they addressed any of 16 research questions pertaining to the effects of different service delivery models on speech-language outcomes for elementary students after 1975 (N =

5). Finally, McGinty and Justice (2006) identified only three studies that were experimental designs and compared language outcomes in classroom-based versus pullout models. The fourth review was specific to the Collaborative Consultation Model, but not to language interventions (Idol et al., 2000). Twelve empirical studies were identified by Idol et al. (2000) between 1994-1997 that used the Collaborative Consultation Model.

Based on the findings of the reviews, there are few studies that have empirically investigated language interventions delivered in collaborative versus non-collaborative conditions. There is some evidence that classroom-based direct language services are as effective as traditional models outside the classroom for some goals (Cirrin et al., 2010). There seems to be an advantage for classroom-based teaching for vocabulary as compared with interventions outside the classroom (Cirrin et al., 2010; McGinty & Justice, 2006; Throneburg, Calvert, Strum, Paramboukas, & Paul, 2000). Moreover, there is some evidence that learners with literacy difficulties can be effectively served when teachers collaborate to generate interventions (Idol et al., 2000). However, the inadequate research base means clinicians must continue to "rely on reason-based practice and their own data until more data become available concerning which service delivery models are most effective" (Cirrin et al., 2010, p. 233).

Intervention studies.

There was a great deal of variability in the procedures used in the corpus of studies that investigated effects of collaboration involving SLPs and teachers on student literacy outcomes. Procedures involved different combinations of collaborative activities beyond class time and during class time, various durations of collaboration interventions, different ages of students, various literacy goals, and different outcome measures. The corpus of studies informed the

design of the research, key features of the systematic collaboration protocol, and procedures involving treatment, assessment, data analysis, and reporting. In this section of the literature review, procedures and findings of the intervention studies will be explained according to the structure of the collaboration model (models using only beyond-class-time collaboration activities and models combining beyond-class-time and in-class collaboration activities). As procedures and findings are explained, elements from the studies that informed the collaboration protocol used in this study will also be described. Following the presentation of the studies, the findings and limitations of the corpus of intervention studies will be summarized.

A synthesis of the research corpus that was analyzed is presented in Table 2. The research corpus included two retroactive evaluations (Cohen-Mimram, et al., 2016; Thomas & Lance, 2014), case studies and action research (Calvert, Kocher, Paul, Throneburg, & Davidson, 2003; Swenson, 2000; Nelson & Van Meter, 2006), and quasi-experimental and experimental research (Ellis, Schlaudecker, & Regimbal, 1995; Farber & Klein, 1999; Hadley, Simmerman, Long, & Luna, 2000; Kaufman, Prelock, Weiler, & Creaghead, 1994; Throneburg et al., 2000). Two studies located via hand searches before 1997 (Ellis et al., 1995; Kaufman et al., 1994) were included because they informed the current research.

Table 2: *Summary of Research on SLP Literacy Partnerships in Elementary Settings*

Study	Design	Treatment Fidelity	2 or more collaboration treatment AND comparison classrooms	2 or more SLPs in collaborative condition	Grades	Language-literacy outcomes
Kaufman et al. (1994)	Quasi-experimental; use of control group (*N* = 32)	No	No	No	3	Discourse level- metapragmatic awareness
Ellis et al. (1995)	Quasi-experimental; use of control group (*N* = 40)	No	No	No	K	Word level- basic concepts
Farber & Klein (1999)	Quasi-experimental; use of control group (*N* = 552)	No	Yes	Yes	K-1	Word, sentence, and discourse levels- MAGIC subtest components
Hadley et al. (2000)	Experimental with random assignment; use of control group (*N* = 86)	No	Yes	No	K-1	Word level- Receptive and expressive vocabulary; Beginning sound awareness; Letter-sound associations

Study	Design	Treatment Fidelity	2 or more collaboration treatment AND comparison classrooms	2 or more SLPs in collaborative condition	Grades	Language-literacy outcomes
Swenson (2000)	Case study (*N* = 1)	No	No	No	2-5	Global language and narrative
Throneburg et al. (2000)	Experimental (lack of total random assignment; use of comparison groups) (*N* = 77)	No	Yes	No	K-3	Word level- vocabulary
Calvert et al. (2003)	Case study; use of comparison groups (*N* = 144)	No	Yes	No	1-2	Word- phonemic production, basic concepts, vocabulary Discourse- story retell
Nelson & Van Meter (2006)	Case examples (*N* = 2)	No	No	No	2-4	Speaking, listening, reading, writing at discourse, sentence, and word levels

Study	Design	Treatment Fidelity	2 or more collaboration treatment AND comparison classrooms	2 or more SLPs in collaborative condition	Grades	Language-literacy outcomes
Thomas & Lance (2014)	Retrospective evaluation (no comparison or control group) (*N* = 409)	No	No	No	K-3	Basic early literacy skills (*DIBELS Next*)
Cohen-Mimram et al. (2016)	Retrospective evaluation; use of a comparison group (*N* = 220)	No	Yes	Yes	K	Word level-expressive naming Sentence level-sentence repetition Discourse level-narrative

Studies that used only beyond-class-time approaches.

One retroactive study and one quasi-experimental study used collaboration models where the collaboration activities occurred beyond class time only. In these models, the teacher and SLP engaged in collaboration activities, but only one partner implemented the techniques discussed in the classroom setting. Cohen-Mimram et al. (2016) retroactively examined the effect of a naturalistic intervention on basic language skills that was delivered by an SLP with three- to five-year-old children (N = 220) in Israel. Children were retroactively assigned to groups based on socio-economic status (SES). One intervention group included children from middle SES neighborhoods (n = 69), a second intervention group included children from low SES neighborhoods (n = 105), and the control group included children from middle SES neighborhoods (n = 46). The collaboration condition involved the teacher, SLP, occupational therapist, and a school psychologist collaboratively developing the intervention. The SLP then delivered the weekly language intervention in small groups for seven months. Additionally, the SLP participated in biweekly guidance sessions to discuss the intervention. It is unclear how long each small group intervention session and biweekly guidance sessions lasted. The intervention involved literacy-based language activities around three story books. Examples of the literacy-based language activities included shared book reading, making and building products related to the books, engaging in play with the created products related to the books, discussing and using concepts in the books, and acting out about the books in student-prepared shows. Six sessions were devoted to each book.

Students' basic language skills were assessed at the word (expressive naming), sentence (sentence repetition), and discourse (narrative story generation) levels using three subtests from

the Goralnik Test, which is normed on Hebrew-speaking children. Comparisons of the middle SES treatment group with the middle SES control group revealed main effects of group, time, and the interaction between group and time, with the treatment group scoring higher, on vocabulary [$F(1, 112) = 9.03$, $p < .01$, $ES = .82$)]. There was also a main effect of group on syntax, with the control group scoring significantly lower on posttest [$F(1, 112) = 0.003$, $p < 0.05$, $ES = .41$]. There was no significant main effect for group or time for narrative skills, but there was an interaction effect. Comparisons of the low middle SES treatment group with the low SES treatment group revealed group mean differences for all pretests and posttests, except for the posttest syntax measure. For both groups, posttest scores were higher than in pretests for vocabulary, syntax, and narrative scores. There was a significant main effect of group and time on vocabulary and narrative scores with the low SES group scoring below the middle SES group. There was also a significant main effect of group and time on syntax, with the low SES group only scoring significantly below the middle SES group on the pretest. The authors concluded that the intervention served to promote language development of the middle SES and low SES students in the treatment groups, particularly in vocabulary.

One of the studies involved a collaborative approach with a teacher and SLP engaging in beyond-class-time collaborative activities where only teachers delivered the instruction. Ellis et al. (1995) investigated the effect of a collaborative consultation intervention on the acquisition of basic concepts by Kindergarten children ($N = 40$). One classroom was assigned to the collaborative consultation condition (based on teacher self-selecting to be in the collaboration condition) and the other classroom served as the standard practice control. The collaborative consultation condition involved a kindergarten teacher, a physical education teacher, an SLP, and a university researcher. The collaborative consultation procedures involved the teachers and SLP

meeting to plan the intervention, discuss the instructional schedule, and for the SLP to provide materials and strategies to present the targeted weekly concept. The general education teachers and physical education teachers then each taught and practiced the targeted weekly concepts in each of their classes for 30 minutes per week, for a total of one hour of coordinated instruction. The educators collaboratively taught nine concepts over the course of eight weeks.

Students' knowledge of basic concepts was measured using the Boehm Test of Basic Concepts-Revised (BTBC-R; Boehm, 1986). The researchers reported a significant difference in the pretest scores, which were used as covariates in the posttest analysis. With the pretest score adjustment, mean posttests score for the nine targeted concepts was significantly higher in the experimental group than then control group [$F(1,37) = 13.413$, $p < .01$)]. There was not a significant difference in the adjusted posttest scores for the 41 non-targeted concepts. Effect sizes were not reported. The authors concluded the findings offer empirical support for continued use of a collaborative consultation approach as a service delivery option for SLPs and teachers to support at-risk students.

Studies that used both beyond-class-time and in-class approaches.

The remainder of the studies from Table 2 incorporated collaboration activities between SLPs and teachers that occurred outside of class time and with partners implementing techniques in the classroom. In a recent retrospective study, Thomas & Lance (2014) reported on a schoolwide approach to support students in grades K-3 with achieving early literacy benchmarks. The SLP designed and coordinated the intervention with general education teachers, paraeducators, and special education teachers. Those involved in the model attended professional development and intervention meetings periodically throughout the year. The approach involved

providing intensive supports to students who did not meet benchmark criteria on the *DIBELS Next* (Good, 2011) assessment. Students received direct explicit instruction in small groups four times weekly for 30 minutes each session over the course of the school year. The SLP provided small group instruction for two hours daily four days out of the week (30 minutes with each grade). Specific procedures for the in-class and beyond-class-time collaboration activities were not explained in sufficient detail for replication. The authors reported the gains made by students in each grade, concluding that an overall 12% increase in the basic literacy scores was noted for all students in all grades.

Three published quantitative case studies used beyond-class-time and in-class models, as did one unpublished pilot study. Calvert et al. (2003) conducted a case study investigating the effects of classroom-based collaborations between an SLP and first- and second-grade teachers compared to a traditional non-integrated pull-out model. For all students (N = 144), narrative skills were assessed at pretest and posttest. Additionally, students with articulation deficits were assessed on articulation and students with language deficits were assessed on semantic knowledge. The SLP and teachers engaged in beyond-class-time activities for 25 minutes weekly. During these meetings, the partners discussed the previous week's lesson, how the teacher targeted speech-language objectives throughout the week, and planned for the upcoming week. During the collaborative intervention in the classroom, partners used a combination of co-teaching models for 30 minutes weekly. Ten additional minutes were dedicated to supporting students' speech-language goals on their IEPs.

The researchers reported a range of findings related to the gains made by students with and without speech-language deficits. Children without language impairments (normal communication and articulation) in the collaborative condition made greater gains on the

narrative task than in the traditional teacher-teach model, however, not significantly greater. For students with language impairments, the gains were comparable in both conditions. The children with articulation impairments made significantly greater gains on their speech sound errors in the collaborative condition. Finally, the students with language impairments in the collaborative condition made greater gains on basic concepts. However, students in the pull-out model made greater gains on the expressive portion of a standardized story retelling measure. Statistical procedures, p-values, and effect sizes were not reported. The authors concluded that the collaborative model resulted in larger gains on some curriculum and communication goals for some students. They emphasized that student characteristics need to be analyzed when making decisions between an all pull-out model, all classroom-based model, or combined model.

In a second case study, Swenson (2000) compared the language gains of a boy from second through fifth grade who received language intervention in two different service delivery conditions. The student received traditional pull-out services from second through fourth grade and then received The Class Within a Class model (CWC) of collaborative service delivery. The service delivery model was described as a clustered inclusion model. Insufficient information for replication was provided about the nature of the in-class and beyond-class-time collaboration activities between the SLP and fifth-grade teacher. The collaborators implemented the approach for 30 minutes twice weekly for five months. Language abilities were assessed three times over a four-and-a-half-year period using a standardized global measure of language and informal narrative writing or storytelling tasks. Although the researcher concluded that the student made significantly more gains in the CWC model, it was unclear how the statistics were analyzed and there was no way to account for maturation or testing effects.

A third case study investigation into literacy partnerships was reported by Nelson and Van Meter (2006) who used case examples of two boys in elementary school with language/literacy intervention goals. The authors described the approach to the literacy collaboration involving special education teachers, general education teachers, and an SLP in a writing lab approach. The duration of the writing lab approach for one student spanned from mid-second through third grade. For the second student, the approach lasted for one semester of his fourth-grade year. Sessions were scheduled for one hour twice per week for 24 weeks. The authors discussed how the collaborators established a plan for shared in-class instruction and intervention, engaged in planning beyond class time, intentionally created learning situations where individuals' language goals could be addressed, and clarified roles and perspectives. The collaborators also used the *BACKDROP* principles (Nelson et al., 2004) for the writing lab approach. *BACKDROP* is an acronym for "Balance, Authentic audience, Constructive learning, Keep it simple, Dynamic, Research and reflection, Ownership, and Patience" (Nelson et al., 2004, p. 16). Although the time dedicated to weekly beyond class-time was unclear, the authors explained the different ways collaborators planned (e.g., via email, phone, and brief face-to-face interactions) and the differences in their conversations from the beginning of the partnership and once collaborators were in their writing lab approach routine. At the beginning of the partnership, the planning discussions were geared more toward logistics and activities; later planning was devoted toward individual students' needs.

In both students' cases, baseline data were obtained through story probes. Students' abilities at the discourse level, sentence level, word level were analyzed. In addition, the collaborators analyzed students' spoken language in conversation and self-regulation. Based on baseline data, the collaborators established written and spoken language goals for each student.

A component of the writing lab approach is continuous progress monitoring of students' performance; therefore, portfolios of interim and final writing products were also maintained. The authors presented initial and final writing products of both students. They presented qualitative and quantitative evidence showing gains both students made in the collaborative writing lab approach.

Another case study that has informed the current project is an unpublished feasibility pilot study conducted by the researcher (Mitchell & Ehren, 2016). The purpose of this pilot study was to determine whether a protocol for a collaborative writing intervention for fifth-grade writers was both (a) feasible for general education teachers and SLPs and (b) effective for student writers. The study used a mixed methods case study design. The participants included one SLP and one fifth-grade general education teacher who formed a collaborative pair. The students in the collaborative classroom were fifth graders (N = 20) where most students were ELs who received Tier 2 services. In the first week of the eight-week study, the participants obtained baseline writing samples. Students were given a completed graphic organizer, which the teacher read to them, and 40 minutes to use the organized information to write a short essay. For six weeks, the participants engaged in co-teaching and parallel teaching for 35 minutes weekly and engaged in debriefing and data-based decision-making beyond class time for 60 minutes weekly. The content of the instruction was comparison/contrast writing in science class with a primary focus on text elements and organization. In the final week of the study, the teacher obtained posttest writing samples using the same administration procedure as the pretest, but with different concepts for comparison. Pretest and posttest writing samples were analyzed using an adapted rubric for scoring text elements and organization and frequency counts for connectives and conventions.

One main finding of the research was that the group mean difference in comparison/contrast text structure elements and organization was significantly higher (p = .013,) at posttest (M = 9.25, SD = 5.5) than pretest (M= 7.1, SD = 4.5), with a medium effect (dz = .60). There was no difference in pretest to posttests scores for connectives and conventions. A second main finding was each participant expressed the protocol was feasible for each of them personally, but that others might not find it to be feasible. Both participants expressed there were benefits and challenges to the protocol and expressed ideas about what parts of the instruction could be improved to meet students' learning needs. A third finding was that the collaborators implemented the collaboration protocol as defined by an IC Map (Hall & Hord, 2015) created for the study, achieving 26/28 points, or with 93% fidelity, at the six-week checkpoint.

Four experimental studies investigated collaborative approaches where the teacher and SLP collaboratively planned and implemented the language-focused instruction. In the earliest study in the included experiments, Kaufman et al. (1994) investigated the effects of a communication skills unit (CSU) that was jointly planned and implemented by a general education teacher, SLP, and SLP student. In the quasi-experiment, students were selected for the CSU treatment group if their classroom used a classroom-based language intervention program called language-in-the-classroom (LIC; N = 16) and students in the control group were selected from a third-grade classroom that did not participate in LIC. Students with communication impairments were exposed to the intervention, but were excluded as subjects. The objectives of the intervention were to increase third graders' awareness of explanation adequacy and to improve students' abilities to explain complex processes. The intervention content incorporated mathematical problem solving. The CSU collaboration procedures involved the collaborators jointly planning and implementing a three-week intervention. Any collaborative activities

leading to the development of the intervention were not reported. During the intervention, the SLP and teacher shared responsibility for instruction and scaffolding responses through co-teaching (45 minutes per session for three sessions). The SLP and teacher also shared responsibility for designing follow-up activities and scaffolding techniques the teacher would implement.

Students' metapragmatic awareness was measured using an instrument adapted from a task of assessing school-age children's understanding of explanation adequacy. Students' were assessed at pretest and posttest based on their responses to four scenarios depicting different response types. The scenarios were video clips of students providing explanations to each other about their math computations. Students in the study were required to rate the explanations in the scenarios according to whether the explanations in the scenarios helped the child in the scenario understand the math problem. Students in the study used a seven-point scale to indicate their perception of explanation adequacy and then justify their ratings. The researchers then applied a coding system to students' rating justifications. The analysis of students' responses revealed students in the treatment group showed significant improvement in their ability to rate and justify the adequacy of an explanation. The treatment group demonstrated an understanding of various types of responses (e.g., answer, procedure, justification, and demonstration), whereas the control group did not. The researchers concluded the CSU intervention resulted in improvements with third graders' awareness of the need to provide effective explanations and about how to help another person apply information through their explanations.

Five years after Kaufman et al.'s (1994) study, Farber & Klein (1999) explored the effects of a collaborative intervention program, Maximizing Academic Growth by Improving Communication (MAGIC), on the listening, speaking, reading, and writing skills of students in

Kindergarten (*N*= 287) and first grade (*N* = 265). Classrooms in the six participating schools were randomly assigned to the treatment or control condition by the principals at the school. The treatment condition involved direct language instruction delivered collaboratively an SLP and teacher. Twelve classrooms and sixteen SLPs were involved in the MAGIC program, with support of two SLP administrators. The collaborative treatment procedures consisted of initial professional development as well as weekly planning sessions and co-teaching three times each week throughout the academic year. Before the collaborative intervention began, collaborating teachers and SLPs attended a two-day professional development workshop addressing topics such as the collaboration process, the language of instruction, and Bloom's Taxonomy of Higher Levels of Thinking. During the implementation of the MAGIC program, one-hour weekly planning meetings took place with two classrooms teachers and three SLPs. Participants were compensated for this extra time. Partners also engaged in co-teaching. SLPs and teachers provided intervention in the classroom three times per week for a total of 2.25 hours per week. The following seven areas of language instruction were embedded during teacher-therapists co-teaching sessions: (a) teacher questions for learning and thinking, (b) teacher responses to student responses, (c) reactions to student questions/comments, (d) linguistic-conceptual complexity, (e) repetition-redundancy-revision, (f) classroom comprehension and feedback, and (g) nonverbal communication.

Students' listening, speaking, reading, and writing skills were assessed using the MAGIC Language Test, which was developed by a committee of 16 school-certified SLPs in the School District of Philadelphia and normed over 1,100 Kindergarten and first graders in the district. The Magic Test included four subtests with specific skills and point ranges: Writing, 11 points; Listening, 25 points; Speaking, 24 points; Reading, 30 points. Results of a one-way ANOVA for

main effects of the treatment on the MAGIC subtests and Magic Total score yielded significant differences on the Listening [$F(2, 551) = 8.95$, $p < .001$)], Writing [$F(2, 551) = 3.35$, $p < .05$)], and Total Test [$F(2, 551) = 4.87$, $p < .001$)] scores. The differences in the Reading subtest were near significant ($p = .068$) and were not significant for Speaking ($p = .151$). Effect sizes were not reported. The researchers concluded that students in the treatment groups demonstrated significantly higher performance on skills involving understanding vocabulary, understanding cognitive-linguistic concepts, and writing relevant sentences with correct mechanics and spelling.

The remaining two studies in the included group were published shortly after Farber and Klein's (1999) research. Hadley et al. (2000) explored the effectiveness of a collaborative classroom model on the vocabulary and phonological awareness development of Kindergarten and first-grade students ($N = 86$). The researchers randomly assigned four regular education teachers from the school to either the treatment group or the standard practice control group; thus, each condition comprised two classrooms. Children were randomly assigned to classrooms as per typical school assignment procedures. Only one SLP was involved in the two collaboration classrooms. Collaboration procedures involved professional education, shared curriculum planning, and implementation of naturalistic language facilitation techniques. The teacher's primary role was to plan activities aligned with the curriculum and the SLP's primary role was to use the curriculum to meet students' communication goals. Collaboration activities that occurred beyond class time involved weekly planning sessions between the SLP and teachers that lasted about an hour. The university researcher and SLP also attended the planning meetings regularly during the fall semester and occasionally during the spring semester. Collaboration activities in the classroom involved a combination of teacher led vocabulary and

phonological awareness activities as well as co-teaching between the SLP and teacher. The teachers and SLPs shared the responsibility of providing direct explicit instruction in vocabulary and letter-sound association. Teachers provided weekly themes, curriculum units, large group activities, and small group activities for language arts, math, and science. The SLP co-taught in each collaborative classroom for two and a half days each week, The SLP led a small group 25-minute phonological awareness station in addition to leading morning meetings, small group, large group activities every week. The SLP was responsible for modeling language facilitation techniques during structured instructional activities and free play. The collaborative classrooms were in place for 23 weeks, with the SLP participating in each classroom for nine to ten hours per week.

Hadley et al. (2000) measured a range of student outcomes related to vocabulary and phonological awareness. Vocabulary tasks included standardized measures of receptive and expressive vocabulary. Phonological awareness tasks were non-standardized measures of rhyming, beginning sound awareness, and letter-sound associations. After adjusting for pretest scores and grade, posttest results revealed significantly higher gains for students in the experimental group for all tasks. There was a significant main effect for classroom for both the expressive vocabulary task [$F(1, 85) = 11.63$, $p = .001$] and the receptive vocabulary task [$F(1, 85) = 11.06$, $p = .001$)]. Similarly, superior gains were observed in the experimental classrooms for explicitly taught skills of beginning sound awareness [$F(1, 85) = 4.23$, $p = .04$)], letter-sound association [$F(1, 85) = 13.48$, $p = .000$)], and a skill of syllable deletion not taught in the intervention [$F(1, 85) = 9.53$, $p = .003$)]. There were no significant differences between the groups on the rhyming measure and no effect sizes for any of the outcomes were reported. Further analyses were also conducted to compare results of native English speakers, non-native

English speakers, children with limited English proficiency, and children receiving speech-language services. The authors concluded that collaborations between SLPs and general education teachers are a viable means of facilitating language growth in school settings.

The final and most recent study involving an experimental design where SLPs and general education teachers collaborated in beyond-class-time and in-class activities was conducted by Throneburg et al. (2000). The researchers examined the vocabulary outcomes of students receiving speech-language services, as well as students not enrolled in speech or language services, in Kindergarten through third grade ($N = 77$). Instruction was delivered in three different approaches, with four classrooms in each condition: (a) collaborative approach, (b) classroom-based model with SLP and teachers working independently, and (c) a traditional pull-out model for students receiving speech or language services. The procedures in the collaboration condition involved an SLP, two SLP graduate students, and the general education teachers meeting initially to plan the intervention and activities. Additionally, the SLPs, graduate students and general education teachers met on a weekly basis (40 mins per week) to plan, discuss student performance, and share materials and ideas. The collaboration activities during class involved shared instructional teaching of five vocabulary words each week, addressing specific IEP speech and language goals, and classroom communication skills. The teacher then continued to emphasize the vocabulary words throughout the week. The classroom collaboration activities lasted 40 minutes each week and included both whole group and small group instruction. The duration of the collaboration was twelve weeks.

The researchers adapted a non-standardized procedure to assess students' vocabulary knowledge. For each of the 20 words randomly selected from the 60 words taught over the course of 12 weeks, students were required to define the word verbally, use the word in a

sentence, and recognize the word's meaning from two choices. Scoring procedures were specific to each task. Word definitions used a three-point scale, usage in a sentence used a two-point scale (with two points awarded for a vague or precise sentence), and meaning recognition was scored as correct or incorrect. At pretest, there were no differences between the three groups in the subjects' pretest scores. Posttest results revealed a significant difference in the group mean vocabulary gains between the three service delivery conditions [$F(2, 15) = 3.82$, $p = .045$; eta squared = .34). Gains were significantly greater for the collaboration condition than the other two conditions; there was no significant difference between the classroom-based non-collaborative condition and pull-out models. The authors concluded the collaborative model was more effective for teaching vocabulary to students receiving speech-language services than the other conditions. Additionally, the collaborative and non-collaborative classroom based models resulted in higher vocabulary gains for students not enrolled in speech-language services when compared to instruction from the classroom teacher alone. The authors concluded that the results supported theoretical advantages of collaboration and an integrated model of service delivery in the schools (Throneburg et al., 2000).

Summary of findings and limitations.

An analysis of the similarities, differences, and limitations of this body of work served to inform the systematic collaboration protocol and design for the current study. Within the group of elementary collaborations, most the studies involved the primary grades (Kindergarten and first grade). A second similarity was that all the studies incorporated, to some extent, explicit vocabulary instruction. Third, all collaborative conditions involved collaborative activities that occurred beyond class time. Although not explained in detail, the partners used beyond-class-

time meetings to plan curriculum activities addressing students' communication goals, discuss student performance, and share materials. In some cases, partners also participated in professional development together before or throughout the collaboration. A fourth similarity was that partners in all the collaboration conditions involved an SLP and general education teacher at a minimum. Finally, in all cases, summative student performance was analyzed using pretest-posttest comparisons. In the experimental and quasi-experimental designs, outcomes from the experimental condition were compared with outcomes from control or comparison conditions.

Differences in the six-study corpus can be categorized into collaboration duration, other partners involved in the collaboration, opportunities for SLP modeling and sharing of language facilitation techniques, instructional focus, and use of standardized vs. non-standardized instruments. The issue of the duration of collaborations in experimental studies is a critical one for practitioners when they are considering feasible service delivery models. It is unlikely that an SLP would be able to form an intensive collaboration partnership with just one teacher for an entire school year while also managing a regular caseload. In the corpus of studies included in this review, the duration of the collaborations ranged from 45 minutes per week for three weeks to nine to ten hours per week for 23 weeks. This reality of the need for more studies comparing dosages of collaboration models at different grade levels and with different instructional foci informed the design of this study.

Another difference among the studies concerned other personnel who were involved in the partnership. In some studies, graduate Communication Sciences and Disorders (CSD) students were involved in the planning and implementation of the collaboration as well as with administration of pretests and posttests. Also, in some studies, other school professionals and

specialists were involved in different aspects of planning and implementation. In many cases, there was also a university partner involved in designing the collaboration and providing coaching. A primary goal of the current study was to narrow the scope of collaboration to only SLP and teacher pairs employed in school districts with coaching from the doctoral researcher to achieve fidelity of the collaboration protocol and vocabulary instructional technique.

A third difference in the studies related to opportunities for SLPs to model and share language scaffolding techniques. In the studies that did not involve shared class time implementation, there may not have been a context for a focus on the language scaffolding elements to be implemented throughout the day. An assumption of the current research project was that beyond-class-time and in-class collaboration contexts are needed for SLPs to share and model language scaffolding techniques. Modeling and implementing language facilitation techniques was an integral aspect of Farber and Klein's (1999) collaboration condition with SLPs. Similarly, Hadley et al. (2000) and Calvert et al. (2003) provided specific examples of the language facilitation techniques used in the collaborative classrooms. With few exceptions (e.g., Calvert et al., 2003), many of the studies lacked reporting of specific language facilitation techniques that were used and that were expected for the teachers to incorporate in their teaching. The lack of specific reporting about specific techniques teachers were expected to use informed the more detailed reporting procedures in this study.

A fourth difference in the corpus of studies was the range of student outcomes targeted and the instructional focus used to address desired outcomes. In addition to explicit vocabulary instruction, the studies also targeted the range of literacy skills listed in Table 2. The class time activities were geared toward the curriculum and communication goals as established when the collaborations were designed. The co-teaching components of instruction delivered by the SLP

and teacher often involved a combination of whole group and small group instruction. Additionally, when instruction was focused on vocabulary instruction, procedures differed in how words were selected and how student performance was assessed.

The limitations from this body of research, as well as from reviews and surveys, also elucidated what needs to be captured in a measurable definition of a collaboration innovation. An unclear definition of the key features of collaboration and IPP makes it difficult to determine if SLPs and teachers are indeed collaborating as opposed to cooperating and coordinating. Additionally, an explicit focus on language scaffolding by both partners is a critical element in literacy partnerships. From the corpus of experimental and quasi-experimental studies, it was unclear whether teachers and SLPs were aware of the need to explicitly discuss context-specific planned and in-the-moment language facilitation techniques and whether the partners reflected on their own language scaffolding practices. Additionally, it was unclear if collaborators made instructional adjustments, and what those adjustments were, based on trouble spots they anticipated or observed in their interactions.

Limitations from existing research are important to consider when designing feasible collaboration models within the current era of accountability. Time constraints and lack of funding for coverage are huge barriers for collaborators and the research needs to continue to address what can be practically implemented. Whereas some of the studies were possible because of grant funding (e.g., Hadley et al., 2000; Throneburg et al., 2000), the goal is to design doable and effective literacy partnerships with the typical resources available to collaborators. As illustrated in Table 2, research is needed in the current educational context.

Finally, the limitations from existing research provided insights into how to design studies with the goal of replication. Largely missing elements from the evidence base that are

needed to inform a research agenda are presented in Table 2. Examples of gaps include: (a) the lack of an operational definition of collaboration and a systematic protocol explained in enough detail to be replicated, (b) few SLP and teacher collaboration pairs in collaboration conditions, and (c) few studies at each grade level. Furthermore, the outcomes measured in the studies varied to the extent that it would not be possible for meta-analyses to be conducted. It should also be noted that few of the studies in the elementary setting were conducted since recent educational reforms such as revised state standards (e.g., CCSS, 2010), RTI, and ESSA. In the current educational era, state standards have changed, as have the demands on SLPs and teachers.

Researchers have acknowledged further investigations are needed to examine the effectiveness of service delivery models, including collaboration models involving SLPs, on a variety of functional literacy outcomes (e.g., Cirrin et al., 2010). A study investigating the effects on collaboration between SLPs and teachers on literacy outcomes would be an important contribution to the limited body of research. For this study, the researcher selected robust vocabulary instruction as the language-focused content of the collaboration and vocabulary knowledge was selected as the student outcomes to investigate.

Literacy Achievement and Vocabulary

Vocabulary is a foundational reading skill at all stages of literacy development (NICHD, 2000). Whereas the pillars of phonemic awareness, phonics, and fluency develop within a relatively short time period for many students, vocabulary and comprehension develop over a person's lifetime (Stahl & Bravo, 2010). Individuals who attain wide breadth and depth of vocabulary knowledge are afforded academic, economic, and social benefits (e.g., Hirsch, 2013). Since early in the 20th century, researchers have reported correlational relationships between

vocabulary size and reading comprehension (e.g., Baumann, 2009; Perfetti & Adolf, 2012), vocabulary size and academic success (e.g., Chall, Jacobs, & Baldwin, 1990; Cunningham & Stanovich, 1997), and vocabulary size and future level of income (e.g., Hirsch, 2013). Students with larger vocabularies have an advantage when understanding relationships between words, efficiently storing and retrieving words, and using academic language in spoken and written language (e.g., Jackson, Leitao, Claessen, 2016). In contrast, students with smaller vocabularies tend to fall behind their peers in literacy achievement and are at risk for academic underachievement and economic disadvantage (Christ & Wang, 2010, Hirsch, 2013). Vocabulary is a linchpin to literacy achievement and an instructional focus worth collaborating around in a literacy partnership.

Robust Vocabulary Instruction

There is a great deal of evidence that robust vocabulary instruction results in vocabulary gains (Beck et al., 2013; Christ & Wang, 2010; Stahl & Fairbanks, 1986). Components of robust vocabulary instruction are needed in an intensified literacy program for students to know, or own, vocabulary words. According to Beck et al. (2013), to have depth of knowledge about a word means to have a rich knowledge of the word's meaning, knowledge about how the word relates to other concepts, and an understanding of how a word's meaning can be extended to metaphors (Beck et al., 2013). The points on the continuum that lead up to having complete knowledge of a word include: (a) having no knowledge about the word, (b) understanding a general sense of the word, (c) having narrow contextually bound knowledge, and (d) having knowledge of a word, but without efficient recall to use at the right time (Beck et al., 2013).

Robust vocabulary instruction is designed to move students from no knowledge/partial understanding to complete understanding. Partial knowledge of a word may begin to develop after a single exposure, context, or example. However, forming a complete understanding of a word requires multiple encounters with different kinds of examples. There are many key features of robust vocabulary instruction, all of which extend beyond providing definitional information and surface level processing (e.g., Beck et al., 2013; Graves, 2016; Kame'enui & Baumann, 2012; Stahl & Fairbanks, 1986). Robust vocabulary instruction is characterized by frequent exposures to targeted words, encounters with targeted words in different contexts, and opportunities to have interactions with targeted words that involve deep and active processing (Apthorp et al., 2012). Robust instruction prompts students to think actively about word meanings (Kame'enui & Baumann, 2012). These types of interactions are achieved when educators select appropriate words for instruction, introduce words and their meanings and sustain practice over a period of days, provide direct and explicit instruction, engage students in reflective interactions with them (Beck et al., 2013; Rupley, Blair, & Nichols, 2009). Components of robust and effective vocabulary instruction include: (a) intentional selection of academic vocabulary words to teach, (b) student friendly definitional information, (c) contextual information, (d) multiple encounters with targeted words over time and in different contexts and (e) interactions with words that involve deep and active processing (Apthorp et al., 2012; Beck et al., 2013; Stahl & Fairbanks, 1986). Deep and active processing requires students to interact with the words in varied contexts, demonstrate comprehension, and generate their own responses to words. Such generative processing involves students using target words in sentences and defining the words in their own way orally or in writing or acting upon definitional information (Stahl & Fairbanks, 1986).

Despite the extensive research base on robust vocabulary instruction and rigorous state standards requiring vocabulary knowledge within all content areas, evidence-based robust vocabulary instructional practices are not consistently being implemented in preschool, elementary, and secondary school settings in the U.S. (Graves, 2016). What is known about typical practice has come from research on core reading programs and vocabulary instruction. Studies over time have shown a lack of a vocabulary component promoting robust vocabulary instruction in basal readers (e.g., Beck, McCaslin, & McKeown, 1980; Ryder & Graves, 1994; Wright & Neuman, 2013). Moreover, observational studies over time have indicated vocabulary instruction tends to be insufficient (e.g., Carlisle, Kelcey, & Berebitsky, 2013; Roser & Juel, 1982). The landscape of vocabulary instruction was summarized by Graves (2016): "The vocabulary instruction in core reading programs and the vocabulary instruction in classrooms more generally are thin, weak, and not based on recent research or what constitutes effective vocabulary instruction" (p. 19). Graves (2016) argued the integration of vocabulary practices needs strengthening both in core reading programs and in the instruction teachers provide.

Language-scaffolded interactions.

Robust vocabulary instruction involves language-scaffolded interactions with students. Scaffolding, as defined by Wood et al. (1976), is "a process that enables a child or novice to solve a problem, carry out a task or achieve a goal that would be beyond his unassisted efforts (p. 90)." This process of providing assistance can take many forms, and often involves learner-directed interactions between more knowledgeable leaners and novice learners (Kim & Hannafin, 2011). Language scaffolding is a dynamic scaffolding approach that involves strategic questioning, contingent responses, and feedback with the goal of problem-solving meaning.

Strategic questions guide students to attend to overlooked cues in spoken and written language that are needed to make meaningful connections (Nelson et al., 2004). The purpose of strategic questions is to develop students' abilities to place an intentional focus on aspects of language that cause meaning-making in a communication type of structure, as opposed to a correction type of structure (Nelson et al., 2004). In language-scaffolded interactions, mature language users continue to guide students to make connections between language and meaning through ongoing contingent responses and feedback (Nelson et al., 2004; Ukrainetz, 2006).

Research on scaffolding in classrooms with a range of student ages, ability levels, and content domains has revealed that classroom scaffolding tends to be effective under certain conditions (Kim & Hannafin, 2011). These conditions include: (a) verbal discourse, (b) teacher modeling, and (c) engaging students in problem-solving and constructing arguments or explanation (Alevan & Koedinger, 2002; Linn, Clark, & Slotta, 2003; Quintana et al., 2004; Reiser, 2004). Supportive scaffolding is different in nature from directive scaffolding (Silliman, Bahr, Beasman, & Wilkinson, 2000). Whereas directive scaffolding tends to be characterized by a sequence of adult initiating, student response, and teacher evaluation, supporting scaffolding involves active problem solving discourse (Nelson et al., 2004; Silliman et al., 2000). Language-savvy educators use supportive scaffolding in their interactions with students. They are aware of, and responsive to, the language abilities of their students. They are tuned in to confusion students have, or are likely to have, with academic language at the word, sentence, or discourse levels. They anticipate what will cause students difficulty in curriculum standards, academic text, and academic discourse. Additionally, they analyze why students will struggle from a language standpoint.

Approaches to Vocabulary Instruction

Research on comprehensive vocabulary instruction has been extensive, employing a wide range of topics. Examples of the wide range of topics include the nature of word learning, effects of early language experiences on vocabulary development, perspectives on which types of words to teach, instructional needs of various student populations (e.g., different ages, ability levels, and English level proficiency), effects of vocabulary knowledge on literacy outcomes, and common vocabulary practices in school settings (e.g., Beck et al., 2013; Graves, 2016).

Abundant evidence exists in the literature about how we learn words (e.g., Cobb & Blachowicz, 2014; Graves, 2016) and about the gradual nature of word learning (Christ & Wang, 2010; Hirsch, 2013). Four critical understandings about the process of word learning were summarized by Cobb and Blachowicz (2014). First, experiences using words impact the depth of students' vocabulary knowledge. Second, engagement is critical. When students are engaged, they have motivation to learn to the words. Third, students' knowledge of words deepens when they make connections with other word meanings and when they see how words can be used in different ways. Fourth, students learn words both through explicit instruction and incidentally. However, incidental exposure alone is insufficient to promote vocabulary gains in students who struggle to read (e.g., Baumann, 2009).

The vocabulary-comprehension link is complex and not all vocabulary instruction has a positive effect on comprehension (Beck, McKeown, & Kucan, 2008; Nagy, 1988). Some experimental studies have demonstrated a large relationship between vocabulary and comprehension (Elleman et al., 2009), whereas some have not (Baumann, Edwards, Boland, Olejnik, & Kame'enui, 2003). Correlational studies have shown vocabulary knowledge to be a

predictor of reading comprehension, however, causal linkages between vocabulary and comprehension are not well understood (Baumann et al., 2003). Generally agreed-upon vocabulary instruction practices in the elementary grades have surfaced from multiple systematic reviews and meta-analyses (e.g., Elleman et al., 2009; NICHD, 2000; RAND, 2002; Stahl & Fairbanks, 1986). Findings from multiple reviews conducted by the What Works Clearinghouse (WWC), along with the findings from the National Reading Panel (NICHD, 2000), have resulted in expert panel recommendations to explicitly teach vocabulary (e.g., Baker et al., 2014; Foorman et al., 2016; Gersten et al., 2007). Instruction in morphological awareness and contextual analysis have also been linked to improved literacy outcomes with varying effects at the sublexical, lexical, and discourse levels (e.g., Bowers, Kirby, & Deacon, 2010; Carlisle, 2010; Fukkink & de Glopper, 1998; Goodwin & Ahn, 2010; Goodwin & Ahn, 2013; Reed, 2008).

Guidelines also exist about vocabulary instruction with under-researched populations. For example, reviews of the literature have been conducted with ELs (e.g., Gersten et al., 2007) and students with learning disabilities (LD) (e.g., Bryant, Goodwin, Bryant, & Higgins 2003; Jitendra, Edwards, Sacks, & Jacobson, 2004). Researchers recommend ELs need extensive and varied vocabulary instruction on essential content words throughout the day to develop academic English (Beck et al., 2008; Gersten et al., 2007). There are no indicators in the research to suggest the components of robust vocabulary instruction that work for monolingual students do not work for ELs (Beck et al., 2008). However, robust vocabulary instruction must be adapted to ELs' strengths and needs (Calderon et al., 2005). For example, educators may emphasize pronunciation of targeted words in English and in students' native languages, raise students' awareness about cognates when they occur, and use bridging from the students' native language

to explain the meaning of the English target word. Additionally, the literature with EL students consistently emphasizes the need for extended, purposeful talk in classroom discussions as a means of developing academic vocabulary (Beck et al., 2008).

Similarly, students with LD need intensive support to build their academic vocabulary repertoires. There are many factors that contribute to their low academic vocabularies. For example, students with LD tend not to engage in dependent reading as often as students without disabilities (or benefit from independent reading to the same degree). Additionally, they lack strategies for gleaning meaning from unfamiliar words in context (Jitendra et al., 2004). The following recommendations were provided by Jiterndra et al. (2004) to enhance vocabulary learning for students with learning disabilities: (a) encourage students to read, (b) teach vocabulary directly incorporating characteristics of robust vocabulary instruction, and (c) optimize word learning through strategies such as deriving meaning from context, word parts, and word relationships. Although there is a great need for further research on the effects of vocabulary instruction with these populations, many of the same types of instructional techniques have been found to be effective with different ages, levels of English language proficiency, and ability levels (Graves, 2016).

Providing rich and varied language experiences.

One component of a comprehensive approach to vocabulary instruction is providing rich and varied language experiences (Graves, 2016). This approach to vocabulary instruction refers to surrounding students with, and involving them in, ongoing rich reading, writing, listening, and speaking experiences (Graves, 2016). Oral language experiences involving listening and discussion are particularly important for students in the early grades who come to school with

underdeveloped vocabularies. Listening and discussion are also important for students in the early grades with stronger vocabularies as well, because the words they encounter in books they can read independently may not be familiar to them (Graves, 2016). Promoting incidental word learning can be accomplished by having students read a wide variety of books, hear language spoken in varied contexts, engage in frequent discussions with adults and peers, and write frequently for intended audiences (Graves, 2016).

Wide reading is one, but not the only, means of providing rich and varied language experiences (Graves, 2016). The concerns about wide reading as the only approach to providing rich and varied language experiences warrant consideration. Some criticisms with wide reading as the only approach to promoting vocabulary growth relate to the slow, incremental process of word learning (Fukkink & de Glopper, 1998). A cumulative effect of wide reading takes many years and researchers do not agree on the exact contribution to incidental word learning to vocabulary growth (Beck & McKeown, 1991; Fukkink & de Glopper, 1998). Along the same lines, many have argued that independent reading does not provide students with the rich language experiences students need to develop academic language skills, particularly for students who struggle (e.g., Miller & Moss, 2013). Another approach to providing rich and varied language experiences is through oral reading. Providing rich languages experiences in oral reading entails explicitly defining words, intentionally selecting books and words, providing deliberate scaffolds in interactive oral readings, engaging students in repeated readings of books, and facilitating repeated encounters of targeted words. There is evidence to support providing rich and varied language experiences as part of a multifaceted comprehensive approach involving robust vocabulary instruction (e.g., Cobb & Blachowicz, 2014; Graves, 2016).

Teaching individual words.

A second component of a comprehensive approach to vocabulary instruction is teaching individual words (Graves, 2016). This approach entails teaching students specific words. There is much research guiding practices that have proven effective for teaching individual words (e.g., Baumann & Kame'enui, 2004; Beck et al., 2013; Graves, 2016). The components of robust vocabulary instruction can be incorporated in various techniques and activities at different grade levels (e.g., Beck et al., 2008; Cobb & Blachowicz, 2014; Graves, 2016).

Critics of the approach of teaching individual words have argued that students need to learn many more words than can be taught individually. Although it is true that students need to learn a great many more words, that should not preclude educators from teaching some of them (Beck et al., 2013; Graves, 2016). Determining which words to teach is a topic many vocabulary scholars have addressed. Different criteria for intentionally selecting which words to teach have been offered. Some approaches have been based upon a developmental view, although there are limitations with this approach because word learning is not developmental (Beck et al., 2013). Other approaches have used frequency counts, however, there are limitations regarding morphological variations, multiple-meaning words, and arbitrary frequency criteria (Beck et al., 2013). Another approach has been to classify words such that students are able to get high mileage out of the selected words they are taught (e.g., Beck et al., 1987; Coxhead, 2000; Nation, 2001; Stahl & Nagy, 2006).

Beck et al. (1987) suggested one such system for using criteria to select high mileage words. The researchers proposed a categorization system of Tier One, Tier Two, and Tier Three vocabulary words. Words in Tier One typically occur in oral conversation with high frequency.

Students are exposed to Tier One words throughout their everyday interactions and such words tend not to need an instructional focus. In the Tier Two category, words are not as common in oral language, are characteristic of language in text, have high utility for mature language users, and are common across subject areas. Students are not as likely to learn words in the Tier Two category on their own without instructional support. Finally, words in the Tier Three category are highly specific to a subject area. Although instruction is needed to teach these concepts, having a rich understanding of these words does not result in high mileage for most learners outside of that specific content area. Based on prior research using robust vocabulary instruction with Tier Two words (e.g., Chilton & Ehri, 2015; Ehren, 2008; Ehren et al., 2010; Spielvogel, 2011), Beck et al.'s (1987) tiered word selection system was used in the study.

Teaching strategies for learning words independently.

A third component of a comprehensive approach to vocabulary instruction is teaching word-learning strategies (Graves, 2016). A rationale for teaching word-learning strategies is based upon the hypothesis that if students make small improvements with unpacking meaning from words, they will learn many more words (Fukkink & de Glopper, 1998). To make improvements with inferring meanings, students must have a plan about what do when they encounter unfamiliar words (Fukkink & de Glopper, 1998). Two primary strategies that have been researched include teaching how to use context and how to use word parts (Graves, 2016). Teaching context refers to teaching students how to find and make sense of context clues; clues either place the word in a general category, give specific clues about the correct meaning of a word, or give misdirective clues (Beck et al., 2013). Using word parts involves teaching students about identifying base words and the meanings of prefixes and suffixes. A third strategy involves

teaching dictionary skills. Dictionary skills involve understanding alphabetical order, using guide words, and applying pronunciation supports (Graves, 2016). A fourth strategy presented by Graves (2016) involves recognizing multiword units and making sense of word combinations where meaning is unclear based on the meanings of the individual words.

Inconclusive research findings have resulted in reservations about approaches involving morphological instruction and context clues alone (Baumann et al., 2003). Research on morphemic analysis (MA) and contextual analysis (CA) has not supported the direct relationship between vocabulary and comprehension proposed by the instrumentalist hypothesis (Baumann et al., 2003). However, researchers have acknowledged limitations in MA and CA studies, which include a small sample of studies and problems with methodological quality (e.g., Baumann et al., 2003; Fukkink & de Glopper, 1998).

The research on the effects of explicit teaching of MA on word learning is inconclusive (Beck et al., 2008). Based on recent research in morphological instruction, students have been taught to infer word meanings through MA (e.g., Baumann et al., 2003; Bowers et al., 2010; Fukkink & De Glopper, 1998; Goodwin & Ahn, 2010; Goodwin & Ahn, 2012; Reed, 1998). However, within this work there is great variation between instructional content, research methods, and duration/intensity (Baumann et al., 2003). It is possible for students to build their knowledge of prefixes and suffixes without applying the knowledge as a literacy skill to determine the meanings of new words (Beck et al., 2008). Bowers et al. (2010) offered a perspective on the influence of morphological knowledge on literacy skills by explaining that predictive and correlational studies do not address the direction of the influence of each. It is possible that "morphological builds literacy skills, that literacy skill builds morphological knowledge, or that there is some mutually supportive relationship" (p. 148). Beck et al. (2008)

offered another perspective on robust vocabulary teaching and instruction on word parts. “There are distinctions, but not conflicts, between teaching robust vocabulary and teaching morphemes” (Beck et al., 2008, p. 44). The differences relate to the direct teaching of morphemes to indirectly determine word meanings versus the direct teaching of target words. The approaches are not conflicting because they are both designed to develop students’ academic literacy skills (Beck et al., 2008).

Like the equivocal findings of MA instruction, the research on the effects of CA on vocabulary learning has been inconclusive. Earlier studies produced mixed results (e.g., Carnine, Kame’enui, & Coyle, 1984; Kuhn & Stahl, 1998; Stahl & Fairbanks, 1986; Marmolejo, 1990). However, more recent experiments have provided evidence that students can be taught how to use context clues to facilitate their word learning (Chilton & Ehri, 2015; Fukkink & de Glopper, 1998). In their meta-analysis of twelve studies, Fukkink and de Glopper (1998) reported a generalized effect size delta of .4 after instruction in the use of context to determine word meaning.

There is evidence supporting the teaching of dictionary skills (Shanahan, 2016); however, limitations of dictionary instruction are worth noting. Even if students know how to find the words in dictionaries and decode the definitions, there are inherent problems (Graves, 2016). Dictionary definitions can be problematic for students because of weak differentiation between target words and related words, vague language, inaccurate interpretation, and multiple pieces of information (Beck et al., 2013). To offset some of these problems with dictionary definitions, researchers have recommended alternative dictionaries that include more student-friendly definitions, with which educators can then tailor for their students. An example is *Collins COBUILD New Student’s Dictionary* (2005).

There is consensus that no single vocabulary teaching program on its own can produce the growth students need to read proficiently (Beck et al., 2013; Fukkink & de Glopper, 1998; Graves, 2016). The approach used in this review and study is Graves's (2016) comprehensive model. Regardless of the model or teaching approaches, scholars agree that motivation to learn words and developing students' word consciousness is a critical component of effective vocabulary instruction.

Fostering word consciousness.

The fourth component to Graves's (2016) model of vocabulary instruction is fostering word consciousness. The term *word consciousness* refers to an awareness and interest in words and word meanings (Graves, 2016). According to Anderson and Nagy (1992), word consciousness involves an integration of knowledge about words, motivation to learn words, and a lasting interest in words. Individuals who are word conscious are aware of the words around them. They are aware of when they understand word meanings versus when they do not. They reflect upon authors' and speakers' word choices, think about which words can be used in the place of others, understand word relationships, appreciate figurative language and word play, and recognize the usefulness of powerful words (Cobb & Blachowicz, 2014; Graves & Watts-Taffe, 2008). Word consciousness is an integrated aspect of many vocabulary programs (e.g., Beck & McKeown, 2007; Beck, et al., 1987).

Educators can foster word consciousness through the literacy environment and through their interactions with students. To foster word consciousness through the environment, educators can stock the classroom library with engaging books (Graves, 2016). In their interactions with students, educators can teach how words work, model and encourage use of

academic language, engage students in wordplay, and involve students in inquiry (Graves, 2016). Specific activities to promote word consciousness have been offered by many vocabulary researchers (e.g., Beck et al., 2008; Beck et al., 2013; Cobb & Blachowicz, 2014; Graves, 2016).

The Vocabulary Scenario Technique

The Vocabulary Scenario Technique (VST), a specific vocabulary instruction routine, incorporates components of robust vocabulary instruction. Multiple variations of the VST have developed from the technique developed by Ehren (2008) as part of a larger reading comprehension approach, STRUCTURE Your Reading (SYR). Ehren (2010) an IC Map for the VST, which is applicable to all variations of the VST. The VST IC Map is included in Appendix D1. Key features of the VST IC Map include: fostering word consciousness, intentional selection of vocabulary words that are linchpins to the curriculum, integration of morphological variations of target words, use of instructor- (or researcher) constructed scenarios, exploration of meaning, multiple encounters, scaffolded and accurate use, student engagement, use of the Cue/Do/Review sequence, incorporation of students' portable word walls, progress monitoring, efforts to facilitate generalization, and assessment of mastery.

A series of studies has been conducted to investigate the effectiveness of different versions of the VST. Ehren (2008) conducted a two-year experimental study in grades six, seven and eight of a strategic reading intervention of which VST was a part. Following the Ehren (2008) study, Ehren et al. (2010) studied the VST component separately with fourth graders using a protocol with 24 encounters and Spielvogel (2011) conducted a quasi-experimental study with fourth graders using a version of the VST protocol that had 16 encounters. In the Ehren, Zadroga, and Proly (2010) pilot study, 43 fourth-grade students in general education classrooms

participated. There were 24 encounters built into the protocol for each word taught. Results of the pilot study revealed significant differences between the treatment classroom and comparison classroom on researcher-created vocabulary measures, with higher posttest scores in the treatment classroom [$F(1, 41) = 27.68$, $p < .001$, partial eta squared = .40].

In an adaptation of the Ehren et al. (2010) protocol, Spielvogel (2011) conducted a Master's thesis using a version of the VST now called the VST-GE16. The GE16 referred to the version used in a general education classroom setting where 16 encounters with each target word in the introduction day was achieved. Fewer encounters in the VST-GE16 protocol than the original protocol allowed for more words to be taught in a week. The purpose of the quasi-experimental study was to investigate differences in fourth-grade students' vocabulary knowledge ($n = 20$) when they received direct instruction using the VST-GE16 protocol (Spielvogel, 2011) with a comparison classroom where typical vocabulary instruction was implemented ($n = 21$). Vocabulary knowledge was measured at pretest and posttest using two researcher-created measures. The first measure was a multiple-choice synonyms task; the second measure was a words-in-context task where a word bank was provided.

Results of an ANCOVA analysis revealed statistically significant differences, on both vocabulary measures when controlling for pretest scores. The group mean score was higher on the synonyms measure in the treatment group [$M = 24.33$, $SE = 0.77$, $F(1, 35) = 14.76$, $p < .001$] than the comparison group [$M = 20.14$, $SE = 0.77$, $F(1, 34) = 43.66$, $p < .001$]. Similarly, the group mean score was higher on the words-in-context measure in the treatment group ($M = 26.24$, $SE = 0.76$) than the comparison group ($M = 19.03$, $SE = 0.78$). Additionally, Spielvogel (2011) reported large effects for both the Synonyms task (partial eta squared = .30) and Words-in-Context task (partial eta squared = .56). Spielvogel (2011) concluded that the VST-GE16

protocol has potential to be used as an effective and efficient vocabulary instructional technique in fourth-grade general education classrooms.

The current study differed from previous VST studies in multiple ways. The research incorporated two versions of the VST, which were implemented in two different conditions. In the treatment condition, the teacher and SLP collaboration pairs implemented a new version of the VST called the VST-T+SLP (Mitchell et al., 2017). The VST-T+SLP incorporated key features from the VST IC Map (Ehren, 2010; Appendix D1) and the VST-SLP Unique Contribution IC Map (Ehren, 2016; Appendix D2). In the comparison condition, non-collaborating teachers taught the same set of vocabulary words using the VST-GE16 version (Spielvogel, 2011). The study involved younger students than the previous studies; three classrooms were third-grade classrooms and the fourth classroom was a blended classroom of second and third graders. There were slight variations to the implementation procedures and in the administration procedures for the pretests and posttests to accommodate the needs of the age group in the study. Finally, the current study differed from the previous VST studies in that the instruction in the treatment condition was delivered collaboratively by general education teacher and SLP collaboration pairs.

Chapter Summary

This chapter justified a rationale for investigating the effectiveness of a collaboration model involving SLPs and third-grade general education teachers. A research agenda is warranted because ongoing investigations of collaboration effectiveness, as measured by student outcomes, are needed. For the agenda to gain momentum, an operational definition of collaboration with measurable key features must exist. Currently, there is no such blueprint to

define collaboration or to measure fidelity of the process. Although theoretical frameworks offer guidance, they do not provide specific steps or measurable key features. Researchers have acknowledged more research is needed to investigate the effects of collaborations on student outcomes (Goddard et al., 2007; Murawski & Swanson, 2001). Additionally, there is a need to accumulate evidence from various studies of the effects of collaboration involving SLPs. The research is needed from preschool to secondary settings and with a range of instructional foci.

Robust vocabulary instruction is a high impact literacy skill and suitable focus of a literacy partnership. There is a need for educators to anticipate, explicitly teach, model, question, and provide feedback to students about how to manipulate language in service to meaning. SLPs are language specialists who have knowledge of language underpinnings, language scaffolding, and evidence-based practices in vocabulary interventions.

In the first section of this chapter, the background of escalated literacy standards and national student literacy performance was explained. Next, the *who* focus described literacy professionals in schools with expertise to serve underperforming students. Following the *who* focus, a critique of the literature on collaboration research was presented to show *how* collaborations are defined, implemented, and assessed (based on available evidence). The chapter concluded with a synthesis of the research on vocabulary research, as vocabulary (*what*) is a high-impact target for a literacy collaboration.

CHAPTER THREE: METHODS

This study investigated the effects of collaboration between SLPs and third-grade general education teachers on students' literacy outcomes, specifically in vocabulary. The study also investigated the behavioral and affective components around collaborators' use of a specific collaboration protocol. The following methods will be explained: (a) research design, (b) setting, (c) participants, (d) sampling and assignment procedures, (e) intervention procedures, (f) data collection procedures, and (g) data analysis.

Research Design

The study was a quasi-experimental design with a comparison group and pretest and posttest samples (Shadish, Cook, & Campbell, 2002). The willingness of teachers and SLPs to voluntarily form literacy partnerships was a critical feature of this study. Therefore, teacher and SLP pairs who expressed interest in collaborating were assigned to the collaboration condition. It would not be fruitful to measure the effects of a pairing in which professionals were not interested in working together (Friend & Cook, 2012; Idol et al., 2000). Thus, random assignment did not apply to the students of the participating teachers. There was one collaboration classroom and one comparison classroom in each school. The proposed method of assignment to conditions aligned with characteristics of quasi-experiments (Shadish et al., 2002).

To account for selection bias inherent in the nonequivalent nature of the groups assigned to both conditions (Shadish et al., 2002), the design incorporated pretest and posttest samples. Incorporating pretest measures taken on the same outcome variables as posttests is an important

factor to consider when facilitating causal inference in quasi-experimental designs. Pretests serve multiple purposes, such as revealing the magnitude and direction of initial group differences and alerting to possible internal validity threats based on group differences (Shadish et al., 2002). Researcher bias was controlled for during the administration of pretests and posttests with students. Assessors from the school district were blinded to which classrooms were in the treatment condition and which were in the comparison condition.

The intervention period for the collaboration and comparison classrooms spanned a total of seven consecutive weeks from January to March 2017. In the weeks before the intervention period began, the teachers and SLPs engaged in multiple preparation activities. The participants completed professional learning modules, led a trial session to orient themselves and their students to the instructional routine, and rated vocabulary words based on a menu of choices provided by the researcher. Once these pre-intervention steps were completed, the pretests were administered. The consecutive intervention weeks (Weeks 1-7) immediately followed the pretests. The posttests were then administered the week immediately following Week 7 of the intervention.

Setting

A number of inquiries were sent regarding participation in the research. Public elementary schools in the United States were recruited from a school district in the Pacific Northwest and a school district in the South. The school districts were chosen because the researcher had previously partnered with both. Access was granted by a school district in the Pacific Northwest. The two schools included in the study had principals who granted the researcher access to staff; additionally, teachers and SLPs expressed interest in participating.

There was a collaborative classroom condition and a comparison classroom condition in each school. This step was taken to control for the potential of confounding factors in one or both of the conditions. School-level factors that may have been different between the conditions were controlled by assigning classrooms in each condition in both schools.

District Demographics

Access to school staff was granted by two principals within the school district in the Pacific Northwest. Teachers and SLPs in two of the elementary schools expressed interest in participating after having read and discussed the Explanation of Research (Appendix B). According to the school district's website, the district is an urban public PreK-12 district that serves over 49,000 students in 78 schools (28 elementary schools, 29 K-8 schools, 10 middle schools, 10 high schools, and one K-12 school). Based on the 2015-16 district report card, the following demographic information applied to grades K-3 in the district: 47% met criteria for economically disadvantaged, 14% were students with disabilities, 13% were ELs, and 72 different languages were spoken. The average class size in elementary English/language arts classes was 21 students. The racial distribution of students in grades K-3 was: White (58%), Hispanic/Latino (15%), Multiracial (10%), Black/African American (9%), Asian (6%), American Indian/Alaska Native (<1%), Native Hawaiian/Pacific Islander (<1%).

School Demographics

The two elementary schools involved in the study were located within the same high school regional boundary. Demographic information was obtained from each school's 2015-16

report card (Table 3). Both schools served preschool through eighth grade with a population of under 450 students. Other comparable demographics included racial/ethnic diversity, diversity of languages spoken, percentage of students on IEPs (17-19%), percentage of ELs (23-28%), and free lunch for all students.

Table 3: *School Demographic Information*

	School 1	School 2
Population	443	359
Grades	PK-8	PK-8
Racial/ethnic distribution	Hispanic/Latino (29%) White (29%) Black/African American (28%) Multiracial (9%) Asian (3%) American Indian/Alaska Native (1%) Native Hawaiian/Pacific Islander (1%)	Black/African American (45%) Hispanic/Latino (30%) White (12%) Multiracial (11%) Asian (1%) American Indian/Alaska Native (0%) Native Hawaiian/Pacific Islander (0%)
Percentage of students on IEPs	19%	17%
Percentage of ELs	23%	28%
Number of languages spoken	13	13
Percentage of students receiving free and reduced lunch	School offered lunch at no charge to all students	School offered lunch at no charge to all students

Classroom Demographics

Both schools had one classroom in the collaborative condition and one classroom in the comparison condition for a total of four classrooms. Classroom demographics are presented in

Table 4. Teachers and SLPs provided de-identified classroom demographic data by answering the questions in Appendix C.

There was some movement of students in School 2 and the demographic data reflect students who moved in or out over the course of the intervention. In the School 2 comparison classroom, one student moved to a different school and one student moved to the School 2 collaboration classroom. In the School 2 collaboration classroom (a second/third grade blend), two second-grade students moved to a different school and the student from the comparison classroom switched to the collaboration classroom.

All the schools in the study used the *Dynamic Indicators of Basic Early Literacy Skills Next* (DIBELS; Good & Kaminski, 2011) as a progress monitoring assessment. The *DIBELS Next* progress monitoring assessment is a screening tool the schools used to track students' progress with early reading skills, including oral reading fluency and retell. The DIBELS categories corresponded to the overall score of the DIBELS progress monitoring assessment. The *Core* category refers to students identified as meeting grade level literacy benchmarks, or who are at low risk. The *Strategic* category refers to students identified as scoring below grade level literacy benchmarks/some risk who typically need additional instructional support. The *Intensive* category refers to students who are well below grade level literacy benchmarks/at risk who typically need additional intensive instructional supports (University of Oregon Center on Teaching and Learning, 2017). The progress monitoring categories were based on the January/February 2017 assessment in all classrooms.

Table 4: *Classroom Demographic Information*

	School 1 Collaboration	School 1 Comparison	School 2 Collaboration	School 2 Comparison
Number of students	26	28	23*(*n*=8 third graders)	23*
Gender distribution	12 male, 14 female	17 male, 11 female	14 male, 9 female	10 male, 13 female
Age range (as of 1/1/17)	8;5-9;5	8;5-9;4	7;5-9;3	8;5-9;5
Percent minority (non-white)	71%	75%	96%	96%
Number on individualized education plans (IEPs)	5	7	2	4
Number receiving language services from SLP	1	4	2	1
Number receiving EL services	5	3	5	6
Number DIBELS Strategic	4	4	6	5
Number DIBELS Intensive	6	13	8	6

*There were some students who moved away or moved into these classrooms during the study.

Teachers described the typical environments in their classrooms and past teaching history they had had with the students in their classes. The following details were provided:

- In the School 1 collaboration classroom, the SLP provided in-class support for a student on her caseload and a preservice teacher at a local university was a regular observer.
- In the School 1 comparison classroom, one paraeducator provided regular classroom support for six students on IEPs.

- In the School 2 collaboration classroom, the SLP provided in-class supports and a paraeducator provided regular behavior and academic supports for individual students.
- In the School 2 comparison classroom, there were no additional in-class supports from other school professionals.

The comparison teacher in School 1 knew many of the students as Kindergarteners from when she was a paraeducator in their classrooms. Both teachers in School 2 were teaching some of their students for a second consecutive year, as they had been teachers in second grade the previous year.

Participants

The primary and targeted participants in the study were the four teachers and two SLPs. The teachers and SLPs agreed to participate after reviewing and discussing the Explanation of Research (Appendix B) with the researcher. As per the direction of University of Central Florida's Institutional Review Board (IRB), the Explanation of Research served as "informed consent". Parental consent was not needed from parents of the students in the participants' classes. See Appendix A for the IRB approval.

Teachers and SLPs self-reported the following data on a questionnaire. See Tables 5 and 6 for a summary of the teachers' and SLPs' demographic and background information. Teachers also provided de-identified demographic information on the students in their classrooms and the totals are provided in Table 4. Students were not the primary participants; however, the group design was based upon student performance. The student outcomes were a measure of the effectiveness of the educators' instructional delivery methods.

Table 5: *Teachers' Demographic Information*

	School 1 Collaboration	School 1 Comparison	School 2 Collaboration	School 2 Collaboration
Total years teaching	1	4	9	11
Years teaching third grade	1	1	1	1
Highest degree held	Masters	Bachelors	Masters	Masters
Age range	30-39	40-49	30-39	30-39
Gender	Female	Female	Female	Female
Race	Caucasian	Caucasian	Caucasian	Caucasian
Extent of previous language scaffolding or EL preparation	Undergraduate background in linguistics; studied Spanish for 14 years; graduate coursework on teaching EL students	No formal EL preparation	Has an educational endorsement in teaching EL and spent full first year teaching EL; ongoing formal preparation over career	No formal EL preparation

Note. EL refers to English Learners.

Table 6: *SLPs' Demographic Information*

	School 1 SLP	School 2 SLP
Total years as SLP	11	20
Total years as school-based elementary SLP	11	20
Highest degree held	Masters	Doctorate
Age range	30-39	40-49
Gender	Female	Female
Race	Caucasian	Caucasian
Extent of previous language scaffolding or EL preparation	Began QTEL* preparation after the study	Began QTEL preparation in the fall; ongoing
Extent of previous collaboration with teacher partner in study	Began at the beginning of the 2016-17 school year	Began at the end of the 2015-16 school year and continued into the current school year

Note. QTEL refers to a professional development initiative called Quality Teaching for English Learners (WestEd, 2010).

Sampling Procedures

The target population included SLPs and general education third-grade teachers in public schools. Thus, a purposive/theoretical sampling procedure, specifically a criterion sampling procedure (Mertens & Wilson, 2012), was used. Additionally, sampling procedures were used to control for confounds in accordance with recommendations made by the What Works Clearinghouse current standards version 3.0 (WWC, 2014). According to the WWC recommendations, comparing outcomes for one school, class, or teacher to another school, class, or teacher should be done as a single unit in order to isolate real causes of differences in outcomes between two schools.

The researcher specified criteria according to the required characteristics of participants in the study. Inclusion criteria for SLPs were set in terms of school-based practice, licensure requirements, and age. First, SLPs had to be practicing in an elementary school setting and willing to establish a partnership with a third-grade general education teacher. Second, they had to hold an active state board license, or hold an active national ASHA certification or be in their clinical fellowship year en route to ASHA certification. Bachelor's level SLPs and SLP assistants were excluded from the study because they have not completed graduate learning experiences in the field. Third, SLPs had to be 18 or older and willing to participate to be included. Inclusion criteria were verified by the participating SLPs. The criteria were also verified based on their eligibility to hold their positions as SLPs in their school district.

Inclusion criteria for teachers were also set in terms of grade level taught, licensure requirements, and age. First, teachers had to teach a general education third-grade classroom. Teachers were eligible to participate if they taught a third-grade blend, or if they had students from other grades in addition to their third-grade students. Teachers in the collaboration condition had to be willing to establish a partnership with the SLP at their school. Teachers who taught language immersion classrooms (i.e., foreign languages) were not be eligible to participate in the study, as language immersion would introduce a language variable beyond the scope of the study. Second, teachers had to hold an active teaching license or a probationary license for new teachers. Third, teachers had to be 18 or older and willing to participate to be included. Inclusion criteria were verified by the participating teachers. The criteria were also verified based on their eligibility to hold their position as teachers in their school district.

The accessible sample consisted of the participants who matched the target population and to whom the researcher had access. The researcher's access depended on school district and

principal approvals. The experimentally accessible population and sampling frame included two SLPs and four third-grade general education teachers at two elementary schools within the same school district in the Pacific Northwest.

Assignment Procedures

SLPs and teachers were non-randomly assigned to groups. SLPs were automatically assigned to the collaboration condition, as their role was an essential part of the collaboration condition. The researcher made the SLPs aware of their assignment to the collaboration condition when the Explanation of Research was discussed. The teachers self-selected their desired condition assignment. The rationale for allowing teachers to self-select related to the construct of collaboration being defined as "coequal parties voluntarily engaged in shared decision-making as they work toward a common goal" (Friend & Cook, 2012, p. 6). The participants had to be willing to enter the partnership with the SLP.

After principals granted the researcher access to staff and the participants responded to an invitation to the study, the researcher met with each school group (SLP and two teachers) separately via video conferencing. In this video conferencing session, the researcher discussed the Explanation of Research and explained what the collaboration/treatment and comparison conditions would entail. The teams within each school then determined which teachers would collaborate with the SLP and who would deliver the vocabulary instruction on her own. The teachers and SLPs were given flexibility to make their assignment decision based upon their students' needs, as well as their own professional goals and preferences. The researcher did not intervene in this decision, as teachers and SLPs in each school were familiar with each other, preferences for collaborating, and needs of their students.

The participants provided explanations as to how the assignment decisions were made at each of their schools. In both cases, the SLPs expressed that a main factor was partnering with a teacher who taught at least one student with a language impairment on the SLP's caseload. Additionally, each SLP had an existing partnership with the teacher who became her collaborative partner in the study. The SLPs and teachers who worked together expressed a desire to continue to do so in the study. In School 1, the SLP reported that she had been providing written language services to a student on her caseload during her partner's writing period. The partners had schedules that aligned and they were both interested in learning about the collaboration protocol. Both partners agreed to continue their partnership in the collaboration condition in the study. In School 2, the SLP had been providing language services in her partner's classroom since the end of the previous school year. The SLP reported that she taught language-focused lessons integrating language targets within narrative units in her partner's classroom. The SLP expressed an interest in learning ways she and her partner could strengthen their existing solid partnership. Both partners agreed to participate in the collaboration condition. The teachers in the comparison conditions expressed they were interested in participating in the study in either condition.

Intervention Procedures

Intervention procedures for the collaboration (treatment) condition and the comparison condition are described below. The collaboration condition involved procedures for the collaboration process and for the implementation of a specific vocabulary instruction technique, the Vocabulary Scenario Technique-Teacher+SLP (VST-T+SLP; Mitchell et al., 2017). The comparison condition involved procedures for the implementation of a similar version of the

vocabulary instruction technique used in the treatment condition, the Vocabulary Scenario Technique-General Education 16 (VST-GE16; Spielvogel, 2011). The number 16 refers to a minimum of 16 encounters of each word on introduction days. The introduction day routines were the same in each condition and a portion of the review day was the same in each condition (Appendices D3 and D4). The portion of the review day routines that was different between the conditions involved the co-teaching of non-examples and word family activities in the collaboration condition.

Collaboration (Treatment) Condition

The collaboration process and the technique used to implement the robust vocabulary instruction are described below. Procedures for guiding the collaboration process were part of the COLLAB Protocol. The COLLAB Protocol refers to the blueprint of the innovation as well as the guiding steps to facilitate collaborators' fidelity of the process. Following the procedures for COLLAB Protocol, the vocabulary technique used in the collaboration classrooms will be explained.

COLLAB protocol.

The COLLAB Protocol is a set of two tools that guided the collaborators to implement the collaboration process with fidelity. One of the tools is the SLP/Teacher Collaboration Innovation Configuration Map (IC Map) (Mitchell et al., 2016; Appendix F). The IC Map, an essential tool of CBAM (Hall & Hord, 1987, 2015), functioned as blueprint that defined acceptable implementation of each key feature and as a fidelity measure. The second tool, the

COLLAB Guiding Steps (Appendix G), provided a specific process for collaborators to employ to meet the key features of the IC Map within an acceptable range. The COLLAB acronym represents actions required to meet high fidelity of the collaboration process as it was defined by the IC Map. COLLAB stands for:

Choose the process and language-focused content of the partnership.

Obtain student baseline.

Lay foundations for language-focused instruction and support through shared planning.

Launch the plan.

Assess student learning and make adjustments according to students' needs.

Build next steps.

The COLLAB Protocol was adapted from previous research on principles and models of collaborations in education (e.g., Blosser, 2016; Friend & Cook, 2012; Nelson et al., 2004). It incorporates aspects of features from Prelock, Miller, and Reed's (1993) model and Lovat's (2015) Perceptions for Partnerships framework. The COLLAB Protocol was also informed by the researcher's experiences collaborating with a special education teacher in a private school and facilitating a collaboration in a pilot study with one teacher and SLP pair. None of the teachers and SLPs who were part of these developments were a part of the research study.

SLP/Teacher collaboration innovation configuration map.

The SLP/Teacher Collaboration IC Map (Mitchell et al., 2016) in Appendix F was the defining blueprint of the collaboration. On the left-hand column, the *key features* of the collaboration innovation are typed in bold. The key features can be thought of as the active ingredients, or the non-negotiables. In the columns to the right of the key features, different

configurations of each key feature are described. *Ideal implementation* of each key feature is described in the far-left column. If there is evidence of ideal implementation for any key feature, that feature is assigned four points. *No implementation* of each key feature is described in the far-right column. If the evidence matches the description of no implementation for any key feature, that feature is assigned zero points. In the columns between ideal implementation and no implementation, there are three columns that describe *in-process implementation*. Points are assigned as three points, two points, or one point according to the evidence matching the description for that key feature. For each key feature, a line of acceptability (called a *fidelity line;* Hall & Hord, 2015) was determined by the researcher according to what implementation configurations would be acceptable versus what would not fit the definition of collaboration. If implementers of a given innovation did not demonstrate use of the key features each key feature in the acceptable range, it can be concluded the implementers did not actually use the innovation.

As depicted in the SLP/Teacher Collaboration IC Map (Mitchell et al., 2016; Appendix F), there are eleven key features with descriptions of the implementation configurations for each. The term *segment* is used in the IC Map to refer to a single cycle/unit/duration/interval of time of a broad instructional focus. In the study, the segment was the seven-week duration of the collaboration around robust vocabulary instruction using the VST-T+SLP. The term *within the segment* is used to refer to smaller intervals within the larger segment. In the study, intervals within the segment generally corresponded to each week's vocabulary words. The key features and ideal implementation description for each are explained below.

1. An SLP and teacher establish a partnership. Ideal implantation is defined as the SLP selecting a teacher to work with for a defined period of time based on the needs of students, the teacher, and/or the school and the teacher willingly agrees to collaborate.

2. The partners plan the time commitment and schedule. Ideal implementation is defined as partners agreeing upon parameters of the collaboration as part of an overall planning process and both partners perceive the parameters to be doable.
3. The partners agree on ground rules. Ideal implementation is defined as the partners explicitly discussing and agreeing upon expectations of active participation from both partners, positive behavior interventions and supports, and ways to hold each other accountable.
4. The partners demonstrate a shared knowledge of students' needs, language base of social interaction and the curriculum, and instructional techniques. In ideal implementation, partners have a shared knowledge of, and discuss, content and techniques.
5. The partners use curriculum/instruction trouble spots as a basis for establishing instructional targets. This feature is divided into identifying trouble spots in advance and in response to student confusion. In ideal implementation, the partners identify potential language trouble spots, analyze language reasons for confusion, and calibrate their plan accordingly.
6. The partners select impactful targets for the collaboration content focus. This feature is divided into selecting impactful targets from the initial segment plan and within the partnership segment. In ideal implementation, partners jointly discuss and set clearly defined impactful targets, which are set according to desired student outcomes, anticipated trouble spots, and/or demonstrated trouble spots.
7. The partners plan student outcome measurement procedures. In ideal implementation, partners identify student outcomes to measure form the start of the partnership. They

agree upon a plan to collect data from the beginning to the end of the collaboration segment as well as to progress monitor performance within the segment.

8. The partners implement class time activities and techniques. This feature is divided into partners' implementation of techniques during co-teaching activities as well as when the teacher is continuing a language sensitive focus when the SLP is not in the room. In ideal implementation, partners are actively involved in implementing techniques based on trouble spots they identified and agreed upon in advance. The teacher continues to use techniques habitually in a robust way and is focused on achieving increased impact on many students.
9. The SLP models and shares language scaffolding techniques. In ideal implementation, the SLP poses strategic questions and engage students in highly interactive practices around meaning associated with word, sentence, or discourse level language. The SLP provides feedback on student accuracy, including information about nuance. There are few missed opportunities and/or few inaccurate attempts when discussing meaning. The SLP's language scaffolding behaviors are consistent from the start to the end of the collaboration segment.
10. The partners gather the student outcome data. In ideal implementation, the partners gather desired student outcome data from the beginning to the end of the segment as well as progress monitoring indicators within the segment.
11. The partners analyze student outcome data. In ideal implementation, the partners analyze student performance data from the beginning to end of the collaboration segment as well as progress indicators within the segment. They jointly determine what instructional adjustments to make.

Collaborators were guided to achieve acceptable fidelity of the key features of the IC Map through a series of guiding steps before, during, and after the seven-week collaboration segment. They were guided by a series of conversation and action prompts, which were explained to them in a professional learning module before the collaboration intervention began. The conversation and action prompts are referred to as COLLAB Guiding Steps.

COLLAB guiding steps.

The tool referred to as the COLLAB Guiding Steps includes a set of conversation and action prompts that were designed to facilitate collaborators' fidelity of the SLP/Teacher Collaboration IC Map in the study. The series of prompts is organized into sixteen steps (Appendix G). Some of the steps were completed once, and others were repeated weekly. In Steps 1-5 of the COLLAB Guiding Steps (the *C* in COLLAB), the collaborators chose the process and language-focused content of the partnership, developed a shared understanding of language underpinnings and instructional techniques, set impactful targets for student learning, planned how to measure student understanding, and identified techniques to implement based on trouble spots. The collaborating pairs were given opportunities in the professional learning module on collaboration to discuss students' needs and their own plans and preferences. During this pre-intervention discussion, collaborators made their agreements about how their collaboration would function within the parameters of the study. Step 6 in the Guiding Steps (the *O* in COLLAB) required that student baseline be obtained. This step was accomplished by following the researcher's plan for obtaining baseline on the three vocabulary measures.

The steps that were repeated weekly were steps 7 through 14 in the framework. Steps 7-9 (the first *L* in COLLAB) were in place to guide discussion of preparations for each week's new

words and ongoing support of scaffolded interactions to promote word learning in the classroom. In Steps 7-9, collaborators prepared to teach the content with a language-focused instructional technique, made grouping decisions based on students who struggle, and planned logistics for the in-class instruction activities. In Step 10 (the second *L* in COLLAB), the teacher implemented the vocabulary instruction as per the routine for the VST-T+SLP introduction days.

In Steps 11-12 (back to the first *L* in COLLAB), the teacher and SLP discussed students' performance on the words introduced during the VST-T+SLP introduction days. The partners discussed what students seemed to understand well and connections that students missed or were confused about. The partners then decided on ways to scaffold interactions with students to explain and practice what was confusing for students. Their scaffolding plan was then implemented during Step 13 (back to the second *L* in COLLAB) when the SLP and teacher followed the VST-T+SLP review day routine (Appendix D3). Step 14 was designed for the partners to assess students' performance from the review day and overall week, reflect on their own scaffolding, and begin the cycle again for the next week's words (back to Steps 7-9).

The final steps of the COLLAB Guiding Steps were completed once at the end of the collaboration period. Step 15 (*A* in COLLAB) was accomplished by following the researcher's plan for obtaining posttest data on the vocabulary measures. In Step 16 (*B* in COLLAB), the partners discussed the value of the collaboration in terms of costs and benefits. This discussion was intended to help guide collaborators in their decision-making about next steps for the partnership.

The time requirements were as follows: (a) 30 minutes per week for the beyond-class-time collaboration activities within the collaboration segment, (b) 60 minutes per week for the vocabulary instruction implemented by the teacher, and (c) 60 minutes per week for the shared

implementation of the review day activities. The collaboration activities that occurred beyond class time involved the teacher and SLP engaging in shared problem solving and decision making around selection of language targets, in-class activity plans, and student data analysis. The format of their conversations beyond class time was not limited to face-to-face meetings. Rather, the partners had flexibility to determine how they wanted to meet (e.g., in person, phone, email, video conferencing, etc.). The time for the beyond-class time-activities was part of the collaborators' regular schedule; additional time was not made available to them for the study. The class time activities, teacher-only vocabulary instruction and the shared implementation of review sessions, were implemented as per the VST-T+SLP (Mitchell et al., 2017).

The researcher provided fidelity feedback to each collaborating pair to help them gauge if they were meeting acceptable fidelity on the SLP/Teacher Collaboration IC Map and on the vocabulary instruction routine. During the first two weeks, the researcher gave written feedback via email to the collaborators highlighting which points they were meeting on the Ideal Implementation column of the IC Map as well as which checkpoints they met on the VST-T+SLP fidelity checklist (Appendices E1 and E2). The IC Map and VST-T+SLP fidelity checklist provided a way for the collaborators to know if they were on the right track and what they needed to do to meet all checkpoints. The researcher also spoke with each SLP over the phone after the first week to provide clarification for questions the SLPs had about the co-teaching and small group sessions. The researcher shared any general feedback given to one collaborative pair with the other collaborative pair (e.g., prompts for ways to include all students when responding as opposed to only calling on students with hands raised, prompts for facilitating a classroom conversation around the stimulus items, allowances for how they structured the student response routine in the small group). After the first three weeks, the

researcher's feedback to follow the COLLAB Guiding Steps was minimal, as the collaborators no longer needed support to follow the routine. One pair was reminded to complete Step 14 and both groups were instructed about what to discuss in Step 15 (they did not have the posttest results at the time they met). Aside from feedback on the collaborative intervention, the researcher also provided ideas for scheduling options for the collaborators when snow days and other unforeseen events interrupted their schedules.

VST-T+SLP protocol.

The collaborators implemented a version of a vocabulary instructional technique called the VST-T+SLP (Mitchell et al., 2017). The procedure for teaching the vocabulary words was adapted from previous research protocols of the Vocabulary Scenario Technique (Ehren, 2008; Ehren et al., 2010; Spielvogel, 2011). Key features of the VST-T+SLP are described in the VST IC Map (Ehren, 2010; Appendix D1) and the VST-SLP Unique Contributions IC Map (Ehren, 2016; Appendix D2). The teacher and SLP followed the VST-T+SLP procedures for the introduction and review days (See Appendix D3). The introduction and review days were organized into *Cue, Do,* and *Review* components. On the introduction days, only the teacher provided the instruction; these teacher-only instructional sessions aligned with Step 10 of the COLLAB Guiding Steps. For the introduction days, the *Cue* consisted of the teacher emphasizing the power of words, relating the learning session back to the previous word learning session, introducing the objectives for the current session, and explicitly explaining expectations for active participation expectations.

During the *Do* component of the introduction days, the teacher taught, facilitated discussion, and scaffolded students' responses for three targeted words using the following steps:

(a) teacher read the scenario, (b) students discussed clues from the scenario about the word's meaning, (c) students generated synonyms for the target word with the teacher's support, (d) teacher replaced the target word with the best-fit synonym word/phrase in the scenario for the students to read again with the target word and the replacement, (e) students wrote the target word and synonym on a card in their portable word wall (PWW), (f) students wrote word family variations on their card in their PWW as the teacher discusses the root words and the different affixes on the words, (g) students generated example sentences orally, and (h) students wrote a correct sentence on the corresponding word card in their PWW.

Visual supports were provided for the teacher and students during the *Do* components of the introduction days. The teacher could use the vocabulary reference sheets for each word as a resource during the session. The reference sheets were intended to serve as a guide for teachers to correctly respond to students' ideas and attempts at using the words correctly. As a model for the students, the teacher visually projected and wrote on "vocabulary posters" provided by the researcher. The posters included the scenarios, models of what to write on the front of the PWW card, and models of what to write on the back of the PWW card. The teachers were also given flexibility to use their own teacher PWW with the overhead to model what to write during instruction. During the closing *Review* component of the introduction days, the teacher asked the class what the synonyms were for each word practiced during that session and elicited choral responses from them. Additionally, the teacher told the students what would happen during the next VST session.

Following the introduction sessions where all six weekly words were practiced, the teacher and SLP implemented the review day procedure each week. The teachers and SLPs had the option to conduct the review session as one 60-minute session or as two 30-minute sessions.

The review day plan was implemented within the parameters of the VST-T+SLP protocol, but with a focus on addressing specific trouble spots the teacher identified and discussed with the SLP after the introduction days (from Steps 11-12 of the COLLAB Guiding Steps). The collaborators were told they could use the vocabulary reference sheet stimulus prompts provided by the researcher for their co-teaching activities to address the confusing words (Appendix D7). However, they were encouraged to adapt the prompts and tailor them to their students' specific background knowledge or demonstrated miscues. In both collaboration classrooms, the SLPs adapted the non-examples and word family activities provided by the researcher to make the prompts more relatable to their students' experiences as well as their own personal experiences.

The weekly review day(s) activities aligned with the in-class collaboration activities in Step 13 of the COLLAB Guiding Steps. For the *Cue* component of the Review day, the collaborators again emphasized the power of words, related the learning session back to the previous word learning session, introduced the objectives for the current session, and explicitly explained expectations for active participation expectations.

During the *Do* component of the review day(s), the SLP and teacher engaged in co-teaching with whole class for 25 minutes and then facilitated large group (teacher) and small group (SLP) instruction for 27 minutes. During the co-teaching portion, the SLP and teacher role-played and facilitated scaffolded interactions around non-examples and correct examples of word meaning and word form. In the highly interactive practice around word meaning (15 minutes), the teacher and SLP presented students with background information through role play. Following the role play, they posed strategic questions that required students to think about the nuance of the word's meaning in the same form the word was presented in the original scenario. In the interactive practice around word form (10 minutes), the teacher and SLP engaged students

in answering strategic questions around word form shifts. Not all the words had to be reviewed during the whole group co-teaching. The collaborators were given flexibility with which words, and how many of the words, to focus on during this time. The partners were also free to incorporate pictures, gestures, or other scaffolds they decided upon that were not provided by the researcher. For example, in one of the collaboration classrooms, the SLP incorporated pictures and explained how they related to the target words. In the other collaboration classroom, the SLP provided engaging personal stories that provided another context for understanding the target words. Throughout the whole class co-teaching portion, students were posed with multiple strategic questions, had multiple opportunities to respond, and received feedback from the teacher and SLP.

During the remaining portion of the *Do* component on the review day(s), the collaborators led two groups through the remaining 27 minutes of the VST-T+SLP review procedure. The SLP led word study instruction with a small group of four students and the teacher led word study instruction with the remaining students in the class. In the small group, the SLP intensified instruction of target word meanings and word family variations. The SLP provided direct and explicit instruction, scaffolding, and feedback on at least one word family variation of three or more target words from the week. Specifically, the SLP provided explicit instruction, modeled, and elicited discussion as students underlined prefixes and suffixes of all word family variations for the targeted words. Additionally, the SLP engaged students in highly interactive practice opportunities to use one or more word family variations. To meet fidelity for the highly interactive practice opportunities, SLPs had to incorporate at least four of the following: (a) review meaning, (b) underline add-ons (prefixes and suffixes), (c) model a correct sentence, (d) elicit one sentence from a sentence-starter in the group, (e) evaluate the accuracy of

the sentence-starter's sentence with the group, (f) scaffold the student's sentence until it was in an accurate form, and (g) award students for accurate use with a Show Your Knowledge hole punch or other token used as part of a class reward system. SLPs had flexibility within this small group instruction around which words from the week to teach, which planned and in-the-moment scaffolds to use according to students' needs, how to respond to off-task behaviors, how to respond when discussions veered somewhat from the immediate instruction, and how to reward students' effort.

During the remaining portion of the *Do* component on the review day(s), the collaborating teacher led word study instruction with the large group of students in the class around the target word meanings and word family variations. The teachers led students in identifying, underlining, and discussing prefixes and suffixes on four or more words from the week in students' PWWs. The teacher then elicited at least two sentences from students (or modeled one and elicited one) using one or more of the taught word family variations. Finally, the teacher paired students together to practice using the words from the week. While students practiced, the teacher walked around the room and elicited sentences and synonyms from each student (providing scaffolding as needed). The teacher rewarded each student with a Show Your Knowledge decorative hole punch on the student's corresponding PWW card for accurate responses.

During the closing *Review* component of the review day(s), the teacher or SLP elicited choral responses from students after asking what the synonyms were for each word practiced during that week. Additionally, the teacher or SLP told the students what would happen during the next VST session.

Within the collaboration condition, the teacher and SLP had flexibility within and beyond VST sessions to scaffold and reinforce students' learning. As stated previously, they had flexibility to use a variety of strategic questions to pose to students as well as with how to support student understanding. In the COLLAB Guiding Steps, Step 14 prompted collaborators to discuss ways to support and reinforce student's word consciousness. The collaborators described some of the ways they fostered word consciousness outside of the VST sessions. For example, the teachers and SLPs capitalized on teachable moments when students (a) told them when they heard or saw the target words in other contexts; (b) attempted to use target words with each other, the collaborators, or other adults; and (c) used target words in settings outside of VST sessions. It was allowable for collaborators to capture such teachable moments, pose strategic questions, and provide opportunities for interaction and feedback in those teachable moments. It was also allowable for collaborators to generate specific plans to foster more encounters and more practice with vocabulary words from the project. However, neither of the collaborating pairs generated specific plans beyond capitalizing on the spontaneous teachable moments related to target word learning.

During each intervention week, there were two sessions of the VST introduction days that were designed to last 30-33 minutes and review session(s) that lasted 60 minutes. Teachers had the option to implement the introduction sessions for each week's words on the same day or on separate days within one school week. The 60-minute review could also be divided into separate sessions, but had to occur after the introduction days for that week's words. The cycle of introduction and review days were to occur within one school week. In addition to the teaching time of the VST sessions, teachers displayed a classroom word wall exhibit using the vocabulary posters from each word from the introduction days for an extra hour each week for that week's

set of words. Teachers used their own system to display the weekly vocabulary word exhibit (e.g., as part of their existing word wall display, on the white board in the classroom, on a trifold board, on a word wall table). The classroom word wall exhibit provided students the same amount of time to access the words in their physical environment. Additionally, the classroom word wall exhibit provided students opportunities to fill in any missing information on their PWW cards during the introduction days (e.g., if they were unable to finish writing or if they were absent).

The researcher provided feedback to the teacher and SLP after each week of instruction to inform them about whether they were meeting fidelity checkpoints on the VST-T+SLP and what they needed to do meet the checkpoints. The researcher provided feedback in writing using the VST fidelity checklist (Appendices E1 and E2). The researcher offered suggestions in the beginning about where time could be cut (e.g., providing the synonyms after students inaccurately attempted to figure them out and waiting until review day to go into depth about the word family word meanings). Regarding scaffolding, the researcher pointed out examples of participants explaining nuanced meanings and reminded them to use the vocabulary reference sheet on times they did not. The feedback given to all participants (collaboration and comparison conditions) via the VST fidelity checklists after the first three weeks was given as + and – markings for the checkpoints.

The collaborators had questions initially about their options for instruction within the parameters of the whole class co-teaching portion of the review day(s). The researcher spoke with the SLPs in both schools and reinforced the following points. First, they did not have to use the examples provided, but could use them as a guide for their own strategic prompts. Second, the researcher reminded the SLPs about the objectives of highly interactive practice and

engaging all students in classroom discourse around whatever prompts they decided to provide. Ideas were discussed about ways to elicit responses from all students, not just students with hands raised (e.g., picking a stick with a student's name after questions were posed to the group, asking for students to show their answers with thumbs up/down, etc.). Third, the researcher altered the original fidelity checklist for the small group based on what could realistically be achieved during the 27-minute small group time. The SLPs were told they only had to focus on three words from the week instead of all six during the small group and were given scaffolding choices from the fidelity checklist to incorporate for each word. The researcher did not share with the SLPs what the other SLP was doing. The purpose of the feedback was to ensure fidelity of the collaboration review day procedures.

VST-T+SLP materials.

The materials list for the VST-T+SLP (Mitchell et al., 2017) is provided in Appendix D5. The researcher provided all materials for the instruction to the participants, except for the overhead projectors and a display for classroom word wall exhibit. Some materials were mailed to each school before the intervention began. The mailed materials included blank portable word walls for students, binders to organize the online module materials, audio recorders, tee shirts with pockets to set the audio recorders, clip boards, organizing cubes, decorative hole punches, and colored pencils. Other materials were uploaded for each participant at the same time in individual shared Google folders the researcher had with each participant. Professional learning modules and practice materials were uploaded during the professional learning phase of the project and remained accessible to all participants throughout the project. The researcher uploaded the vocabulary sheets needed for each week's vocabulary words one week prior to the

instruction of each set of words. The vocabulary sheets included the scenarios, vocabulary posters for display, vocabulary reference sheets, and cut-able squares with the PWW text (students could glue to their PWW cards if they were unable to finish writing). An example of information provided for each word is provided in Appendix D7.

Comparison Condition

The teachers in the comparison condition implemented the instruction on their own using the VST-GE16 version of the vocabulary instructional technique (Spielvogel, 2011; Appendix D4). The protocol and materials used in the comparison condition are explained below.

VST-GE16 protocol.

The procedure for teaching the vocabulary words using the VST-GE16 was also adapted from previous research protocols using the Vocabulary Scenario Technique (Ehren et al., 2010; Spielvogel, 2011). The teachers in the comparison condition followed the VST-GE16 procedures for the introduction and review days (See Appendix D4). The introduction and review days were organized into *Cue, Do,* and *Review* components. The *Cue, Do,* and *Review* components of the introduction days mirrored the introduction routine in the VST-T+SLP. The routine for the review day was somewhat different between the two conditions.

There were two main requirements for the review day(s) each week in the comparison group. The first requirement was that each teacher implement 35 minutes of review during one session as per the VST-GE16 *Cue, Do,* and *Review* components. For the introduction and review days, the *Cue* consisted of the teacher emphasizing the power of words, relating the learning

session back to the previous word learning session, introducing the objectives for the current session, and explicitly explaining expectations for active participation expectations. The *Do* component was similar to the VST-T+SLP review where the teacher led the large group in explorations of word family variations and meanings. The teacher then led the whole class in identifying, underlining, and discussing prefixes and suffixes on all six words from the week in students' PWWs. The teacher elicited at least two sentences from students (or modeled one and elicited one) using one or more of the taught word family variations (Appendix D6). Finally, each teacher in the comparison condition paired students together to practice using the words from the week. While students practiced, the teacher walked around the room and elicited sentences and synonyms from each student (providing scaffolding as needed). The teacher rewarded each student with a Show Your Knowledge decorative hole punch on each student's corresponding PWW card for accurate responses. During the closing *Review* component of the review days, the teacher elicited choral responses from students about the synonyms for each word practiced during that week. The teacher then told the students what would happen during the next VST session.

The second requirement for the comparison condition review day(s) was that the teacher supplement the remaining time after the VST-GE16 review session with a teacher-chosen vocabulary activity to total the 60-minutes of weekly review. Teachers had the option to divide the remaining time into multiple sessions if they wished. They were not guided about what types of vocabulary activities to use and were not allowed to talk to each other about what their activities entailed. Teachers provided a brief log of the weekly teacher chosen review activity descriptions and time devoted to each activity (Appendix D8). They also explained their activities in more detail to the researcher. The teacher in the comparison group in School 1

engaged students in review activities using games, such as bingo and charades. She reported the students particularly enjoyed bingo, so she made bingo sets for each week's set of words for the week those words were taught. The bingo cards had both the target words and synonyms of the target words from the week. The teacher in the comparison group in School 2 reported that she had students continue to use words in sentences in writing. She also had students use dictionaries to look up the target words and find their definitions. As stated previously, teachers in the comparison classrooms also displayed a classroom word wall exhibit with the current week's words for an extra hour beyond VST instruction. Regarding generalization practice, neither of the comparison teachers generated specific plans beyond capitalizing on the spontaneous teachable moments related to target word learning.

The researcher provided feedback to the teachers in the comparison condition in writing via email after each week of instruction during the first three weeks. The researcher's feedback let them know if they were meeting fidelity checkpoints and what they needed to do meet the checkpoints. After the first three weeks, the feedback was then given in increments according to when the teachers uploaded their recordings. The comparison teachers submitted multiple weeks at once after the first three weeks. This was allowed by the researcher, as both comparison teachers had achieved high levels of fidelity after the first two weeks.

VST-GE16 materials.

The materials list for the VST-GE16 (Appendix D5) was similar to the list for the VST-T+SLP with a few exceptions. As with the VST-T+SLP, the researcher provided all materials for the instruction to the participants, except for the overhead projectors and a display for classroom word wall exhibit. The mailed materials were the same. The materials uploaded by the researcher

differed only with regard to the content of the vocabulary reference sheet. In the comparison condition, the teachers' vocabulary reference sheets did not include stimulus items and talking points for non-examples and word family activities. The materials were uploaded to each participant's individual Google Drive folder (shared only with the researcher) at the same time.

Treatment and Comparison Conditions Compared

In summary, there were multiple similarities between the collaboration and comparison condition intervention procedures. First, the word study language-focused content was chosen by the researcher for all participants to implement, as robust vocabulary instruction has been recommended as a high impact literacy target that does not tend to be taught with regularity. Second, the same words were taught using similar versions of a vocabulary instructional technique. Third, the researcher provided similar types of materials to all participants. Fourth, the time dedicated to introducing and reviewing vocabulary words was the same in both conditions. Fifth, the researcher provided feedback pertaining to each participant's fidelity of the VST implementation. A sixth similarity was the timeline in which the intervention took place. Each version of the vocabulary instructional technique was implemented for seven consecutive weeks within the same seven-week period.

The collaboration and comparison conditions differed in terms of affordances of the collaborative service delivery and specific VST review day procedures. The collaborative service delivery afforded opportunities for the teacher and SLP pairs to discuss student performance, particularly trouble spots, and ways to address students' confusion during and outside of VST sessions. The collaborative service delivery also provided opportunities for SLPs to model language scaffolding techniques during co-teaching sessions (see Appendix H for examples of

scaffolding techniques discussed by the researcher and SLPs as part of the Language Scaffolding professional learning module). Within the structure of the VST-T+SLP review day routine, SLPs and teachers posed specific strategic questions and prompts to students that were based upon identified student misunderstandings or ongoing instructional needs. The researcher provided the collaborators with ideas for stimulus items incorporating non-examples and word family activities on the vocabulary reference sheet. The collaborators then adapted those stimulus items for their co-teaching instruction. Additionally, the SLPs structured small group word study activities to provide selected students with more intensive word study practice at their instructional levels.

Another feature of the collaboration condition was the potential for teachers to extend language scaffolding techniques within teacher-only VST sessions and beyond VST sessions altogether. This generalization potential was reflected in the study's assumptions. Despite using similar vocabulary instructional routines, the types and frequency of language scaffolding during the collaborating teachers' instruction may have differed because of the SLPs' contributions to the collaboration.

Word Selection

Before the intervention period, teachers in both conditions were presented with the same 80-item Tier Two academic vocabulary word menu provided by the researcher. The academic words selected for the vocabulary word menu were verified for face validity by the researcher's dissertation committee chairperson, an expert in the field. The 80 Tier Two academic vocabulary words were compiled based on the researcher's analysis of suggested classifications of words, and specific words, from multiple sources. Suggested classifications of words were based upon

Beck et al.'s (1987) three-tiers vocabulary framework and the CCSS (2010). The words included on the vocabulary menu were considered academic Tier Two words according Beck et al.'s (1987) three-tiers vocabulary framework, discussed previously. Many vocabulary scholars have recommended that educators target Tier Two words. They have asserted that rich knowledge of Tier Two words can play a powerful role in advancing verbal functioning and comprehension (e.g., Beck et al., 2013). The Tier Two word-classification system aligns with state standards for teaching academic vocabulary. For example, an emphasis on academic vocabulary is reflected in an anchor standards in language for students across grade levels in the CCSS (2010). Examples of specific language standards for third graders include (CCSS, 2010):

- "Demonstrate understanding of figurative language, word relationships and nuances in word meanings" (CCSS.ELA-LITERACY-L.3.5).
- "Distinguish shades of meaning among related words that describe states of mind or degrees of certainty" (CCSS.ELA-LITERACY.L.3.5.C).
- "Use a known root word as a clue to the meaning of an unknown word with the same root" (CCSS.ELA-LITERACY.L.3.4.C).
- "Acquire and use accurately grade-appropriate conversational, general academic, and domain-specific words and phrases, including those that signal spatial and temporal relationships" (CCSS.ELA-LITRACY.L.3.6).

All words included on the menu were Tier Two academic vocabulary words. Ideas for specific Tier Two words were gathered from multiple sources. Sources included words used in other studies (e.g., Chilton & Ehri, 2015), word lists published online by other schools (e.g., Great Schools, 2017; Hyde Park Central School District [HPCSD], 2014), the third-grade word list used by *Flocabulary* (2016), teacher-recommended lists of words to know within the school

district based on third-grade literature, academic word lists (e.g., Coxhead, 2000; Creative School Services, n.d.; Smith, n.d.), and words suggested by Beck et al. (2008). Beck and colleagues (2008) provided examples of Tier Two words in literature common to grade ranges; some words from the grade ranges of K-2 and 3-5 were selected for the menu. The researcher selected repeated words between these lists and complied the 80-word menu for the teachers.

A jury method was used to elicit teachers' opinions about the 44 words that should be taught during the intervention. The teachers in both conditions rated the 80 words compiled by the researcher according to a usefulness scale and familiarity scale. Both scales were Likert scales with a range of 1-4. See Appendix I for descriptions of the scales and the 80-word menu the four teachers completed. The researcher then analyzed the mean and mode for each word based on the familiarity score and the usefulness score. The researcher set the following criteria for the first round of word selection: familiarity mean of 2 or lower and usefulness mean of 3 or higher. Using these criteria, 34 words were selected. There were 13 additional words from the menu that had a mean slightly above 2 on the familiarity scale or slightly above 3 on the usefulness scale. From these 13 words, the researcher selected the final 10 words based on the mode scores for each word. Words were selected if the familiarity mode score was 1 or 2 and if the usefulness mode score was 3 or 4. Using these criteria, there were two words remaining, from which the researcher chose one. The decision was made based on a state standard regarding teaching nuance of words that express degrees of certainty.

Of the initial group of 44 words selected, 39 words were taught during instruction. Due to the pacing of instruction, six words were taught for six weeks and three words were taught in Week 7. This adjustment was made instead of increasing to eight words each week starting Week 3 as originally planned. The researcher determined which five words to drop from instruction

(and from pretest scores and posttest items) based on words receiving the most correct responses on the SYN and WIC tasks from the total group students in all four classes.

Word-form variations of the target words were selected by the researcher in addition to the targeted words in the form presented in the word form menu. Up to three word-form variations were targeted for instruction for each word. All parts of speech were represented in the sample of target words and word family variations. Prefixes, derivational suffixes, and inflectional suffixes were selected according to the CCSS (2010) and district materials about affixes to be explicitly taught by third grade.

After the teachers completed the vocabulary ratings on the 80-word menu, they did not know which words from the list would be selected for the study. They did not know the words they would be teaching until one week before each set of words was to be taught. The researcher posted each week's vocabulary words, scenarios, posters, and vocabulary reference sheets for all the teachers and SLPs at the same time, one week before those words were to be taught. The scenario target words and word family variations for each week are presented in Appendix D6. The contexts of the three scenarios each introduction day were related. An example of three scenarios presented on Week 1 Day 2 and an example of a vocabulary reference sheet are provided in Appendix D7.

Professional Learning

The SLP and teacher participants completed researcher-designed online professional learning modules tailored to their roles in the study. They also participated in an interactive component in person or via video conferencing. The participants received continuing education

credit hours for completing the professional learning modules and implementing the vocabulary instructional technique in their practice, but were not incentivized financially.

The modules were made available to the participants through digital folders they shared with the researcher individually. Initially, the modules and all materials for the study were shared on Edmodo. Each comparison teacher was in a separate group with the researcher and each collaboration pair was in a separate group with the researcher. Due to some initial challenges with using Edmodo efficiently, the researcher also uploaded all modules and content for the study in individual shared folders with each participant using Google Drive.

The online components and interactive sessions were designed and led by the researcher, a certified and experienced SLP. An overview guide of each of the modules is presented in Appendix J. The comparison teachers only completed the module on the VST-GE16 (Appendix J1). The collaboration teachers and SLPs completed the module on the VST-T+SLP (Appendix J2) individually and the module on collaboration (Appendix J3) as partners. The procedural part of the collaboration professional learning module emphasized how to follow the COLLAB Guiding Steps. The SLP/Teacher Collaboration IC Map (Mitchell et al., 2016) was introduced and the researcher explained the intent, key features, and ideal implementation descriptions. The entire IC Map was not provided to them; the researcher did not want to overwhelm them beyond the Guiding Steps.

In addition to the VST-T+SLP and collaboration modules, the SLPs completed a module on language scaffolding (Appendix J4). In the language scaffolding module for the SLPs, the researcher emphasized three main points about their roles. First, the researcher presented a rationale for the need for ongoing language scaffolding within classroom learning environments. Second, the researcher highlighted the SLPs' unique contributions within a literacy partnership

with an intensive focus on language scaffolding. Third, the researcher facilitated their development of an action plan to share and model specific language scaffolding techniques with their teacher partners. Examples of language scaffolding techniques discussed are presented in Appendix H. The ASHA (2010) SLP Roles and Responsibilities content was integrated as a part of this module.

Each professional learning module consisted of a comprehension check, which the participants completed after the online component and before the interactive component with the researcher. Participants demonstrated their understanding of the content and treatment fidelity expectations through the check-for-understanding tasks. They also demonstrated their understanding and discussed their reflections within the interactive portion of the module with the researcher.

Each online module was designed to take two hours and each interactive session was designed to last one hour. The online portions included narrated PowerPoints and demonstration videos that explained the rationale for the topic, a definition of the innovation or technique, and steps detailing how to implement the technique. The interactive portions involved the researcher discussing participants' questions and reflections, clarifying missed items on the informal check-for-understanding assessment, providing practice opportunities, and giving feedback to participants regarding fidelity checkpoints. Participants completed the modules and interactive components according to what suited their own schedules beginning in December and ending in the first week of January, upon return from winter break. All participants had access to the online modules assigned to them throughout the research project. The researcher informed the participants that if they had interest after the study ended, the researcher would provide them access to any of the modules not assigned to them during in the study.

The total time for professional learning varied according to participants' roles. The time totaled around nine hours for the collaborating teachers and 13 hours for the SLPs. The total time included the time to complete the online modules, organize the materials, and complete the learning assessment (seven hours for collaborating teachers and nine hours for SLPs) as well as to complete the interactive portion of each module (two hours for collaborating teachers and four hours for SLPs). To accommodate schedules and participants' preferences, the interactive portions of the VST and collaboration modules were condensed into a single video conferencing interactive session for the collaborators. Thus, both collaboration pairs heard the same information from the researcher in terms of discussion and feedback. The researcher met with the SLPs in person at the same time for the interactive portion of the language scaffolding module. Both SLPs heard the same information from the researcher in this interactive session as well.

The professional learning time totaled close to seven hours for the comparison teachers. The total time included time to complete the online modules, organize the materials, and complete the learning assessment (five hours). The comparison teachers each had a one-on-one interactive session with the researcher. One of the interactive sessions was a face-to-face session (60 minutes) and the other was via Skype (90 minutes). Even though the Skype session with one of the comparison teachers was longer than the face-to-face session with the other comparison teacher, the content discussed and practiced was the same.

Research Rules

The researcher talked to all participants about threats to validity and about the importance of preventing contamination. The participants verified that they understood they were not to talk to others within the study about what they were doing throughout the pretest, intervention, and

posttest weeks. They were allowed to let other school professionals at their school know that they were participating in research, but were not permitted to collaborate with anyone around the content involved in the research. The SLP and comparison teachers were still allowed to work together to meet students' needs, as long as the interactions were not about the vocabulary focus of the study. Additionally, the research did not preclude students from receiving any of their regular educational services, including speech-language services. The regular interventions were not, however, to reinforce practice of the vocabulary words from the study. The participants were also allowed to continue to collaborate as they normally would with other school professionals, but not around the vocabulary instruction. In order to prevent the chance of either of the SLPs having extra practice using the COLLAB Protocol with teachers outside of the study, SLPs were told to use the COLLAB Protocol only with their teacher partners until after the study concluded.

Practice VST Teaching

In addition to completing the online and interactive portions of the professional learning modules, each teacher conducted a trial run of one vocabulary word with her class using her assigned version of the VST introduction day. The comparison teachers conducted the practice session on their own with their students and the SLPs accompanied the collaboration teachers for the practice session. The practice session provided an opportunity for teachers to practice the routine and introduce the routine to the students. Additionally, it provided an opportunity for the SLPs to see what the teacher-only sessions would entail and to introduce themselves to the students. The participants recorded their sessions and the researcher provided feedback to each participant about fidelity and timing.

Summary of Participants' Activities

A summary of the participants' activities before, during, and after the seven-week intervention is provided in Table 7. Before the intervention, the participants agreed to participate in the study and confirmed vocabulary instruction was a part of their literacy instruction that needed continued focus. They described examples of their typical vocabulary instruction, which included teaching curriculum vocabulary words in context, talking about synonyms and antonyms with students, having students draw pictures to represent new vocabulary words, playing games with the new words, acting out new words, teaching prefixes and suffixes, writing sentences with new words, and having students use dictionaries to look up definitions.

Before the study, each participant also completed professional learning modules assigned to her according to her role in the study. The collaborators completed the modules on VST-T+SLP and collaboration. They completed the COLLAB Steps 1-5 together as a part of the Collaboration module and filled out the Stages of Concern Questionnaire (SoCQ) independently following that module. The comparison teachers completed the professional learning module on the VST-GE16 before the intervention. The remainder of the pre-intervention activities included word selection and pretest administration. Teachers in both conditions rated the vocabulary words from the researcher-created vocabulary menu. Pretests were administered by the school district assessors.

During Weeks 1-6 of the intervention, the collaborators completed the COLLAB Steps 7-14, which included 60 minutes of VST-T+SLP introduction sessions, 60 minutes of VST-T+SLP review day instruction, and 30 minutes for the beyond class time activities. Teachers displayed the vocabulary posters of the week's words in a classroom word wall exhibit for an additional 60

minutes each week beyond VST time. Also during Weeks 1-6, the comparison teachers implemented 60 minutes of the VST-GE16 introduction sessions, completed 60 minutes of review instruction involving the VST-GE16 and teacher-chosen activities, and displayed the week's vocabulary posters in a classroom word wall exhibit for an additional 60 minutes each week. The difference in Week 7 was that only three words were taught on one introduction day, the review day was shortened to 30 minutes, and the collaborators completed only the in-class steps of the COLLAB Guiding Steps.

After the last week of instruction, the posttests were administered in both conditions. The collaborators additionally completed the COLLAB Guiding Steps 15 (discussing instructional adjustments based on ongoing student performance) and Step 16 (discussing plans for the partnership). Additionally, the collaborators completed the post-intervention SoCQ.

Table 7: *Summary of Participants' Activities*

	Collaboration/Treatment Teachers and SLPs	Comparison Teachers
Before Intervention	• Agreed to participate in the collaboration condition • Confirmed continued need for vocabulary instruction focus • Completed assigned professional learning modules • Completed SoCQ • Completed COLLAB Steps 1-5 • Teachers rated vocabulary words • Pretests administered by district assessors (COLLAB Step 6)	• Agreed to participate in the comparison condition • Confirmed continued need for vocabulary instruction focus • Completed assigned professional learning modules • Teachers rated vocabulary words • Pretests administered by district assessors
During Intervention	*Repeated for Weeks 1-6* • COLLAB Steps 7-14; 30 minutes each week for beyond class time activities • Introduced 6 vocabulary words (VST-T+SLP); total of 60 minutes • Reviewed 6 vocabulary words (VST-T+SLP); total of 60 minutes • Displayed classroom word wall exhibit for additional 60 minutes each week *Week 7* • Only COLLAB Steps 10 and 13 • Introduced and reviewed 3 words instead of 6 • Displayed classroom word wall exhibit for additional 60 minutes each week	*Repeated for Weeks 1-6* • Introduced 6 vocabulary words (VST-GE-16); total of 60 minutes • Reviewed 6 vocabulary words (VST-GE16 and teacher-chosen activites); total of 60 minutes • Displayed classroom word wall exhibit for additional 60 minutes each week *Week 7* • Same as above, except introduced and reviewed 3 words instead of 6 • Displayed classroom word wall exhibit for additional 60 minutes each week
After Intervention	• Posttests administered by district assessors (COLLAB Step 15) • Completed COLLAB Step 16 • Completed SoCQ	• Posttests administered by district assessors

Data Collection Procedures

Research Approvals

Before collecting data, the principal investigator obtained approvals to conduct the research from the IRB at the University of Central Florida (Appendix A), the school district approval board, and school principals. As per the IRB approval, the research was considered exempt educational research. Written consent was not required from the participants or students' parents by the IRB or school district approval boards. The Explanation of Research served as "informed consent" for the participating teachers and SLPs (Appendix B). After school principals granted the researcher access to staff, the researcher emailed invitation letters about the study to SLPs and teachers in those schools. When teachers and SLPs responded to the researcher expressing interest in participating, the researcher emailed them the Explanation of Research and scheduled a time to discuss the study via video conferencing. After discussing the Explanation of Research and participants' rights, the participants expressed their continued interest in participating. The teachers and SLPs indicated they understood that their participation was voluntary and that they could withdraw from the study at any time without penalty. No financial incentive was offered to participants or the school district for participating in the study.

Instrumentation

Dependent variable measures for students' outcomes are explained below. Following the instruments used to measure student performance, the tools used to assess collaborators' indicators of progress toward adoption are explained.

Student outcome measures.

Three researcher-created instruments (i.e., Synonyms, Words-in-Context, and Non-examples) were used to assess students' vocabulary knowledge and knowledge about vocabulary usage in context. Researcher-created measures are more sensitive to acquisition of word knowledge on taught words than standardized measures (NICHD, 2000) and are commonly used in vocabulary research. Vocabulary researchers over time have used similar types of researcher-created assessments as those in this study (Lesaux, Kieffer, Faller, & Kelley, 2010; Nagy, Townsend, Lesaux, & Schmitt, 2012; Read, 2000; Stahl & Fairbanks, 1986). Some researcher-created measures require expressive demonstration of knowledge and others assess different levels of vocabulary knowledge depth through formats such as multiple choice and cloze sentences (Nagy et al., 2012; Read, 2000; Stahl & Fairbanks, 1986). The format selected for this study involved measuring receptive performance using paper and pencil tasks that could be administered in a group format.

The pretest and posttest measures in this study were adapted from similar measures used by Spielvogel (2011) and in a study underway (Rosa-Lugo et al., 2017). Each of the measures was reviewed by the researcher's dissertation committee chairperson, an expert in the field, for face validity. Each measure is provided in Appendix K. On students' papers there were spaces for students to write their names, blank spaces for student and teacher codes once names were removed, and the printed date. The pretests and posttests were created once the corpus of 44 Tier Two vocabulary words were selected by the principal investigator based on the ratings of the teachers. Because five of the vocabulary words were dropped from the intervention, the posttest measures had fewer items than the pretest measures.

Synonyms.

The first researcher-created task was the Synonyms (SYN) measure (Appendix K1). The purpose of the SYN measure was to assess students' knowledge of semantic relationships, specifically synonyms. For each item, students were presented with the target vocabulary word and were required to circle one synonym from four choices. The correct choice matched a synonym that had been provided to teachers as part of their instructional materials for each word. The three foil choices included words such as antonyms, words that sounded like the target word, words that were synonyms to other target words taught, and words that did not capture the nuance of the target word. Similar synonyms measures were also used in previous studies involving the VST (e.g., Ehren, et al., 2010; Spielvogel, 2011).

Of the original 44 words to be taught during the intervention, 23 words were included on the SYN pretest measure. Four of the words from the pretest were omitted from the instruction; therefore, those four questions were discarded from the pretest scores and the posttests only included 19 items from the pretest. The words selected for the SYN pretest were randomly selected from the total 44 words. Some of the words originally selected for the SYN task were replaced with words originally selected for the Words-in-Context task during development of the measures. Words were swapped to create stimulus questions for the Words-in-Context task with word family variations that had the same parts of speech as other taught word family variations. The pretest and posttest included the same question and answer choices (except for the omitted words), but presented in a different order.

To administer the SYN task, the assessor read the entire task to the students and visually projected the task on the overhead projector. The assessor pointed to each item number, target

word, and answer choice as she read (Appendix K4). The assessor led the students through two demonstration practice items to make sure they understood the task. Next, the assessor read each stimulus word and each of the answer choices. Students were to select an answer choice for each question that they thought was correct. Each correctly answered item received one point. Each student's total points were added for a total SYN score.

Words-in-context.

The second researcher-created task was the Words-in-Context (WIC) measure (Appendix K2). The purpose of the WIC measure was to assess students' knowledge and usage of Tier Two vocabulary words in sentences. For each set of three stimulus fill-in-the-blank sentences, students were given a word bank of five vocabulary words. Students were required to match the word choice that best completed each sentence. To lessen the burden of writing, students were directed to draw a line from the dot in front of the sentence to the dot beside the answer choice. For some items, word choices were presented as the same word forms in the scenarios. For other items, the words choices were derivational forms of the base words introduced in the scenarios. The foil answer choices were designed to reduce syntax clues and demands (Spielvogel, 2011). The WIC measure was based on a previous study using a similar method (e.g., Spielvogel, 2011).

Of the original 44 words to be taught during the intervention, 21 words were included on the WIC pretest measure. One of the words from the pretest was omitted from the instruction; therefore, that sentence was discarded from the pretest score. The posttest included 20 items from the pretest. The words selected for the WIC pretest were the remaining words (after the words were selected for the SYN task) from the total 44 words. As previously noted, during the creation of the assessment, some of the words originally selected for the WIC task were replaced

with words originally selected for the SYN task. The pretest and posttest included the same question and answer choices (except for the omitted sentence), but the sentence sets and corresponding answer choices were presented in a different order.

Similar to the administration of the SYN task, the assessor read the entire WIC task to the students and visually projected the task on the overhead projector. The assessor led the students through two demonstration practice items to ensure students' understanding of the task. For each sentence set with corresponding answer choices, the assessor read the answer choices, stimulus sentence, the answer choices again, and the stimulus sentence again (Appendix K4). The assessor pointed to each sentence and answer choice as she read. Students were to select an answer choice for each question that they thought was correct. Each correctly answered item received one point. Each student's total points were added for a total WIC score.

Non-examples.

The third researcher-created task was the Non-Examples (NON-EX) measure (Appendix K3). The purpose of the NON-EX measure was to assess students' abilities to make correct judgements about whether words were used correctly in sentences. Each item on the NON-EX subtest comprised three sentence choices using one form of the target word or taught word family variations in each sentence. Students were required to mark an X on the line in front of the sentence that did not make sense. The incorrect sentences varied in terms of the errors within the sentence. Some sentences were incorrect because of the nuanced meaning; others were incorrect because of the morpho-syntax usage. The NON-EX task was not used in previous VST studies. The new task was created for this study to detect changes in students' word

consciousness around word meaning and form, which were emphasized through the scaffolding in the collaboration condition.

Of the original 44 words to be taught during the intervention, 20 words were included on the non-examples pretest measure. Two of the words from the pretest were omitted from the instruction, therefore those sentence sets were discarded from the pretest score. The posttest included 18 items from the pretest. The words selected for the NON-EX pretest were randomly selected from the total 44 words. The pretest and posttest included the same question and answer choices (except for the omitted items), but the sentence sets and answer choices were presented in a different order.

Similar to the administration of the SYN and WIC tasks, the assessor read the entire NON-EX measure to the students and visually projected the task on the overhead projector. The assessor led the students through two demonstration practice items to make sure they understood the task. For each sentence set, the assessor read each the sentence (and pointed as she read), told students to mark an X on the line in front of the sentence that did not make sense, and read each sentence once more (Appendix K4). Students were to select an answer choice for each question that they thought was correct. Each correctly answered item received one point. Each student's total points were added for a total NON-EX score.

COLLAB protocol adoption.

Research-validated instruments from the Concerns Based Adoption Model (CBAM; Hall & Hord, 2015) were used to assess collaborators' progress toward adopting the COLLAB Protocol in their practice. The CBAM tools assessed SLPs' and teachers' thoughts, feelings, and

behaviors related to the collaboration protocol. The tools of CBAM include IC Maps, Levels of Use (LoU), and Stages of Concern (SoC).

SLP/Teacher collaboration IC map.

The SLP/Teacher Collaboration IC Map (Mitchell et al., 2016) was described previously as part of the COLLAB Protocol (Appendix F). The IC Map not only served as a blueprint for acceptable implementation of the COLLAB Protocol, but also as an indicator of whether collaborators could achieve fidelity with the protocol. The degree to which partners achieved fidelity implementing the protocol was one piece of evidence indicating that adoption of the protocol may be possible. Based on multiple data sources the collaborators submitted (described further in the Fidelity of Implementation section), the researcher assigned points to each key feature according to the degree to which each key feature was met. For each of the eleven key features, four points were assigned to ideal implementation, a range of one to three points were assigned according to the in-process descriptions, and zero points were assigned for no implementation of the key feature. Points were also tallied in terms of the points attained on what the researcher determined to be acceptable interactions of the key features (see bolded fidelity lines for each key feature on the IC Map). A total fidelity score using the IC Map was calculated for each collaboration pair over the course of the entire collaboration interval in the study. Each pair's fidelity score was calculated by dividing the total points achieved by the partners by the total points possible and multiplying by 100.

Levels of use.

The LoU scale comprises eight levels of implementer behavioral profiles (Hall, Dirksen, & George, 2006; Hall & Hord, 2015). The profile levels and descriptions are summarized in Table 8 (Hall & Hord, 2015, p. 108). *Nonusers* can be classified according to the following three levels: Level 0 refers to nonuse, Level I refers to orientation, and Level II refers to preparation. Distinctions between the nonuser levels are made according to the knowledge an individual has about an innovation, an individual's state of exploring an innovation's value and demands, and the state in which an individual is exploring to first use an innovation (Hall & Hord, 2015). *Users* are classified according to five levels: III- mechanical use, IVA- routine, IVB- refinement, V- integration, and VI- renewal.

Table 8: *Levels of Use of the Innovation*

Users	**VI**	**Renewal:** State in which the user re-evaluates the quality of the use of the innovation, seeks major modifications of or alternatives to present innovation to achieve increased impact on clients, examines new developments in the field, and explores new goals for self and the system.
	V	**Integration:** State in which the user is combining his or her own efforts to use the innovation with related activities of colleagues to achieve a collective impact on clients within their common sphere of influence.
	IVB	**Refinement:** State in which the user varies the use of the innovation to increase impact on clients within immediate sphere of influence. Variations are based on knowledge of both short- and long-term consequences for clients.
	IVA	**Routine:** Use of the innovation is stabilized. Few if any changes are being made in ongoing use. Little preparation or thought is being given to improving innovation user or its consequences.
	III	**Mechanical Use:** State in which the user focuses most effort on the short-term, day-to-day use of the innovation, with little time for reflection. Changes in use are made more to meet user needs than client needs. The user is primarily engaged in a stepwise attempt to master the tasks required for the innovation, often resulting in disjointed and superficial use.
Nonusers	**II**	**Preparation:** State in which the user is preparing for first use of the innovation.
	I	**Orientation:** State in which the user has recently acquired or is acquiring information about the innovation and/or has recently explored or is exploring its value orientation and its demands upon user and user system.
	0	**Nonuse:** State in which the user has had little or no knowledge of the innovation, has no involvement with the innovation, and is doing nothing toward becoming involved.

Note. Reprinted with permission (Hall & Hord, 2015, p. 108). See Appendix N2.

According to Hall and Hord (2015), distinctions between the user levels are made based upon the types of adaptations individuals make in their use of the innovation (Hall & Hord, 2015). At the Mechanical Use level, implementers make changes in how they use an innovation in order to figure out a system to make the innovation work for them. In other words, they make adaptations for user benefits, not client/student benefits. At the Routine level, implementers are stable in their use of an innovation and do not make adaptations. At the Refinement level,

implementers make adaptations to the innovation or how they use the innovation after reflecting on ways the adaptations could further benefit their clients/students. At the Integration level, implementers make adaptations to increase benefits of their clients/students and do so with other users of the innovation. At the final level, Renewal, implementers make adaptations to increase benefits of their clients/students; there may be a few major changes (including replacing the innovation) or many small adjustments.

LoU can be assessed using one-legged interviews and via focused interviews with a branching design (Hall & Hord, 2015). For the study, each collaborator's LoU was determined by reviewing multiple data sources. The data sources included audio recordings of in-class and beyond-class-time collaboration activities, participants' planning and/or debriefing documentation (e.g., documentation on the provided protocol template, notes, portions of emails, etc.), and collaborators' responses to branching interview questions conducted by researcher. The principal investigator asked each collaborator the scripted branching interview questions (Hall & Hord, 1987, 2015) in Appendix L1. Because of the nature of the study, all four questions were asked and participants were prompted to give examples of how they used the COLLAB Protocol. Decisions about LoU were guided by the IC Map and Hall and Hord's (1987) explanations about distinctions between each level of use.

Stages of concern questionnaire.

The affective aspect of change can be analyzed according to SoC (Hall & Hord, 2015). Techniques for assessing SoC include one-legged interviews, open-ended concerns statements, and the SoC Questionnaire (SoCQ; Hall & Hord, 2015). SoC was assessed using the SoCQ.

Additionally, some of the collaborators' thoughts and concerns about the COLLAB Protocol were revealed through the branching interview questions.

The SoCQ (Form 075; see Appendix M) was used to assess collaborators' thoughts and attitudes about the COLLAB Protocol before and after the seven-week intervention period. The 35-item SoCQ was designed by Hall, George, and Rutherford (1979) to apply to all educational innovations. The questions on the SoCQ, as well as an open-ended statement at the end of the questionnaire, remain the same. The name of the innovation is simply inserted in the questionnaire. The SoCQ has been used for research purposes as well as for staff development and for facilitating implementation of various educational innovations (Hall & Hord, 1987, 2015). One advantage of the SoCQ includes its strong reliability and internal consistency (Hall & Hord, 2015). Test/retest reliabilities range from .65 to .86; alpha coefficients range from .66 to .83 (Hall & Hord, 2015). Another advantage of the questionnaire is the resulting concerns profiles that can be analyzed. Data from the SoCQ were converted to a relative intensity calculation, which were visually analyzed on a graphic profile according to the SoC continuum.

The seven stages of the SoC continuum as defined by Hall and Hord (2015, p. 86) are outlined in Table 9. Of the 35 questions on the SoCQ, there are five different questions that are designed to assess each of the seven stages of concern.

Table 9: *Stages of Concern About the Innovation: Paragraph Definitions*

Impact	**6 Refocusing:** The focus is on the exploration of more universal benefits from the innovation, including the possibility of major changes or replacement with a more powerful alternative. Individual has definite ideas about alternatives to the proposed or existing form of the innovation. **5 Collaboration:** The focus is on coordination and cooperation with others regarding use of the innovation. **4 Consequence:** Attention focuses on impact of the innovation on "clients" in the immediate sphere of influence.
Task	**3 Management:** Attention is focused on the processes and tasks of using the innovation and the best use of information and resources. Issues related to efficiency, organizing, managing, scheduling, and time demands are utmost.
Self	**2 Personal:** Individual is uncertain about the demands of the innovation, his/her adequacy to meet those demands, and his/her role within the innovation. This includes analysis of his/her role in relation to the reward structure of the organization, decision making, and consideration of potential conflicts with existing structures or personal commitment. Financial or status implications of the program for self and colleagues may also be reflected. **1 Informational:** A general awareness of the innovation and interest in learning more detail about it is indicated. The person seems to be unworried about himself/herself in relation to the innovation. She/he is interested in substantive aspects of the innovation in relation to the innovation in a selfless manner, such as general characteristics, effects, and requirements for use.
Unrelated	**0 Unconcerned:** Little concern about or involvement with the innovation is indicated. Concern about other thing(s) is more intense.

Note. Reprinted with permission (Hall & Hord, 2015, p. 86). See Appendix N2.

The seven stages of the SoC are organized into what Fuller (1969) described as levels of concerns (the term *concerns* refers to thoughts and perceptions). According to Fuller's research with student teachers, student teachers' concerns progressed through the following four levels: *Unrelated concerns, Self-concerns, Task concerns*, and *Impact concerns*. *Unrelated concerns* include the SoC Stage 0 Unconcerned. Relative intensity scores in SoC Stage 0 Unconcerned reflect the degree to which the individual is more concerned about other things than the innovation. *Self-concerns* include the SoC Stages 1 Informational and 2 Personal. Relative intensity scores in SoC Stage 1 Informational reflect the extent to which individuals want to know more about the innovation and requirements for use. At SoC Stage 2 Personal, individuals

are concerned about how using the innovation will affect them and may be uncertain about their ability to meet the demands of the innovation. *Task concerns* include the SoC Stage 3 Management. Relative intensity scores in SoC Stage 3 Management reflect individuals' concerns with the demands of using the innovation, particularly in terms of scheduling, efficiency, organization, and time management.

Impact concerns include the SoC Stage 4 Consequence, Stage 5 Collaboration, and Stage 6 Refocusing. Relative intensity scores in SoC Stage 4 Consequence reflect the degree to which individuals' attention is focused on how their use of the innovation affects clients/students. In SoC Stage 5 Collaboration, relative intensity scores reflect the extent to which individuals are focused on coordinating use of the innovation with others. Relative intensity scores in SoC Stage 5 Refocusing reveal indicators of individuals' interest in exploring improvements to the innovation that will result in more benefits.

According to Hall and Hord (1987), an individual can present with any array of intensity levels in each concern stage. When an individual's profile is analyzed graphically, with each SoC on the horizontal axis, that person's general profile of high intensity concerns and low intensity concerns is displayed. Peaks reflect more intense stages of concern, whereas valleys reflect less intense stages (Hall & Hord, 1987).

Assessment Procedures

Student pretesting and posttesting.

Assessors who were blind to condition administered the vocabulary pretests and posttests to students in each classroom; however, the researcher had a part in serving as a floater and

conducting make-up posttest sessions. The director of special education arranged for a program administrator in the district to help coordinate assessors. Four district employees agreed to serve as blind assessors: a program administrator (a former special education teacher), an administrator serving as a special education teacher on special assignment, and two SLPs who have leadership roles within the district (not otherwise involved in the study). The researcher knew three of the assessors from having previously partnered with the district. The researcher met with the assessors in person and by phone to orient them to each task. The assessors were shown how to model the demonstration examples for each task, read the script for each item, and manage pacing within each task. They also had access to videos demonstrating how to administer each task. The researcher provided the demonstration videos to them through a share Google folder.

The assessors all expressed an interest in helping to administer the pretests and posttests. The assessors and the researcher believed two people would be needed in each room, particularly with the classroom teacher out of the room. The assessor teams included one educator with a background in teaching paired with an SLP. The assessors decided who would lead the test administration and who would take on the support role. The lead assessor's role was to introduce the task schedule, explain each task, lead the students through the example items, and visually project and read all questions and answer choices to the students according to the script provided. The supporter's role was to make sure students were on the correct page, direct students to where on the page the assessor was reading from if students were unsure about which question was being read, and to remind students to remain quiet with their eyes on their own paper. The lead assessor and supporter together passed out and collected the students' papers and kept track of the time.

The district administrator assessors were familiar with the classrooms in both schools, as the schools were within the cluster of schools they served. These assessors selected the classrooms at School 1 they were most familiar with for administering the pretests. Following their selection at School 1, the researcher assigned the assessor pairs at School 2. Each assessor pair administered the assessments in a collaboration condition classroom at one school and a control condition classroom at the other school. The assessors did not know whether the classrooms were treatment or comparison classrooms.

Vocabulary pretests were administered to students in both conditions during the last week of school before winter break. The researcher scheduled the dates according to teacher preferences and confirmed with the principal that there were no events or drills scheduled for that time. Due to scheduling limitations, the pretest days for both schools occurred differently. The pretest day for School 1 occurred over one session on one day (Monday) for a total of 75 minutes; all three tasks were administered. In contrast, the pretest day for School 2 took place over two sessions on two consecutive days (Tuesday and Wednesday) for a total of 75 minutes; the first two tasks were administered on the first day and the third task was administered on the second day. In each school, each assessor pair administered the pretests simultaneously in the two classrooms. See Appendix K4 for the scripts used for each of the three pretests.

Before the pretests were administered, the teachers read announcements to their students provided by the researcher. The announcements alerted the students that teacher visitors would be coming into their classroom and asking them questions to find out what they know about words they would be learning after the winter break. Students were told that the tasks would not be graded, but that they were to try their best.

During the pretest administration, teachers left the room and did not see the content in any of the pretest tasks. Two of the supporter assessors and one of the teachers were sick on the pretest administration at School 1. The researcher made the choice to continue with the pretests as scheduled. In the comparison classroom with the absent teacher, the researcher talked to the substitute teacher and the paraeducator about staying in the room to help with behavior management only. The substitute was told he was permitted to help students know where they were supposed to be on the page if they were lost, but that otherwise helping students was not allowed. He and the paraeducator were also told not to share with the teacher anything about the content of the pretests. In the collaboration classroom, the researcher served as the supporter while the district administrator served as the lead assessor.

An example of each measure and the task administration scripts are provided in Appendices K1-K4. Each vocabulary task was printed on a different color paper. The SYN and WIC tasks were handed out as part of a single packet. The SYN task (white paper) was administered first. The WIC task (purple paper) was administered second. Students could answer questions ahead of the assessor if they chose, but they were not allowed to move onto the next section until the assessor read the directions. Because there was potential for the NON-EX task to provide clues about word meanings for target words in the SYN and WIC tasks, the two tasks were collected before the third task, NON-EX, was introduced. The NON-EX task (blue paper) was administered last. At School 1, the NON-EX task was given on the same day as the other tasks; at School 2, it was given on the day after the SYN and WIC tasks.

After the pretests were administered and collected, one of the district administrators helped assign numeric codes to students' papers and removed students' names. A numeric code range was provided by the researcher for each classroom. The codes were assigned based on the

order that the papers were stacked. The teachers were each given a key with the codes assigned to each student and told to keep the code in a locked cabinet. Teachers used those student codes on the attendance logs and to provide de-identified demographic data to the researcher. The researcher was unable to schedule make-up assessments for students who were absent during the pretests. Codes were still given to students who were absent to account for their participation during the intervention and for the posttests.

The vocabulary posttests were administered to students in both conditions in the week directly following the last week of the intervention. The only difference in the tasks themselves was the order in which the stimulus questions and answers were presented. The same procedures were used for the posttests as the pretests, except teachers were allowed to stay in the classrooms to help with behavior management for the posttests (the researcher talked with each teacher about not giving hints to students about answers). The researcher arranged the schedule according to teachers' preferences and confirmed that the date was clear with the principals. The pretest day for School 1 occurred over one session on one day (Monday) for a total of 75 minutes; all three tasks were administered. The pretest day for School 2 took place over two sessions on two consecutive days (Tuesday and Wednesday) for a total of 75 minutes; the first two tasks were administered on the first day and the third task was administered on the second day. Teachers read the announcements to students the school day before the posttests to let students know what to expect.

The same assessor pairs who administered the pretests also administered the posttests. The assessors were in the same classrooms at each school as during the pretests, except the researcher served as the supporter during the posttest days at School 2 when some of the assessors were out due to sickness. In the comparison classroom for tasks 1-2, and in the

collaboration classroom for task 3, the researcher served as the supporter while the district SLP assessor served as the lead assessor. The researcher chose to serve as the supporter instead of the teacher to limit possibilities of teachers accidentally giving clues about answers.

The researcher administered one make-up posttest session at each school. Between both schools, six students participated in the make-up sessions. In each group, the researcher knew which children were from which classrooms. There was at least one child from each condition in each session the researcher conducted. A research assistant listened to one of the researcher's recorded make-up sessions and verified that the script was followed.

After the posttests were administered and collected, the researcher matched the numeric codes to the students' papers, removed students' names, and wrote the corresponding codes on students' papers. An assessor checked behind the researcher that students' names on their papers matched the numeric code on each key.

Collaborators' levels of use.

Multiple sources of data were collected throughout the seven-week intervention to measure the collaborators' levels of use of the COLLAB Protocol. At the start of the collaboration, the partners completed the online professional learning module and interactive video-conferencing session with the researcher. The partners completed Steps 1-5 (determining plans and agreements) of the collaboration protocol and submitted documentation of their plans and agreements on the protocol to the researcher.

After the first two weeks of the intervention, the participants expressed that submitting the weekly logs was too time consuming. Therefore, participants were asked to audio record their beyond-class-time conversations and submit the recordings to the researcher for review. They

also provided the researcher with email exchanges between themselves that pertained to prompts in the collaboration protocol. Participants recorded their collaborative class sessions and submitted them weekly to the researcher.

The researcher talked with each SLP after Week 3 using a branching interview (Hall & Hord, 2015). Neither of the collaborating teachers could schedule a time to talk during this checkpoint. Another interview checkpoint happened after the intervention period concluded (Appendix L1). The researcher interviewed each collaborator separately after the intervention using a similar branching interview as used in the Week 3 checkpoint. In addition, the researcher met with the SLPs together in person after the study. The SLPs were members of a K-3 literacy committee and were interested in talking about next steps for introducing the collaboration process and vocabulary instructional technique to other SLPs on their committee. The SLPs discussed their impressions of the collaboration process, which also provided evidence of use.

Collaborators' stages of concern.

The collaborators individually completed a SoCQ (Hall & Hord, 2015) before and after the intervention period. The 35-item questionnaire (Appendix M) was designed to measure collaborator's thoughts and concerns using the COLLAB Protocol. The questionnaire was given to the collaborators following the online collaboration module, where the COLLAB Guiding Steps were defined and modeled. The participants completed the same post-intervention questionnaire the week immediately following Week 7 of the intervention.

The principal investigator gave collaborators the same information about the SoCQ and instructions for answering the questions. First, they were told the term *concern* referred to thoughts, feelings, and perceptions (not necessarily a fret or worry). Second, the researcher told

them not to refer to their pre-intervention questionnaires when completing the post-intervention questionnaire. The researcher also instructed them to complete the questionnaire regarding the collaboration process as the innovation, as opposed to only the vocabulary instructional technique. Additionally, they were asked to think of the collaboration process as separate from the demands of the research (specifically, the demands of submitting evidence to the researcher). Last, the researcher instructed them to think of the collaboration process as lasting for a specified duration of time, not the whole year. In other words, their context was the seven-week duration of the collaboration segment in the study. Participants were also told they could write additional comments on the questionnaire.

Data Analysis

Power

An a priori power analysis was conducted using G*Power 3.1 (Faul, Erdfelder, Buchner, & Lang, 2009) to determine the sample size needed to achieve a power of 80%. The statistical tests used in the a priori analysis were ANOVA repeated measures within factors, between factors, and within-between interaction. The input parameters for each factor included the following: (a) effect size f = .25, (b) alpha = .05, (c) power = .8, (d) number of groups = 2, (e) number of measurements = 2 (pretest and posttest), and (f) correlation among repeated measures = .5. An additional input parameter for the repeated measures within factor and within-between factor was a nonsphericity correction of 1. The output parameters are summarized in Table 10. Based on the results of the power analysis, the researcher designed the research with a recruitment goal of four collaboration pairs and four comparison teachers, exceeding the number

of students needed for a high power. When the researcher was only able to recruit two collaboration pairs and two comparison teachers, the researcher decided to move forward with the research, as the number of students in the primary participants' classrooms still exceeded what was needed to achieve a high power.

Table 10: *Power Analysis*

Statistical Test	Output Parameters		
	Critical F	Power	Total *N*
Repeated measures, within factors	F = 4.15	.81	34
Repeated measures, between factors	F= 3.94	.81	98
Repeated measures, within-between interaction	F = 4.15	.81	34

Statistical Analyses

Multiple procedures were used in the analysis of research questions 1-3, including propensity score matching, the expectation-maximization (EM) algorithm, and a two-factor split-plot analysis of variance (ANOVA). An ancillary analysis was also conducted to determine effect sizes within each condition. Cohen's (1988) *d* was calculated for each condition in the ancillary analysis.

Descriptive statistics of students' pretest scores by class and condition were examined. Due to differences in group size and student characteristic data between the collaboration treatment condition and the comparison condition, and due to non-random assignment, propensity score matching was conducted. Propensity score matching allowed the researcher to match students from the collaboration condition with students from the comparison condition.

The propensity score allows researchers to analyze nonrandomized observations, such that it resembles some characteristics of random assignment (Austin, 2011). The propensity score is the probability of treatment assignment based upon predetermined characteristics (Austin, 2011). In the study, the propensity score was a projection of which group students were assigned to the treatment and comparison conditions based on the predetermined variables of pretest scores, IEP (excluding speech-only IEPs), EL, Gifted, and DIBELS category. Therefore, propensity score matching was used to match students on those factors (Thoemmes, 2016).

In the few cases where students who had moved away or moved into the class, students did not have DIBELS scores. The researcher contacted their teachers and inquired about the tiers of instructional supports those students were receiving. As a proxy for an actual DIBELS score, students who received Tier 2 instructional supports in literacy were reported in the dataset as having a DIBELS *Strategic* category score. Students who received Tier 3 instructional supports in literacy were reported as having a DIBELS *Intensive* category score. The rationale for using the instructional support as a proxy was because in many RTI models, students who are meeting grade-level benchmarks receive Tier 1 core instruction in that subject. Students who are not meeting benchmarks receive additional intensive supports (Tier 2 or Tier 3 instruction; e.g., Fuchs, Fuchs, & Compton, 2012). Before propensity scoring could be conducted, missing data needed to be filled. The EM algorithm was used to project missing data.

With a closely matched set of students from the collaboration condition (n = 34) and comparison condition (n = 34), a two-factor split-plot ANOVA was conducted to answer research questions 1-3. The procedure was used because the researcher was investigating main effects of a within-group factor, a between-group factor, and the interaction between time and group. The within-group factor was time (pretest to posttest) in both conditions. The between-

group factor was the condition; one condition was the collaborative treatment condition and the other was the comparison condition. The interaction referred to the interaction between time (pretest and posttest) and group (collaboration and comparison conditions). The dependent variables, which were interval in scale, were the scores on each of the vocabulary measures. The statistical assumptions were tested for each measure (pretest and posttest) and violations were analyzed to determine if they were within acceptable limits. Results were calculated and analyzed using SPSS (Version 22.0) and G*Power (Faul et al., 2009). Cohen's (1988) *f* effect size was calculated using G*Power by entering the value of partial eta squared.

COLLAB Protocol Adoption Indicators

To determine participants' levels of use, multiple forms of evidence were analyzed. Evidence included participation with the researcher in the interactive portion of the online module, partners' documentation of Steps 1-5, weekly submission of logs, emails, and/or recordings of beyond-class-time activities, weekly submission of recordings of in-class VST sessions, and branching interviews (Hall & Hord, 2015; Appendix L1) by phone with the researcher. The branching interviews were conducted with the SLPs at Weeks 3 and after Week 7 and with the teachers after Week 7. Based on discussion of the evidence with two committee members, their levels of use were described using the LoU constructs.

To determine participants' stages of concern, the SoC Quick Scoring Device (Hall & Hord, 2015) was used to calculate raw score totals and percentile scores for each stage of concern. The percentile scores were then plotted on a relative intensity graph to create a visual profile. The relative intensities of each collaborator's concerns were compared from pretest to posttest. Trends were visually analyzed across all collaborators at pretest and again at posttest.

Additional evidence was gathered from recorded interviews between partners and based upon branching interview responses to explain trends or discrepancies in the profiles of concern intensities.

Fidelity of Implementation

To ensure fidelity of implementation of assessment and intervention procedures, the researcher prepared the assessors and participants and tracked fidelity. For the pretest and posttest administration, research assistants analyzed the recordings according to the following criteria:

1. Were the tasks given in the correct order?
2. Was the script for the task example items followed? Describe any variations. Include duration of task example items.
3. Was the script followed for the task items? Describe any variations. Include duration of task administration.
4. Describe any noise or distractions in the room. Include duration of time for redirection.

Fidelity was calculated by assigning one point for the tasks being given in the correct order, one point for each task when the script for the task example item was followed, and one point for each task when the script for the real task items was followed. If there were minor deviations on a few task items, a half of a point was given for the task administration. If there were major deviations, zero points were given for that task administration.

To ensure high levels of implementation fidelity in both intervention conditions, the researcher prepared the participants in the professional learning phase with what they needed to

learn to implement their roles in the study with fidelity (explained in the Professional Learning section). All participants completed learning assessments the module(s) they completed, practiced the routines with the researcher, and received feedback during the interactive portion of the module. Additionally, the researcher provided feedback on a fidelity checklist to participants throughout the seven-week intervention period. After the posttest week was completed, the researcher conducted exit interviews with all participants (Appendix L1). For all teachers and SLPs, the researcher confirmed aspects of fidelity not captured by the audio recordings.

Multiple data sources were gathered to determine collaborators' implementation fidelity of the collaboration process as defined by the SLP/Teacher Collaboration IC Map (Mitchell et al., 2016). Collaborators submitted weekly documentation and/or recordings of their activities that occurred beyond class time and weekly recordings of all VST-T+SLP sessions. In addition to their submissions, the researcher spoke with the participants about their use of the COLLAB Protocol and VST-T+SLP. The SLPs spoke separately with the researcher about the collaboration process during a Week 3 branching interview (one call was recorded and notes were documented from the other). The researcher also conducted individual branching interviews with all four collaborators separately after the study concluded; these interviews were recorded as evidence of fidelity and levels of use. After the study, the SLPs met together to discuss their impressions and ideas for next steps within their district; their insights provided further evidence of fidelity and levels of use.

The researcher reviewed all the evidence submitted by the collaborators from the COLLAB Guiding Steps. The collaborators submitted Steps 1-5 once before the seven-week intervention. Evidence for Step 6 was collected from the pretest administration. Evidence for Steps 7-14 were submitted every week for the seven-week intervention. Evidence for Step 15

was collected from the posttest administration. Last, collaborators submitted their recorded conversations with their partners in Step 16 after the seven-week intervention. The researcher documented all the steps each collaboration pair followed to determine fidelity of the Guiding Steps. Many of the steps had multiple parts. If all the parts of a step were followed, the collaborators received full credit for that step (two points). If at least one part of the step was followed, the collaborators received partial credit for having followed the step (one point). The points for the weekly steps (Steps 7-14) were calculated for Weeks 1-6. The purpose of determining fidelity of the Guiding Steps was to verify the collaborators used the Guiding Steps as a means of achieving fidelity on the SLP/Teacher Collaboration IC Map.

The SLP/Teacher Collaboration IC Map was used as the scoring tool to determine collaborators' fidelity of implementation of the construct of collaboration as it was defined in the study (Mitchell et al., 2016; Appendix F). Points were assigned to key features based on the degree to which the key features were met. For each of the eleven key features, four points were assigned to ideal implementation, a range of one to three points were assigned according to the in-process descriptions, and zero points were assigned for no implementation of the key feature. Points were also tallied in terms of the points attained on what the researcher determined to be acceptable implementation of the key features (see bolded fidelity lines for each key feature on the IC Map). A total fidelity score using the IC Map was calculated for each collaboration pair over the course of the entire collaboration interval in the study. Each pair's fidelity score was calculated by dividing the partners' total points achieved by the total points possible and multiplying by 100.

Data sources were also gathered to determine fidelity of implementation of the VST versions in the collaboration and comparison conditions. In both conditions, fidelity of the

practice session for the introduction routine was reviewed and feedback was then given in writing to all participants, and in some cases discussed over the phone. The time pressure was removed for the practice session. For each week of the vocabulary instruction, participants submitted their audio recordings of the introduction days and the review day(s). The comparison teachers did not submit audio recordings of their own chosen review activities. Fidelity of teacher-chosen activities was determined based on the activity logs submitted by the comparison teachers and as described by the teachers in an exit interview. The researcher reviewed and calculated fidelity percentages on all recorded sessions for both conditions (except for one recording in each of three classrooms due to various problems with recording). The fidelity checklist for the introduction days in both conditions is presented in Appendix E1. The fidelity checklists for the VST-T+SLP review day is provided in Appendix E2 and for the VST-GE16 review day in Appendix E3.

Adherence points were calculated based on number of checkpoints achieved in the *Cue*, *Do*, and *Review* portions of each session for a total session point score for each session. Fidelity for each session was calculated by dividing the total number of points achieved by the total number of possible points and dividing by 100. A separate category for session length and instructional time was analyzed based on the length of the session. The time factor was analyzed separately from adherence because time descriptions better reflected differences in classrooms related to time factors than simply assigning points or a yes/no for time. In some cases, the session duration was longer than others due to behavioral redirections, transitions, and support to help students get organized. When actual instructional time was accounted for during each session, there was more consistency around the time window goal of 30-33 minutes. Visual evidence was provided of students' PWWs and classroom word wall exhibits via sample pictures

teachers submitted. The principal investigator also saw these pieces of evidence in person during site visits during the posttest week.

Inter-Rater Reliability

Inter-rater reliability was determined to verify fidelity calculations on: (a) assessment procedures, (b) assessment results, (c) fidelity of the SLP/Teacher Collaboration IC Map, (d) collaborators' levels of use of the COLLAB Protocol, (e) collaborators' stages of concern about the COLLAB Guiding Steps, (f) implementation of the VST-T+SLP in the collaboration classrooms, and (g) implementation of the VST-GE16 in the comparison classrooms. For each inter-rater reliability task, the researcher prepared the research assistants. Regarding the VST fidelity checklists, the researcher and research assistants first listened to a practice recording together and the research assistant completed the checklist with as much support as needed. Then the research assistants practiced one session on their own and the researcher provided feedback about any inaccuracies or confusion. The research assistants then completed the fidelity checklists on their own.

Inter-rater reliability of the pretest and posttest administration was determined by having research assistants who were blind to the classroom conditions review the recordings. They listened to 25% of the same recordings and indicated whether the assessor followed the script for the example items and the task items.

Regarding assessment results, all the pretest and posttests were scored by the researcher and scored by research assistants. The researcher provided the answer key for each assessment and rules for scoring. Research assistants who were not blind to condition scored 100% of the checks independently from the researcher. The purpose was to limit occurrences of mistakes with

scoring and to discuss questions with some student responses to shape the definitions/rules used by the blind scorer. Inter-rater reliability checks were then performed by a research assistant who was blind to the condition on 25% of the all pretests and posttests in each classroom. The researcher reported number of agreements / number of agreements + disagreements X 100 (Gast, 2010). A research assistant who was not blind to condition then double checked the researcher's data entry of all final scores and de-identified student and teacher demographic information in SPSS.

Inter-rater reliability for the collaboration process was determined using the SLP/Teacher Collaboration IC Map. The researcher applied the evidence she collected and analyzed across the entirety of the collaboration segment and determined values for each key feature on the IC Map. The evidence collected and analyzed included the initial agreements of the partners (Steps 1-5 of the COLLAB Protocol), the weekly evidence submitted by the partners (Steps 7-14 of the COLLAB Protocol), the partners' discussion for Steps 15-16 of the COLLAB Protocol, and the branching interviews. The researcher then met with two of her dissertation committee members at the same time to discuss their ratings of the IC Map key feature values based on a portion of the evidence submitted by each collaboration pair. For each collaboration pair, the researcher presented the evidence from the COLLAB Guiding Steps log for Steps 1-5, randomly selected weeks from the first and second half of the segment (Week 3 and Week 6 evidence), and evidence of the pretests and posttests. Following a discussion of the key features and evidence that aligned with each, the committee members gave their ratings.

Collaborators' levels of use of the COLLAB Protocol was also discussed as a group with the same two dissertation committee members following the collaboration fidelity discussion. The researcher presented evidence from the branching interviews and evidence of COLLAB

Guiding Steps from two of the intervention weeks with the two committee members. As a group, the researcher and committee members discussed indicators of each collaborator's level, or levels, of use. In addition to the discussion, a research assistant counted the number of steps completed from COLLAB Guiding Steps 1-6, Steps 7-14 (for two intervention weeks), and Steps 15-16 for each collaboration pair. The researcher compared her calculation of the number of Guiding Steps completed with the number calculated by the research assistant. Inter-rater reliability was calculated using # agreements / # agreements + disagreements X 100.

All the SoCQs (pre- and post-intervention) were independently scored by the researcher and a research assistant. Any mistakes in calculating raw scores or percentile ranks were reviewed by the researcher and corrected.

Implementation of the VST-T+SLP in the collaboration classrooms was determined by comparing the fidelity points calculated on the introduction days and review days.
As the introduction days were similar and did not involve the SLP, the research assistant who was blind to condition independently calculated *Cue, Do, Review*, and *Total* fidelity points on 25% of the introduction days (3/13 introduction sessions in all classrooms and an additional session in one classroom for a total of 13/52 introduction sessions). Fidelity checks of the *Review* portions of Day 2 introduction days were conducted by a research assistant who was not blind to condition; this was done as an attempt to avoid exposing the blind assistant to clues about the SLP coming into the classroom on VST review day. The researcher, and a research assistant who was not blind to condition, both listened to 29% of the collaboration review day portions involving the co-teaching and the SLP small group (2/7 review day sessions in each class). An attempt was made for a blind research assistant to calculate fidelity on the teacher large group portion of those collaboration review sessions; however, she could hear the SLP. Inter-rater

agreement was calculated using the point-by-point method (Gast, 2010). The number of agreements was divided by the sum of agreements and disagreements; that value was multiplied by 100.

Similarly, implementation of the VST-GE16 in the comparison classrooms was determined by comparing the fidelity points calculated on the introduction days and review days. A research assistant randomly pulled the numbers corresponding to vocabulary sessions to be scored from a bag. The 25% of observations to be scored for inter-rater agreement of the introduction days and review days were used for both conditions. The researcher and research assistants who were blind to condition independently calculated *Cue, Do, Review*, and *Total* fidelity points on 25% of the introduction days (3/13 introduction sessions in all classrooms and an additional session in one classroom for a total of 13/52 introduction sessions) and 29% of the review days (2/7 review day sessions in each class). Inter-rater agreement was calculated using the point-by-point method (Gast, 2010). The number of agreements was divided by the sum of agreements and disagreements; that value was multiplied by 100.

Chapter Summary

In this chapter, the methodology used in the study was explained. The study used a quasi-experimental design with a comparison condition and pretest and posttest samples. Three of the research questions pertained to the effects of collaboration between SLPs and third-grade general education teachers on students' vocabulary outcomes. The fourth question guided the exploration of indicators of progress collaborators made toward adopting the COLLAB Protocol. The following methods were explained: (a) research design, (b) setting, (c) participants, (d) sampling

and assignment procedures, (e) intervention procedures, (f) data collection procedures, and (g) data analysis.

CHAPTER FOUR: RESULTS

In this study, the researcher investigated the effects of collaboration between SLPs and third-grade general education teachers on students' vocabulary outcomes when compared to the vocabulary outcomes of students in classes taught by teachers who did not collaborate with SLPs. The study employed a quasi-experimental design with a comparison condition and pretest and posttest samples (Shadish et al., 2002). The three research questions pertaining to student performance were answered with the use of a two-factor split-plot ANOVA. The research also examined indicators about progress the collaborators made toward adopting the COLLAB Protocol in their practice as measured by CBAM tools (Hall & Hord, 1987, 2015). The purpose of examining indicators toward adoption was to inform the practicability of the collaboration protocol for use by teachers and SLPs.

The chapter begins by describing dosage of intervention protocols, which includes a summary of student attendance. Next, procedures used for missing data and propensity score matching are presented. Following the missing data and propensity score matching procedures, statistical assumptions of the two-factor split-plot ANOVA are explained, as are the results of the analysis for the research questions 1-3 using the matched dataset. Next, evidence of the progress toward adoption of the COLLAB Protocol is presented to answer the fourth research question. At the end of the chapter, a summary of fidelity of implementation and inter-rater reliability is provided.

Dosage of Intervention Protocols

All 13 vocabulary introduction sessions were implemented by the teachers in each classroom in the seven-week intervention. In terms of session length, the VST introduction routine was anticipated to take 30-33 minutes. This approximation was based upon previous research where four words were taught in each introduction session using the VST-GE16 in fourth-grade classrooms. Given the pace of teaching three words each introduction day as per the VST routine with third graders, teachers were not able to teach a fourth word within 30 minutes. Therefore, teachers were instructed to complete the introduction day routine with three words in 30-33 minutes. As shown in Table 11, the average session length varied between the four classrooms. The sessions tended to be longer in the School 2 Collaboration and School 1 Comparison classrooms. In both classrooms, there was more time devoted to transitions, behavior management, redirection, and organization. In one classroom, the teacher incorporated movement for the class and had students transition between the carpet for the scenario discussion and their desks for the writing portion of each word. The transitions added additional time to the session length. When the time for transitions and redirections was excluded, the average length of instructional time approximated 36 minutes in the School 2 Collaboration classroom and 34 minutes in the School 1 Comparison classroom.

Table 11: *Vocabulary Introduction Day Session Length*

Condition	Average Session Length	Range of Session Length
School 1 Collaboration (VST-T+SLP)	29:45 minutes	19-34 minutes
School 2 Collaboration (VST-T+SLP)	41:45 minutes* *(36 mins)*	32-47 minutes
School 1 Comparison (VST-GE16)	36:30 minutes* *(34 mins)*	32-42 minutes
School 2 Comparison (VST-GE16)	25:30 minutes	20-30 minutes

*Entire session length was longer than actual instruction when accounting for time dedicated to redirections, helping students get organized, and transition time. Time in italics is the average instructional time within the sessions.

All of the seven review day vocabulary sessions were implemented in each classroom (a portion of one large group review in a collaboration classroom was not completed due to a fire drill). A summary of the session lengths is provided below for all four classrooms (Table 12). Week 7 is a separate column because the review day only covered three words from the week and the review time was reduced from 60 minutes to 30 minutes.

Session length varied between the two collaboration groups. The School 1 collaborators divided the review day portion into two 30-minute sessions; each of the review day portions thus had a *Cue* and *Review*. There tended to be more time required to get students ready. For example, in Week 5 there was a 79-minute review session length in the School 1 collaboration classroom. However, instructional time after and between transitions was 67 minutes. Time was a limiting factor for the School 2 collaborators, as they had a 50-minute block for the review day and had less time for the large group and small group breakouts.

The comparison teachers also had a 60-minute block of time for review day. The comparison teachers were to implement the VST-GE16 review portion and fill the remainder of the time with a teacher-chosen activity. Teachers recorded their VST-GE16 portions of the review and kept a log of their teacher-chosen activities and time. The School 1 comparison teacher reported from her log that the teacher-chosen activities were charades and bingo. She set a timer for the teacher-chosen activities according to how much time was left after the VST portion of the review. The School 2 comparison teacher reported from her log the teacher-chosen activities included dictionary skills and sentence games using the words and whiteboards.

Table 12: *Vocabulary Review Day Session Length*

Condition	Average Session Length (Weeks 1-6)	Range of Session Lengths (Weeks 1-6)	Week 7 Session Length
School 1 Collaboration (VST-T+SLP)	67:30 minutes	54-79 minutes	29 minutes
School 2 Collaboration (VST-T+SLP)	51:45 minutes	46-61 minutes	31 minutes
School 1 Comparison (VST-GE16 and teacher- chosen activities)	*VST-GE16* 48:30 minutes *Teacher-chosen activities* Reported as remaining time in 60 minutes after VST review time	VST-GE16 42 – 62 minutes	VST-GE16 32 minutes
School 2 Comparison (VST-GE16 and teacher-chosen activities)	*VST-GE16* 32:30 mins *Teacher-chosen activities* 24 mins	VST-GE16 19-37 minutes	VST-GE16 7 minutes *Teacher-chosen activities* 15 minutes

Student Attendance

All third graders who attended class in each of the four participating classrooms were included in the dataset before propensity score matching. Attendance logs were provided by three teachers. Two of the four teachers reported attendance for Weeks 1-7, one of the teachers reported attendance for Weeks 1-6, and one teacher did not submit an attendance log. In the case where no attendance logs were submitted, the teacher reported there were no chronic absences. There were also no students who moved in or out during the study. Additionally, the teacher reported she made a point to schedule the vocabulary sessions when students who see specialists in other settings would not miss vocabulary sessions (or would only miss a portion of some vocabulary sessions).

Based on the submitted logs, all but one student attended at least half of the introduction days and at least half of the review days. The exception was one student in the comparison classroom who moved away. It should be noted one student in the collaboration condition and one student in the comparison condition were new students who began attending in Week 4. One of these students was not added to the classroom attendance log and one was added to the attendance log a week after moving in. The two move-in students were included in the dataset (no pretests), as they attended school for at least half of the intervention weeks. There was also one student who switched classrooms in School 2; he student started the intervention in the comparison classroom and was exposed to words in Weeks 1-3. The student then began attending the collaboration classroom for words in Week 5-7. The student's attendance was only logged for Weeks 5 and 6. For the purpose of the analysis, this student was analyzed in the comparison condition, as his teacher was the comparison teacher when group assignments were

determined. Documentation from the attendance logs for the remainder of the third-grade students revealed they all received instruction on a minimum of 20 of the 39 words between their attendance in introduction and review day sessions. They were present for a minimum of half of the introduction sessions (partial or whole session) and for a minimum of half of the review sessions (partial or whole session). Based on logs completed fully for third graders in the collaboration condition (n = 33), the average number of introduction sessions attended was 11.21, the average number of review sessions attended was 6.36, and the average number of words students received instruction on was 35.36. This calculation excluded the move-in student and did not account for the Week 7 introduction day and review day for 7 students. Based on logs completed fully for third-grade students in the comparison condition (n = 20), the average number of introduction sessions attended was 11.45, the average number of review sessions attended was 6.35, and the average number of words students received instruction on was 37.05. This calculation excluded the student who moved away, the student who switched classes, the student who moved in, and the classroom where attendance logs were not submitted.

Missing Data

There were some occurrences of missing student pretest and posttest data due to absences, students moving away, and students moving into classrooms. Students' pretest and posttest scores (before matching) for each measure are presented by class in Figures 1-4; the missing dots in the class graphs in Figures 1-4 reflect the missing data. The dots along the dotted line represent each student's pretest score. The dots along the solid line represent each student's posttest score. The order of the students is the same in all three tasks. In other words, Student 1 in one classroom graph corresponds to the same Student 1 in each of the three tasks for that

classroom. In the School 1 Collaboration classroom, four students were absent at pretest. All students completed the posttest (Figure 1). In the School 2 Collaboration second/third-grade blended classroom (Figure 2), all students in the class are represented in the graph; however, the analysis included only third graders (n = 8). In terms of missing data for the third graders, one student who moved in was not present for three of the pretests and one of the posttests. In the School 1 Comparison classroom (Figure 3), there were no missing data. In the School 2 Comparison classroom (Figure 4), five students were absent for Task 1-2 pretests and four students were absent for the Task 3 pretest; two of those students were move-ins after the pretests. At posttest, one student moved away and another moved into the School 2 Collaboration classroom. That student was analyzed as part of the School 2 Comparison classroom because that was the condition originally assigned.

Before propensity score matching was conducted, missing data was replaced with imputed values using an intention to treat (ITT) analysis. The EM algorithm was selected as the missing-value technique to apply to missing pretest and posttest scores in the study. The EM algorithm used an iterative regression-based process to produce estimates of maximum likelihood. In this process, the predictors were all the other variables in the model (Graham, 2009). Results should be interpreted with an understanding that missing data were imputed using this regression-based process.

The EM algorithm is one of various approaches to handle missing data. There is a lack of consensus about the best way to handle missing data (Puma, Olsen, Bell, & Price, 2009). One conservative missing-value technique is last observation carried forward (LOCF; Torgerson & Torgerson, 2008). In LOCF, the pretest scores would be used to replace the missing posttest scores in cases of attrition. A consideration with LOCF is the possibility of an underestimation of

improvement, particularly if comparison participants are lost to attrition (Murza, Nye, Schwartz, Ehren, & Hahs-Vaugn, 2014). Other techniques include mean replacement, linear trend at point, and the EM algorithm. Analyses of various missing-value techniques have been conducted with cluster randomized trials. Nonbiased results have been shown with many techniques where up to 40% of data were missing, except for mean replacement (Murza et al., 2014; Puma et al., 2009). Although the study was not a cluster randomized design, the findings of nonbiased results with missing-value techniques were best available evidence; thus, a missing value technique was applied in this study.

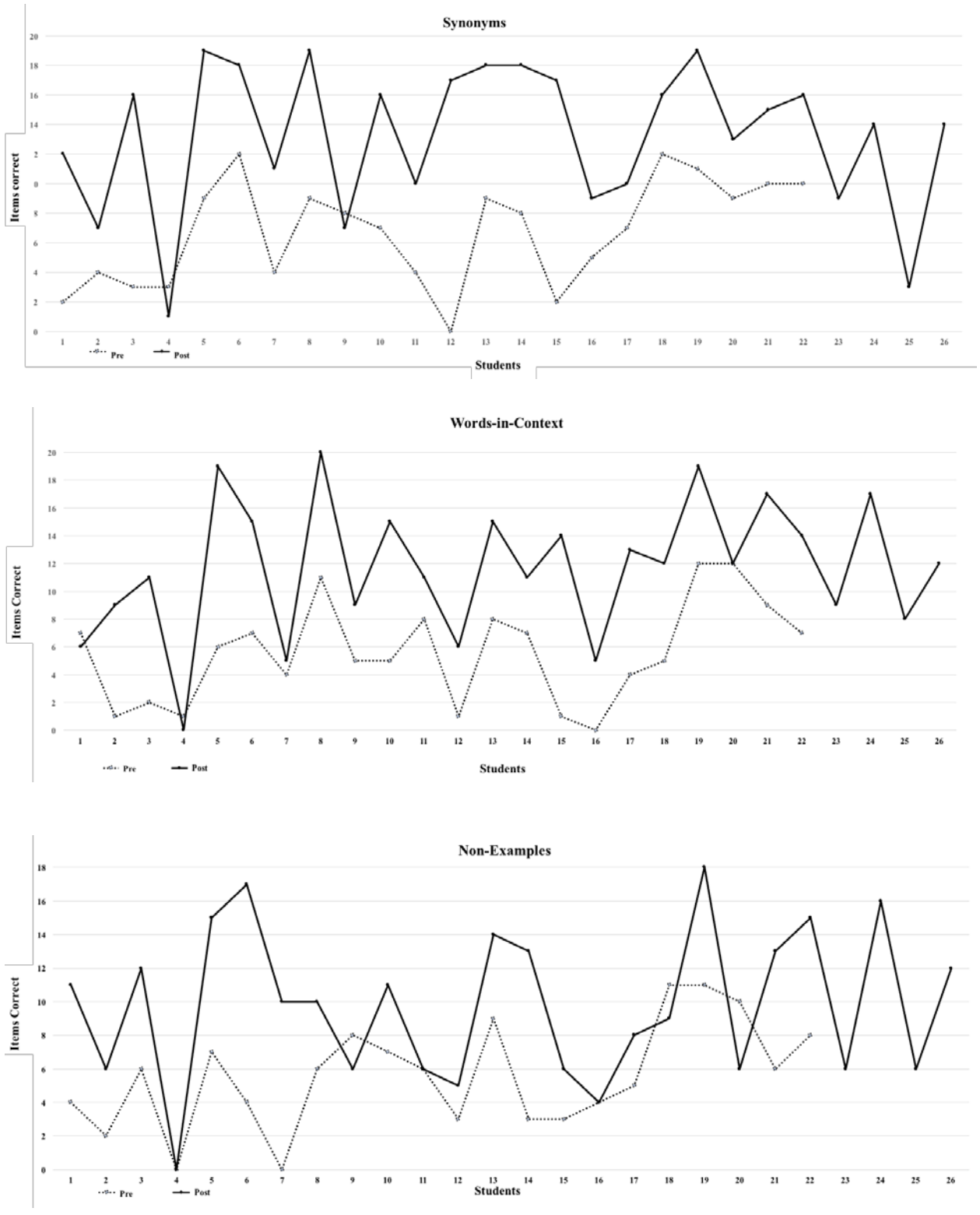

Figure 1: *School 1 Collaboration Classroom*

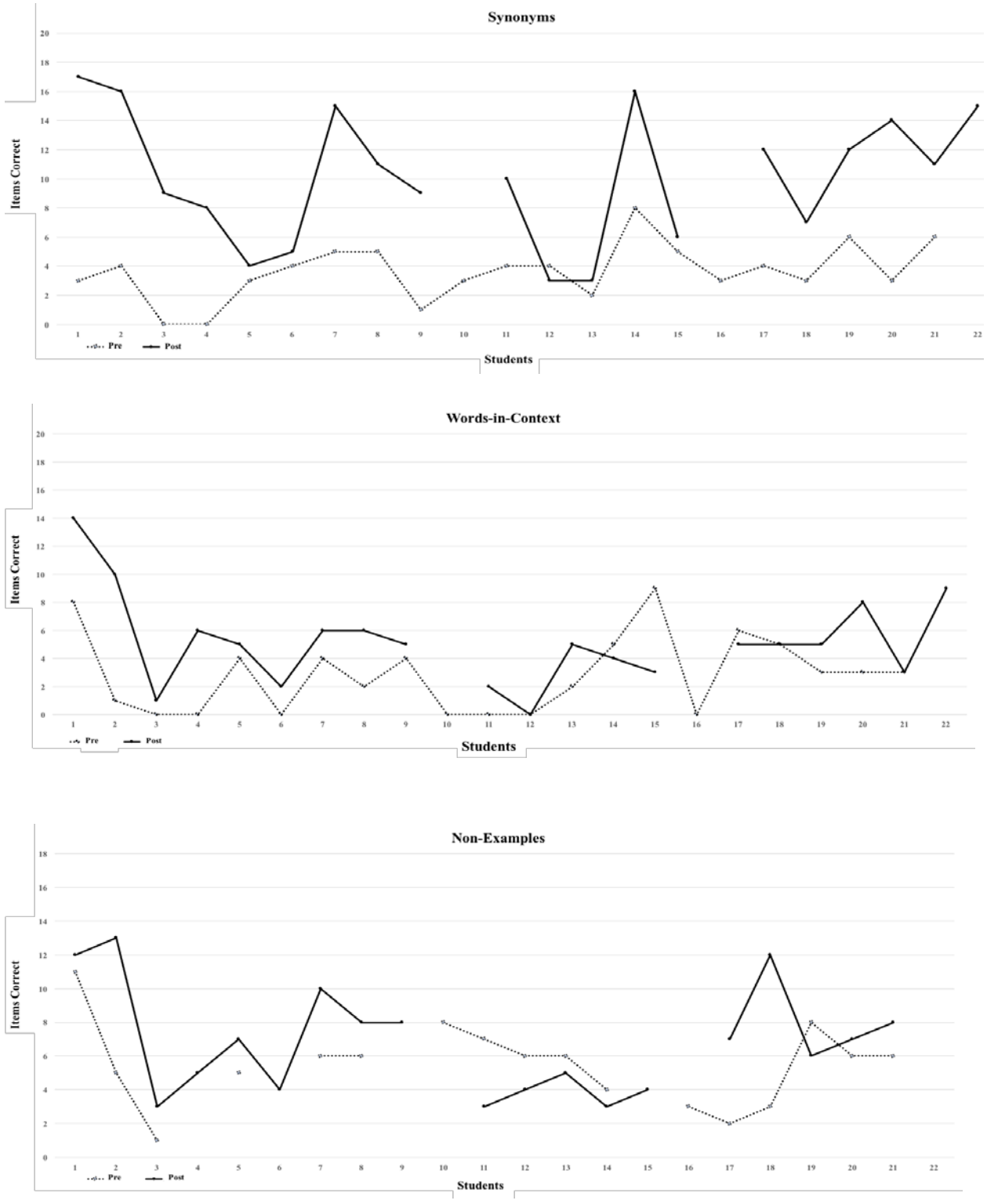

Figure 2: *School 2 Collaboration Classroom*

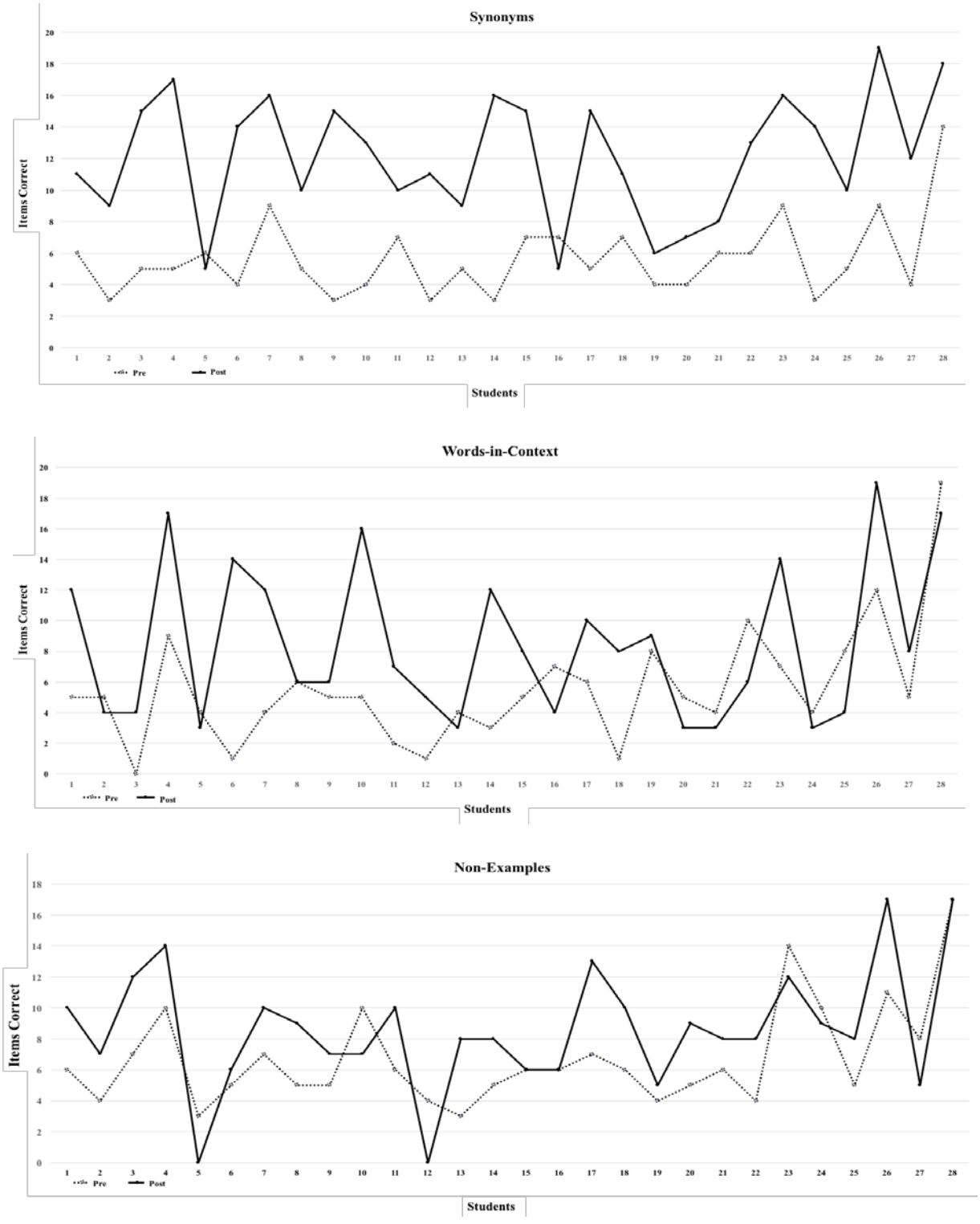

Figure 3: *School 1 Comparison Classroom*

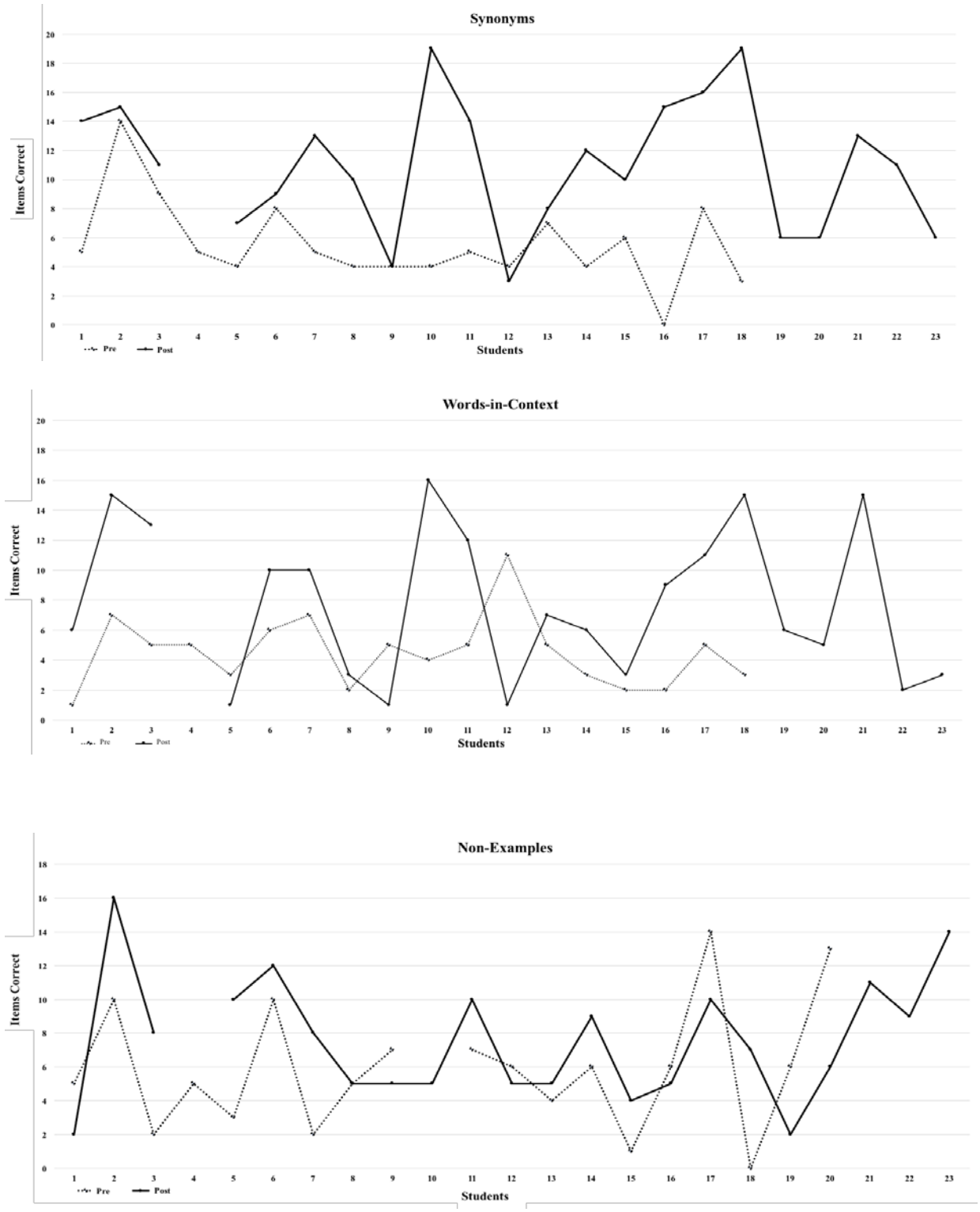

Figure 4: *School 2 Comparison Classroom*

Descriptive Statistics by Class and Condition

Descriptive statistics by class and condition are presented in Table 13 and Table 14. The tables include a summary of the number of students in each classroom, student characteristic data, and the mean and standard deviation on each vocabulary pretest measure. The student characteristic factors included whether the student: (a) received services on an IEP (excluding speech-only IEPs), (b) received language services from an SLP for a language impairment, (c) received EL services, and (d) was identified as talented and gifted (TAG). The final factor was each student's DIBELS progress monitoring category, which was based on the DIBELS *Next* overall score. All students had a DIBELS category. Some students had a DIBELS category and additional characteristic variables. For example, a student could have been DIBELS Strategic and EL.

Table 13: *Descriptive Statistics by Class Before Matching*

	School 1 Collaboration	School 2 Collaboration	School 1 Comparison	School 2 Comparison
n Third graders	26	8	28	23
n IEP	5	2	8	4
n Language Impairment	1	0	4	1
n EL	5	2	3	6
n Gifted	1	0	1	0
n DIBELS Core	16	2	11	11
n DIBELS Strategic	4	3	4	6
n DIBELS Intensive	6	3	13	6
Pretest *M* (*SD*)	SYN: 6.77 (3.29) WIC: 4.34 (3.39) NONEX: 5.78 (2.96)	SYN: 4.27 (2.15) WIC: 4.34 (1.85) NONEX: 6.19 (2.48)	SYN: 5.64 (2.45) WIC: 5.54 (3.83) NONEX: 6.75 (3.27)	SYN: 5.66 (2.69) WIC: 4.80 (2.29) NONEX: 6.17 (3.48)

Table 14: *Descriptive Statistics by Condition Before Matching*

	Collaboration	Comparison	Total
n Third Graders	34	51	85
n IEP	5	12	17
n Language Impairment	1	5	6
n EL	7	9	16
n Gifted	1	1	2
n DIBELS Core	18	22	40
n DIBELS Strategic	7	10	17
n DIBELS Intensive	9	19	28
Pretest *M* (*SD*)	SYN: 6.18 (3.22) WIC: 5.40 (3.13) NONEX: 5.86 (2.82)	SYN: 5.65 (2.54) WIC: 5.21 (3.22) NONEX: 6.49 (3.35)	SYN: 5.86 (2.82) WIC: 5.28 (3.17) NONEX: 6.12 (3.14)

Before propensity score matching, a two-factor ANOVA revealed there were no significant differences by condition in the group pretest scores for the SYN task [$F(1, 83) = .718$, $p = .399$], WIC task [$F(1, 83) = .074$, $p = .786$)], or the NON-EX task [$F(1, 83) = .766$, $p = .384$)]. However, there were unequal sample sizes and unequal numbers of student subgroups based on at-risk factors (i.e., IEP, language services, EL, DIBELS Strategic, and DIBELS Intensive).

Propensity Score Matching

The propensity of children to be assigned to the intervention or comparison groups was estimated using data from children in the four participating classrooms. Previous empirical and theoretical research was used to determine the covariates for matching. The matching covariates used to estimate the propensity scores were predictive of the outcomes and occurred prior to the outcome. In addition to the interaction terms, the matching variables were: (a) IEP other than speech-only, (b) EL, (c) Gifted, (d) DIBELS Strategic, (e) DIBELS Intensive, (f) SYN pretest score, (g) WIC pretest score, and (h) NON-EX pretest score. Logistic regression was used to estimate the predicted probability of assignment to an intervention or comparison classroom. Matching on the propensity scores was conducted with the SPSS plug-in PS Matching (Thoemmes, 2016). The children were matched 1:1 without replacement using optimal matching within a caliper of .25. This yielded a 100% matched set of children in the intervention versus comparison groups ($n = 34$ intervention and $n = 34$ comparison).

Overall balance, as measured by relative multivariate imbalance, decreased after matching (.912 as compared to .941). Means and percentage bias were compared before and after matching. Of the covariates, absolute standardized mean differences close to zero are preferable

as that indicates small differences between the treated and untreated units. Thresholds of less than .10 suggest balance. Absolute standardized mean differences were below .25 for all covariates and interactions with the exception of two interactions, suggesting relatively good balance in the model. In aggregate, matching on the propensity score resulted in a matched sample where all the baseline covariates and most of the interaction terms were very similar between children in the classrooms taught by teacher and SLP pairs in the collaboration treatment and children who were taught by the teachers in the comparison condition. A summary of descriptive statistics by condition after the propensity score matching procedure was applied is presented in Table 15. Posttest means and standard deviations for each measure in both conditions are presented separately for each research question in the interaction analyses.

Table 15: *Descriptive Statistics by Condition After Matching*

	Collaboration	Comparison	Total
n Third Graders	34	34	68
n IEP	5	4	9
n Lang	1	0	1
n EL	7	8	15
n Gifted	1	1	2
n DIBELS Core	18	15	33
n DIBELS Strategic	7	9	16
n DIBELS Intensive	9	10	19
Pretest *M* (*SD*)	SYN: 6.18 (3.22) WIC: 5.40 (3.13) NONEX: 5.86 (2.82)	SYN: 5.71 (2.75) WIC: 5.40 (3.40) NONEX: 5.86 (3.28)	SYN: 5.95 (2.98) WIC: 5.40 (3.24) NONEX: 5.88 (3.04)

After propensity score matching, a two-factor split-plot ANOVA revealed there were no significant differences at pretest between the matched comparison and collaboration groups for the SYN task [$F(1, 66) = .418$, $p = .520$], WIC task [$F(1, 66) = .000$, $p = .999$], or the NON-EX task [$F(1, 66) = .000$, $p = .985$]. Additionally, there were no pretest differences between the matched comparison and collaboration groups after an outlier was removed from the comparison condition for the WIC task [$F(1, 65) = .362$, $p = .549$] and the NON-EX task [$F(1, 65) = .274$, $p = .603$]. The outlier was removed due to pretest scores that were significantly higher than the matched group.

Research Questions One, Two, and Three

After propensity score matching, a two-factor split-plot ANOVA was conducted to answer the first three research questions. The within-group factor was time (pretest to posttest). The between-group factor was the condition; one condition was the collaboration treatment condition and the other was the comparison condition. The interaction refers to the interaction between time (pretest and posttest) and group (collaboration and comparison conditions). Results were calculated and analyzed using SPSS (Version 22.0) and G*Power (Faul et al., 2009). Effect sizes using Cohen's (1988) *f* were reported for the within group factor, between-group factor, and interaction factor. Cohen's *f* was used because of its applicability when analyzing the differences between means of related group within-groups factors, between-group factors, and interactions between time and groups using G*Power. Partial eta squared (partial η^2) values were directly calculated into Cohen's *f* in G*Power. Effect sizes using the Cohen's *f* scale are as follows: small ($f = .1$), medium ($f = .25$), and large ($f = .4$). An ancillary analysis was also

conducted to calculate the separate effect sizes, Cohen's (1988) *d*, within each condition for research questions 1-3. The ancillary analysis was conducted because of its potential to inform school professionals' decisions around use of the VST-T+SLP and/or the use of the VST-GE16 in third-grade classrooms. Cohen's *d* was used as the effect size because of its application to dependent *t* tests; in these ancillary analyses for research questions 1-3, differences between pretest and posttest scores *within each condition* were compared. Cohen's *d* was calculated within each condition using the formula (Lomax & Hahs-Vaughn, 2012):

Cohen's *d* = mean difference / standard deviation of the difference scores

Effect sizes using Cohen's *d* are considered small when *d* = .2, medium when *d* = .5, and large when *d* = .8 (Cohen, 1988).

Statistical Assumptions

Four assumptions and effects of violations of the two-factor split-plot were analyzed regarding research questions 1-3. The first assumption, independence, is achieved when cases in the sample are randomly selected from the population (Lomax & Hahs-Vaughn, 2012). Due to the quasi-experimental design of the study, randomization was not achieved. However, propensity score matching was used, which provided some evidence of independence. Therefore, scatterplots of the residuals were analyzed for evidence of independence. Patterns within scatterplots may suggest a violation of the assumption, whereas a random distribution of dots above and below 0 suggest evidence the assumption was met. When violations of the assumption of independence occur, there may be less variation than if a random sample had been taken and there is a higher probability of Type I or Type II errors (Lomax & Hahs-Vaughn, 2012). Both types of errors result in incorrect decisions. Type I errors occur when the null is rejected when

the null is actually true (and should not be rejected). Type II errors occur when the null is not rejected when the null is actually false (and should be rejected).

The second assumption that was examined is sphericity, which is the assumption that the variance of the difference scores for each factor level pair is the same (Lomax & Hahs-Vaughn, 2012). The assumption of sphericity can be examined through formal statistical tests, such as Mauchly's Test of Sphericity (Lomax & Hahs-Vaughn, 2012). If the *p*-value is larger than alpha, the assumption of sphericity is met and the conservative Geisser-Greenhouse *F* test can be used (Lomax & Hahs-Vaughn, 2012). If there is a violation of the sphericity assumption, the *F* is not as robust and an adjusted F test is needed (e.g., Huynh-Feldt; Lomax & Hahs-Vaughn, 2012). In the study, there were only two scores for each measure, therefore the sphericity assumption did not apply.

The third assumption, homogeneity of variance, refers to equal variances of the two populations (Lomax & Hahs-Vaughn, 2012). Homogeneity can be examined by comparing ratios of smallest to largest sample variances, examining scatterplots of residuals, and applying formal statistical tests of equal variances, such as Levene's test (Lomax & Hahs-Vaughn, 2012). Violations of the assumption of homogeneity of variance result in an increased likelihood of Type I or Type II errors. The effect of this violation is minimal in cases when the sizes of the two samples are equal and if data are not missing. The effect of the violation decreases as the sample size increases (Lomax & Hahs-Vaughn, 2012). In the data analysis for the study, homogeneity of variances was determined using Levene's test of equality of error variances. When the *p*-value of .05 for Levene's test was greater than the alpha level, the assumption of homogeneity was determined to have been met.

The fourth and final assumption, normality, is met when the difference scores are normally distributed (Lomax & Hahs-Vaughn). Normality can be examined by using graphs of difference scores, formal statistical procedures, and skewness and kurtosis statistics (Lomax & Hahs-Vaughn, 2012). Graphs that can be used to examine normality include stem-and-leaf plots, box plots, plots of group means by group variance, histograms, and Q-Q plots of residuals. Formal statistical tests include the Kolmogorov-Smirnov and Shapiro-Wilk tests. These formal statistical tests indicate the extent to which the sample distribution is statistically different from a normal distribution. A *p*-value greater than alpha suggests the sample distribution is not significantly different than what would be expected in a normal distribution (Lomax & Hahs-Vaughn, 2012). The effects of violations to the normality assumption are minimal for violations that are considered moderate. Moreover, the effects are less severe with large sample sizes, equal or nearly equal sample sizes, and with similarly shaped distributions (Lomax & Hahs-Vaughn, 2012). The determination of normality in the study was based upon examination of graphs and plots, the Shapiro-Wilk test (using a *p*-value of .05) and skewness and kurtosis statistics.

Research Question One

When SLPs and teachers implement a vocabulary instructional technique using a systematic collaboration protocol (treatment condition), is there a significant difference in third-grade students' vocabulary scores on a synonyms task when compared with the scores of students in classrooms where non-collaborating teachers implement a similar technique (comparison condition)? *Hypothesis: There will be a significant interaction between time and condition. The mean vocabulary word scores based on time will increase for both groups. There will be larger effects in the collaboration condition classrooms.*

Assumptions testing results.

Students were not randomly assigned to groups; therefore, the independence assumption was violated. However, propensity score matching was employed and the assumption of independence was tested. A scatterplot of residuals was used to determine if there was evidence of independence. Based on an analysis of the simple scatterplot at pretest, the distribution of residuals above and below the horizontal line appeared symmetrical. The analysis of the scatterplot at posttest indicated evidence of a random display of residuals above and below the horizontal line, with an asymmetrical distribution. The assumption of sphericity did not apply because there were only two measurement points (pretest and posttest).

Normality assumptions were tested using residuals of the pretest synonym scores and the posttest synonym scores. There was evidence indicating normality at pretest and evidence of some nonnormality at posttest. At pretest, there were nonsignificant results for the Shapiro-Wilk test ($SW = .97$, $df = 68$, $p = .103$). Additionally, skewness (.59) and kurtosis (.59) statistics were within +/-2, suggesting evidence of normality. Analysis of the Q-Q plot revealed the majority of points fell on or close to the diagonal line, with one dot further from the line. Examination of the box plot suggested some nonnormality, with two outliers extending beyond the top whisker. The Grubb's Outlier Test and critical values of Grubb's Outlier (G) Test (1969) were applied to the two outliers from the box plot visual analysis. The formula is:

$$G_{max} = M_{max} - M / SD$$

where G_{max} is used if the observed greater than the mean, M_{max} is the extreme value, M is the mean, and SD is the standard deviation. The extreme value in both outliers was 14; $M = 5.95$, and $SD = 2.98$. The critical value for an alpha of .05 and a sample size of 70 was 3.09. The value

of $G_{2.70} < 3.09$ indicating the observed values were not different from the mean, therefore, the scores were included in the analysis.

At posttest, there were significant results for the Shapiro-Wilk test (*SW* = .96, *df* = 68, *p* = .019) indicating the residuals were significantly different from a normal distribution. However, skewness (-.58) and kurtosis (-.35) statistics were within +/-2, suggesting evidence of normality. Analysis of the Q-Q plot revealed many points that fell close to the diagonal line and some that did not. Examination of the box plot suggested normality, with no outliers.

The assumption of homogeneity of variance was not met according to results of Levene's Test of equality of error variances at pretest [*F*(1, 66) = 4.15, *p* = .046)]. The effect of a violation of equal variances is minimal with equal sample sizes of groups (Lomax & Hahs-Vaughn, 2012), as seen in this study. The assumption of homogeneity of variance was met at posttest [*F*(1, 66) = 3.26, *p* = .075)]. Overall, the violations to the assumptions were not severe and an analysis using the two-factor split-plot ANOVA was justified. Violations do, however, increase the chance of Type I or Type II errors and results should be interpreted with this caution.

Two-factor split-plot ANOVA results.

Estimated marginal means and results of the two-factor split-plot ANOVA results for the Synonyms (SYN) task are presented in Table 16 and Table 17. The results were based upon all students from the matched dataset, as there were no outliers (*n* = 34 collaboration, *n* = 34 comparison).

Table 16: *SYN Estimated Marginal Means*

	M	*SE*	95% Confidence Interval	
			Lower	Upper
SYN Time (pre)	5.95	.63	5.22	6.67
SYN Time (post)	12.13	.56	11.02	13.24
Group: Collaboration	9.44	.53	8.38	10.51
Group: Comparison	8.63	.53	7.57	9.69

Table 17: *SYN Two-Factor Split-Plot*

	F	Sig	Partial Eta Squared	Observed Power	Effect Size (Cohen's *f*)
SYN Time	122.49	.000	.650	1.00	1.36
SYN Time*Group	.380	.540	.006	.093	.08
Group	1.17	.284	.017	.186	.13

Regarding the within-group factor, there was a statistically significant difference in SYN scores [$F(1, 66) = 122.49$, $p = .000$)] based on time (pretest to posttest). The SYN posttest estimated marginal mean ($M = 12.12$, $SD = 4.58$, $SE = .56$) was significantly greater than the pretest estimated marginal mean ($M = 5.95$ $SD = 2.98$, $SE = .63$). Lower and upper bounds of pretest scores with a 95% confidence interval were 5.22-6.67 and of posttest scores were 11.02-13.24. The observed power was high at 100%. The results indicated that if there were not actually a statistically significant difference, the probability of seeing a difference between pretest and posttest means as high as the observed value would be less than one time in 1,000. Regarding the size of the effect, approximately 65% of the variance in SYN scores was accounted for by time (partial $\eta^2 = .650$). Cohen's *f* effect size was calculated as $f = 1.36$ using G*Power by entering the value of partial η^2. Using Cohen's *f* scale of small (.10), medium (.25),

and large (.4), the size of the effect according to Cohen's *f* scale was considered large. These results indicated the significant increase from pretest to posttest within the entire matched group of students (*n* =68) was not likely due to random variation in the data, but likely due to the robust vocabulary instruction in both conditions. The results also indicated that the size of the group mean increase from pretest to posttest was beyond what would be expected from students' development without the instruction and beyond what would be expected with typical instruction (Hattie, 2009). The large effect sizes were within the zone of desired effects (Hattie, 2009).

Regarding the between-group factor, there was not a statistically significant main effect [$F(1,66) = 1.17$, $p = .284$)] based on group on SYN scores. The estimated marginal mean of the collaboration group ($M = 9.44$, $SE = .532$) did not differ from the comparison group ($M = 8.63$, $SE = .532$). Lower and upper bounds for a 95% confidence interval were 8.38-10.51 for the collaboration group and 7.57-9.69 for the comparison group. The observed power was very low (.186) at about 19%. Less than 1% of the variance in SYN scores was accounted for by group (partial $\eta^2 = .017$). A Cohen's *f* effect size was calculated as $f = .13$ using G*Power by entering the value of partial η^2. Using Cohen's *f* scale, the size of the effect is considered small. A difference was not detected in the mean SYN scores (pretest and posttest scores combined) between the collaboration treatment group and comparison group. The low indicated that there was a low probability of detecting a difference if there were one.

Regarding the interaction between group and time, there was not a statistically significant interaction effect [$F(1,66) = .380$, $p = .540$)] on the SYN task. In other words, the main effect from pretest to posttest did not change as a result of condition. In the collaboration condition, the mean increased from pretest ($M = 6.18$, $SD = 3.22$) to posttest ($M = 12.71$, $SD = 5.14$). The mean increase that occurred in the comparison condition was similar; the mean increased from pretest

(*M* = 5.71, *SD* = 2.75) to posttest (*M* = 11.55, *SD* = 3.93). The observed power for the within-group and between-group factor was very low (.093) at about 9%. Less than 1% of the variance in SYN scores was accounted for by the interaction between group and time (partial η^2 = .006). Because there was no interaction, a profile plot was not analyzed. A Cohen's *f* effect size was calculated as *f* = .08 using G*Power by entering the value of partial η^2. Using Cohen's *f* scale, the effect size of the interaction was minimal. There was not a detectable difference in the group performance when comparing the pretest to posttest gains in the collaboration group with the pretest to posttest gain in the comparison group. The low power indicated that there was a low probability of detecting a difference if there were one.

In summary, there was a statistically significant increase in the mean score from pretest to posttest within the entire matched group on the SYN task. The size of the effect was large (*f* = 1.36). There was not a statistically significant difference between the groups. The large effect size for time in the absence of an effect for group or interaction reflected gains students made in both conditions from pretest to posttest.

Effect size comparison.

Cohen's *d* effect sizes were computed within each condition by dividing the mean difference by the standard deviation of the difference scores (Cohen, 1988). In the collaboration condition (*n* = 34), the mean difference was 6.52 and the standard deviation of the difference scores was 4.65; this was calculated as a large effect (*d* = 1.4). In the comparison condition (*n* = 34), the mean difference was 5.89 and the standard deviation of the difference scores was 4.62; this was calculated as a large effect (*d* = 1.27). In summary, the size of the effects on the SYN

task were comparably large. The results indicated that the size of the group mean increase from pretest to posttest (within each of the conditions separately) was beyond what would be expected from students' development without the instruction and beyond what would be expected with typical instruction (Hattie, 2009). The large effect sizes in both conditions were within the zone of desired effects (Hattie, 2009).

Research Question Two

When SLPs and teachers implement a vocabulary instructional technique using a systematic collaboration protocol (treatment condition), is there a significant difference in third-grade students' vocabulary scores on a words-in-context task when compared with the scores of students in classrooms where non-collaborating teachers implement a similar technique (comparison condition)? *Hypothesis: There will be a significant interaction between time and condition. The mean vocabulary scores based on time will increase for both groups. There will be larger effects in the collaboration condition.*

Assumptions testing results.

Students were not randomly assigned to groups; therefore, the independence assumption was violated. However, propensity score matching was employed and the assumption of independence was tested. The scatterplot procedure was used to determine if there was evidence of independence. There was evidence of independence at pretest and posttest. The simple scatterplots at pretest and posttest both indicated evidence of a random display of residuals above

and below the horizontal line, with an asymmetrical distribution. The assumption of sphericity did not apply because there were only two measurement points (pretest and posttest).

Normality assumptions were tested using residuals of the pretest WIC scores and the posttest WIC scores. Evidence indicated nonnormality at pretest and posttest. At pretest, there were significant results for the Shapiro-Wilk test (SW = .92, df = 68, p = .000). Although the skewness statistic fell within +/-2 (1.27), the kurtosis statistic did not (3.55). The high kurtosis statistic indicated a leptokurtic distribution with a narrow peak, which was apparent in the histogram. The Q-Q plot revealed some evidence nonnormality with the majority of the points falling on or close to the diagonal line, with one dot away from the line. Examination of the box plot revealed some evidence of nonnormality, with one outlier extending beyond the top whisker. At posttest, there were also significant results for the Shapiro-Wilk test (SW = .956, df = 68, p = .017), indicating the residuals were significantly different from a normal distribution. Skewness (.172) and kurtosis (-1.016) statistics were within +/-2, suggesting evidence of normality. The Q-Q plot revealed many points fell close to the diagonal line and some did not. Examination of the boxplot suggested some normality, with no outliers.

The Grubb's Outlier Test and critical values of Grubb's Outlier (G) Test (1969) were applied to the pretest outlier from the box plot visual analysis. The formula is:

$$G_{max} = M_{max} - M / SD$$

where G_{max} is used if the observed greater than the mean, M_{max} is the extreme value, M is the mean, and SD is the standard deviation. The extreme value was 19; M = 5.34, and SD = 3.24. The critical value for an alpha of .05 and a sample size of 70 was 3.09. The value of $G_{4.22} > 3.09$ indicating the observed value was different from the mean, therefore, that student's WIC scores

were omitted from the analysis. A possible assignable cause of the outlier at pretest was the student's identification as gifted.

With the outlier removed, evidence indicated normality at pretest and posttest. At pretest, there were nonsignificant results for the Shapiro-Wilk test (*SW* = .98, *df* = 67, *p* = .206). The skewness statistic fell within +/-2 (.38), as did the kurtosis statistic (-.08). The Q-Q plot revealed some evidence of normality with the majority of the points falling on or close to the diagonal line. Examination of the box plot also revealed evidence of normality, with no outliers. At posttest there were also nonsignificant results of the residuals for the Shapiro-Wilk test (*SW* = .97, *df* = 67, *p* = .067). Skewness (.216) and kurtosis (-.781) statistics of the residuals were within +/-2, suggesting evidence of normality. The Q-Q plot revealed many points fell close to the diagonal line and some did not. Examination of the boxplot suggested normality, with no outliers.

The assumption of homogeneity of variance was met according to results of Levene's Test of equality of error variances before and after the outlier was removed. Before the outlier was removed, the results of Levene's test at pretest were nonsignificant [$F(1, 66) = .071$, $p = .791$] and at posttest were nonsignificant [$F(1, 66) = .182$, $p = .671$]. After the outlier was removed, the results at pretest again were non-significant [$F(1, 65) = .2.12$, $p = .150$] and at posttest were nonsignificant [$F(1, 65) = .57$, $p = .45$]. Overall, the violations to the assumptions were not severe and an analysis using the two-factor split-plot ANOVA was justified. Violations do, however, increase the chance of Type I or Type II errors and results should be interpreted with this caution.

Two-factor split-plot ANOVA results.

Estimated marginal means and results of the two-factor split-plot ANOVA results for the Words-in-Context (WIC) task are presented in Table 18 and 19. The results were based upon the matched dataset with one outlier removed from the comparison condition (n = 34 collaboration, n = 33 comparison). With the outlier removed, the comparison mean and standard deviation at pretest (M = 5.40, SD = 3.40) and posttest (M = 7.95, SD = 4.67) changed to M = 4.99, SD = 2.44 at pretest and M = 7.67, SD = 4.45 at posttest.

Table 18: *WIC Estimated Marginal Means*

	M	*SE*	95% Confidence Interval	
			Lower	Upper
WIC Time (pre)	5.19	.34	4.51	5.88
WIC Time (post)	9.10	.58	7.94	10.26
Group: Collaboration	7.96	.56	6.85	9.07
Group: Comparison	6.33	.56	5.20	7.46

Table 19: *WIC Two-Factor Split-Plot*

	F	Sig	Partial Eta Squared	Observed Power	Effect Size (Cohen's *f*)
WIC Time	54.08	.000	.454	1.00	.91
WIC Time*Group	5.27	.025	.075	.619	.28
Group	4.25	.043	.062	.530	.26

Regarding the within-group factor, there was a statistically significant difference in WIC scores [F (1, 65) = 54.08, p = .000)] based on time (pretest to posttest). The WIC posttest estimated marginal mean (M = 9.10, SD = 4.93, SE =.58) was significantly greater than the pretest estimated marginal mean (M = 5.19, SD = 2.79, SE = .34). Lower and upper bounds of

pretest scores with a 95% confidence interval were 4.51-5.88 and of posttest scores were 7.94-10.26. The observed power was high at 100%. The results indicated that if there were not actually a statistically significant difference, the probability of seeing a difference between pretest and posttest means as high as the observed value would be less than one time in 1,000. Regarding the size of the effect, approximately 45% of the variance in WIC scores was accounted for by time (partial $\eta^2 = .454$). Cohen's *f* effect size was calculated as $f = .91$ using G*Power by entering the value of partial η^2. Using Cohen's *f* scale of small (.10), medium (.25), and large (.4), the size of the effect was considered large. These results indicated that the significant increase from pretest to posttest within the entire matched group of students (n =67) was not likely due to random variation in the data, but likely due to the robust vocabulary instruction in both conditions. The results also indicated the size of the group mean increase from pretest to posttest was beyond what would be expected from students' development without the instruction and beyond what would be expected with typical instruction (Hattie, 2009). The large effect sizes were within the zone of desired effects (Hattie, 2009).

Regarding the between-group factor, there was a statistically significant main effect [$F(1, 65) = 4.26$, $p = .043$)] based on group. Estimated marginal means of the collaboration group (M = 7.96, SE =.56) differed from the comparison group (M = 6.33, SE = .564); the collaboration group mean was higher than the comparison group mean. Lower and upper bounds for a 95% confidence interval were 6.85-9.07 for the collaboration group and 5.20-7.46 for the comparison group. The observed power was low (.53) at about 53%. About 6% of the variance in WIC scores was accounted for by group (partial $\eta^2 = .062$). The results indicated that if there were not actually a statistically significant difference, the probability of seeing a difference in posttest means between groups as high as the observed value would be 43 times in 1,000. A Cohen's *f*

effect size was calculated as $f = .26$ using G*Power by entering the value of partial η^2. Using Cohen's *f* scale, the size of the effect is considered medium. These results revealed that a significant difference was detected in the mean WIC scores (pretest and posttest combined) between the collaboration treatment group and the comparison group. The estimated marginal mean for the WIC task was larger in collaboration condition and the difference was not likely due to random variation in the data.

Regarding the interaction between group and time, there was a statistically significant interaction effect [$F(1, 65) = 5.27$, $p = .025$)]. In other words, the main effect from pretest to posttest changed as a result of condition. The observed power was 62% (.619). About 8% of the variance in WIC scores was accounted for by the interaction between group and time (partial $\eta^2 = .075$). The results indicated that if there were not actually a statistically significant difference, the probability of seeing a difference in posttest means between the interaction between time and group high as the observed value would be 25 times in 1,000.

Because there was a main effect for interaction, a profile plot was analyzed. As shown in the profile plot in Figure 5, the group mean scores in both conditions increased from pretest to posttest and the lines representing both conditions did not intersect. The mean in the collaboration condition ($M = 5.40$, $SD = 3.13$) was slightly higher than the mean in the comparison condition at pretest ($M = 5.21$, $SD = 3.22$). At posttest, the mean in the collaboration condition ($M = 10.53$, $SD = 5.02$) was higher than the mean in the comparison condition at posttest ($M = 8.18$, $SD = 4.95$). The line representing the scores in the collaboration condition increased with steeper slope from pretest to posttest than that of the comparison condition. Cohen's *f* effect size was calculated as $f = .28$ using G*Power by entering the value of partial η^2. Using Cohen's *f* scale, the effect size of the interaction was considered medium. There was a

detectable difference in the group performance on the WIC measure when comparing the pretest to posttest mean increase in the collaboration group with the pretest to posttest mean increase in the comparison group.

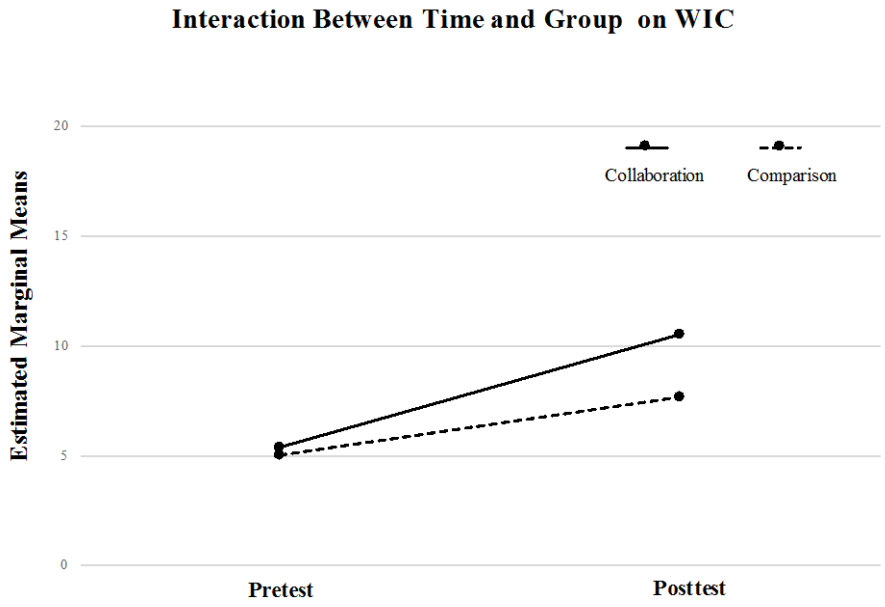

Figure 5: *Plot of Interaction Between Time and Group on WIC*

In summary, there was a statistically significant increase in the mean WIC score from pretest to posttest within the entire matched group, a statistically significant difference in the size of the WIC scores, and a statistically significant interaction effect between from pretest to posttest based on condition. The interaction between time and group revealed greater gains from pretest to posttest in the collaboration condition. The size of the effect was large for the within-group factor (f = .91), medium for the between-group factor (f = .26), and medium for the interaction (f = .28).

Effect size comparison.

Cohen's *d* effect sizes were computed within each condition by dividing the mean difference by the standard deviation of the difference scores (Cohen, 1988). In the collaboration condition (n = 34), the mean difference was 5.13 and the standard deviation of the difference scores was 3.82; this calculated effect size was large (d = 1.34). In the comparison condition with the outlier removed (n = 33), the mean difference was 2.69 and the standard deviation of the difference scores was 4.84; this calculated effect size was medium (d = .56). In the comparison condition with the outlier retained (n = 34), the mean difference was 2.55 and the standard deviation of the difference scores was 4.83; this calculated effect size was medium (d = .53). The results indicated that the size of the group mean increase from pretest to posttest (within each of the conditions separately) was beyond what would be expected from students' development without the instruction and beyond what would be expected with typical instruction (Hattie, 2009). The implications of a larger effect size within the collaboration condition will be discussed in the Discussion chapter.

Research Question Three

When SLPs and teachers implement a vocabulary instructional technique using a systematic collaboration protocol (treatment condition), is there a statistically significant difference in third-grade students' vocabulary and morpho-syntax judgment on a non-examples task when compared with the scores of students in classrooms where non-collaborating teachers implement a similar technique (comparison condition)? *Hypothesis: There will be a significant interaction between time and condition. The mean vocabulary and morpho-syntax judgment*

scores based on time will increase for both groups. There will be larger effects in the collaboration condition.

Assumptions testing results.

Students were not randomly assigned to groups; therefore, the independence assumption was violated. However, propensity score matching was employed and the assumption of independence was tested. The scatterplot procedure was used to determine if there was evidence of independence. There was evidence of independence at pretest and posttest. The simple scatterplots at pretest indicated evidence of a random display of residuals above and below the horizontal line, with an asymmetrical distribution. The residuals at posttest appeared symmetrical above and below the horizontal line. The assumption of sphericity did not apply because there were only two measurement points (pretest and posttest).

Normality assumptions were tested using residuals of the pretest NON-EX scores and the posttest NON-EX scores. Evidence indicated nonnormality at pretest and normality at posttest. At pretest, there were significant results for the Shapiro-Wilk test ($SW = .95$, $df = 68$, $p = .012$). The skewness statistic fell within +/-2 (.76) as did the kurtosis statistic (1.86). The Q-Q plot revealed some evidence nonnormality with the majority of the points falling on or close to the diagonal line, with two dots away from the line. Examination of the box plot also revealed some evidence of nonnormality, with two outliers extending beyond the top whisker. At posttest, there were nonsignificant results for the Shapiro-Wilk test ($SW = .98$, $df = 68$, $p = .520$), indicating the residuals were not significantly different from a normal distribution. Skewness (1.00) and kurtosis (-.33) statistics were within +/-2, suggesting evidence of normality. The Q-Q plot

revealed the dots fell close to the diagonal line. Examination of the box plot suggested normality, with no outliers.

The Grubb's Outlier Test and critical values of Grubb's Outlier (G) Test (1969) were applied to the two pretest outliers from the box plot visual analysis. The formula is:

$$G_{max} = M_{max} - M / SD$$

where G_{max} is used if the observed greater than the mean, M_{max} is the extreme value, M is the mean, and SD is the standard deviation. The extreme values were 17 and 13; M = 5.70, and SD = 2.73. The critical value for an alpha of .05 and a sample size of 70 was 3.09. For the extreme value of 17, $G_{3.66} > 3.09$ indicating the observed value was different from the mean, therefore, the student's Non-Examples scores were omitted from the analysis. A possible assignable cause of the outlier at pretest was the student's identification as gifted. For the extreme value of 13, $G_{2.35} < 3.09$, indicating the observed value was not different from the mean. Therefore, the student's scores were retained in the analysis.

With the outlier removed, evidence indicated normality at pretest and posttest. At pretest, there were nonsignificant results for the Shapiro-Wilk test (SW = .98, df = 67, p = .49). The skewness statistic fell within +/-2 (.17), as did the kurtosis statistic (.28). The Q-Q plot revealed some evidence of non-normality with the majority of the points falling on or close to the diagonal line, with the exception of one dot. Examination of the box plot also revealed evidence of nonnormality, with one outlier. The Grubb's Test was again applied to the extreme value of 13 (this time with the first outlier removed). $G_{2.67}$ was less than the critical value of 3.09 in the Grubb's Table and was retained in the dataset. At posttest there were also nonsignificant results of the residuals for the Shapiro-Wilk test (SW = .99, df = 67, p = .63). Skewness (.03) and kurtosis (-.34) statistics of the residuals were within +/-2, suggesting evidence of normality. The

Q-Q plot revealed all points fell close to the diagonal line. Examination of the box plot also suggested normality, with no outliers.

The assumption of homogeneity of variance was met according to results of Levene's Test of equality of error variances before and after the outlier was removed. Before the outlier was removed at pretest, $F(1, 66) = .022$ and $p = .882$; at posttest, $F(1, 66) = 1.561$ and $p = .216$. After the outlier was removed at pretest, $F(1, 65) = .177$ and $p = .675$; at posttest, $F(1, 65) = 2.473$ and $p = .121$. Overall, the violations to the assumptions were not severe and an analysis using the two-factor split-plot ANOVA was justified. Violations do, however, increase the chance of Type I or Type II errors and results should be interpreted with this caution.

Two-factor split-plot ANOVA results.

Estimated marginal means and results of the two-factor split-plot ANOVA results for the NON-EX task are presented in Table 20 and 21. The results were based upon the matched dataset with one outlier removed from the comparison condition ($n = 34$ collaboration, $n = 33$ comparison). With the outlier removed, the comparison mean and standard deviation at pretest ($M = 5.86$, $SD = 3.28$) and posttest ($M = 8.07$, $SD = 4.03$) changed to $M = 5.53$, $SD = 2.67$ at pretest and $M = 7.80$, $SD = 3.76$ at posttest.

Table 20: *NON-EX Estimated Marginal Means*

	M	*SE*	95% Confidence Interval	
			Lower	Upper
NON-EX Time (pre)	5.70	.34	5.03	6.37
NON-EX Time (post)	8.57	.50	7.57	9.56
Group: Collaboration	7.61	.49	6.62	8.59
Group: Comparison	6.66	.50	5.66	7.66

Table 21: *NON-EX Two-Factor Split Plot*

	F	Sig	Partial Eta Squared	Observed Power	Effect Size (Cohen's *f*)
NON-EX Time	36.32	.000	.358	1.00	.75
NON-EX Time*Group	1.57	.215	.024	.234	.16
Group	1.82	.182	.027	.264	.17

Regarding the within-group factor, there was a statistically significant difference in NON-EX scores [$F(1, 65) = 36.32$, $p = .000$)] based on time (pretest to posttest). The NON-EX posttest estimated marginal mean ($M = 8.57$, $SD = 4.11$, $SE = .50$) was significantly greater than the pretest estimated marginal mean ($M = 5.70$, $SD = 2.73$, $SE = .34$). Lower and upper bounds of pretest scores with a 95% confidence interval were 5.03-6.37 and of posttest scores were 7.57-9.56. The observed power was high at 100%. The results indicated that if there were not actually a statistically significant difference, the probability of seeing a difference between pretest and posttest means as high as the observed value would be less than one time in 1,000. Regarding the size of the effect, approximately 36% of the variance in NON-EX scores was accounted for by time (partial $\eta^2 = .358$). Cohen's *f* effect size was calculated as $f = .75$ using G*Power by entering the value of partial η^2. Using Cohen's *f* scale of small (.10), medium (.25), and large

(.4), the size of the effect was considered large. These results indicated that the significant increase from pretest to posttest within the entire matched group of students (n =67) was not likely due to random variation in the data, but likely due to the robust vocabulary instruction in both conditions. The results also indicated that the size of the group mean increase from pretest to posttest was beyond what would be expected from students' development without the instruction and beyond what would be expected with typical instruction (Hattie, 2009). The large effect sizes were within the zone of desired effects (Hattie, 2009).

Regarding the between-group factor, there was not a statistically significant main effect [$F(1, 65) = 1.82$, $p = .182$) based on group on the NON-EX task. Estimated marginal means of the collaboration group ($M = 7.61$, $SE = .49$) did not differ from the comparison group ($M = 6.66$, $SE = .50$). Lower and upper bounds for a 95% confidence interval were 6.62-8.59 for the collaboration group and 5.66-7.66 for the comparison group. The observed power was low (.264) at about 26%. About 3% of the variance in NON-EX scores was accounted for by group (partial $\eta^2 = .027$). A Cohen's f effect size was calculated as $f = .17$ using G*Power by entering the value of partial η^2. Using Cohen's f scale, the size of the effect was considered small. A difference was not detected in the NON-EX scores (pretest and posttest combined) between the collaboration treatment group and comparison group. The low power indicated that there was a low probability of detecting a difference if there were one.

Regarding the interaction between group and time, there was not a statistically significant interaction effect [$F(1, 65) = 1.57$, $p = .215$)] on the NON-EX task. In other words, the main effect from pretest to posttest did not change as a result of condition. The observed power was low (.234) at about 23%. About 2% of the variance in NON-EX scores was accounted for by the interaction between group and time (partial $\eta^2 = .024$). Because there was no interaction, a

profile plot was not analyzed. Cohen's *f* effect size was calculated as *f* = .16 using G*Power by entering the value of partial η^2. Using Cohen's *f* scale, the effect size of the interaction was small. There was not a detectable difference in the group performance on the NON-EX task when comparing the pretest to posttest gains in the collaboration group with the pretest to posttest gains in the comparison group. The low power indicated that there was a low probability of detecting a difference if there were one.

In summary, there was a statistically significant increase in the mean score from pretest to posttest within the entire matched group on the NON-EX task. The size of the effect was large (*f* = .75). There was neither a main effect for group, nor a significant interaction effect between time and group (i.e., there was not a statistically significant difference between the groups). The large effect size for time in the absence of an effect for group or interaction appeared to reflect gains made by both conditions from pretest to posttest.

Effect size comparison.

Cohen's *d* effect sizes were computed within each condition by dividing the mean difference by the standard deviation of the difference scores (Cohen, 1988). In the collaboration condition (*n* = 34), the mean difference was 3.46 and the standard deviation of the difference scores was 4.14; this calculated effect size was large (*d* = .84). In the comparison condition with the outlier removed (*n* = 33), the mean difference was 2.27 and the standard deviation of the difference scores was 3.62; this calculated effect size was medium (*d* = .63). In the comparison condition with the outlier retained (*n* = 34), the mean difference was 2.20 and the standard deviation of the difference scores was 3.59; this he calculated effect size was medium (*d* = .61).

In summary, the size of the effect was large in the collaboration condition and medium in the comparison condition. The results indicated that the size of the group mean increase from pretest to posttest (within each of the conditions separately) was beyond what would be expected from students' development without the instruction and beyond what would be expected with typical instruction (Hattie, 2009). The implications of a larger effect size within the collaboration condition will be discussed in the Discussion chapter.

Question Four

Do CBAM tools indicate that SLPs and teachers are making progress toward adopting the collaboration protocol? *Hypothesis: Regarding their use of the collaboration protocol, the collaborating teachers and SLPs will achieve a minimum of 80% fidelity as measured by the IC Map. They will also establish Routine use of the protocol by the end of the seven-week collaboration as defined by the Levels of Use scale. Regarding their perceptions of the collaboration protocol, the collaborating teachers and SLPs will express high concerns about management on the Stages of Concern Questionnaire. However, if they can achieve fidelity using the protocol and determine the benefits outweigh the costs, teachers and SLPs may express interest about using the protocol in their practice.*

Levels of Use

All participants were considered "Users" as opposed to "Nonusers" according to the LoU scale (Hall & Hord, 1987). The User categories include Level III Mechanical, Level IVA Routine, Level IVB Refinement, Level V Integration, and Level VI Renewal. Based on

documentation and recordings of the COLLAB Steps submitted before and during the seven-week intervention, both collaborating pairs exhibited characteristics of Routine users of the COLLAB Protocol over the course of the collaboration segment.

Fidelity scores on the SLP/Teacher Collaboration IC Map and COLLAB Guiding Steps provided evidence that all collaborators met criteria as Users. Both sets of partners achieved high fidelity on the IC Map (94-96%). Additionally, both collaboration pairs achieved high fidelity of the COLLAB Guiding Steps required before and after the collaboration segment (88-94%) and acceptable fidelity for steps deemed as high-priority steps to complete every week (79-88% for Steps 10-13). Fidelity of implementation will be discussed in more detail in the Fidelity of Implementation section of this chapter.

According to Hall & Hord (2015), what differentiates the User categories of the LoU scale is, in large part, whether users make modifications to the innovation. Furthermore, the types of modifications, and the reasons for the modifications, distinguish the different levels of use. The script in the branching interview addresses this distinction directly. The first question in the branching interview pertains to whether the adopter of an innovation is using the innovation. All four collaborators in the study indicated that they were using the COLLAB Protocol. Therefore, the researcher asked them if they made any changes in their use of the innovation.

The collaborators in both schools indicated they did not make changes to the structure or intent of the process. Evidence of Routine use (i.e., not making modifications to the COLLAB Guiding Steps) was verified through collaborators' recorded beyond-class-time activities and classroom sessions. The collaborators did acknowledge that the time they were able to give to their collaboration activities beyond class time was dependent upon scheduling and time each person had available. Time and efficiency factors were adaptations the collaborators adjusted for.

When used in practice, the collaborators could make time adjustments as part of their agreements and still follow the intent of the COLLAB Guiding Steps.

The timeframe of 30 minutes per week for beyond-class-time activities was manageable some weeks, but not consistently. The School 1 collaborators spent an average of 22 minutes each week on the activities beyond class time, with a range of 10-30 minutes over the course of the collaboration segment. The School 2 collaborators spent an average of 26 minutes each week on the activities beyond class time, with a range of 10-35 minutes over the course of the collaboration segment. Both SLPs stated the time they were able to devote to Steps 7-9, 11-12, and 14 each week was dependent more on their workload (and each partner's workload) than student need. Additionally, some of the steps, once established in the routine, were understood to continue and were not revisited weekly by the collaborators (e.g., parts of Steps 7, 8, and 9). Adaptations to an innovation to benefit the user are characteristic of Mechanical use. The adjustments the users made regarding time and efficiency have potential to inform acceptable modifications to the COLLAB Guiding Steps.

The third question posed to each collaborator was if they coordinated their use of the innovation with other users, including those not in the original group. Because of the nature of the research study, participants were told they were not allowed to collaborate with anyone other than their partner. They were also not allowed to talk about the COLLAB Protocol until after the study. All collaborators indicated they did not coordinate their use of the COLLAB Protocol with anyone other than their collaborating partner.

The fourth question in the branching interview had implementers consider whether they explored making major modifications or replacing the innovation. Because of the nature of the research study, the collaborators indicated they did not explore modifications or replacement

during the study. Evidence about collaborators' ideas about modifications or replacements after the study was gathered from the recording of their COLLAB Steps 15-16 as well as from the exit interview with the researcher. Their ideas about modifications will be described in the Discussion chapter.

In summary, all the collaborators exhibited evidence of Mechanical and Routine use according to the LoU descriptions (Hall & Hord, 2015). Both pairs achieved a high level of fidelity of the collaboration process as defined by the SLP/Teacher Collaboration IC Map. The primary adjustments partners made to benefit their own ability to use the COLLAB Guiding Steps had to with time they could dedicate each week to the beyond-class-time collaboration activities.

Stages of Concern

The collaborators independently indicated their concerns about the COLLAB Guiding Steps on the SoCQ before and after the intervention period. The term *concern* refers to "the composite representation of the feelings, preoccupation, thought, and consideration given to a particular issue or task" (Hall, George, & Rutherford, 1979). The graphs of each collaborator's SoC profiles are presented in Figure 3. Each SoC is presented on the horizontal and the relative intensity of each concern is presented on the vertical axis. The higher the relative intensity, the stronger the feelings were expressed about questions related to a particular SoC. Conversely, low relative intensities indicate less intense feelings about the questions related to a given SoC. Individuals can have concerns at more than one stage. Additionally, there is a predicted pattern to evolving concerns profiles in the change process (Hall & Hord, 1987, 2015). The ideal progression described by Hall and Hord (2015) is a wave motion of intensities. Before

implementers use an innovation, Self-concerns (i.e., Informational and Personal) are expected to be the most intense. As implementers begin using the innovation, Task concerns (i.e., Management) are expected to rise in intensity and Self-concerns are expected to decrease. Over three to five years, Impact concerns (i.e., Consequence, Collaboration, and Refocusing) are hypothesized to increase and Self and Task concerns are expected to lessen. According to Hall and Hord (2015), this progression can take a few years and the ideal progression does not always occur. Multiple factors influence implementers' adoption of an innovation.

> "*If* the innovation is appropriate, *if* there is sufficient time, *if* the leaders are initiating, and *if* the change process is carefully facilitated, then implementers will move from early Self-concerns to Task concerns (during the first years of use) and, ultimately, to Impact concerns (after 3 to 5 years)" (Hall & Hord, 2015, p. 87).

As shown in Figure 6, individuals' concerns profiles from before initiating the partnership around vocabulary were similar to each of their profiles after the seven-week intervention period. The profile of early use concerns described by Hall and Hord (2015) generally described the trends in the graphs; implementers tended to have higher Self and Task concerns than Impact concerns. The relative intensities regarding Management concerns were high for each collaborator. Interestingly, the relative intensities for Unconcerned were higher post-intervention than pre-intervention for three of the collaborators. This may be an artifact of the research study. In other words, after the study was over perhaps the participants gave less consideration to involvement with the COLLAB Guiding Steps. The low relative intensity of Consequence concerns does not appear to capture the concerns about the impact that the collaborators expressed in discussions with their partners and with the researcher. Individual profiles are discussed in detail below.

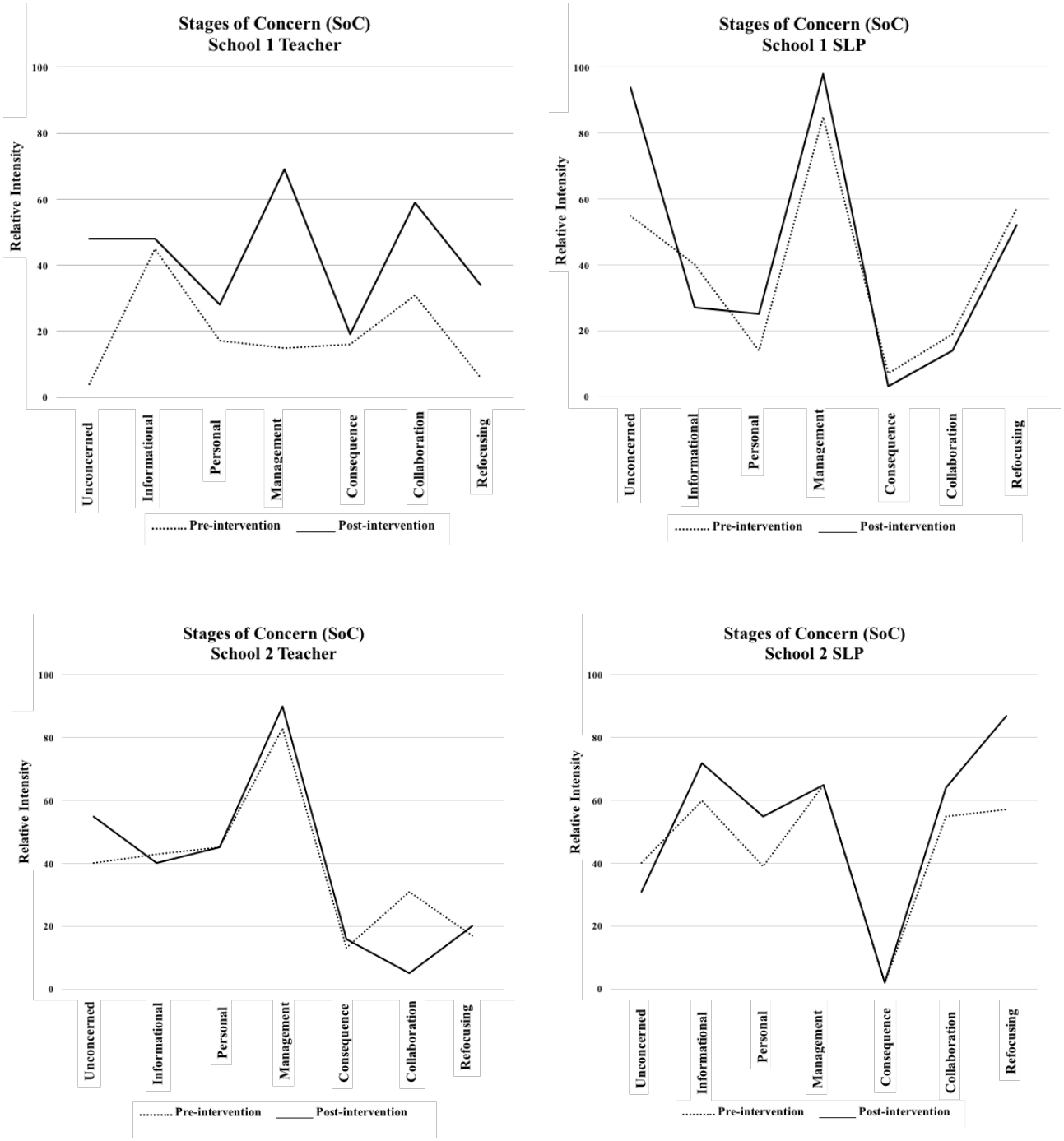

Figure 6: *Concerns Profiles of Each Collaborator*

The teacher in School 1 (top left corner of Figure 6) had a similar concerns profile before and after the seven-week intervention, except for a much higher relative intensity for Management concerns after the collaborative intervention (69%). Relative intensities were higher in all concerns categories after the seven weeks. In their recorded discussion of COLLAB Steps 15-16, the School 1 teacher and SLP partner expressed interest in continuing to collaborate for the remainder of the year and into the next year. They both expressed a need to pare down some of the steps and possibility the time involved.

The teacher in School 2 (bottom left corner of Figure 6) also had a similar profile before and after the seven-week intervention. Two noticeable differences based on visual analysis are a higher relative intensity for Unconcerned after the study and lower relative intensity for Collaboration after the study. Management concerns peaked as the highest relative intensity before (80%) and after (90%) the study.

The SLP in School 1 (top right corner in Figure 6) presented with an almost identical profile before and after the seven-week intervention. Management concerns were remarkably high at both points (85% and 98%). Additionally, a second peak after the study was the high relative intensity for Unconcerned (94%). In the comments section of the SoCQ, the SLP wrote, “I like the idea of collaborating, but I don’t know how to do it in the time I have. The COLLAB framework is good, but it is not a match for my setting.”

The SLP in School 2 (bottom right corner in Figure 6) also presented with an almost identical profile before and after the study. She had slightly higher relative intensities of personal concerns (55%), collaboration (64%) and refocusing (87%) after the study.

As with the teachers, both SLPs expressed an interest in continuing a partnership with their teacher partners incorporating some adaptations. The SLPs voiced Consequence concerns

regarding the progress of students on their caseloads. For example, one SLP explained that if the collaboration results in gains for many students in the class, but does not result in sufficient gains for students with language impairments, the collaborative intervention would need to be adjusted. Additionally, the SLPs discussed Management concerns in their role about how to use the COLLAB Guiding Steps with multiple teachers at the same time. Typically, SLPs serve students multiple classes, grades, and in some cases different schools. The SLPs expressed that with a full caseload and meetings after school most days, there is little time for collaboration activities beyond class time.

Fidelity of Implementation

Many aspects of the study required fidelity checks in the study. The multiple components are organized below according to assessment administration, fidelity of the collaboration process, and fidelity of the vocabulary instruction in both conditions. The research assistants reviewed 90% of the recordings of assessment administration (one of the make-up posttest sessions was not recorded). The researcher also conducted fidelity checks on all recorded VST class sessions, all recorded conversations beyond class time in the collaboration condition, and reviewed all COLLAB logs and emails submitted by the collaborators.

Assessment Administration

The assessors recorded their pretest and posttest administration for fidelity purposes. Additionally, the researcher was at each school during the test administration to help coordinate the set-up, collection of assessments, and to be on call if there were problems. The researcher

could look through windows into each class to monitor the administration of the assessments and verified that the assessments were projected visually on the overhead.

There was some variability with the administration of the pretests in each classroom. Due to the teachers being out of the classroom, behavior management was problematic at times in some of the classes. Students were given processing time to answer the questions, but some of the students finished quickly and would talk or distract others. Multiple redirections were given to remind students that talking was not allowed during the tasks. Additionally, the transition to begin the assessment took longer in one comparison classroom and one collaboration classroom, which limited the time for the last task. In these two situations, most of the items on the NON-EX task were only read once and the response time was shortened. Assessors consistently administered the pretests in the correct order (100%), demonstrated the example items using the think aloud script (100%), and read the task items according the script provided (83%; on NON-EX in both conditions the answer choices were read once instead of twice). The time range for each pretest task (excluding the demonstration items) between all the classes was as follows: SYN (10-12 minutes), WIC (14-16 minutes), and NON-EX (11-17 minutes).

There was less variability between the classrooms with the administration of the posttests. There were fewer redirections for behavior, which was likely due to teachers being in the room, students being more familiar with the routine, and students recognizing the words on the tasks. Assessors consistently administered the posttests in the correct order (100%), demonstrated the example items using the think aloud script (100%), and read the task items according the script provided (100%). The time range for each posttest task between all the classes was as follows: SYN (7-9 minutes), WIC (12-15 minutes), and NON-EX (14-17

minutes). Each task had slightly fewer items than the pretest versions because of the words that were later tossed from the pretest.

Make-up posttests were administered to the children who were absent. The assessors were unable to administer the make-up posttests, so the researcher administered them at both schools in the hallways. In School 1, there was one student from each condition present in the researcher-administered posttests. In School 2, there were three students from the comparison classroom and one student from the collaboration classroom. Task 1 was administered before lunch and tasks 2 and 3 were administered after lunch. One of the researcher-administered posttest sessions was recorded and reviewed by a research assistant.

SLP/Teacher Collaboration IC Map

Both collaboration pairs achieved high fidelity implementing the collaboration process over the course of the seven-week segment as defined by the SLP/Teacher Collaboration IC Map (Appendix F). The School 1 partners achieved 94% fidelity (49/52 points) and the School 2 partners achieved 96% fidelity (50/52 points). All key features were met within the acceptable range. The researcher's calculations were verified by two dissertation committee members with 100% inter-rater reliability, which is discussed in more detail in the inter-rater reliability section of this chapter.

The SLP/Teacher Collaboration IC Map was flexible such that collaborators could achieve the key features in ways that fit their shared style. One area of difference between the collaborating pairs was in how they identified and discussed students' demonstrated language trouble spots. The teachers were in a position to observe student trouble spots during the introduction days. Teachers consistently shared their observations on trouble spots with the

SLPs, however, the approaches were somewhat different. One of the pairs tended to email back and forth and then discuss the emails further in face-to-face conversations. Words to focus on in the co-teaching session were suggested by the teacher as a result of student responses in the introduction days and the SLP planned the stimuli for the co-teaching session and small group. The other pair tended to discuss the teacher's notes and analyze students' miscues in person. The SLP then planned stimulus items for the co-teaching session and small group were based upon the miscue analysis discussion.

A second difference between the pairs was the key feature pertaining to a continued language-scaffolded focus outside of the VST-T+SLP review sessions. Both teachers maintained such a focus by implementing the introduction routines of the VST and by using teachable moments when they occurred to promote generalization of practiced words. There were differences in the ways the teachers used techniques in teachable moments and with how the number of students engaged in the interactions.

A score of three points on the IC Map was given to each collaborating pair in the area of agreeing upon ground rules. When the COLLAB Guiding Steps were developed, they did not include steps to explicitly discuss shared expectations about active participation from both partners, specific positive behavioral interventions and supports (PBIS) to use with students, and a plan for holding each other accountable. Although the partners did not explicitly discuss these topics from the beginning, they demonstrated active engagement and accountability from the beginning. They also continued to use the PBIS systems already established in the classroom. They upheld these ground rules consistently throughout the seven-week intervention.

COLLAB Guiding Steps

Both collaborating pairs achieved a lower fidelity on the COLLAB Guiding Steps than on the SLP/Teacher Collaboration IC map. Not all of the weekly steps needed to be completed by the collaborators every week, particularly once they developed their instructional routines. The high-priority weekly steps were Steps 10-13, which both collaborating pairs implemented with acceptable fidelity every week.

The pair in School 1 achieved 12/13 points (92%) on the steps leading up to the collaboration segment, 53/96 points (56%) of the weekly steps, and 2/3 points on the steps after the collaboration segment, for a total of 60% fidelity. Their fidelity of the high-priority weekly steps was 79%.

The pair in School 2 achieved 13/13 points (100%) on the steps leading up to the collaboration segment, 75/96 points (78%) of the weekly steps, and 2/3 points on the steps after the collaboration segment, for a total of 80% fidelity. Their fidelity of the high-priority weekly steps was 88%.

Vocabulary Instruction

Fidelity was also determined for the VST-T+SLP and VST-GE16 protocols. The introduction day routine was the same in the VST-T+SLP and VST-GE16. The fidelity checklist for the introduction days in both conditions is presented in Appendix E1. Adherence points per session were calculated based on number of checkpoints achieved in the *Cue*, *Do*, and *Review* portions of each session for a total session point score for each session. Fidelity for each session was calculated by dividing the total number of points achieved by the total number of possible

points and dividing by 100. Adherence points for the entire seven-week intervention was calculated by dividing the number of points achieved for all sessions reviewed (excluding sessions with recorder problems) by the number of possible points for all sessions reviewed multiplied by 100. A separate category for session length and instructional time was analyzed; those results are presented in the first section of the chapter. The average adherence percentages for the introduction days, as well as the range of adherence percentages, are presented in Table 19. All four teachers demonstrated high fidelity of implementation of the introduction routine in the VST; the averages ranged from 91-96%. It should be noted that there were recording problems on one of the sessions in a collaboration classroom and one in a comparison classroom; those sessions were not reviewed.

Table 22: *Fidelity of VST Introduction Day Sessions by Class*

Condition	Average Adherence	Range of Adherence
School 1 Collaboration (VST-T+SLP)	92%	79%-100%
School 2 Collaboration (VST-T+SLP)	95%	84%-100%
School 1 Comparison (VST-GE16)	96%	84%-100%
School 2 Comparison (VST-GE16)	91%	84%-95%

The review day routine differed in the collaboration classrooms and the comparison classrooms. In the collaboration classrooms, the SLP and teacher used the VST-T+SLP for the 60 minutes. In the comparison classrooms, the teachers used the VST-GE16 and teacher-chosen

activities for the 60 minutes. The fidelity checklists for the VST-T+SLP is provided in Appendix E2 and for the VST-GE16 in Appendix E3. Adherence points per session, and for the entire intervention period, were calculated the same as they were for the introduction days (but with total possible points adjusted for the review day routines). A separate category for session length and instructional time was analyzed; those results are presented in the first section of the chapter. The average adherence percentages for the review days, as well as the range of adherence percentages, are presented in Table 20.

In terms of adherence for the review day routines, teachers in all four classrooms achieved moderate to high levels of fidelity over the course of the seven-week period. For the VST-T+SLP review day, the fidelity points were spread out over the following components: *Cue, Do co-teaching, Do teacher large group, DO SLP small group*, and the session *Review*. As not all points were achieved in every category every session, the average adherence for both collaborating pairs fell within 80-84% fidelity. However, both groups consistently achieved 88-100% in the co-teaching portion and reviewed at least three words according to the protocol in the large and small group breakouts. The minimum adherence points for both groups (54% and 57%) occurred during week 1. The adherence points were lower for Week 1 for a few reasons. First, the collaborators were not able to practice the review day portion of the VST-T+SLP prior to Week 1. Second, one of the large group teacher sessions did not take place during Week 1 due to a fire drill. Third, one of the small group SLP sessions took place, but the recording was inaudible and the researcher could not score fidelity from it.

In the comparison condition, average adherence was high in one classroom and moderate in the other. The main area where adherence points were missed in the School 2 comparison classroom were in the *Cue* and end of session *Review* portions. The teacher consistently

reviewed each word through the VST-GE16 day 3 *Do* portion according to the protocol. However, on three occasions, the session was cut short and the Show Your Knowledge portion of the sessions did not occur.

Table 23: *Fidelity of VST Review Day Sessions by Class*

Condition	Average Adherence (Weeks 1-6)	Range of Adherence (Weeks 1-6)	Adherence (Week 7)
School 1 Collaboration (VST-T+SLP)	84%	54%-93%	93%
School 2 Collaboration (VST-T+SLP)	80%	57%-95%	100%
School 1 Comparison (VST-GE16 and teacher-chosen activities)	93%	76% - 100%	100%
School 2 Comparison (VST-GE16 and teacher-chosen activities)	77%	43%-95%	43%

In addition to submitting their session recordings, participants verified their use of the vocabulary instructional technique in interactions with the researcher. Participants submitted picture examples of students' PWWs, pictures of their classroom word wall exhibits, attendance logs, and activity logs. Evidence confirming the visual components of the vocabulary instruction was further verified by the researcher in person after the posttests. The researcher saw the PWWs, classroom word wall exhibits, and projectors used during sessions. Additionally, the researcher checked in with each teacher during and after the study to confirm their system of displaying the classroom word wall exhibit for an extra hour each week. All teachers displayed the classroom word wall exhibit (i.e., vocabulary words from the week with content to be included on the front and back of each PWW) for an extra hour beyond the introduction and review day time. One exception occurred in the comparison classrooms in Week 7 when the word classroom word wall exhibit was not displayed.

As part of the exit interview, all participants were asked to confirm whether others were present during their VST instruction and whether they discussed the study with others during the intervention period. Both SLPs had graduate SLP students assigned to them during the school year (they had informed the researcher before the study). The researcher and SLPs discussed that the students could observe the sessions, but were not permitted to take an active part with any aspect of the research. The SLPs both confirmed that their students were not involved in any part of the intervention and that no other adults were present during the co-teaching sessions. An extra adult was noticed in one of the collaboration classrooms during the posttests. The teacher explained that the adult was part of a university partnership program and observed in the classroom on a regular basis. She confirmed this person had no involvement in the study. In the other collaboration classroom, the teacher explained that there were occasionally other adults (i.e., paraeducator, special educator) in the room during VST introduction session at times. Their roles were to support students' behavior. The teacher informed them about the study and told them that they were not to provide instruction on the vocabulary words to the students within or outside the class. In one of the comparison classrooms, the teacher had a paraeducator assigned to the classroom. The paraeducator's role was to provide behavioral support to particular students. The teacher in this classroom also informed the paraeducator about the vocabulary study. She discussed with the paraeducator that the paraeducator was not permitted to provide instructional support related to the vocabulary words or to discuss the procedures used in the study.

Fidelity was also documented in terms of the schedule of instruction and word order of the taught words. Teachers in all four classrooms taught the same sets of targeted vocabulary words in the same order, except for three minor deviations. In one of the comparison classrooms,

the order of the words on Week 1 Day 1 was out of sequence. Also in one of the comparison classrooms, the Week 7 words were taught before the Week 6 words. The third deviation occurred in a collaboration classroom and was due to rescheduling because of snow. The introduction days for Weeks 4 and 5 were completed and then the review days for Weeks 4 and 5 were completed. These minor variations did not appear to impact results.

Other unforeseen situations that occurred did not appear to introduce variation that would impact results. In one of the comparison classrooms, progress monitoring took place during Week 1 of the intervention, leaving little time in the literacy block for all students to be present for the intervention. Therefore, the teacher was one week behind the other three classrooms with the word instruction schedule and snow days further prevented her from getting on the same instructional schedule. The teacher taught the Week 6 words and the three Week 7 words during the final week. There were also a few instances (one in each of the classrooms) of audio recordings that were not submitted. The participants verified that the sessions occurred as per the routine.

Inter-Rater Reliability

Inter-rater reliability was calculated on the administration of the pretests and posttests, the scoring of the pretests and posttests, and fidelity of intervention procedures in the collaboration and comparison conditions. The point-by-point formula for calculating inter-rater reliability agreements/agreements + disagreements x 100% was used (Gast, 2010). In addition, social validity results were verified by research assistants who reviewed the SoCQs, transcriptions, and researcher notes.

Assessment Administration

The researcher compared the fidelity notes taken from one complete pretest recording and one posttest recording (25% of assessment sessions) documented by two research assistants. Each research assistant assigned points according to whether the tasks were administered in the correct order, if the script for the task example items was followed, and if the script was followed for the task items. The point-by-point analysis method was used to calculate inter-rater reliability (Gast, 2010). Inter-rater reliability was calculated at 94%.

Assessment Scoring

A research assistant who was blind to condition scored 25-28% of the pretests in each classroom and 25-28% of the posttests in each classroom. The pretests and posttests were selected by review according to a random numbers generator. The researcher trained the research assistant to the task by reviewing the criteria on for scoring and discussing examples of pretests not selected for the review. Each question received either a + for one point or a – for zero points. The research assistant used the answer key for each task that was provided by the researcher and had constant access to the scoring guidelines. The researcher compared the scoring results she recorded with the scoring results of the research assistant. Every item and the total score were reviewed. Inter-rater reliability on each of the pretest tasks (SYN, WIC, and NON-EX) was 100%. Inter-rater reliability on the posttests was 100% for two of the tasks (SYN and NON-EX) and 99.8% for the WIC task.

In addition to the portion of assessments reviewed by the researcher for inter-rater reliability, research assistants who were not blind to condition also scored the remainder of the

pretests and posttests. The researcher again compared her score to those scored by the research assistants. Most of the differences in the recorded scores were attributable to scorer error and caught through the double-checks. In a few cases, the student markings were unclear and scored differently by the researcher and research assistants. In those cases, the markings were discussed to consensus using the criteria for scoring. The researcher entered all data into SPSS and a researcher assistant double checked the data entry. There was 100% agreement on the data entry.

CBAM Tools

Inter-rater reliability was calculated using each row on the SLP/Teacher Collaboration IC Map as an opportunity for an agreement or disagreement. Some of the key features were subdivided and the last key feature was not applicable for the study (participants did not have student outcome data from the researcher right away). Of the 13 rows on the IC map, the researcher and two committee members agreed on 13/13 (100%) of the ratings for both of the collaboration pairs.

To determine LoU, the committee members also discussed evidence from the COLLAB Steps 1-6, Steps 7-14 for two intervention weeks, Steps 15-16, and the exit interview data. Examples of evidence indicating Mechanical and Routine use were agreed upon by the committee members and the researcher. In addition, a research assistant reviewed the same evidence sources listed above to count the number of COLLAB Guiding Steps that were completed by each collaboration pair. Using the point-by-point method of agreement, inter-rater reliability between the researcher and research assistant on the COLLAB Guiding Steps was 98%.

The researcher and one research assistant scored all the SoC Questionnaires. There was 100% agreement between the researcher's calculated raw scores and percentages with the research assistant's calculated scores.

Vocabulary Instruction

Inter-rater agreement of the VST introduction days in both conditions were calculated by applying the point-by-point formula to the researcher's fidelity checklist total session adherence points with the research assistant's tallied points. Three of the introduction days from each classroom, and a fourth introduction day from one classroom, were used to calculate inter-rater reliability (25% of introduction sessions). Percent of agreement by class ranged from 96-100%. Total agreement was 99.8%.

Agreement was for the review days in both conditions was calculated in the same way as the introduction days. Because there were fewer review sessions than introduction sessions, the fidelity checklists from two complete review instructional sessions was reviewed (29%) for each class. Percent of agreement by class in the collaboration condition was 98% and 92%. Percent of agreement by class in the comparison condition was 98% and 97%.

Chapter Summary

In this chapter, the results of the research were presented. Research questions 1-3 explored vocabulary outcomes of students who were matched in the collaboration condition (n = 34) and comparison condition (n = 34). Vocabulary outcomes of three researcher-created assessments were analyzed. On the first measure, SYN, there was a significant main effect for

time (pretest to posttest) within the entire group (n = 68) and the size of the difference was large (f = 1.36). In other words, the posttest mean score was significantly higher in both groups than the pretest mean score and this difference was not likely due to chance. There was no significant main effect for group, nor was there an interaction effect between time and group on the SYN task. This meant that a statistically significant difference in the mean SYN scores was not detected between the collaboration group and the comparison group. However, when the size of the mean increase from pretest to posttest were analyzed within collaboration group and comparison group separately, the effect sizes for the SYN measure were found to be large (d = 1.4 in the collaboration condition; d = 1.27 in the comparison condition) and in the zone of desirable effects.

On the second measure, WIC, there was a significant main effect for time, significant main effect for condition, and significant interaction effect between time and condition. Additionally, the size of the effect was large for time (f = .91), medium for condition (f = .26), and medium for the interaction between time and condition (f = .28). These results meant that for the entire matched group, the posttest mean was significantly higher than the pretest mean, the difference was not likely due to chance, and the size of the difference was large. Additionally, a difference in the posttest mean scores between the collaboration and comparison conditions was detected. The increase in the students' scores from pretest to posttest as a group were higher in the collaboration condition than the comparison condition and the difference was not likely due to random variation in the data. Rather, the nature of the collaboration condition contributed to a detectable difference based on students' WIC posttest scores. When effect sizes were analyzed within collaboration group and comparison group separately, the effect sizes for the WIC

measure were found to be large in the collaboration condition (d = 1.34) and medium in the comparison condition (d = .56).

The third measure was the NON-EX task. Similar to the SYN and WIC tasks, there was a significant main effect for time within the entire group and the size of the group mean increase was large (f = .75). In other words, the posttest mean score was significantly higher than the pretest mean score and this difference was likely due to the vocabulary interventions and not due to chance. As with the SYN task, there was no significant main effect for group, nor was there an interaction effect between time and group on the NON-EX task. This meant that a statistically significant difference in the posttest mean scores was not detected between the collaboration group and the comparison group. However, when the size of the mean increase from pretest to was analyzed within collaboration group and comparison group separately, the effect size of the NON-EX measure was found to be large in the collaboration condition (d = .84) and medium in the comparison condition (d = .63).

Regarding indicators of progress toward adopting the COLLAB Protocol (research question 4), there were indicators that both collaboration pairs evidenced early stages of adoption when supported by the structure of the research. Within the seven-week segment, both collaboration pairs were able to achieve high fidelity (94% and 96%) on the SLP/Teacher Collaboration IC Map. Additionally, each of the collaborators exhibited Mechanical and Routine levels of use of the COLLAB Protocol. The collaborators each had a unique concerns profile; each collaborator's individual profiles were similar from pre-intervention to post-intervention. Overall, collaborators' Task/Management concerns were more intense than their Impact concerns, which according to change research, is to be expected after such a short time implementing a new practice (Hall & Hord, 2015). Both collaborating pairs indicated a desire to

continue their partnership, but expressed an intention to make modifications to the COLLAB Guiding Steps to accommodate their Management concerns. At this early exploration stage of the COLLAB Protocol, it is unclear what changes could be made to the COLLAB Guiding Steps that would still result acceptable fidelity of the key features of collaboration as defined by the SLP/Teacher Collaboration IC Map. Nonetheless, the findings have meaningful implications for practice and inform areas of future research.

CHAPTER FIVE: DISCUSSION

There were two main objectives of this study. The first objective was to investigate whether literacy partnerships between SLPs and third-grade general education teachers, who used systematic collaboration protocol, yielded better vocabulary outcomes for students than teachers instructing without collaborating with SLPs. The second objective was to examine indicators of collaborators' progress toward adopting a specific collaboration protocol. The first three research questions explored whether collaboration between SLPs and third-grade general education teachers resulted in greater vocabulary gains for students than for students in non-collaborative classrooms on three researcher-created vocabulary measures. The measures were the SYN, WIC and NON-EX tasks. The fourth research question examined indicators of collaborators' progress toward adopting the COLLAB Protocol as measured by CBAM tools (Hall & Hord, 2015): Innovation Configuration Map (IC Map), Levels of Use (LoU), and Stages of Concern (SoC). In this chapter, a discussion is presented around the interpretation of the findings of each research question, social validity considerations, limitations, practical implications, and recommendations for future research.

Discussion of the Findings

Research Question One

When SLPs and teachers implement a vocabulary instructional technique using a systematic collaboration protocol (treatment condition), is there a significant difference in third-grade students' vocabulary scores on a synonyms task when compared with the scores of

students in classrooms where non-collaborating teachers implement a similar technique (comparison condition)?

The results of the two-factor split-plot ANOVA for the matched groups revealed a significant main effect from pretest to posttest within the entire matched dataset; however, there was neither a significant main effect for group (collaboration versus comparison condition), nor an interaction between time and group. Parts of the hypothesis were supported. The mean vocabulary word scores based on time increased for both groups. The significant increase in the group mean from pretest to posttest can be attributed to the robust vocabulary instruction in both conditions. Parts of the hypothesis were not supported. There was no detectable difference in the pretest to posttest group mean increase between the two groups.

A possible explanation for the absence of a detectable difference between the groups from pretest to posttest may be due to the mean gains in both groups (collaboration and comparison conditions) being comparably large. The language-scaffolded environments in both conditions facilitated definitional word learning at the word level. The purpose of the SYN measure was to assess students' knowledge of target words. For each item, the target word was presented as it was introduced in the scenarios. The language-scaffolded environments in both conditions resulted in large effect sizes. In both conditions, the effects were largest for the SYN task. The SYN task was perhaps the easiest of the three measures because there were not sentence-level processing demands.

The results of this analysis were commensurate with previous research investigating the effects of robust vocabulary instruction on definitional outcomes. For example, Spielvogel (2011) found significant gains on vocabulary outcomes using the VST-GE16 with fourth graders. In that study, the researcher implemented the VST-GE16 in a treatment condition and compared

results with typical vocabulary instruction delivered in a comparison condition. The robust vocabulary instruction in the treatment condition resulted in a large effect for the SYN task (partial eta squared = .30, n = 20). Large effect sizes from two studies using definitional word-specific measures were also reported by Stahl and Fairbanks (1986). Stahl and Fairbanks (1986) calculated effect sizes as $ES = M_{\text{treatment}} - M_{\text{control}} / SD_{\text{control}}$. In the first study, Beck, Perfetti, and McKeown (1982) incorporated instruction with definitional and contextual information, student generated sentences, and multiple encounters. A large effect size (ES = 1.360) was reported. In a second study, McKeown, Beck, Omanson, and Perfetti (1983) also incorporated definitional and contextual information, student generated sentences, and multiple encounters in robust vocabulary instruction with fourth graders and a large effect size was reported (ES = 6.150). In a more recent study with sixth graders (N = 476), Lesaux et al. (2010) reported a small to medium effect of vocabulary instruction on academic vocabulary words on a researcher-created multiple choice test (d = .39). It was not surprising that large effects were found in both conditions in the study, as robust vocabulary instruction using a tested technique was implemented in both conditions.

In this analysis, the researcher did not disaggregate the data for students with language learning disabilities (LLD), as only one student in the matched sample received language services from an SLP. Of the few students receiving language services in the study, two were second graders (who were excluded from the analysis) and five were unmatched students from the comparison condition. The issue of how students with significant language problems perform with the SLP involvement needs to be examined in future analyses to investigate the hypothesis that students with LLD would make greater vocabulary gains if in an SLP collaborative classroom than if they were not. Based on the large gains in both conditions, it is likely that

students with LLD would show greater gains on the SYN task than tasks with syntactic processing demands.

Research Question Two

When SLPs and teachers implement a vocabulary instructional technique using a systematic collaboration protocol (treatment condition), is there a significant difference in third-grade students' vocabulary scores on a words-in-context task when compared with the scores of students in classrooms where non-collaborating teachers implement a similar technique (comparison condition)?

Like the SYN measure, a significant difference within the entire matched group was detected, with the posttest mean being greater than the pretest mean. Unlike the SYN measure, there was also a significant difference detected between the two groups from pretest to posttest. The mean WIC score in the collaboration group and the gains made from pretest to posttest were larger in the collaboration group. The hypothesis was supported. The mean vocabulary word scores based on time increased for both groups, there was a difference in the gains between the groups, and the gains were larger in the collaboration condition.

The significant main effects for group and the interaction between time and group reflected that the language-scaffolded environment in the collaboration condition facilitated word learning that was detected by the WIC measure. The purpose of the WIC measure was to assess students' knowledge of target words as well as variations of target word forms as they were presented in the instructional scenarios. Some of the word choices on the WIC measure were in the same word form that students learned and practiced the words on the introduction days of the VST. However, some forms of the target words students learned on the introduction days were

changed to fit the context of stimulus sentences on the WIC measure. A different level of metalinguistic processing was required in the WIC task than the SYN task. In the WIC task, students had to apply knowledge of word meanings in various word forms to correctly identify which word (from a choice of five) was the correct choice to fill in the sentence blank. The context clues in the sentences were subtle; explicit definitions were not embedded in the sentences. Thus, the WIC task introduced processing demands that required more nuanced word meaning knowledge and that involved comprehension at the sentence level. The larger gains in the collaboration condition were noteworthy because they signaled differences between the language-scaffolded environments. It appeared that the SLPs' expertise informed more robust language scaffolding in the language environment that made a difference in the metalinguistic skill that was employed in the WIC task.

There appeared to be qualitative differences in the language-scaffolded environments in the two conditions. In the collaboration condition, planned and in-the-moment scaffolding techniques used during the VST sessions were based upon students' demonstrated trouble spots. The SLPs were not simply extra helping hands in the room. Rather, they jointly planned and modeled critical thinking word study activities (e.g., meanings, nuance, and form). The synergy between the SLP and teacher resulted in a highly-scaffolded language environment during the VST-T+SLP sessions. Based on the researcher's observations about the language environment, in the collaboration condition there appeared to be more:

1. Opportunities for classroom dialogue during co-teaching sessions.
2. Soliciting reasons from students why learning vocabulary words is important.
3. Opportunities for students to engage in productive task-focused talking; less managing of student talking from a behavior standpoint.

4. Guided encounters with in-the-moment strategic scaffolds.
5. Guided examples and non-examples.
6. Meta-conversation about nuanced meanings and word forms.
7. Checking students' meaning, providing words to help students express their intended meanings.

The highly-scaffolded language environment was not a by-product of the collaboration; it was a key feature of the COLLAB Protocol. Before the study began, the SLPs completed the module on language scaffolding to better understand the researcher's expectation that they would intentionally model and share specific types of scaffolds (Appendix H). The difference in the language environments, as a result of SLP involvement, was a plausible explanation of the significant main effect of the interaction.

The results of this analysis are commensurate with previous investigations where the effects of robust vocabulary instruction on context outcomes were examined. For example, in Spielvogel's (2011) study previously mentioned, the robust vocabulary instruction in the treatment condition resulted in a significant gain and a large effect for the WIC task (partial eta squared = .56, n = 20). A large effect was also calculated for a study conducted by Stahl (1983) in the Stahl and Fairbanks (1986) review that included a sentence cloze task. Stahl and Fairbanks (1986) calculated effect sizes as $ES = M_{\text{treatment}} - M_{\text{control}} / SD_{\text{control}}$. Stahl (1983) investigated the effects of definitional and mixed approaches (definitional and contextual information) to instruction with fifth graders. The vocabulary instruction was characterized by a definitional emphasis, a balance between definitions and contextual information, sentence generation, and multiple exposures. The effect size for the definition approach was ES = 1.421 and for the mixed approach was ES = 2.044. In a more recent study with sixth graders (N = 476), Lesaux et al.

(2010) reported a small effect of vocabulary instruction on academic vocabulary words on a researcher-created test that required knowledge of targeted words' meaning in context (d = .20). The smaller effect size in the Lesaux et al. (2010) study may have been due to differences in the content of the context-based task. The items on the context measures in the Lesaux et al. (2010) study included items measuring global comprehension of expository passages, inferences about statements in the expository passages, and identification of synonyms of taught words from the context of the passages.

Investigations of effects of an SLP's involvement on the vocabulary growth of students with LLD in collaborative conditions are warranted. Based on the difference detected in the gains between the collaboration condition and the comparison condition, there are differences in the metalinguistic knowledge and application of word meanings in context captured by the WIC measure that would be critical for students with LLD. Findings about students' metalinguistic knowledge and correct usage of words in sentences may be more meaningful measures of depth of word knowledge than synonyms alone.

Research Question Three

When SLPs and teachers implement a vocabulary instructional technique using a systematic collaboration protocol (treatment condition), is there a statistically significant difference in third-grade students' vocabulary and morpho-syntax judgment on a non-examples task when compared with the scores of students in classrooms where non-collaborating teachers implement a similar technique (comparison condition)?

The results of the two-factor split-plot ANOVA for the matched groups revealed a significant main effect from pretest to posttest within the entire group; however, there was no

detectable difference between the groups. Although part of the hypothesis was not supported (there was not a significant main effect for group or for interaction between time and condition), two parts of the hypothesis were supported. First, the mean NON-EX mean score increased for the entire matched group from pretest to posttest. The significant increase in the group mean from pretest to posttest can likely be attributed to the robust vocabulary instruction in both conditions. Second, the effect size was slightly larger in the collaboration condition than in the comparison condition. The difference in the effect sizes may have been due to differences in the language-scaffolded environments between the two conditions.

The purpose of the NON-EX measure was to assess students' judgements about word meanings and morpho-syntax usage at the sentence level. Target word forms, as well as word family variations (e.g., baffled, baffles, baffling), were used in three sentences. The NON-EX task required a different level of metalinguistic processing than the SYN and WIC tasks. In addition to understanding the meaning of target words, students had to recognize how the target words, and word family variations, were supposed to be used regarding morphology and syntax. The stimulus sentences included a variety of sentence structures, some of which may have been developmentally challenging for third graders. Interestingly, when scoring the assessments, it was noticed that some students answered a target word correctly on either the SYN or WIC task, but incorrectly answered the NON-EX task with the same target word (or word family variation). The converse was also true; students at times answered target word items correctly on the NON-EX task and incorrectly answered items with the same target word or variation on the SYN or WIC task. Occurrences like these may indicate guessing; however, they may also highlight Beck et al.'s (2013) continuum of partial knowledge of a word to full knowledge of a word. For example, the NON-EX task was challenging in that the stimulus items could have been incorrect

for a number of reasons (e.g., nuance, part of speech, verb tense). Additionally, many of the sentences contained compound and complex forms, which required the processing of complex text. These challenges were not as prevalent in the SYN or WIC tasks, which presented word choices and opportunities for process of elimination based on word meaning.

Although there was neither a significant main effect for group nor an interaction effect between time and group on the NON-EX task, the differences between the effect sizes in each condition is again noteworthy. The differences matter because of the implications highly-scaffolded language environments have on students' meaning-making. A particular focus on scaffolding using non-examples incorporated in only the collaboration condition warrants discussion. A focus on non-examples in the co-teaching portion of the collaborators' review day was included based on recommendations by vocabulary scholars (e.g., Beck et al., 2013).

Non-examples provided a flexible context for which collaborators could design role play, pose strategic questions, and explore with students why words worked or not in specific contexts. In other words, the non-examples scaffolding technique facilitated metalinguistic discussions. Both collaborating teachers reported that the non-examples role play and storytelling led by the SLPs were fun and engaging for students. The SLPs in both classrooms designed and led the co-teaching portion of the VST-T+SLP review days with input from the teachers. Teachers provided input about difficulties students had understanding and using words from the week. Although both collaboration pairs were provided with stimulus items from the researcher, the SLPs and teachers tailored the stimulus items to their own students. For example, one of the SLPs structured the non-examples as stories. The stories were personal to her own life, the teacher's life, or related to classroom events with which the students were familiar. She provided background information in an extended form of a scenario and led up to a contrast with a non-

example. From there, all students had opportunities to respond with physical gestures about if they thought she used the word correctly. Students, the SLP, and the teacher then engaged in a classroom discussion about if the target word was used correctly or not and other ways to use the word.

The second SLP and teacher structured the non-examples as short role-play scenarios. Again, the SLP and teacher tailored stimulus items to their students' background experiences and to their own lives. The SLP led the scenario and the teacher responded with a non-example response. All students had opportunities to respond with physical gestures or were randomly called upon by picking sticks with names. Students, the SLP, and the teacher then engaged in a classroom discussion about whether the target word was used correctly and about other ways to use the word. The SLP also provided pictures to represent the words explored in this way. Partners discussed with students the connections between the images and the meanings of target words.

Other studies have used sentence anomaly tasks as measures of word knowledge. The results of this analysis are commensurate with medium to large effects reported by Stahl & Fairbanks (1986) in two studies (Ahlfors, 1979; Stahl, 1983) involving sentence anomaly tasks following robust vocabulary instruction with sixth graders. Ahlfors (1979) compared the effects of instructional procedures involving context, definition, and experience on sixth graders' vocabulary knowledge as measured by immediate and delayed sentence anomaly tasks. Stahl and Fairbanks (1986) calculated effect sizes as $ES = M_{\text{treatment}} - M_{\text{control}} / SD_{\text{control}}$; effect sizes from the three approaches ranged from .661-1.710. Similarly, Stahl (1983) reported large effects with fifth graders on sentence anomaly tasks (ES = 1.347, ES = 1.864) following instruction characterized

by a definitional emphasis, a balance between definitions and contextual information, sentence generation, and multiple exposures.

Future research investigating metalinguistic knowledge as measured by non-examples with students who have LLD would inform instructional approaches using such stimulus items. The SLPs reported that some lower performing students (including students requiring language services) had much more difficulty recognizing non-examples and explaining why the non-examples were incorrect. Because non-examples provide opportunities for deep and active processing, assessments that detect incremental growth of metalinguistic knowledge involving non-examples may be warranted in practice and research. The NON-EX task used in this study has potential to serve this function.

Research Question Four

Do CBAM tools indicate that SLPs and teachers are making progress toward adopting the collaboration protocol?

A second purpose of the study was to examine indicators about progress the users made toward adopting the collaboration protocol in their practice. Indicators about adoption have potential to inform the practicability of the collaboration protocol for teachers and SLPs to utilize in their settings. A collaboration protocol found to be effective is only useful if it is used in practice. Fidelity and feasibility are important issues to explore when attempting to design protocols the users will have success implementing and will perceive as doable. To explore collaborators' progress toward adoption of the COLLAB Protocol in their practice, the three CBAM tools were used: IC Map, LoU, and SoC (Hall & Hord, 1987, 2015). This framework was used because it was designed to measure implementation change in educational settings. CBAM

was originally developed by Hall and Hord in the 1970s. The tools have been validated by research over time and remain current (Hall & Hord, 2015).

Fidelity progress and adoption.

Use of an innovation is not simply a matter of whether educators use an innovation or not, but rather about how they use it (Hall & Hord, 2015). Fidelity of innovation implementation and levels of use are indicators about how educators use an innovation in their practice. The SLP/Teacher Collaboration IC Map was needed because there is no other tool currently that defines the construct of collaboration according to measurable key features and serves as a treatment fidelity measure. The SLP/Teacher Collaboration IC Map defined for the collaborators what they were supposed to do. The COLLAB Guiding Steps provided the collaborators with a systematic sequence to follow in order to meet acceptable criteria of the key features on the IC Map.

The collaborators achieved high fidelity of implementation (94-96%) of the collaboration process as measured by the SLP/Teacher Collaboration IC Map. Their adherence to the key features, or active ingredients, of the IC Map were indicators of fidelity. Additionally, their adherence to the COLLAB Guiding Steps before, during, and after the collaboration segment provided insight into which steps were critical for achieving fidelity on the IC Map. For example, Steps 7-9 and 14 were not implemented with regularity, particularly after the collaborators had established their collaboration routines around the VST-T+SLP. Collaborators expressed that some of these steps felt redundant. They did not feel the need to revisit the steps every week because they continued to maintain instructional foci and arrangements from the previous week(s). Steps that were consistently repeated weekly were Steps 10-13, which

appeared to be high-priority steps in terms of leading toward high fidelity of the active ingredients of the SLP/Teacher Collaboration IC Map.

Teachers and SLPs expressed that the process became more familiar as they got used to it. For example, one teacher stated, “It does require that you take the time to do it at first, but once we set it up, it just kind of starts cruising.” She further explained the prompts in the COLLAB Guiding Steps were helpful when getting started, but then the partners did not rely so much on them. However, they could return back to the COLLAB Guiding Steps like a reference manual. An SLP expressed a similar sentiment by stating the structure became familiar, they kept much of their structure the same from week to week, and they became more efficient over time.

After the study concluded, both collaborative pairs expressed a desire to continue their partnerships. They discussed making adaptations moving forward such that the process would be less complicated, but that would still benefit their students. For example, one of the pairs discussed repeating the collaboration segment using the VST-T+SLP to teach Tier Two words in the beginning of the next school year. The other pair discussed breaking the collaboration segments into curriculum units, continuing a focus on vocabulary, incorporating vocabulary notebooks, and using more Quality Teaching for English Learner (QTEL) techniques (WestEd, 2010). These discussions provided evidence of emerging Integration levels of use. At the Integration level of use, two or more users plan and implement adaptations that will benefit students.

Evidence about collaborators’ ideas about modifications or replacements after the study was gathered from the recording of their COLLAB Guiding Steps 15-16 as well as from the exit interview with the researcher. There was evidence from the teachers and SLPs about ideas for Refinement in terms of changes they would like to make to benefit students. There was also

evidence of modifications they would like to make in order for the process to be more manageable and efficient, relating back to Mechanical use. Examples of Refinement considerations included:

- Incorporating more QTEL aspects in co-teaching sessions to allow for more student conversation and practice opportunities instead of the small group portion.
- Holding each other accountable to the collaboration activities beyond class time when the built-in accountability as part of the research is not there.
- Planning for future segments (e.g., by theme, storybook units, or incorporating other Tier Two vocabulary words).
- Paring down the steps of the COLLAB Guiding Steps so they are not so complex; pinpoint the important pieces (e.g., What do we want to teach? What are the language underpinnings? What is going to be hard? What do we do? Did we do it? What do we keep? What do we change?).

The hypothesis about fidelity and levels of use was supported. Despite a short duration implementing the COLLAB Protocol innovation, all four collaborators achieved high fidelity and demonstrated Mechanical and Routine use. High fidelity and Routine use by both collaboration pairs after only seven weeks is promising in terms of potential for the COLLAB Protocol to be a practical option as a collaboration model for teachers and SLPs.

Concerns and adoption.

The collaborators' thoughts, perceptions, and beliefs (i.e., *concerns*) about using the COLLAB Protocol were indicators of progress toward adoption (Hall & Hord, 2015). The

researcher's hypothesis about the SLPs' and teachers' Management concerns was supported. The collaborating teachers and SLPs expressed concerns with high relative intensities about Management on the SoCQ. This trend was to be expected when implementing any new practice after such a short amount of time. According to the implementation change research, the shift from high intensities of Task/Management and low Impact concerns to low Task/Management and high Impact concerns can take three to five years (Hall & Hord, 2015). Interpretations of specific categories of concerns are presented below.

The collaborators acknowledged that much of what added to their *Task/Management* concerns was related to the research aspect of the intervention. As part of the research, collaborators had to learn the protocol in a few weeks before the intervention began. There was consensus that navigating the professional learning modules was cumbersome and could have been made easier in a face-to-face setting. The collaborators also had to submit evidence to the researcher on a regular basis throughout the collaboration segment.

The weekly COLLAB Guiding Steps template was overwhelming and took a great deal of time to complete in writing. The collaborators switched to recording their conversations and sending related parts of emails to the researcher as evidence of having completed the COLLAB Guiding Steps. The recordings of the collaborators' conversations allowed the researcher to document details that may otherwise have been left out of collaborators' own written logs. Scheduling was also a constant challenge for the collaborators. They had to schedule their conversations beyond class time, as well as their class sessions, within a strict weekly timeframe. The timeframe which was further complicated by multiple snow days. Practicability concerns such as these revolve around the research protocol. However, implementation does not have to be as time consuming and as a tightly controlled as a research study.

The collaborators also acknowledged their Task/Management demands apart from the demands of the research. Both collaborating pairs expressed an interest in continuing a partnership with their SLP partners with some adaptations to the COLLAB Protocol. In School 1, the partners resumed the type of partnership they had before the study and expressed a desire to repeat the collaborative intervention again in the next school year. In School 2, the partners also resumed the type of partnership they had before the study and continued to use some aspects of COLLAB Guiding Steps and robust vocabulary instruction. Adoption of an innovation, however, requires that the innovation still be implemented as defined by the IC Map. If the SLPs' and teachers' Management concerns impact their use of the COLLAB Protocol, fidelity as measured by SLP/Teacher Collaboration IC Map may be lower after the study. Additionally, when users adopt a new innovation, their progress depends on the types of supports they receive during the course of adoption. In a sense, the research provided many of the supports needed in early adoption. For users to adopt the COLLAB Protocol in their practice, users would need to receive tailored supports over a longer period to sustain its use (Hall & Hord, 2015). The form that such tailored supports would have to take is fodder for future research.

Regarding *Personal* concerns, one SLP demonstrated higher personal concerns after the study than before the intervention began, which was unexpected. Her higher personal concerns after the study may have reflected her interest in learning more about how to make the collaboration process sustainable and her role within it. The SLP had a leadership role within the SLP language/literacy committee. Through discussions with her, it was apparent she was interested in exploring ways to make the collaboration process effective, efficient, and sustainable for herself. She also expressed interest in coaching SLPs who are interested in forming literacy partnerships with teachers. As the study concluded, she was planning

professional learning opportunities ideas for a small group of SLPs around literacy interventions in the classroom. The high relative intensities around collaboration (64%) and refocusing (87%) appeared to reflect her considerations about her own use of the COLLAB Guiding Steps with the same teacher partner and her plan to engage in continued discussions around collaborative services with the SLP group.

The low relative intensities of *Consequence* concerns based on the SoCQ for all of the collaborators did not appear to match their overt concern with how students performed as a result of the collaboration. Between their discussions with each other and their exit interviews the researcher after the study, the collaborators often referenced their students' engagement and performance. For example, in the recorded conversation with her teacher partner, one SLP explained, "I absolutely want to keep doing classroom-based services, no matter what. The question is, how? I need to focus on the kids on my caseload… I cannot wait to see, does this work for kids with language disorders?"

An interesting finding was the higher relative intensity of *Refocusing* concerns by one teacher and one SLP at post-intervention when compared to pre-intervention. Refocusing concerns refer to ideas about alternatives of existing forms of an innovation with the focus on exploring more global benefits. This finding is important. The COLLAB Protocol is in the early stages of research and participants' insights about changes may inform future versions of guiding steps. For example, it would be worthwhile to investigate if a high level of fidelity with the SLP/Teacher Collaboration IC Map can be achieved if guiding steps not needed on a regular basis within a collaboration segment are pared down. The collaborators' concerns informed what users might need to consider when adopting the COLLAB Protocol.

It is difficult to predict what the CBAM tools would have revealed had collaborators' concerns and levels of use been measured over a longer period of time, because scholars who study the change process indicate that change takes time (Elmore, 2004; Fullan, 2004; Hall & Hord, 1987; Hall & Hord, 2015). The collaborators achieved Routine use with the process when applied to a vocabulary instructional technique that also became familiar to them. Two of the collaborators also evidenced Refocusing concerns with the process and content that were familiar to them. If partners designed another vocabulary-focused segment, it is likely the partners would continue to exhibit Routine use or begin to make changes in the process that have greater benefit for students. If they designed a segment with different instructional foci and different ways to analyze student progress, the partners may exhibit more characteristics of Mechanical use. Additionally, even if an SLP were to become a Routine user, new teacher partners in the collaboration would need support to achieve Mechanical use. According to Hall and Hord's (2015) research, high relative intensities of Management concerns would be expected for a few years for most users of a new practice.

Social validity.

Data from research question four provided evidence of social validity. The levels of social validity explored were those recommended by Wolf (1978). The first level related to the whether the *goals* of the collaboration process were what collaborators wanted. The second level related to the acceptability and appropriateness of the *procedures* and whether the effort was deemed worthwhile. The third level related to the extent to which the collaborators were satisfied with the intended and unintended *results*.

The goals of the collaboration protocol were to provide SLPs and teachers with a systematic process to engage in shared creation where partners could jointly identify and solve language-related problems. Specific goals were to facilitate collaborators' shared decision-making behaviors to establish a partnership, identify trouble spots from a language perspective, determine a language-scaffolded instructional focus for the collaboration, determine a plan for measuring student performance, jointly implement a shared plan with highly interactive language scaffolding, analyze student performance, and adjust instruction based on student performance. The rationale for the behavioral goals for the collaborators was based upon the need to support students in acquiring academic literacy skills.

The goals of the collaborators were in accord with the goals of the collaboration protocol. The collaborators expressed their goals and expectations regarding perceived benefits of the collaboration as part of COLLAB Guiding Steps 1-5 before the study began. Two collaborating partners explained their goal of strengthening their existing partnership such that there was more shared decision-making, planning, and implementation of instruction. The partners expressed the following perceived benefits of using the collaboration protocol around the VST-T+SLP. First, students would have a greater understanding of word meanings. Second, the SLP would have a better understanding of students' needs and strengths. Both collaborating pairs expressed possible benefits to them as partners were to have opportunities to: (a) discuss and work together that otherwise would not happen, (b) learn a vocabulary technique together, (c) streamline data collection, (d) tailor scaffolds to students, and (e) provide enriched differentiated learning experiences for students.

The collaborators expressed their views on the appropriateness and feasibility of the collaboration protocol procedures during their recorded conversation of COLLAB Guiding Step

16 and in exit interviews with the researcher. They shared what they believed to be acceptable parts of the procedures and what they felt were unfeasible. One of the collaboration pairs expressed that an acceptable component of the protocol was that it forced them to talk when schedules might have otherwise caused them to miss meetings with each other. The SLP explained this was a critical piece for them because the discussions were what allowed her to connect language instruction to the classroom curriculum. It could have been the nature of the study, and not the protocol itself, that forced the accountability. Nonetheless, the COLLAB Guiding Steps were designed to facilitate conversations between partners, including how partners plan to hold each other accountable. A question worth exploring is whether simplifying the COLLAB Guiding Steps will yield greater buy-in from collaborating pairs and result in similar student outcomes.

The collaborators expressed that a second acceptable component of the collaboration protocol was the structure of the COLLAB Guiding Steps. The protocol used the same structure every week and both pairs expressed that the structure became more familiar as they got used to it. A common sentiment reported by the collaborators was that they became more efficient over time.

A third component of the protocol all the collaborators agreed upon as a benefit was the co-teaching aspect. For example, one teacher expressed, “I think the most beneficial part for me and for a lot of my students was when you came in and watched them play with the words in the different ways. It was that whole discussion of it- that’s how you change the word, or that’s not how you use it, or it’s supposed to be past tense or not. That’s where I saw the most bang for our buck. It was that team bit.” One collaboration pair continued co-teaching after the study and the

other pair indicated their plan to repeat the collaborative intervention using the VST-T+SLP in the fall of the next school year.

The collaborators also expressed what they believed about the procedures to be unfeasible. There was consensus that the time required to implement all the weekly steps of the COLLAB Guiding Steps was overwhelming. They acknowledged that part of the time demands had to do with the nature of the research study; however, they still needed a great deal of time to meet and plan. They shared that some weeks they were not able to devote as much time to the collaboration activities beyond class time due to a heavy workload and scheduling conflicts. Additionally, the SLPs explained that the idea of using the COLLAB Protocol with more than one teacher at a time seemed unfeasible. The researcher further discussed this concern with the SLP participants to brainstorm ways to resolve this issue. One consideration discussed included setting different parameters within the COLLAB Protocol with partnering teachers. For example, SLPs and teachers could consider different durations of collaboration segments and different time parameters within segments. A second consideration discussed was the possibility of exploring whether one SLP could partner with grade-level teachers around the use of the same language-focused content. A third option discussed was a model of clustering students in classrooms such that students receiving more intensive services are in the same classroom. In a model of clustering students, SLP and teacher collaborators would have a basis for forming a partnership. In other words, a clustering model may facilitate buy-in from collaborators if they perceive the effort of collaborating to be worth it, given the potential of impacting many students who need additional support. Additionally, collaborators would have opportunities to use the collaboration process over time to the point of internalizing the process. The COLLAB Protocol, or any collaboration model being explored, will continue to warrant discussion about buy-in and

feasibility in light of students' needs, teachers' workload demands, and SLPs' workload demands.

A second aspect about the procedures deemed in need of refinement was the complexity of the COLLAB Guiding Steps. Participants were given the COLLAB Guiding Steps in a blank Microsoft Word document, or template, where they were to type their notes. The steps on the document could also be cut and pasted into Google Drive (one of the pairs at times typed their notes for the COLLAB Guiding Steps in this shared document). Below each step on the template, there was space for the participants to log their ideas, agreements, meeting notes, etc. The purpose of the COLLAB Guiding Steps document was to present prompts for the collaborators in an effort to facilitate completion of each step. A secondary purpose was related to gathering and organizing evidence for the research; collaborators submitted their notes on the COLLAB Guiding Steps document as one form of evidence of their use of the protocol. Before the intervention began, the partners typed their agreements on the Word document for Steps 1-6. For each week of the intervention, each pair had a separate Word document with the COLLAB Guiding Steps to be repeated weekly (Steps 7-14). The template was designed to be comprehensive enough to guide collaborators who had never worked together before. However, the template was dense with text and overwhelming. One SLP explained it felt like she and her partner were in constant crisis mode. The SLPs offered the following suggesting for how to refine the steps in the protocol. They suggested paring it down and eliminating the wording to pinpoint the important pieces. For example, "What do we want to teach? What are the language underpinnings? What is going to be hard? What do we do? Did we do it? What do we keep? What do we change about our plan?"

Another procedural component the collaborators expressed uncertainty about was attempting to use the COLLAB Protocol in the absence of supports provided by the researcher. One SLP explained that implementing the COLLAB Protocol would require more time from partners if the techniques, assessments, and instructional materials had not been provided to them. Future research could continue to investigate the use of collaboration models with specific language techniques (or choices of techniques for collaborators to use) that are built into the collaboration intervention. Providing collaborators with specific techniques to use for pre-selected targets would allow for more control in a research study. However, research could also explore the use of collaboration models when collaborators determine their own instructional focus, use materials from their curriculum, and plan assessments. Although the demands of collaborators would initially be greater in some ways whey they determine their own instructional focus, collaborators' buy-in would likely be enhanced when they can decide their own instructional targets around which to collaborate. The approach of having collaborators decide and implement their own instructional focus is needed in practice and research.

Social validity was also explored through collaborators' views about their satisfaction with the results. Each collaborator discussed their impressions with their partner and individually with the researcher. In terms of indicators of student learning, all the collaborators attested to student engagement with some students using the words outside of the VST sessions. Both partner pairs perceived that students were highly engaged during the co-teaching activities. The collaborators also provided examples of students' enthusiasm to use words outside of the VST sessions. One SLP explained that some students would talk to her while in line for recess and use a sentence with a new word. Another SLP reported that students signed up to sit with her at lunch and used newly taught words in their conversations.

Regarding student performance on the posttests, the collaborators were only shown preliminary student data when the discussions occurred. The educators expressed pleasure seeing evidence of student gains. However, they had questions about statistical significance, size of gains, and performance of subgroups (provided to them at a later time). Additionally, the SLPs inquired about the size of gains that would be expected for students with language impairments on each of the three measures. This is an important question and an area for future research.

The effects on student learning were still being monitored after the study concluded. For example, one teacher mentioned how she wanted to see whether students would use the new words in their writing. The other collaborating teacher reported she continued to observe evidence of student learning in reading lessons. She described using a system where students indicated with a hand gesture when they encountered one of the words from the study. When students recognized their new words, she asked them for synonyms and gave the students a class-token reward. The teacher explained that the students seemed to understand, and take pride in, the idea of "owning" words.

Overall, the collaborators expressed satisfaction with student engagement, student enthusiasm for learning and owning words, and evidence of students generalizing new words. They were also pleased with preliminary posttest data showing large gains for many students. They expressed concern in cases where student gains were minimal, particularly for some students who needed intensive instructional supports. Collaborators expressed satisfaction with forming new language-scaffolding techniques habits, or being more aware of using them, in their instruction. Both collaboration pairs reported plans to continue their partnerships. Their discussions with each other and with the researcher suggested the partners planned to use parts of the COLLAB Guiding Steps they perceived as beneficial for the students and feasible for them.

Limitation Considerations

Several limitations had potential to threaten internal and external validity in the study. Explanations of the limitations and their possible effects are presented below.

1. A trade-off of the design was to allow teacher participants the choice to assign themselves to the collaboration condition or to the comparison condition. The purpose of this decision was directly related to the definition of the collaboration, as a process within which partners wanted to establish a partnership (e.g., Friend & Cook, 2012). As a result, students in the classrooms were not randomly assigned to condition. Non-random assignment violates the statistical assumption of independence and limits generalizability. To mitigate the effects of non-random assignment, propensity score matching was utilized. Propensity score matching resulted in an acceptable range of 1:1 matching; however, there were a few differences regarding student characteristics in the matched dataset. The differences in the student characteristics were minimal and did not appear to impact the results.
2. The sample size of third graders in the collaboration condition (n = 34) and comparison condition (n = 34) was small. The small sample size likely contributed to low power on the between-group factor and interaction factors. Low power indicated that had a difference actually existed, the difference may not have been detected. The small sample size also limited generalizability.
3. Data for the total number of students in the matched group (N = 68) included some missing pretest and posttest data. Results should be interpreted with an understanding that

an EM algorithm was used to impute missing data. There were not many cases of missing data, so it was unlikely the results were affected beyond a minimal degree.

4. There was some time variability in terms of the length of instructional time within the classes. The time differences between each class were lessened when accounting for on-task instructional time. One collaboration classroom tended to have longer VST-T+SLP introduction sessions and shorter VST-T+SLP review day sessions than the other classes. The other collaboration classroom tended to exceed the 60-minute review by 7 minutes; however, this time included transition time as the sessions were divided into two days. One of the comparison classrooms tended to complete the VST-GE16 introduction day instruction more quickly than the other comparison classroom where redirections extended the length of the sessions. Time differences had potential to impact differences in student performance. However, the instructional time appeared equitable overall among all the classes and, therefore, was a non-issue.
5. Some of the attendance logs were missing or incomplete. The researcher included all third graders in the dataset, as there was evidence, or evidence to indicate, that all students were present for a minimum of half of the introduction sessions, half of the review sessions, and half of the total words taught. Based on attendance comparisons between groups from attendance logs, there was some variability of attendance between individual students. However, as a condition, the averages of introduction sessions attended, review sessions attended, and words taught were similar.
6. The study did not include a large number of students with LLD or who were ELs. As a result, it was not possible to generalize how these subgroups responded to the intervention in either condition. A future analysis of the data from the study will explore

subgroup performance based on the available sample. A question of high practical importance to explore is the extent to which the SLPs' contributions to the language environments resulted in greater gains for students who struggle. If evidence suggests this were the case, discussions would be warranted between educators and school administrators about ways to structure learning environments such that SLPs and teachers have opportunities to use the COLLAB Protocol with groups of students with LLD.

7. Researcher-created instruments were used for the student outcome measures. Standardized measures of vocabulary were not used because they would not be sensitive enough to detect vocabulary knowledge changes based on words specifically taught in instruction (NICHD, 2000). None of the measures were tested for reliability or content validity as part of this study. However, the dissertation chair reviewed all measures for face validity. Also, similar types of measures used in the study have been used in vocabulary research. Specifically, the SYN and WIC measures were used in Spielvogel (2011) and in a study underway (Rosa-Lugo et al., 2017). Additionally, similar formats designed to measure depth of knowledge in receptive tasks have been used in vocabulary research (Stahl & Fairbanks, Leseax et al., 2010; Nagy et al., 2012; Reed, 2000).
8. The researcher was unable able to recruit multiple SLP and teacher collaboration pairs. After having spoken with multiple prospective districts, only one district approved the research. Within the district, there were only two SLP and teacher collaboration pairs who agreed to participate. Although generalizability is a limitation, the design set a foundation for future studies involving more collaboration pairs.
9. The researcher had prior professional connections with the SLP participants, which had potential to introduce researcher bias. The researcher took steps to control for

contamination and monitored fidelity throughout the intervention. Effects of researcher bias did not likely impact these results.

10. Efforts were made to exclude the researcher from the classrooms during the pretest and posttest administration because she was not blind to condition. However, the researcher served as a support role during some of the sessions in both conditions when assessors were absent due to sickness. Additionally, the researcher administered the make-up posttest assessments. The impact of the researcher's involvement in the classroom during assessment administration on the results was considered minimal.
11. Other adults were present at times in the participating classrooms, which introduced a potential for contamination. The adults were either observers (i.e., SLP interns and a college intern) or classroom supports (i.e., paraeducators, special education teacher) who were part of students' behavior supports at school. The adults were told about the study. They were instructed not to teach or reinforce the vocabulary words or to discuss any details about the instruction with others until after the study was over. After listening to all the sessions (with the few exceptions of recorder problems), there were two instances when the researcher heard other adult voices. One instance was in a collaboration classroom when a paraeducator was heard reading along with the choral readings of the scenarios. The second instance was in a comparison classroom when a substitute paraeducator was heard commenting on students' sentences during part of a review session. These instances did not appear to have more than a minimal impact on the fidelity of the conditions.
12. There was no control group, or comparison group using typical instruction, as part of the design of the study. However, previous research comparing vocabulary gains of students

in VST treatment groups compared to vocabulary gains of students in typical-instruction comparison groups (e.g., Ehren et al., 2010; Spielvogel, 2011) revealed statistically significant differences between the two conditions. Moreover, the sizes of the effects were greater than would be expected for maturation alone (Hattie, 2009). Therefore, it is highly likely that the gains in the collaboration condition and comparison condition in the study were attributable to the robust vocabulary instruction and not simply maturation.

Implications for Practice

The Role of the SLP

The goals, procedures, and results of this study have potential to facilitate a shift in the roles of SLPs in schools. The COLLAB Protocol offers SLPs one concrete option to help them fulfill their role of collaboration with school professionals to support the needs of students. This is an important contribution because collaboration is required by their professional standards (ASHA, 2010). The COLLAB Protocol is an option that can assist SLPs by: (a) defining measurable key features of the collaboration process, (b) describing what actions are needed for partners to move toward acceptable implementation, (c) specifying expectations for language scaffolding, (d) providing linear steps for SLPs and teacher partners to follow, (e) prompting a plan for data-based decision-making, and (f) offering SLPs and teacher partners flexibility to tailor their instructional approaches to their students' needs.

The COLLAB Protocol is a tool that SLPs can use as a concrete approach when designing highly-scaffolded language environments with teachers. In practice, the use of the COLLAB Protocol would not require the same degree of rigidity or complexity that is required

in a research study. The protocol offers one option for SLPs to use for a variety of service delivery purposes, including in-classroom services to students with IEPs. Additionally, it can guide specific roles for them in a Response to Intervention (RTI) model, now more frequently called a Multi-Tiered System of Supports (MTSS) model. The Kansas Technical Assistance System Network defined MTSS as "a coherent continuum of evidence based, system-wide practices to support a rapid response to academic, behavioral, and social skill needs" (KSTASN, 2015, "Overview," para. 2). The RTI framework is an approach that incorporates assessment, instruction, and intervention principles at various tiered levels of instruction. A typical Tier 1 instructional level, or what Fuchs et al. (2012) referred to as *primary prevention*, includes the core general instruction all students receive in their mainstream classrooms. At the Tier 2 and Tier 3 instructional levels, the interventions are more explicit, more intensive, and more supportive than typical core instruction (Torgesen, Rashotte, Alexander, Alexander, & MacPhee, 2003).

The procedures and results in the study inform the roles of SLPs in RTI. SLPs' expertise with facilitating highly-scaffolded language environments can be applied in ways such that students who struggle, including students with LLD, receive constant language support. The COLLAB Protocol is an option that may be needed when SLPs' involvement in RTI is unclear or minimal. Based on the most recent ASHA Schools Survey findings (ASHA 2016a, ASHA 2016b), there is variability in the number of SLPs involved in RTI. According to the ASHA 2016 Schools Survey, 16% of elementary SLPs reported serving no role in RTI/MTSS (ASHA, 2016a). The most frequently identified RTI pre-referral role for SLPs in preschool (37%), elementary (69%), and secondary settings (50%) was providing strategies to classroom teachers

(ASHA, 2016a). Beyond simply providing strategies to classroom teachers, the COLLAB Protocol facilitates the modeling, sharing, and monitoring of language-focused strategies.

If the COLLAB Protocol is an option SLPs, teachers, and administrators are interested in using, the question of how to support educators' use of the protocol warrants discussion. Considerations for users, change facilitators, and educators of preservice SLPs and teachers are offered in the following sections. Additionally, considerations about the costs and benefits of collaborating are offered as a perspective for users when engaging in value determination discussions.

Considerations for New Users: Process

Considerations are offered for SLP and teacher partners who are interested in using the COLLAB Protocol in their practice. New users who wish to try the COLLAB Protocol in their practice will need supports, much like those provided to the collaborators in the study, to implement it with fidelity. Supports could mirror those the researcher provided in the study, including professional learning modules and discussions with the SLPs and teachers about their roles within the collaboration. The supports in the study were frontloaded at the beginning of the seven-week segment. However, in practice, tailored supports would likely be needed to support adoption over time. It would be advisable for SLPs and teacher partners to receive support from a change facilitator, someone familiar with the COLLAB Protocol, throughout the adoption process. Considerations for, and about, change facilitators are offered following a discussion about considerations for users.

Considerations for users about *establishing a partnership* warrant discussion, as initiating a collaboration is not always straightforward. The participants' decisions in the study, and in the

researcher's pilot study (Mitchell & Ehren, 2016), may inform others' decisions about how to initiate a partnership. In this study, the SLPs and teachers decided to continue existing partnerships they had with each other. The collaborators' previous working relationships may have positively impacted student outcomes in the collaboration condition, as partners appeared comfortable with their co-teaching instruction from the beginning of the segment. In the pilot study, the SLP initiated a partnership with a teacher (someone with whom she had not previously worked) based on the SLP's desire to collaborate around literacy to support low academic performers. The teacher in the pilot study expressed a desire to learn about a writing intervention from the SLP to support EL students' academic writing. Another factor to consider when forming a partnership is access of students who need intensive support (e.g., students with LLD or who are otherwise demonstrating challenges with literacy acquisition). In this study, each SLP acknowledged that she shared at least one student on her caseload with her teacher partner. In the pilot study, students needing Tier 2 and Tier 3 supports were clustered into the same science period. A third factor to consider when establishing a partnership relates to the conditions that will result in the most robust outcomes. For example, an SLP might consider initiating a partnership with one teacher who sees value in collaborating with an SLP, is interested in learning about ways to enrich language scaffolding in the classroom, and who teaches students needing Tier 2 and Tier 3 supports in the same literacy period. SLPs are encouraged to consider these factors when eliciting buy-in from prospective teacher partners.

A fourth consideration for establishing a partnership, and eliciting buy-in from prospective teacher partners, is having a plan to market specific instructional techniques that teachers want to use based on perceived student need. In this study, and in the pilot study, the researcher presented to the SLPs and teachers what the collaboration and instructional techniques

would entail. Additionally, the researcher spoke with the partners about their roles in the partnership. Thus, in practice, it may be helpful for teachers if SLPs offer prospective teacher partners a menu of language techniques to incorporate in a partnership. Teachers could select from language-focused instructional techniques that meet their students' needs. An example of a concrete high impact literacy target at all grade levels is robust vocabulary instruction (Beck et al., 2013; Graves, 2016). In this study, the VST-T+SLP was offered as the instructional technique to target students' academic vocabulary knowledge.

Two considerations worth noting for prospective users *during the collaboration segment* are based on the researcher's observations. First, staying power and accountability are needed by partners for the agreed upon segment length. Some participants explained they appreciated how they were held accountable to their plan every week. This accountability, although built into the COLLAB Guiding Steps, may have also been an artifact of the research project. Thus, in practice, partners would need to discuss how they will stay accountable to the plan, even when workload demands are heavy. They would also need to have patience with learning the process early on. Although there was much to learn early on, all the collaborators expressed that they became more efficient with their collaboration activities beyond class time once they were more familiar with the weekly COLLAB Guiding Steps. Furthermore, in practice, partners would have the flexibility to determine how long they would want their collaboration segments to be. They could start with a segment shorter than seven weeks if the duration in the study was a longer time commitment than they could manage.

A second point is that partners could be creative with how they share information and ideas in their conversations beyond class time. Participants in the study used a variety of methods that worked for them, such as face-to-face, email, and phone conversations. From the

researcher's observations, a creative idea for productive collaboration activities beyond class time would be to have teachers share recordings of parts of their sessions for SLPs to analyze for evidence of language trouble spots for students. In the study, the students' attempts at generating sentences on the introduction days would have given SLPs a better sense about students' scaffolding needs than what the teachers could remember from the sessions.

New users are also urged to assess the value of the collaboration *at the end of each segment*. After the first collaboration segment, users may have a better sense about the parameters to set and the language-focused content to use in future segments (with the same teacher partner and/or with other teachers). This was the case in the current study and the pilot study. Teachers and SLPs offered ideas about instructional adjustments they would make if they were to repeat or continue the instruction without the rigidity of a research study. SLPs may also have a better sense about what techniques to offer in a menu to teachers and how to market those with staff and administrators. Furthermore, there is potential for creative coaching models to stem from collaboration segments. An SLP in the study shared ideas about supports she could provide to impact highly-scaffolded language environments in addition to the one collaboration segment started with one teacher partner.

Considerations for New Users: Content

The COLLAB Guiding Steps provide a flexible process for SLPs and teachers to design collaborative language-focused interventions with a variety of instructional targets and with different grade levels. In the study, robust vocabulary instruction constituted the language-focused (*what)* content deemed worthwhile for collaborators to target in a literacy partnership. Academic vocabulary was selected as a high impact approach to intensifying literacy instruction

based on evidence-based recommendations (Baker et al., 2014; Foorman et al., 2016; Gersten et al., 2007) and state standards (CCSS, 2010).

Despite recommendations to teach academic vocabulary in a comprehensive literacy program, the project was met with resistance during recruitment. Concerns were expressed that vocabulary instruction involved teaching a discreet skill and would take too much time away from literacy instruction. This view on teaching vocabulary reflects barriers with potential to preclude scaling up evidenced-based robust vocabulary practices. These barriers are important to note because an SLP who presents an option of collaborating around a robust vocabulary instructional technique would also need to present prospective teacher partners a rationale for the instructional approach.

In the study, the researcher explained a rationale for robust vocabulary instruction, supported participants' learning of the VST, and explicitly discussed the focus of language scaffolding with the SLPs. Both versions of the VST used in the study were systematic techniques, not simply activities, that incorporated components of robust vocabulary instruction as built-in scaffolds (e.g., intentionally selected academic vocabulary words, multiple encounters, student friendly definitional information, contextual information; Beck et al., 2013). One aspect of the vocabulary instruction that was not built into the VST routine was the teaching of multiple meaning words. However, during the exploration of word meanings, the discussion of multiple meaning words was encouraged. When the VST is implemented outside of a research study, that component would be added.

SLPs and teacher partners who decide to incorporate a focus on robust vocabulary instruction are reminded of the importance of word selection and the need for a focus on scaffolded interactions. The words chosen for the instruction would need to be responsive to

students' and teachers' needs, have definitional information that is understandable to students, and be useful for students to know across academic domains (Beck et al., 2008). Additionally, students would need practice using the words and educators would need practice providing contingent in-the-moment responses. It is hypothesized that scaffolding habits-of-mind would result in a change in the language environment. In the collaboration condition, there were more planned scaffolds based upon students' demonstrated trouble spots and a different quality to the in-the-moment scaffolds by the teacher and SLP. These differences between the conditions were reflected in the student vocabulary outcomes.

All six teacher and SLP participants explained new habits of, or heightened levels of awareness about, language scaffolding and robust vocabulary instruction after using the VST. Their perspectives illustrated how an instructional focus on academic vocabulary words impacted the language-scaffolding environment in their classrooms. One of the collaborating teachers explained that she discusses synonyms and word family words more when she scaffolds. Another collaborating teacher described how she asks students more questions about why a word works or not and what evidence they found from context clues. She reported that she incorporates more non-examples to see if students can catch what is off and to reinforce what makes correct examples right. She also said she uses the other scaffolds from the VST, such as discussing synonyms and having students use new words in sentences. A teacher in the comparison condition explained new habits she formed after having implemented the VST-GE16. She explained, "I do a lot more stopping and explaining of words." The teacher gave examples of asking students their ideas about what words mean in context, asking how they can figure out the word's meaning, and rereading the text with a synonym. She explained she "is much more aware." The other teacher in the comparison condition shared a scaffolding habit she

more during vocabulary instruction. She found that giving students verbal sentence starters or sentence frames helped them formulate their own sentences correctly. She also said she talked more about students' answers with them if their answers were not accurate.

SLPs were also asked about new habits they formed in terms of language scaffolding and about their approach to vocabulary instruction in general. Both SLPs addressed a heightened emphasis on nuance, non-examples, and morphology as part of vocabulary instruction. One of the SLPs explained she goes further in her feedback with students and has them expand on their thinking in their explanations. The other SLP described how she is more aware of the method to what she does as an SLP, which she felt was validating. She expressed seeing the value she adds to instruction with general education teachers.

The SLPs' reflections about nuance appear central to language-scaffolding, as the nuance of speakers' and writers' language choices convey a depth of meaning. Even at the level of word study, an instructional issue in robust vocabulary instruction is an awareness of, and explicit teaching of, nuance. The challenge of capturing the essence of a word's nuance was reflected in the intentionality of writing the scenarios and in teachers' decisions about which synonyms to select for students' word cards. The scenarios and synonyms alone did not always capture the essence of nuance. For example, the synonyms "guess", "predict", "think about" and "suppose" do not by themselves capture the nuance of what it means to *speculate* about something. To explore what it means to speculate requires talking about situations that would require speculating, exploring non-examples (e.g., the word speculate would not fit the context if a person already knew the answer), and explaining the thought process that goes along with speculating (as opposed to randomly guessing). Students need a lot of practice in understanding and using academic vocabulary. Ehren (personal communication, August 1, 2016) noted that in

her observations of educators using VST with a variety of populations, it is challenging to distinguish nuance of word meanings so that students know how to use a word appropriately. A depth of knowledge about words' meanings requires the combination of the scenarios, discussion of synonyms that were close matches, synonym discussions with qualifiers (e.g., "But wait, there's more to it than that!"), student-friendly definitions, interactions with student-generated sentences, and multiple examples. To prepare for this instruction, educators need to be aware that nuance requires explicit instruction and be comfortable showing their own thinking when they are not sure about a word's nuance. Language-savvy educators possess a consciousness about nuance that is reflected in their scaffolded interactions with students.

Although teaching academic vocabulary was chosen as the language-focused content for the study, collaborators could choose from a variety of language-focused content and techniques around which to collaborate. Language-focused instructional approaches involve explicit teaching and scaffolding of one or more language underpinnings of reading, writing, speaking, and listening (Ehren, 2006). The language underpinnings include the sub-systems of language and meta-skills (Ehren, 2006). The sub-systems of language include phonology (rules governing the structure and sequence of speech sounds and syllables shapes), morphology (rules governing the internal organization of words, such as root words, prefixes, and suffixes), syntax (rules governing the internal organization of sentences), semantics (rules governing the meaning of words and word combinations), and pragmatics (rules governing the social use of language, such as conversational interactions) (e.g., Kamhi & Catts, 2012). Word study interventions involving the language basis of spelling are also appropriate targets for language-focused instruction (Masterson & Apel, 2014). Also included under the construct of language underpinnings are metacognitive and metalinguistic skills (Ehren, 2006). Metacognition refers to an awareness of

thinking processes and metalinguistic involves an awareness of language processes (Kame'euni, & Baumann, 2012).

Selecting high impact language instructional targets and providing scaffolds for students to achieve instructional goals are two powerful ways to intensify literacy instruction (Vaughn, Wanzek, Murray, & Roberts, 2012). Many of the language targets and scaffolding techniques are emphasized in Universal Design for Learning (CAST, 2011) and are recommended practices for teaching EL students. Language scaffolding techniques are not separate from the curriculum teachers use. Rather, they are techniques that allow students to actively participate in, and make meaning from instruction. Whether robust vocabulary instruction or other language-focused targets are chosen as the content around which to collaborate, a highly-scaffolded language environment is a critical feature of SLP and teacher partnerships. Opportunities for SLPs to model and discuss specific language-scaffolding techniques with teachers were incorporated in the COLLAB Guiding Steps before the collaboration began and throughout the collaboration segment.

Considerations for Change Facilitators

As with the implementation of any new practice, it is recommended that new users receive tailored supports to facilitate their adoption of the practice (Hall & Hord, 2015). Change facilitators could be persons who have used, researched, or are otherwise familiar with the COLLAB Protocol. In the study, the researcher served as the change facilitator. She conducted the professional learning remotely via online modules and video conferencing. She also provided feedback to all participants via email. Additionally, she measured the collaborators' use of, and concerns about, the innovation. Ideally in practice, a change facilitator would provide job

embedded professional learning around the COLLAB Protocol, assess users' use and concerns, provide tailored supports across repeated collaboration segments, and evaluate the success of the job embedded professional learning experiences (Guskey, 2000; Hall & Hord, 2015).

There are three important concepts the change facilitator and collaborating partners would need to collectively understand. First, the change facilitator and users would need to understand the nature of the change process, as the process requires patience. In the study, the duration of the intervention was relatively short in the larger scheme of time needed for implementing change (Hall & Hord, 2015). Based on the research of Hall and Hord (1987, 2015), a shift from Management concerns to Impact concerns can take three to five years. Throughout the adoption process, the change facilitator would need to be aware of the users' concerns and be prepared to provide supports addressing those concerns. Second, the change facilitator would not be a collaborator with the SLP and teacher or in an evaluative position from an administrative standpoint. Rather, the change facilitator would serve to educate the users on the process, provide feedback about their progress with the process, and determine supports users need throughout the change process. Third, it would be important for the change facilitator and users to understand that the COLLAB Guiding Steps provide concrete steps based on the key features in a linear fashion. However, there is flexibility for the collaborators to determine their own instructional and delivery parameters within the steps. The SLP/Teacher Collaboration IC Map, on the other hand, is the unchanging component that describes elements that must be present in the collaboration.

In addition to the change facilitator's involvement before and during a collaboration segment, it would also be advisable for the change facilitator to be a part of post-segment value determination discussions. In the study, the post-collaboration segment discussion provided

evidence about participants' new habits and their thoughts about next steps for their collaboration. From the recordings of the partners' Step 16 discussion, the researcher gained a sense about what both pairs planned for their own next steps. A change facilitator may be needed to connect partner pairs so they can share their experiences with each other, particularly early in the adoption process after having completed one collaboration segment. Discussions such as these have potential to move users to Integration Levels of Use.

A platform for users to discuss their experiences and ideas for COLLAB Protocol and the instructional techniques used could be arranged through professional learning communities (PLCs). Hord (1997) defined a professional community of learners using the construct as it was presented by Astuto, Clark, Read, McGree, and Fernandez (1993): teachers and administrators in a school "continuously seek and share learning, and act on their learning" (p. 1). The goal is for students to benefit from the educators' learning and actions. An example of an SLP discipline-specific PLC is one the SLP participants were involved in within the district, which was a K-3 language/literacy committee. A major focus of the committee was providing more in-class services. The SLP participants shared their "what's next" ideas for the COLLAB Protocol after the study that could be shared with the committee. Questions explored were:

- What content is worth collaborating around (as opposed to cooperation or coordination)?
- Which teachers are interested in forming partnerships?
- Where is there high classroom student need for sheltered instruction or language-scaffolded instructional practices?
- Which components of the COLLAB Guiding Steps are needed to achieve the partnership goals?

- What is a reasonable amount of time for the partnership to achieve its goals for student learning?

In addition to SLP discipline-specific PLCs, there may be potential for the COLLAB Protocol to be explored by SLPs and teachers within interdisciplinary grade-level PLCs. Such forums would allow SLPs with opportunities to market themselves as having language expertise. The collaboration activities in the COLLAB Guiding Steps involving data-based decision-making may also contribute to the goals of grade-level PLCs. Thus, there is potential for the COLLAB Protocol to be explored by members of PCS to determine if, and how, it may contribute to their goals toward student learning.

Implications for Preservice Preparation

If the COLLAB Protocol is an option university educators are interested in using with graduate students, discussion is warranted to examine ways to provide guided practice for graduate SLP clinicians and preservice teachers. A reasonable beginning focus with graduate SLP clinicians and preservice teachers would be practice implementing components of select key features (e.g., developing accurate scaffolding behaviors, determining high impact targets and techniques). Another focus could be having graduate SLP clinicians and preservice teachers engage in interprofessional education (IPE; WHO, 2010) to plan an intervention using COLLAB Steps 1-5. As part of an IPE exercise, the students could determine which instructional techniques they would use to meet the needs of a particular group of students and how they would measure student outcomes. A second possibility for a preservice focus would require coordination between universities and externship supervisors in school settings. If universities

were able to provide professional learning for supervisors, placement supervisors could support graduate clinicians and preservice teachers as a change facilitator in actual school settings.

Costs and Benefits of Collaborating

When determining whether to enter a partnership, educators have many factors to consider. The COLLAB Guiding Steps include prompts to facilitate partners' discussions about whether the time and effort required as part of the collaboration is worth trying for one or more collaboration segments. The cost-benefit discussion allows partners an opportunity to discuss a partnership commitment by addressing barriers and benefits directly. Common barriers reported in the literature include school cultures that do not support collaboration, collaborators' separate goals and expectations, lack of time for interaction and planning, and inadequate systems for communication (Paul et al., 2006). In terms of school culture, the COLLAB Guiding Steps prompt collaborators to check in with their principals about their goals and resource needs for the collaboration. Regarding the lack of time for interaction and planning, the COLLAB Guiding Steps simply foster conversation between partners about time parameters they want to set for themselves. Examples of parameters they are promoted to set for themselves include convenient times to meet, preferred options for communication, and agreements about holding each other accountable.

Common benefits to consider in a cost-benefit analysis of collaboration are reported in literature and were expressed by collaborators and their principals in the study. According to Blosser (2016), desired outcomes of collaboration can be categorized into student outcomes (e.g., functional communication and educational performance), partnership outcomes (e.g., relationships and competency), and program and system outcomes (e.g., changes in the system to

facilitate collaboration such as school culture of collaboration). In terms of student outcomes, collaborators in the study reported evidence of student learning in addition to evidence provided by the posttest results. They reported a high level of student engagement during co-teaching sessions. They also described repeated instances of students generalizing their recognition and use of the target words outside of VST sessions. In terms of partnership outcomes, partners reported satisfaction with the progression of their working relationships. Although program and system outcomes were not analyzed as part of the study, principals at both schools expressed their perceptions of benefits of collaboration from a program perspective. The principals shared that benefits of collaboration between teachers and language/literacy specialists include: (a) opportunities to share expertise and instructional practices, (b) a common language for teachers and students to use, (c) a unified vision based on a joint analysis of data, and (d) use of the same instructional techniques with students.

Thus, when determining whether to enter into a collaboration, SLPs and teachers would need to consider the practicability of the collaboration model, whether there is adequate organizational support, and if the model has potential to contribute to systems-level changes that are part of district and school priorities. Additionally, it is recommended that educators collect data to determine if collaborations do in fact result in greater student achievement. Although the body of collaboration intervention research involving SLPs is limited, there are some indicators that collaborations involving SLPs result in greater gains than student progress in non-collaborative conditions. This was the case in the current study as well as in previous studies in elementary settings that compared student outcomes in collaborative treatment groups versus control and comparison conditions (e.g., Calvert et al., 2003; Ellis et al., 1995; Farber & Klein, 1999; Hadley et al., 2000; Kaufman et al., 1994; Throneburg et al., 2000).

In situations where the costs of collaborating do not outweigh the benefits, some educators may determine that collaboration is not the solution for their goals. Perhaps collaboration could be one of a menu of choices for creating highly-scaffolded language environments in the classroom. In the study, the actions to achieve highly-scaffolded language environments included the following: (a) providing modeling, coaching, and feedback to teachers as they learned how to implement a robust vocabulary instructional technique (VST-T+SLP and VST-GE16), (b) implementing a robust vocabulary instructional technique with high fidelity and consistency over a period of seven weeks, (c) modeling and implementing of language scaffolding techniques by SLPs in the classroom, (d) using language scaffolding techniques outside of the VST sessions, and (e) exhibiting an enthusiasm for language and word wondering/learning.

High quality professional learning experiences offer an alternative (or a supplement to a collaboration model) to creating highly-scaffolded language environments. In this approach, SLPs could be involved in promoting language-focused techniques as a part of professional learning initiatives within their schools and districts. Another approach may be to provide coaching around language targets and instructional techniques, such as the VST. The SLPs in the study expressed that the VST could be a way to get into the classroom, as could coaching or facilitating professional learning around the use of the VST. A resource developed for the study was a specific menu of scaffolding techniques SLPs could share with teacher. This type of resource may be valuable for teachers who are interested in using specific language scaffolding techniques and for SLPs who have expertise in employing them.

In summary, should SLPs and teachers choose to enter into partnerships, they now have an empirically tested collaboration model as an option to use in their practice. The COLLAB

Protocol is a concrete tool that can assist SLPs and teachers when designing, implementing, and assessing collaboration models to support the academic growth of students. For the tool to be useful to SLPs and teachers, partners will need guidance to learn and use the protocol. Thus, practice implications were presented for new users, change facilitators, and professionals involved in preservice education.

Recommendations for Future Research

Recommendations for future research were informed by the literature review, limitations of the study, and findings of the study. The first set of recommendations is related to collaboration research involving SLPs. The second recommendation is more narrowly related to language scaffolding, and the third pertains to the line of vocabulary research with the VST. A final recommendation relates to the type and dosage of professional learning needed to support partners collaborating around specific content.

Regarding the first set of recommendations, a research agenda is needed that includes more empirical investigations of the effects of collaboration between SLPs and teachers on student outcomes. A research agenda would provide a means of accruing practice-based evidence about effective collaboration involving SLPs that are feasible for SLPs and teachers to use in their settings. More studies are needed comparing dosages of collaboration models for practitioners to design literacy partnerships for their particular curriculum content, language goals, and grade level. Suggested considerations for future research include investigations of collaboration involving: (a) a larger number of SLP and teacher pairs; (b) a variety of grades, language-focused targets and techniques, and literacy outcomes; and (c) instructional foci, techniques, and assessment procedures determined by the SLP and teacher partners. Future

research could also explore the effects of collaboration between different combinations of language/literacy experts on student outcomes (e.g., SLPs and special education teachers, special education teachers and general education teachers, etc.). Considerations about key features according to different combinations of professionals' expertise may result in different versions of Collaboration IC Maps, which could be adapted from the SLP/Teacher Collaboration IC Map. Additionally, future research investigating the effects of collaboration of student performance on high-stakes assessments (the sections related to the instructional content of the collaboration) would be useful.

As part of the research agenda, researchers should be continually focused on how to design effective collaboration models that have a likely chance of being used by SLPs and teachers in their settings. Limitations related to feasibility from existing research were also present in the current study. Time constraints and lack of financial compensation for time spent beyond the workday are huge barriers to collaborators. Although the research differed from previous studies that were possible with grant funding (e.g., Hadley et al., 2000; Throneburg et al., 2000), the issue of making the model a practical one for SLPs and teachers to use is far from resolved. More research is needed to design doable and effective literacy partnerships with the typical resources available to collaborators.

The COLLAB Protocol offers tools for future collaboration research and action research; however, the tools are still in an exploratory stage. The process of developing an IC Map is an interactive and iterative one. The process requires expert opinions and multiple drafts that are revised as more insights inform the key features and configuration descriptions (Hall & Hord, 2015). More trials are needed to fine tune the SLP/Teacher Collaboration IC Map with input from experts in educational collaboration as well as from collaborators themselves. There may be

typical collaborators' behaviors that are not currently reflected in the key feature implementation descriptions from *no implementation* to *ideal implementation*. There may also be differences in opinion about where the fidelity lines for each key feature are drawn and whether any key features are missing.

The COLLAB Guiding Steps will also need to be modified so they are more user-friendly and feasible. Investigations exploring which components can be pared down while still achieving high fidelity on the SLP/Teacher Collaboration IC Map would be valuable contributions to the research and to SLPs and teachers looking to implement a collaboration protocol. Another approach would be to explore the feasibility of other versions of guiding steps as tools, while still using the SLP/Teacher Collaboration IC Map as the definitional measure. There is potential for models such as Blosser (2016), Idol et al. (2000), Neslon et al. (2004), Prelock et al. (1993), and Wallach and Ehren (2004) to serve as the guiding steps with which to implement the SLP/Teacher Collaboration IC Map.

A second recommended area for future research involves investigating the degree to which teachers' language scaffolding habits changed as a result of collaborating with an SLP. Language scaffolding was an integral part of the COLLAB Protocol that was not studied apart from the collaboration. However, from listening to the recordings of the classroom discourse during the VST-T+SLP sessions and the VST-GE16 sessions, the researcher observed that there was a difference in the frequency of strategic questions, contingent responses, and metalinguistic classroom discourse in the two conditions. Specifically, there appeared to be more extended dialogue around student examples and the appropriateness of students' responses in the collaboration classrooms. Future research could incorporate coded observations of teachers'

language scaffolding habits before and after collaborating with an SLP, while also examining the effects on student outcomes.

Coding procedures used by other researchers (e.g., Apthorp et al., 2012; Gamez & Lesaux, 2015; Silliman et al., 2000) could be adapted for such research purposes as well as instructional feedback purposes. Findings from studies that assess effects of teachers' language scaffolding habits after collaborating with SLPs may inform practical ways SLPs could complete coaching cycles or collaboration cycles with multiple teachers. Findings would also inform ways classroom observational tools, such as the Classroom Teaching (CT) scan (Kennedy, Rodgers, Romig, Lloyd, & Brownell, 2017), could define and measure teachers' real time use of specific language scaffolding techniques. An observational coding system for language scaffolding, such as Silliman et al.'s (2000) method of categorizing supportive scaffolds and directive scaffolds, could be used as a common language between collaborating partners. The scaffolding observation coding system could also be used as an instructional tool in IPE experiences involving graduate SLP clinicians and preservice teachers.

A third area of future research relates to the VST line of vocabulary research specifically as well as gaps in vocabulary research in general. This was the first investigation using the VST-T+SLP version, the first time incorporating any version of the VST with third graders, and the first time using the NON-EX vocabulary measure. The sample size in the study was small and studies are needed to replicate the procedures with more third-grade students from a wider population. Future analysis should incorporate analysis of student performance by subgroup. For example, research focused on performance of students with LLD would further inform SLPs' service delivery decisions.

Recommendations have also been made in the literature for vocabulary research in general. More studies are needed that have ecological validity (educators implementing interventions in their authentic settings) and that contribute to instructional implications of dosage and intensity. Regarding the assessments used in vocabulary instruction, content validity of researcher-created assessments is needed. Additionally, more measures are needed to determine the effects of vocabulary instruction on syntax (e.g., Foorman et al., 2016).

Regarding the fourth recommended area for future research, investigations are needed to determine the type and dosage of professional learning experiences required to teach educators how to implement new practices. Research on professional learning has revealed that change in educators' practice occurs when professional learning experiences incorporate modeling, practice, feedback, and coaching (Graner, Ault, Mellard, & Gingerich, 2012). Information about types of professional learning experiences would inform the development of learning experiences educators find to be the most helpful (e.g., which types of activities word best as online modules versus which components are most effective as face-to-face interaction). Additionally, findings about the dosage and intensity of these components are needed to assist researchers and designers of professional learning experiences to support educators using a new educational practice, such as a systematic collaboration protocol.

Conclusion

The findings of this study revealed that collaboration between SLPs and third-grade general education teachers resulted in large effects of students' vocabulary outcomes on three researcher-created vocabulary measures. When compared with the student outcomes in the comparison condition, there was a statistically significant difference between the conditions on

the WIC measure (main effect for time, group, and interaction between time and group). This was a meaningful finding with important implications for practice. Additional key findings included a statistically significant increase from pretest to posttest on all three measures within the entire matched group (n = 68), indicating support for robust vocabulary instruction in general. Moreover, when Cohen's *d* effect sizes were calculated within each condition (collaboration n = 34; comparison n = 34), there were large effects for all three tasks in the collaboration condition. In the comparison condition, there were large effects for the SYN task and medium effects for the WIC and NON-EX tasks, indicating that the language-scaffolded environment in the collaboration condition made a difference in students' understanding of word meanings and word forms in context.

The findings contributed to accumulating effectiveness data of robust vocabulary instruction using previous versions of the VST (Ehren, 2008; Ehren et al., 2010; Spielvogel, 2011) as well as the collaborative version, VST-T+SLP. More research is needed to investigate the effectiveness of the VST with larger samples of students who struggle with literacy, including students with language learning disabilities and ELs. Nonetheless, there is a growing body of evidence that supports the use of the VST as one option for intensifying vocabulary instruction in a comprehensive literacy program.

The findings of this study also revealed that collaborators could achieve a high fidelity of the collaboration process as defined by the SLP/Teacher Collaboration IC Map within a seven-week collaboration segment. Collaborators demonstrated Mechanical and Routine use of the COLLAB Protocol according to the CBAM LoU descriptions (Hall & Hord, 2015). Collaborators expressed Management/Task concerns associated with the COLLAB Guiding Steps and explained their intentions about modifying their use of the COLLAB Guiding Steps in

the future. A research agenda is needed to investigate the effects of collaboration (using a definable construct of collaboration and measuring treatment fidelity) on student outcomes. A constant focus of the research agenda should be to explore the feasibility of effective collaboration models such that SLPs and teachers will adopt the practice and sustain implementation through the change process. The research community has a responsibility to support SLPs and teachers in this effort to support students' acquisition of academic literacy skills.

APPENDIX A: UCF INSTITUTIONAL REVIEW BOARD APPROVAL

University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Approval of Exempt Human Research

From: **UCF Institutional Review Board #1 FWA00000351, IRB00001138**

To: **Mary P. Mitchell**

Date: **October 24, 2016**

Dear Researcher:

On 10/21/2016, the IRB approved the following activity as human participant research that is exempt from regulation:

Type of Review:	Exempt Determination
Project Title:	Effects of Collaborations Between Speech-Language Pathologists and Third Grade Teachers on Student Literacy Outcomes
Investigator:	Mary P. Mitchell
IRB Number:	SBE-16-12526
Funding Agency:	
Grant Title:	
Research ID:	N/A

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the Investigator Manual.

Sophia F. Dziegielewski

IRB Chair

APPENDIX B: EXPLANATION OF RESEARCH

EXPLANATION OF RESERACH

Title of Project: Effects of Collaborations Between Speech-Language Pathologists and Third Grade General Education Teachers on Student Literacy Outcomes

Principal Investigator: Mary Mitchell, M.S., CCC-SLP and doctoral candidate
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You are being invited to take part in a research study. Whether you take part is up to you.

Rationale for the study: Collaborations between language/literacy experts and teachers are believed to play an important role in supporting students who struggle with the knowledge and skills needed to meet 21st century literacy standards. However, the research base lacks a common operational definition of collaboration as well as a solid foundation of empirical evidence investigating the effects of collaborations on student literacy outcomes.

Purposes of the research study:

- Operationally define collaboration.
- Investigate students' vocabulary gains based on two different ways a vocabulary technique is implemented. To facilitate current educational approaches in the classroom, a specific vocabulary instructional approach will be implemented under two conditions. In one condition SLPs and third grade general education teachers will collaborate to implement the technique and in a comparison condition, teachers will implement the technique without systematically collaborating with SLPs.
- Examine whether current curriculum can be supplemented with affective and behavioral components with teachers and SLPs adopting a new systematic collaboration practice. Teachers' and SLPs' thoughts and feelings about the collaboration protocol, as well as their levels of use of the protocol, will be explored.

Procedures**:**

- The duration of the study will be 10 weeks beginning as early as October 2016. The intervention will last 6 weeks. Professional learning will be conducted over 2 weeks for pre-intervention professional learning involving all participating teachers and SLPs on the vocabulary instruction technique (3 hours), teacher and SLP pairs on the process of the collaboration (3 hours), and SLPs on language scaffolding techniques (3 hours). One week will be allotted for pre assessment (75 minutes total) and one week for post assessment (75 minutes total).
- Out-of-class collaboration activities will take place for 30 mins/week and in-class collaboration activities will take place for 60 mins/week.
- 4 teachers and SLP partners who choose to collaborate will be assigned to the collaboration condition. 4 teachers who choose to participate without an SLP partner will be assigned to the comparison condition.
- Students assigned to all the classrooms of the 4 collaborating teachers and SLPs will be exposed to language scaffolding techniques targeted by the collaborating SLP and teacher pair; students in the treatment group will receive typical instruction used by their teachers.
- Three researcher-created vocabulary pretests and posttests will be administered to students in both conditions (i.e., SLP + teacher collaboration and teacher-only condition).

- Two types of pretest and posttests will be administered to SLPs and teachers in the treatment condition (questionnaires, observations, and open-ended interviews).
- The location of the study will be at the teachers' and SLPs' regular elementary school setting.
- Note: After the study all participating teachers who are interested will receive professional learning on the collaboration protocol and language modification techniques.

What the Researcher is Asking of Participating SLPs:

BEFORE THE INTERVENTION:

- Read the explanation of research once all approvals have been granted.
- Complete one 3-hour online professional learning (PL) session related to the vocabulary instruction technique; 2 hours will be online content and 1 hour will be supplemental video conferencing support.
- Complete one 3-hour professional learning (PL) session with their teacher partners focused on the systematic collaboration protocol via video conferencing.
- Complete one 3-hour PL session specific to participating SLPs focused on language scaffolding techniques via video conferencing.
- Provide general demographic professional background information about self; in order to assess the modified educational practices provide de-identified student performance data with minimal demographic data (e.g., age, race, languages spoken, differentiated instructional status) to assess curriculum module performance; provide general information about prior collaboration experiences and school culture; provide a description of type and amount of adult support in the classroom.
- Consent to audio and/or video recording of in-class and beyond class-time collaboration activities with special attention to not include any children's identifying information.
- Answer a 35-item questionnaire about thoughts/feelings about the collaboration intervention.

DURING THE INTERVENTION PERIOD (6 weeks):

- Participate in out-of-class collaboration activities (based on a menu of choices explained in the collaboration professional learning module) for 30 minutes/week. SLP and teacher partners can determine when/how to engage in the out-of-class collaboration activities (e.g., Skype, phone, face-to-face, email, etc.)
- Modify existing vocabulary acquisition to include robust vocabulary instruction for 8 words each week. Implement in-class collaboration activities (based on language scaffolds outlined in the SLP professional learning module) using the weekly Tier Two vocabulary words for 60 minutes/week.
- During 2 treatment fidelity checkpoints, provide input about the experience via branching interviews, open-ended questions, and by showing examples.

AFTER THE INTERVENTION PERIOD (1 week):

- Provide input about the experience via branching interviews, open-ended questions, and by showing examples.
- Answer a 35-item questionnaire about thoughts/feelings about the collaboration intervention.

What the Researcher is Asking of Participating Teachers in the Collaboration Condition

BEFORE THE INTERVENTION:

- Read the explanation of research once all approvals have been granted.

- Complete one 3-hour online professional learning (PL) session related to the vocabulary instruction technique; 2 hours will be online content and 1 hour will be supplemental video conferencing support.
- Complete one 3-hour PL session with their SLP partners focused on the systematic collaboration protocol via video conferencing.
- Provide general demographic professional background information about self; in order to assess the modified educational practices provide de-identified student performance data with minimal demographic data (e.g., age, race, languages spoken, differentiated instructional status) to assess curriculum module performance; provide general information about prior collaboration experiences and school culture; provide a description of type and amount of adult support in the classroom.
- Consent to audio and/or video recording of in-class and beyond class-time collaboration activities with special attention to not include any children's identifying information.
- Select 48 Tier Two vocabulary words for the instruction from a menu of 80 choices.
- Answer a 35-item questionnaire about thoughts/feelings about the collaboration intervention.
- Provide access to students for pretesting acquisition of the curriculum (to be administered by a trained professional at the school/district).

DURING THE INTERVENTION PERIOD (6 weeks):

- Participate in out-of-class collaboration activities (based on a menu of choices explained in the collaboration professional learning module) for 30 minutes/week. Teacher and SLP partners can determine when/how to engage in the out-of-class collaboration activities (e.g., Skype, phone, face-to-face, email, etc.).
- Modify existing vocabulary acquisition to include robust vocabulary instruction for 8 words each week.
  Day 1 of each week = 30 minutes for 4 Tier Two words using vocabulary instructional technique
  Day 2 of each week = 30 minutes for 4 Tier Two words using vocabulary instructional technique
  Day 3 of each week = 60 minutes for review of 8 weekly words (with SLP for in-class collaboration activities)
- Allow access to audio recording for fidelity of the vocabulary instruction and will document vocabulary review activities. Special attention will be given to not include any children's identifying information in the recordings.
- During 2 treatment fidelity checkpoints, provide input about the experience via observations, branching interviews, open-ended questions, and by showing examples.

AFTER THE INTERVENTION PERIOD (1 week):

- Provide input about the experience via branching interviews, open-ended questions, and by showing examples.
- Answer a 35-item questionnaire about thoughts/feelings about the collaboration intervention.
- Provide access to students for posttesting (to be administered by a trained professional at the school/district).

What the Researcher is Asking of Participating Teachers in the Non-Collaborating Condition

BEFORE THE INTERVENTION:

- Read the explanation of research once all approvals have been granted.
- Complete one 3-hour online professional learning (PL) session related to the vocabulary instruction technique; 2 hours will be online content and 1 hour will be supplemental video conferencing support.

- Provide general demographic professional background information about self; in order to assess the modified educational practices provide de-identified student performance data with minimal demographic data (e.g., age, race, languages spoken, differentiated instructional status) to assess curriculum module performance; provide general information about prior collaboration experiences and school culture; provide a description of type and amount of adult support in the classroom.
- Consent to audio and/or video recording of in-class and beyond class-time collaboration activities with special attention to not include any children's identifying information.
- Select 48 Tier Two vocabulary words for the instruction from a menu of 80 choices.
- Provide access to students for pretesting acquisition of the curriculum (to be administered by a trained professional at the school/district).

DURING THE INTERVENTION PERIOD (6 weeks):

- Modify existing vocabulary acquisition to include robust vocabulary instruction for 8 words each week.
  Day 1 of each week = 30 minutes for 4 Tier Two words using vocabulary instructional technique
  Day 2 of each week = 30 minutes for 4 Tier Two words using vocabulary instructional technique
  Day 3 of each week = 60 minutes for review of 8 weekly words
- Allow access to audio recording for fidelity of the vocabulary instruction and document vocabulary review activities. Special attention will be given to not include any children's identifying information in the recordings.
- During 2 treatment fidelity checkpoints, provide input about the experience via observations, branching interviews, open-ended questions, and by showing examples.

AFTER THE INTERVENTION PERIOD (1 week):

- Provide access to students for posttesting (to be administered by a trained professional at the school/district).

What the Researcher Will Provide:

- Work with the teacher to ensure preparedness for implementing the learning content and materials before the study as applicable for participants.
- All professional learning content and materials after the study for comparison teachers and SLPs and teachers who were unassigned to groups.
- Content and materials as per the vocabulary instructional technique for six weeks of vocabulary instruction.
- Feedback to district regarding the results of the instructional strategy.

Study contact for questions about the study or to report a problem: If you have questions, concerns, or complaints contact Mary Mitchell, Department of Communication Sciences and Disorder, at mary.mitchell@ucf.edu. You can also contact Dr. Barbara Ehren, Faculty Supervisor, Department of Communication Sciences and Disorders (407) 823-4793.

IRB contact about your rights in the study or to report a complaint: Research at the University of Central Florida involving human participants is carried out under the oversight of the Institutional Review Board (UCF IRB). This research has been reviewed and approved by the IRB. For information about the rights of people who take part in research, please contact: Institutional Review Board, University of Central Florida, Office of Research & Commercialization, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at (407) 823-2901.

APPENDIX C: DEMOGRAPHIC QUESTIONNAIRES

Classroom and Teacher Demographic Information

Part 1. Teacher Information

Teacher code: **Type(s) of active professional license(s) you hold:** **Highest degree earned:** **Gender:** **Age:** 20-29 _____ 30-39 _____ 40-49 _____ 50-59 _____	**Racial/ethnic background:** **List all languages you speak fluently:**	**Total years teaching:** **# of years teaching in elementary school:** **# of years teaching 3rd grade:** **# of years teaching grades other than K-5**: **Number of years at present school:** **In how many schools have you held full time appointments?**

Part 2. Classroom Demographic Information

What is the gender distribution in your class? # of girls: # of boys: **Which languages are spoken by the students in your classroom?** Languages: **How many students in your class receive free or reduced lunch?** # of students:	**What is the racial/ethnic distribution as listed on students' registration forms?** ***You can change the wording of the categories listed to fit the categories in the registration forms.*** ***Tally # of students who identify as:*** White: Hispanic/Latino: Multi-racial: Asian: Black/African American: Native Hawaiian/Pacific Islander: Native Indian/Alaska Native:

Part 3. Chart was provided to collect the following de-identified student demographic data

- Student code
- Grade level
- If student receives special education services on an individualized education plan (IEP)
- If student receives language services from an SLP on an IEP
- If student receives ELL services
- If student is identified as talented and gifted (TAG)

- Progress monitoring tool and date of most recent assessment
- DIBELS category (overall)
- Tiered instructional placement level

SLP Demographic Information

1. Code assigned to you for the study: _____

2. Type of active license(s) held (e.g., ASHA CCC-SLP, state board license, state/district teaching license, other):
   _____

3. Number of languages you speak fluently: _____

   Which languages: _____

4. Racial/ethnic background: _____

5. Number of years practicing as a school-based SLP: _____

   Number of years practicing as a school-based SLP in elementary school settings: _____

6. In addition to the years you have served as a school-based SLP, have you provided language/literacy intervention outside of school settings? *Yes* *No*

   If so, for how many years? _____

APPENDIX D: VST PROTOCOLS AND MATERIALS

Appendix D1: VST IC Map

Vocabulary Scenario Technique
Innovation Configuration Map DRAFT
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Key Elements	Ideal Implementation (4)	In Process (3)	In Process (2)	In Process (1)	No Implementation (0)
Word Consciousness	Conveys an appreciation of and enthusiasm for the power and use of words and fosters the same in students	Conveys an appreciation of and enthusiasm for the power and use of words.	Talks about the use as well as the power of words but is not particularly enthusiastic.	Talks about the use of words but is not particularly enthusiastic.	Teaches vocabulary but does not address the power and use of words explicitly.
Word Selection	Targeted words are Tier 1 or Tier 2 words for the grade level, are linchpins of the curriculum, and are unknown to students.	Targeted words are Tier 1 or Tier 2 words for the grade level, are linchpins of the curriculum, but may include words students know.	Targeted words are Tier 1 or Tier 2 words for the grade level, are unknown to students, but are not linchpins of the curriculum.	Targeted words are mostly Tier 3 words for specific subjects.	Targeted words are randomly selected or come from a "list" not calibrated to curriculum for the grade.
Morphological Variations	Morphological variations of the word, appropriate to the grade level, are identified and used robustly in instruction.	Morphological variations of the word, appropriate to the grade level, are identified and "mentioned" in instruction.	Morphological variations of the word, appropriate to the grade level, are written on PPWs, but not used in instruction.	Morphological variations of the word identified are not appropriate to the grade level.	Morphological variations are not targeted.
Instructor Scenario Construction	Scenarios meet these criteria: • between 2 and 5 sentences • contain no other words that students would not know	Scenarios meet 4/5 criteria.	Scenarios meet 3/5 criteria.	Scenarios meet 2/5 criteria.	Scenarios meet 0 or 1/5 criteria.

	• are grounded in students' culture and experiences • explicate the meaning of the word • use the same morphological form as the targeted word				
Meaning Exploration	Synonyms (words or phrases) accepted and used by the teacher carry the same nuanced meaning as the targeted word.	The teacher provides synonyms true to the meaning of each scenario but does not elicit them from students.	The teacher uses or accepts one or more synonyms that are not true to the meaning of each scenario.	The teacher gives a definition but does not elicit or provide synonyms for the targeted words.	The teacher reads the scenarios but does not explore meaning of the targeted words.
Multiple Encounters	The targeted number and kind of encounters are achieved in instruction during the week across listening, speaking, reading and writing		Multiple encounters are addressed but not the number or type specified for the protocol iteration across listening, speaking, reading and writing.		Attention is not paid to number and kind of encounters.
Scaffolded and Accurate Use	Teacher provides appropriate scaffolds consistently to guide meaning making with targeted words, when students provide no response or an errored response.		Teacher provides some scaffolds to guide meaning making with targeted words, when students provide no response or an errored response, but not t consistently		Teacher accepts an errored response or moves to another student when a student does not provide an appropriate response.
Student Engagement	Teacher identifies, guides and monitors specific behaviors of ALL students regarding the processing and production of the targeted words (e.g. requires choral responding)	Teacher identifies, guides and monitors specific behaviors regarding the processing and production of the targeted words, but does not engage ALL students consistently.	Teacher calls on certain students frequently with some students not responding.	Teacher prompts students to respond but not all students are engaged.	Instruction is teacher focused without engaging learners.

Cue/Do/Review instructional protocol	Teacher employs Cue/Do/Review procedures correctly throughout instruction.	All Cue/Do/Review elements are present and done correctly but not consistently.	Evidence of one or more of Cue/Do/Review elements correctly executed is present.	Evidence of one or more of Cue/Do/Review elements is present but errors exist in execution.	No evidence of any Cue/Do/Review elements.
Portable Word Wall (PWW)	Teachers instruct students on the creation and use of personal resources (PWW) for meaning and morphological variations of targeted words (e.g. 3x5 card for each word).	Teacher models and guides the creation of PWWs but not use.	Teacher discusses the creation of PWWs but does not explicitly instruct students on creation or use.	Students are left on their own to develop PWWs.	Students do not have PWWs.
Progress Monitoring	Teacher uses progress monitoring data to design and implement (in collaboration with others as appropriate) additional instruction as needed. (Subsumes #3	Teacher engages students in monitoring the appropriate use of words consistently, including before the student's contribution is recorded on the PWW.	Teacher ensures that appropriate use of words is monitored frequently, including before the student's contribution is recorded on the PWW.	Progress in understanding the meaning of some of the targeted words is monitored.	Progress in understanding the meaning of the targeted words is not monitored.
Mastery	Teacher assesses meaning mastery of targeted words in a variety of ways (e.g. various test formats and use in writing)		Mastery tests are given but word use in real writing is not required		Word meaning is not assessed.
Generalization	Instructor works actively (with others, if appropriate) to generalize words to academic content areas.	Instructor plans specific generalization activities outside of the VST context.	Instructor discusses specific generalization opportunities with students in content areas.	Instructor discusses generalization of VST in content areas.	Instructor does not address generalization.

Appendix D2: VST-SLP Unique Contribution

Vocabulary Scenario Technique – SLP Unique Contribution
Innovation Configuration Map DRAFT
© Student Success Initiatives, Inc (2016). Used with permission.

Key Elements	Ideal Implementation (4)	In Process (3)	In Process (2)	In Process (1)	No Implementation (0)
Word Selection	Identifies high leverage words that students who struggle may not know in addition to the words targeted by the teacher in typical classroom instruction.		Identifies words that are not all high leverage that students who struggle may not know in addition to the words targeted by the teacher in typical classroom instruction.		Selects only the words targeted by the teacher in typical classroom instruction.
Morphological Variations	Conducts mini lessons on specific types of morphological variations (e.g. plurals) with students who are having difficulties in that area		Addresses morphological variations as they come up in specific words.		Does not teach morphological variations of words.
	Models and provides sufficient practice to meet individual student needs in using morphological variations of the words targeted by the teacher and words targeted by the SLP.	Models and provides sufficient practice to meet individual student needs in using morphological variations of the words targeted by the teacher.	Models and provides some practice in using morphological variations of words targeted by the teacher and/or SLP	Works with morphological variations of some targeted words but does not model.	Does not address morphological variations except perhaps incidentally
Meaning Exploration	Teaches word consciousness, especially regarding nuanced meaning.	Teaches word consciousness, especially regarding nuanced meaning with teachers *or* students.		Little meta conversation in scaffolded dialogues. An essence of IRE teacher talk vs. strategic scaffolding	Little to no teaching of word consciousness and nuanced meaning with teachers or students.

	Engages in more meta conversation about the role of the word in making meaning, providing the language to talk about words. Conducts more practice with meaning manipulation including more examples and non-examples.	Engages in more meta conversation about the role of the word in making meaning, providing the language to talk about words with teachers *or* students.			
Multiple Encounters	Provides additional encounters for targeted words across listening, speaking, reading or writing as needed by students who struggle with specific words, including the explicit teaching of oral production, decoding and spelling of targeted words following structural rules.	Provides additional encounters for most words without targeting individual needs of students who struggle.	Provides additional encounters for some words without targeting individual needs of students who struggle.	Provides some additional encounters for not consistently.	Does not provide additional encounters for words.
Scaffolded and Accurate Use • **Planned scaffolded instruction** • **On the spot for incomplete or incorrect responses (contingent responding**	Consistently identifies the nature of errors/misunderstandings and uses that analysis to provide additional information, prompts or questions.	In *some* instances, identifies the nature of errors/misunderstandings and uses that analysis to provide additional information, prompts or questions.	Attempts meta conversation, but does not follow up to see if the student understands.	An essence of IRE teacher talk vs. strategic scaffolding	Does not identify the nature of errors/misunderstandings to provide additional information, prompts or questions.
	Provides a variety of supports students who are struggling need to				If student's response is incorrect, moves on or accepts incorrect answer.

	understand and use the targeted words. (e.g. use of graphic organizers)				
	Provides informative and corrective feedback in a timely fashion to students having difficulty and checks for understanding of the feedback. Withdraws scaffolds as appropriate.	Provides informative and corrective feedback in a timely fashion to students having difficulty but does not check for understanding of the feedback.	Provides informative feedback to students having difficulty in a timely fashion.	Provides informative and/or corrective feedback but within an timeframe that is not helpful to students.	Does not provide feedback.
Student Engagement	Works with smaller groups of students to ensure active engagement of students who are struggling.	Works with smaller groups of students (only those on SLP's caseload) to ensure active engagement.		Works with smaller groups of students outside the classroom setting to ensure active engagement of students who are struggling.	Does not work with smaller groups of students to ensure active engagement of students who are struggling.
Cue/Do/Review instructional protocol	Provides explicit and detailed advance and post organizers to situate learning which may include visual schedules. Focuses on additional modeling for students who need it.	Verbal or visual organizers Advance and post organizers Focuses on additional modeling for students who need it.	Only advance or post organizer Focuses on additional modeling for any students who need it.	Focuses on additional modeling only for students on SLP caseload who need it.	Does not provide explicit and detailed advance and post organizers to situate learning which may include visual schedules. Does not focus on additional modeling for students who need it.
Portable Word Wall (PWW)	Designs follow up activities with PWW for classroom use.	Designs follow up activities without PWW for classroom use. Designs follow up activities and gives them to teacher.		Implements follow up activities on own and does not share with teacher.	Does not design follow up activities using targeted words for classroom use.

Progress Monitoring	Uses classroom progress monitoring data to design and implement additional instruction as needed. Engages students in monitoring their vocabulary learning and aligning it with IEP and/or curriculum goals.	Both of the following: Uses own formative assessment data and gives it to/tells the teacher Engages students in monitoring their vocabulary learning.	1 of the following: Uses own formative assessment data and gives it to/tells the teacher Engages students in monitoring their vocabulary learning.	Uses own formative assessment data and does not share it with the teacher.	Does not use data to design and implement additional instruction as needed. Does not engage students in monitoring their vocabulary learning.
Mastery	Provides additional information to the classroom teacher on word learning with targeted words with which students are having difficulty.				
Generalization	Works with the teacher(s) to design specific generalization activities with words students know well enough to transfer.	Designs specific generalization activities, shares them with the teacher, and supports the teacher's use.	Designs specific generalization activities, shares them with the teacher, but does not support the teacher's use.	Designs specific generalization activities and leaves it up to the student to practice on own at home or school.	No attention is given to a designing and supporting generalization activities.

Appendix D3: VST-T+SLP Protocol

VST-T+SLP

See Materials List

INTRODUCTION DAYS

CUE

- Explain the reason for a focus on language and learning vocabulary. Emphasize the power of language and how you will help them become word experts.
- Bridge today's learning to the previous lesson.
- Orient to today's lesson. Read the learning objectives sign for the day and direct the section students need to turn to in the PWWs.
- Explain expectations for active participation.
- Distribute portable word walls (PWWs).

DO (Take each word through Steps 1-8 one at a time. Repeat for each word.)

Step	Teacher Action
Step 1: Read the scenario.	Display the visual of the vocabulary scenario on the screen and read the scenario once out loud.
Step 2: Find meaning clues.	Students determine the target word meaning in scenario with teacher support.
Step 3: Think of synonyms.	Students generate synonyms with teacher support.
Step 4: Try out one correct synonyms.	Pick just one correct word from the list and write it above the target word in the scenario (projected vocab poster). Lead the students in two choral readings of the scenario. First with the target word, then with the synonym.
Step 5: Write the target word and synonym.	Students write the target word and a best-fit synonym on the front of one card in the weekly section of their PWWs.
Step 6: Write word family variations.	Teacher introduces word variations and provides spelling visual.
Step 7: Generate sentences.	Students generate example sentences orally.
Step 8: Write a correct sentence.	Students write a correct example sentence on the back of word card for that target word.

REVIEW

- Teacher asks students to recall synonyms for each word introduced today.
- Students chorally respond
- Teacher collects PWWs and prepares students for what will happen in the next VST session.

REVIEW DAY(S)

CUE

- Explain the reason for a focus on language and learning vocabulary. Emphasize the power of language and how you will help them become word experts.
- Bridge today's learning to the previous lesson.
- Orient to today's lesson. Read the learning objectives sign for the day and direct the section students need to turn to in the PWWs.
- Explain expectations for active participation.
- Distribute portable word walls (PWWs).

DO

- Co-teaching: Nonexamples & nuance (15 mins); Word family activities (10 mins)
- Teacher large group & SLP small group (27 mins)

Co-teaching

Step	Partners' Actions
Step 1: Co-teach non-examples *15 mins*	Partners role play non-examples chosen collaboratively based on words students had the most trouble with on Days 1-2. Have enough words ready to take through non-examples for 15 mins (it's okay if you don't get to all of them). Partners engage students in highly scaffolded interactions and provide feedback.
Step 2: Co-teach word family variations *10 mins*	Partners present sentences (options 1-2) or categories of add-on prefixes or suffixes (option 3) based on words students had the most trouble with or word variations you anticipate they may have trouble with. Partners engage students in highly scaffolded interactions around word form shifts, including parts of speech changes.

Teacher large group

Step	Teacher's Actions
Step 3: Explore and use word family variations	Pass out colored pencils. Project the target word and word family variations. Choral read each word variation. Have students help identify the root words and add-ons (prefixes and suffixes). Discuss their meanings. Model correct underlining of the add-ons. When you talk about the add-ons, use the vocab prep sheet to provide student friendly definitions of the morphological variations. Have two students each generate a sentence using one of the target word variations. If a student's example does not capture the essence of the word or is used in the wrong way, think-aloud to make your questions about the example visible and to

	provide scaffolds to help the student understand. Use the vocab prep sheet resource for yourself if needed. Repeat for at least 4 of the 6 words from the week.
Step 4: Show your knowledge!	Model how to think-pair-share for the students' paired practice if needed. Walk around to each student; have him/her choose a word from the week and tell you the word's meaning or example sentence. Scaffold as necessary for the child to make accurate meaning. Acknowledge each student's demonstration of learning with one decorative hole punch on the corresponding word card.

SLP small group

Step	SLP's Actions
Step 3: Explore word family variations	Pass out colored pencils. Display the target word and word family variations. Choral read each word variation. Provide explicit instruction and modeling of underlining add-ons of all word family variations for the word. Have students help identify the add-ons (prefixes and suffixes) and their meanings. Model correct underlining on vocab poster from exhibit. When you talk about the add-ons, use the vocab prep sheet to provide student friendly definitions of the morphological variations. Provide models to help them think of how the word family variations can be used. Read example sentences (or generate your own) if needed to help students think of how to use any of the word family variations.
Step 4: Use variations and show your knowledge!	Students take turns generating a sentence using a word family variation of three more target words. SLP provides highly scaffolded practice to include: + reviewing meaning + underlining add-on + modeling (if needed) + elicit 1 sentence + evaluate sentence with group + scaffold student's sentence + award with Show Your Knowledge hole punch or class reward system

Bring large and small groups together for closing.

REVIEW

- Teacher asks students to recall synonyms for each word introduced today.
- Students chorally respond
- Teacher collects PWWs and prepares students for what will happen in the next VST session.

Appendix D4: VST-GE16 Protocol

VST-GE16 (© Spielvogel, 2011)

See Materials List

INTRODUCTION DAYS

CUE

- Explain the reason for a focus on language and learning vocabulary. Emphasize the power of language and how you will help them become word experts.
- Bridge today's learning to the previous lesson.
- Orient to today's lesson. Read the learning objectives sign for the day and direct the section students need to turn to in the PWWs.
- Explain expectations for active participation.
- Distribute portable word walls (PWWs).

DO (Take each word through Steps 1-8 one at a time. Repeat for each word.)

Step	Teacher Action
Step 1: Read the scenario.	Display the visual of the vocabulary scenario on the screen and read the scenario once out loud.
Step 2: Find meaning clues.	Students determine the target word meaning in scenario with teacher support.
Step 3: Think of synonyms.	Students generate synonyms with teacher support.
Step 4: Try out one correct synonyms.	Pick just one correct word from the list and write it above the target word in the scenario (projected vocab poster). Lead the students in two choral readings of the scenario. First with the target word, then with the synonym.
Step 5: Write the target word and synonym.	Students write the target word and a best-fit synonym on the front of one card in the weekly section of their PWWs.
Step 6: Write word family variations.	Teacher introduces word variations and provides spelling visual.
Step 7: Generate sentences.	Students generate example sentences orally.
Step 8: Write a correct sentence.	Students write a correct example sentence on the back of word card for that target word.

REVIEW

- Teacher asks students to recall synonyms for each word introduced today.
- Students chorally respond
- Teacher collects PWWs and prepares students for what will happen in the next VST session.

REVIEW DAY(S)

CUE

- Explain the reason for a focus on language and learning vocabulary. Emphasize the power of language and how you will help them become word experts.
- Bridge today's learning to the previous lesson.
- Orient to today's lesson. Read the learning objectives sign for the day and direct the section students need to turn to in the PWWs.
- Explain expectations for active participation.
- Distribute portable word walls (PWWs).

DO

Step	Teacher's Actions
Step 1: Explore and use word family variations	Pass out colored pencils. Project the target word and word family variations. Choral read each word variation. Have students help identify the root words and add-ons (prefixes and suffixes). Discuss their meanings. Model correct underlining of the add-ons. When you talk about the add-ons, use the vocab prep sheet to provide student friendly definitions of the morphological variations. Have two students each generate a sentence using one of the target word variations. If a student's example does not capture the essence of the word or is used in the wrong way, think-aloud to make your questions about the example visible and to provide scaffolds to help the student understand. Use the vocab prep sheet resource for yourself if needed. Repeat for at least all 6 words from the week.
Step 2: Show your knowledge!	Model how to think-pair-share for the students' paired practice if needed. Walk around to each student; have him/her choose a word from the week and tell you the word's meaning or example sentence. Scaffold as necessary for the child to make accurate meaning. Acknowledge each student's demonstration of learning with one decorative hole punch on the corresponding word card.

REVIEW

- Teacher asks students to recall synonyms for each word introduced today.
- Students chorally respond
- Teacher collects PWWs and prepares students for what will happen in the next VST session.

Teacher-Chosen Activities
Record your review activities, dates, and times on the activities log.

Appendix D5: VST Materials List

Note: Italicized text denotes materials for partners in collaborative condition only

Introduction Days (Days 1-2)	Review Day(s) (Day 3)
Teacher equipment • Projector and screen • White board, markers, eraser • Audio recorder and shirt with a chest pocket	Teacher *(and SLP)* equipment • Projector and screen • White board, markers, eraser • Audio recorders and shirts with a chest pocket • Decorative hole punches
Handy clipboard materials • Teacher reference sheets: VST script, vocabulary reference sheets, *and scaffolding tips* • *Data sheet* and pen • Vocabulary "poster" for each word	Handy clipboard materials • Partners' reference sheets: VST script, vocabulary refrence sheets, *and scaffolding tips* • Data sheet and pen
Student equipment • Portable Word Walls (PWWs) • Regular pencil for each	Student equipment • Portable Word Walls (PWWs) • 1 colored pencil for each student
Resources to be projected/displayed • Learning objectives visual • Vocabulary poster visual to be projected for each word during instruction. Each "poster" includes scenario, visuals for front and back card in PWW. • Classroom word wall exhibit (tape each vocab word poster on large piece of bulletin paper after the introduction sequence)	Resources to be projected/displayed • Learning objectives visual • Vocabulary poster visual to be projected for each word during instruction. Each "poster" includes scenario, visuals for front and back card in PWW. • Classroom word wall exhibit (tape each vocab word poster on large piece of bulletin paper after the introduction sequence) • Planned non-examples for co-teaching role play • Word family example sentences for co-teaching
After session • Attendance log	After session • Attendance log • Activities log (Comparison teachers)

Appendix D6: Vocabulary Words Weeks 1-7

The bolded word is the word form of the target word in the introduction day scenario and practice.

Week 1

desire (N), desire (V), desires (V), desired (V)
astonishment (N), astonish (V), astonished (V, ADJ)
envious (ADJ), enviously (ADV), envy (V, N)
detest (V), detests (V), detested (V), detestable (ADJ)
dreadful (ADJ), dread (V), dreads (V), dreadfully (ADV)
baffles (V), baffled (V, ADJ), baffling (ADJ)

Week 2

inquire (V), inquired (V), inquirer (N), inquiry (N)
insisted (V), insist (V), insisting (V), insists (V)
assured (V), assure (V), assuring (V), assures (V)
debated (V), debate (V, N), debaters (N)
protested (V), protesting (V), protest (N), protesters (N)
dispute (N), disputes (N, V), disputed (V)

Week 3

abruptly (ADV), abrupt (ADJ)
plummet (V), plummeting (V), plummets (V), plummeted (V)
perseverance (N), persevere (V), persevering (V), persevered (V)
cease (V), ceases (V), ceased (V), unceasing (ADJ)
gradual (ADJ), gradually (ADV)
hesitated (V), hesitate (V), hesitates (V), hesitating (V)

Week 4

intended (V), intend (V), intends (V), intending (V)
refrain (V), refrained (V), refrains (V), refraining (V)
humble (ADJ), humbly (ADV)
ponder (V), pondering (V), ponders (V), pondered (V)
persuaded (V), persuade (V), persuades (V), persuasive (ADJ)
speculate (V), speculated (V), speculates (V), speculating (V)

Week 5

scatter (V), scattered (V, ADJ), scatters
hovers (V), hover (V), hovering (V), hovered (V)
maneuvered (V), maneuver (N), maneuvers (N), maneuverable (ADJ)
meander (V), meandering (V), meanders (V), meandered (V)
grave (ADJ), gravest (ADJ), gravely (ADV)
remarked (V), remarks (N), remarkable (ADJ), unremarkable (ADJ)

Week 6

devise (V), devising (V), devises (V), devised (V)
inspiration (N), inspire (V), inspires (V), inspired (V)
attained (V), attain (V), attainable (ADJ), unattainable (ADJ)
contribution (N), contributions (N), contributor (N), contribute (V)
abundance (N), abundant (ADJ), abundantly (ADV)
indulge (V), indulging (V), indulges (V), indulged (V)

Week 7

reside (V), residing (V), resides (V), resided (V)
gloating (V), gloats (V), gloated (V)
exclude (V), excluded (V, ADJ), excludes (V)

Appendix D7: Week 1 Day 1 Example

Week 1 Day 2 Scenarios

We had to take our kittens to the vet to get shots. I **detest** having to get shots at the doctor's office. I really hate getting shots!

For me, getting shots at the doctor's office is **dreadful**! I hate it when I have to get shots. Having to get shots is just awful. I think shots will hurt so much and I don't want to cry in front of the nurse.

My cats didn't even seem to react to the shots- that **baffles** me! It confuses me how the shots don't seem to bother the cats like they bother me. I don't understand it.

Vocabulary Reference Sheet Example: DREADFUL

Intro Day

Scenario
For me, getting shots at the doctor's office is **dreadful**! I hate it when I have to get shots. Having to get shots is just awful. I think shots will hurt so much and I don't want to cry in front of the nurse.

Student friendly definition (COBUILD Learners, 2016)
Something that is dreadful is awful and very unpleasant

Added definitional information for instructor's reference (Collins online; Merriam-Webster online)
Something that is dreadful causes a person to have extreme uneasiness about something that will or might happen
Something that is dreadful causes great reluctance, apprehensiveness

Synonyms
awful, very unpleasant (not pleasant), very bad, causing fear

Target word + 3 words in word family

dreadful (N) = awful dread (V) dreads (V) dreadfully (ADV)

Example sentence
For me, playing the piano in front of people is dreadful.

Review Day

Role play: Examples and Non-examples (COLLABORATION CONDITION ONLY)

Option 1: Teacher and SLP act as friends talking about things that are unpleasant and that cause them to feel nervous.
Person 1 talks to the "friend."
Person 2 pauses and thinks aloud. Turns to the class to help her figure out if what her friend said makes sense.

Option 2: Teacher and SLP use a non-example given by a student during Days 1-2 of the word week, plan how to quickly role play it, and identify talking points.

Non-example & talking points (provided)	Non-example & talking points (student)	Example & talking points (provided)
The words in the song are dreadful for me because I am afraid I will forget the words and people will laugh at me.		Singing in the school concert is dreadful for me because I am afraid I will forget the words and people will laugh at me.
Why incorrect: It doesn't make sense to say the words of the song are dreadful when you mean to say that the act of singing is dreadful. How could we change this incorrect example to a good example of dreadful?		Why correct: It makes sense to say the act of singing in the school concert is dreadful because of what you think might go wrong.

Word family activities (COLLABORATION CONDITION ONLY)

Option 1: Does this sentence make sense and sound right?

The little boy dread going to the doctor's office.

a. Why or why not? Option to call on one person or think/pair/share. Discuss and scaffold.
Note: in the African American English dialect, the third person –s is sometimes omitted. If this is the case, or causes confusion, you can acknowledge this difference and explain that in the school language we are practicing, you would say "dreads" instead of "dread" in this sentence.

b. What are some other ways we could say this sentence so it makes sense? If students don't mention these, you can bring any of these up:

The little boy dreads going to the doctor's office.
The little boy thinks going to the doctor's office is dreadful.

Option 2: Which words could we change to make into a verb? Discuss and scaffold.

Morphological variations

Morphological variation	Student friendly definition	Example sentence (if you need it)
dread (V)	If you *dread* something, you *feel* nervous about it because you *think* it will be upsetting or unpleasant**.**	I dread playing the piano in front of people.
dreads (V)	If someone *dreads* something, he/she *feels* nervous about it because he/she *thinks* it will be upsetting or unpleasant.	My sister said she also dreads playing the piano in front of a group.
dreadful*ly* (ADV)	In a very bad or unpleasant way	"I don't want to play the piano in front of everyone," I said dreadfully.

Vocabulary "poster" example: DREADFUL

dreadful

Scenario

For me, getting shots at the doctor's office is **dreadful**! I hate it when I have to get shots. Having to get shots is just awful. I think shots will hurt so much and I don't want to cry in front of the nurse.

Word Family

dreadful = awful
dread
dreads
dreadfully

Example sentence

For me, playing the piano in front of people is dreadful.

Appendix D8: Activity Log

Activities Log Week _____

Part 1 Directions: Log the review activities you facilitate with your students for the review time (30 mins) beyond the VST-GE16 review day (30 mins). Provide the date, a 1-2 sentence description of the activity, and the time spent on the activity. Only fill up the rows you need in the chart.

Date	Brief Activity Description	Time Spent

Part 2 Directions: Confirm whether you left the classroom word wall exhibit up during the review 60-minutes and for one extra hour during the instructional week.

YES NO The classroom word wall exhibit was on display during the 60-minutes of review.

YES NO The classroom word wall exhibit was on display in the classroom for an extra hour beyond the intro and review sessions during the instructional week.

Appendix D9: Attendance Log

Example of Attendance Logs

Key
1 present
0 absent (less than half of session)
p part of the time (at least half of session)

Collaboration Attendance Log Template

Student Code	Week 1, Day 1 Date: _____	Week 1, Day 2 Date: _____	Week 1, Day 3 Date: _____
			Group:*
			Group:
			Group:

**Group: SLP or T (teacher) for second half of in-class collaboration session*

Comparison Attendance Log Template

Student Code	Week 1, Day 1 Date: _____	Week 1, Day 2 Date: _____	Week 1, Day 3 (35 mins VST) Date: _____	Week 1, remaining 25-min review time Date(s): _____

APPENDIX E: VST FIDELITY CHECKLISTS

Appendix E1: VST Introduction Days

VST-T+SLP (Mitchell et al., 2017) and VST-GE16 (Spielvogel, 2011)
Day 1 and Day 2

Date _____ Observer _____

Week _____ Day *1 2* Duration of Session _____

Instructional time excluding transitions, redirections, student organizational support, etc.
_____

CUE Features

Feature	Yes = 1	No = 0	Comments
Bridge from previous lesson 1 = Any reference to project (word learners, word wonderers), which week they are in the project, new words learned or added); may include rationale for learning vocabulary 0 = the lesson is not situated in the context of past word learning sessions			
Orientation to today's lesson 1 = Any reference to adding new words today; prep cues such as, "new word!" 0 = no orientation to the lesson			
Expectations regarding performance 1 = Any reference to active participation 0 = no reference to *active* participation; may just alert students to being ready and paying attention			

Total CUE points _____ / 3

Do Features
P= Points E+ = Additional encounters C = Comments

Adherence	**Point Descriptions**	**Word 1** _____	**Word 2** _____	**Word 3** _____
E1 (Step 1) T reads to them and talks about scenario	1= Implemented as per protocol with acceptable adaptations 0 = Omitted step or had student(s) read the whole scenario	**P** _____ *E+:* *C:*	**P** _____ *E+:* *C:*	**P** _____ *E+:* *C:*
E2 (Steps 2-3) S offers synonym	1= Implemented as per protocol with acceptable adaptations (e.g., teacher makes any reference to "What do you think the word means?; What are clues in the sentence?; provides synonym if students unable to think of them) 0 = Omitted step *If questionable or unacceptable synonym was accepted, make note in comments.*	**P** _____ *E+:* *C:*	**P** _____ *E+:* *C:*	**P** _____ *E+:* *C:*
E3 (Step 4) All read target word in scenario and reread sentence with target word or entire scenario with synonym Clarification: Type of encounter= students hear or say target word in the context of the scenario	1= Implemented as per protocol with acceptable adaptations (e.g., students read entire scenario twice; teacher reads scenario, therefore the encounter is achieved) 0 = Omitted step or encounter with target word is not achieved *If questionable or unacceptable synonym was accepted, make note in comments.*	**P** _____ *E+:* *C:*	**P** _____ *E+:* *C:*	**P** _____ *E+:* *C:*
E4 E5 (Step 5) All instructed to, and write, the word and synonym on the front of their card	1= Implemented as per protocol with acceptable adaptations (e.g., have them write the target word before step 5 and synonym after step 2; students are given a writing accommodation). 0 = Omitted step	**P** _____ *E+:* *C:*	**P** _____ *E+:* *C:*	**P** _____ *E+:* *C:*
E6 E7 (Step 6) T talks about at least two morphological variations	1 = Teacher introduces all word family variations provided and provides spelling visual	**P** _____ *E+:*	**P** _____ *E+:*	**P** _____ *E+:*

	0 = Omitted step or omitted more than one of the provided word family variations *Write the word family variations you hear in the comments section.*	*C:*	*C:*	*C:*
E8 E9 (Step 6) All write morphological variations	1= From audio, evidence that teacher instructs them to write and gives them time to write (e.g., students are given a writing accommodation) 0 = Omitted step	**P** _____ *E+:* *C:*	**P** _____ *E+:* *C:*	**P** _____ *E+:* *C:*
E 10 (Step 7) T asks S to think about using word in a sentence	1= Implemented as per protocol OR with acceptable prompt (e.g., when is a time you…?) OR if students have the routine down and the teacher's expectation that students generate a sentence leads to students generating sentences. 0 = Omitted step	**P** _____ *E+:* *C:*	**P** _____ *E+:* *C:*	**P** _____ *E+:* *C:*
E11 E12 (Step 7) T elicits 2 sentences from students (or elicits 1 and provides 1)	1= Implemented as per protocol or with acceptable adaptation (e.g., > 2 sentences elicited) 0 = Omitted step *Comment if word form or part of speech is different from use in scenario.* *Also comment if sentence accepted is inaccurate.*	**P** _____ *E+:* *C:*	**P** _____ *E+:* *C:*	**P** _____ *E+:* *C:*
E 13 (Step 8) T writes/projects 1 sentence on screen or gives a model for students at their desk	1= From audio, evidence that teacher provides a model for one correct sentence to write 0 = Omitted step *Comment if word form or part of speech is different from use in scenario. Also comment if sentence provided does is inaccurate.*	**P** _____ *E+:* *C:*	**P** _____ *E+:* *C:*	**P** _____ *E+:* *C:*

E 14 (Step 8) All copy sentence	1= From audio, evidence that teacher instructs them to write and gives them time to write (e.g., students are given a writing accommodation) 0 = Omitted step *If questionable or unacceptable sentence was accepted, make note in comments.*	**P _____** *E+:* *C:*	**P _____** *E+:* *C:*	**P _____** *E+:* *C:*
Visual display used for scenarios	1= From audio, evidence that teacher displays the scenarios for students to see	**P _____**	**P _____**	**P _____**
At least 14 encounters	1 = 14 or more encounters of the word occur in the DO portion 0 = 0-13 encounters of the word occur in the DO portion	**P _____**	**P _____**	**P _____**
Total points for each word		**Total Points _____ / 12**	**Total Points _____ / 12**	**Total Points _____ / 12**

Review Features

Feature	YES = 1 or 2	NO = 0	Comments
E15 T query about meaning (for each word introduced this day) 1 = Asks question before whole class for all of the words or over half of the words 0 = Omitted step			
E16 S gives meaning of word (for each word introduced this day) 2 = Class chorally responds answer (or turn/talk with answer then provided) 1 = Only 1 or a few students answer 0 = Omitted step			
Orientation to next VST lesson			

Total REVIEW points _____ /4

Total CUE + DO + REVIEW points

CUE	DO Word 1	DO Word 2	DO Word 3	REVIEW	Total
					_____ / 43

Time Features: Record the minutes you calculated in the corresponding box.

	Entire Session	Instructional Time Excluding Redirects and Transitions
30-33 mins		
26-29 mins OR 34-37 mins		
Less than 25 mins OR more than 38 mins		

Picture evidence from week

- Front of word walls completed
- Back of word walls completed
- Classroom exhibit

Appendix E2: VST-T+SLP Review Day(s)

(Mitchell et al., 2017)

Date _____ Observer _____

Week _____ Review Day *All* *Part 1* *Part 2* Duration of Session _____

Instructional time excluding transitions, redirections, student organizational support, etc.
_____

CUE Features _____ / 3

Feature	YES = 1	NO = 0	Comments
Bridge from previous lesson			
Orientation to today's lesson			
Expectations regarding performance			

Do Features Co-Teaching

Point descriptions	Feature	Points (P)
4 = As described in feature to the right (may integrate semantics and morpho-syntax). Students are posed with multiple strategic questions, have multiple opportunities to respond, and receive feedback. Both the teacher and SLP are involved in the interactions; SLP may take on more of a lead role, but teacher is still engaged in the interactions. 3 = Students are posed with few strategic questions and few opportunities to respond. 2 = Interaction is a consistent pattern of the teacher/SLP simply correcting errors (without discussion) or moving on if a student gives an incorrect or incomplete response. 1 = Interaction is characteristic of telling vs. exploring. The instructor(s) are doing most/all of the talking. The teacher is involved minimally in the language interactions, is not engaged in the language interactions, or is may only be managing behavior. 0 = Omitted step or no evidence of involvement from both teacher and SLP.	Partners follow Step 1: Teacher and SLP co-teach; facilitate scaffolded interactions around non-examples and nuance.	**P _____** Comments:
	Partners follow Step 2: Teacher and SLP co-teach; facilitate scaffolding interactions around word forms.	**P _____** Comments:

Total Co-teaching Points = _____ / 8

Minutes: Non-Examples, Ex, Nuance		Minutes: Word Family	
>17	**_____**	**>12**	**_____**
14-16	**_____**	**9-11**	**_____**
10-13	**_____**	**6-9**	**_____**
< 10	**_____**	**< 6**	**_____**

Do Features: Teacher Large Group

Feature	Points Descriptions	Word 1	Word 2	Word 3	Word 4	Words 5-6 optional
All underline add-ons (Step 1)	1 = Teacher leads students in underlining add-on prefixes and suffixes 0 = omitted step or leaves students to figure out on own					
2 sentences with at least one word family word (Step 1)	1 = Teacher elicits at least 2 sentences using word family variations (or elicits one + provides one) 0 = omitted step					
Show Your Knowledge (Step 2) Students pair and practice	1 = Students pair and practice 0 = omitted step		**Circle 1 0**			
Show Your Knowledge (Step 2) Teacher provides feedback and hole punches	1 = Teacher provides feedback and hole punches 0 = omitted step		**Circle 1 0**			

Total DO points _____ / 14

DO Features: SLP Small Group

Steps 3-4	Points Description	Word 1	Word 2	Word 3	Words 4-6 (optional)
SLP provides direct and explicit instruction with scaffolded feedback on at least one word family variation of 3 or more target words from the week.	1 = at least one word family variation targeted for each word 0 = a word family variation is not targeted	Points _____ Comments:	Points _____ Comments:	Points _____ Comments:	Comments:
SLP provides explicit instruction and modeling of underlining add-ons of all word family variations for the word	1 = SLP leads students in underlining all add-ons for the word 0 = Step is skipped or students are left to underline on own	Points _____ Comments:	Points _____ Comments:	Points _____ Comments:	Comments:
SLP provides highly scaffolded practice to include: + reviewing meaning + underlining add-on + modeling (if needed) + elicit 1 sentence + evaluate sentence with group + scaffold student's sentence + award with Show Your Knowledge hole punch or class reward system	2 = SLP provides highly interactive practice and feedback using 4 or more of the listed actions 1 = SLP engages in 1-3 of the listed actions 0 = SLP engages in 0 of the listed actions	Points _____ Comments:	Points _____ Comments:	Points _____ Comments:	Comments:

SLP Small Group Do _____ / 12

Time Features: Record the minutes you calculated in the corresponding box.

Time	Small Group Session	Instructional Time for VST Excluding Redirects and Transitions
22-25 mins		
18-21 mins OR 26-29 mins		
Less than 17 mins OR more than 30 mins		

Review Features

Feature	YES = 1 or 2	NO = 0	Comments
E15 T query about meaning (for each word introduced this day) 1 = Asks question before whole class for all of the words 0 = Omitted step			
E16 S gives meaning of word (for each word introduced this day) 2 = Class chorally responds answer 1 = Only 1 or a few students answer 0 = Omitted step			
Orientation to next VST lesson			

Total REVIEW points _____ / *4*

Appendix E3: VST-GE16 Review Day(s)

Spielvogel (2011)

Session Date _____ Observer _____

Week _____ *Day 3- VST portion of 60-min review activities* Duration of VST portion _____

CUE Features

Feature	YES = 1	NO = 0	Comments
Bridge from previous lesson			
Orientation to today's lesson			
Expectations regarding performance			

Total CUE points _____ / 3

Do Features

Feature	Points Descriptions	Word 1	Word 2	Word 3	Word 4	Word 5	Word 6
All underline add-ons (Step 1)	1 = Teacher leads students in underlining add-on prefixes and suffixes 0 = omitted step or leaves students to figure out on own						
2 sentences with at least one word family word (Step 1)	1 = Teacher elicits at least 2 sentences using word family variations (or elicits one + provides one) 0 = omitted step						
Show Your Knowledge (Step 2) Students pair and practice	1 = Students pair and practice 0 = omitted step	**Circle 1 0**					

Show Your Knowledge (Step 2) Teacher provides feedback and hole punches	1 = Teacher provides feedback and hole punches 0 = omitted step	**Circle 1 0**

Total DO points _____ / 14

Review Features

Feature	YES = 1 or 2	NO = 0	Comments
E15 T query about meaning (for each word introduced this day) 1 = Asks question before whole class for all of the words 0 = Omitted step			
E16 S gives meaning of word (for each word introduced this day) 2 = Class chorally responds answer 1 = Only 1 or a few students answer 0 = Omitted step			
Orientation to next VST lesson			

Total REVIEW points _____ / *4*

Total CUE + DO + REVIEW points

CUE	DO	REVIEW	Total
			_____ /

Time Features: Record the minutes you calculated in the corresponding box.
Objective: VST Day 3 + Teacher Choice = 60 mins

Time	Entire VST Session	Instructional Time for VST Excluding Redirects and Transitions	Teacher Choice Time (from log)	Classroom word wall exhibit on display for 1 extra hour outside of enhanced vocabulary learning?

30-33 mins				
26-29 mins OR 34-37 mins				
Less than 25 mins OR more than 38 mins				

APPENDIX F: SLP/TEACHER COLLABORATION IC MAP

SLP/TEACHER Collaboration Innovation Configuration (IC) Map- Working Document
(© Mitchell, Ehren, & Towson 2016) Used with permission.

Key Feature	Ideal (4)	In process (3)	In process (2)	In process (1)	No implementation (0)
Establish a partnership	SLP selects a teacher to work with for a defined period of time based on needs of students, teacher, and/or school and teacher willingly agrees to collaborate	SLP selects a teacher to work with for a defined period of time based on convenience (e.g., schedule), teaching style, or personality preference and teacher willingly agrees to collaborate	SLP selects a teacher to work with when the opportunity arises (e.g., at the last minute)	SLP or teacher express interest in collaborating, but the interest is not shared by the other partner OR There is little choice involved; SLP and teacher are mandated to work together	SLP and Teacher do not collaborate (or decide not to continue a collaboration)
Plan time commitment and schedule	SLP + Teacher set agreed upon parameters regarding collaboration duration, time commitment, and schedule as part of an overall planning process; both perceive the parameters of the duration, time commitment, and schedule to be doable	SLP + Teacher set agreed upon parameters regarding time commitment and schedule without determining a duration for the collaboration segment interval; both perceive the parameters to be doable	SLP + Teacher set agreed upon parameters regarding time commitment and schedule without determining a duration for the collaboration segment interval; one or both partners question the doability	SLP + Teacher make plans to work together when the time suits (e.g., at the last minute)	SLP + Teacher work together, but do not plan the time commitment and schedule in advance.
Agree on ground rules	From the beginning, SLP + Teacher explicitly discuss and agree on (a) expectations for active participation from both partners, (b) positive behavioral interventions and supports, and (c) ways to hold each other accountable.	SLP + Teacher may not explicitly discuss the following from the beginning, but demonstrate (a) shared expectations about (a) active participation from both partners; (b) positive behavioral interventions and supports, and (c) accountability to their plan.	SLP + Teacher may not explicitly discuss the following from the beginning, and do not consistently demonstrate (a) shared expectations about (a) active participation from both partners; (b) positive behavioral interventions and supports, and (c) accountability to their plan.	SLP + Teacher do not discuss, but occasionally make attempts to require (a) active participation from both partners, (b) implementation of positive behavioral interventions and supports, and (c) accountability to a plan.	SLP + Teacher do not discuss or make attempts to require (a) active participation from both partners, (b) implementation of positive behavioral interventions and supports, and (c) accountability to a plan.

Demonstrate a shared understanding of students' needs, language base of social interaction and curriculum, and instructional techniques	Teacher and SLP have a shared knowledge of, and discuss, content and techniques. (examples: attend PL together or share information from PL, read the same professional articles/books, or share resources)	Teacher and SLP have a shared knowledge base, but don't explicitly discuss content and techniques (or there is very little discussion involving explicit content and techniques)	Over the course of the collaboration, Teacher and SLP are developing a shared knowledge of content and techniques and continue to add to their knowledge base. There is not yet a sound basis of content and techniques for decision-making.	Teacher and SLP have no shared knowledge base of content and techniques and do not attempt to develop their understanding.	Teacher and SLP have no shared knowledge base of content and techniques, do not attempt to develop their understanding. The lack of a shared understanding causes problems in the partnership.
Use curriculum/ instruction trouble spots as a basis for establishing instructional targets	In advance, SLP + Teacher together identify what may be potential language trouble spots (e.g., curriculum standards, instructional activities) and analyze underlying language reasons for potential confusion. They calibrate their plan accordingly.	In advance, SLP + Teacher together identify what may be potential language trouble spots (e.g., curriculum standards, instructional activities), but do not analyze underlying language reasons for potential confusion. They calibrate their plan accordingly.	In advance, SLP or teacher identifies what may be potential language trouble spots (e.g., curriculum standards, instructional activities) and shares ideas with the other. There is little to no discussion about underlying reasons for potential confusion. They calibrate their plan accordingly.	In advance, SLP or teacher identifies what may be potential language trouble spots (e.g., curriculum standards, instructional activities). There is little to no discussion about underlying reasons for potential confusion. They do not calibrate their plan accordingly.	In advance, neither the SLP nor the teacher identifies potential language trouble spots (e.g., curriculum standards, instructional activities), analyzes reasons for the trouble spots, or calibrates the plan.
	In response to student performance, SLP + Teacher together identify what language trouble spots were (e.g., curriculum standards, instructional activities) and analyze underlying language reasons for potential confusion. They calibrate their plan accordingly.	In response to student performance, SLP + Teacher together identify what language trouble spots were (e.g., curriculum standards, instructional activities), but do not analyze underlying language reasons for potential confusion. They calibrate their plan accordingly.	In response to student performance, SLP or teacher identifies what language trouble spots were (e.g., curriculum standards, instructional activities) and shares ideas with the other. There is little to no discussion about underlying reasons for potential confusion. They	In response to student performance, SLP or teacher identifies what language trouble spots were (e.g., curriculum standards, instructional activities). There is little to no discussion about underlying reasons for potential confusion. They do not calibrate their plan accordingly.	In response to student performance, neither the SLP nor the teacher identifies what language trouble spots were (e.g., curriculum standards, instructional activities), analyzes reasons for the trouble spots, or calibrates the plan.

			calibrate their plan accordingly.		
Select impactful targets for the collaboration content focus	From the initial plan for the partnership, SLP + Teacher jointly discuss and set clearly defined impactful targets. Targets are set according to desired student outcomes, anticipated trouble spots, and/or demonstrated trouble spots.	From the initial plan for the partnership, SLP + Teacher jointly discuss and set loosely defined impactful targets. Targets are set according to desired student outcomes, anticipated trouble spots, and/or demonstrated trouble spots.	From the initial plan for the partnership, the teacher OR the SLP sets impactful targets. Targets are set according to desired student outcomes, anticipated trouble spots, and/or demonstrated trouble spots. Partner shares the targets with the other.	From the initial plan for the partnership, the teacher OR the SLP sets impactful targets. The rationale for the targets may be unclear. Partner does not share the targets with the other partner.	From the initial plan for the partnership, neither the teacher nor the SLP sets impactful targets.
	Within the partnership segment, SLP + Teacher jointly discuss and set clearly defined impactful targets. Targets are adjusted when needed according to desired student outcomes, anticipated trouble spots, and/or demonstrated trouble spots.	Within the partnership segment, SLP + Teacher jointly discuss and set loosely defined impactful targets. Targets are adjusted when needed according to desired student outcomes, anticipated trouble spots, and/or demonstrated trouble spots.	Within the partnership segment, the teacher OR the SLP sets impactful targets. Targets are adjusted when needed according to desired student outcomes, anticipated trouble spots, and/or demonstrated trouble spots. Partner shares the targets with the other.	Within the partnership segment, the teacher OR the SLP sets impactful targets. The rationale for the targets may be unclear. Partner shares the targets with the other partner. Targets are not adjusted when needed.	Within the partnership segment, neither the teacher nor the SLP sets impactful targets.
Plan student outcome measurement procedures	From the start of the partnership, SLP + Teacher identify student outcomes to monitor at the word, sentence, and/or discourse levels. Partners agree upon a plan to collect desired student outcome data from the beginning to end of the collaboration segment (e.g., pre/posttests, projects, writing samples) for all	From the start of the partnership, SLP + Teacher identify student outcomes to monitor at the word, sentence, and/or discourse levels. Partners agree upon a plan to collect desired student outcome data from the beginning to end of the collaboration segment	Over the course of the partnership, SLP + Teacher identify student outcomes to monitor at the word, sentence, and/or discourse levels. Partners agree upon a plan to collect progress indicators (e.g., products, documented student responses, or	One partner identifies student outcomes to monitor at the word, sentence, and/or discourse level and takes his/her own data; partners do not have a plan for sharing progress monitoring data one or both partners collect.	Neither partner identifies student outcomes to monitor at the word, sentence, and/or discourse level; there is no plan to collect progress monitoring data.

	students AND progress indicators within the segment (e.g., products, documented student responses, observations) for class a whole or selected students.	(e.g., pre/posttests, projects, writing samples) for all students OR progress indicators within the segment (e.g., products, documented student responses, observations) for class as a whole or selected students.	observations) for class as a whole or selected students.		
Implement class time activities and techniques	SLP + Teacher implement in-class activities and techniques based on to trouble spots they agreed upon in advance and in response to demonstrated student performance. In the case of whole class teaching (including demonstration lessons), both partners are involved. The SLP may take the instructional lead with the teacher facilitating student connections to background experiences and curriculum. The teacher may also take the lead in behavior management.	SLP + Teacher actively implement in-class collaboration activities and techniques based on to trouble spots they agreed upon in response to demonstrated student performance. In the case of whole class teaching (including demonstration lessons), both partners are involved. The SLP may take the instructional lead; the teacher takes the lead in behavior management and is minimally involved in helping students make connections to their background experiences and curriculum.	SLP + Teacher actively implement the in-class collaboration activities and techniques one partner planned based on trouble spots. In the case of whole class teaching (including demonstration lessons), both partners are involved. The SLP may take the instructional lead with the teacher facilitating student connections to background experiences and curriculum. The teacher may also take the lead in behavior management.	Partners attempt to implement activities and techniques based upon suggestions of the other. Partners may not refine instruction based on trouble spots. The SLP gives ideas to the teacher to implement without providing modeling, coaching, or feedback. OR The teacher tells the SLP what the lesson plan is for the day for the SLP to then build upon. The teacher leads classroom instruction; SLP follows along and builds upon the instruction when opportunities arise to address students' goals.	Partners do not attempt to implement activities and techniques based upon suggestions of the other. Partners do not refine instruction based on trouble spots.

	In the case of teacher continuing language-focused instruction when SLP is not in the room, teacher provides evidence of 1 or more language scaffolding techniques habitually in a robust way. Teacher is focused on achieving increased impact on many students.	In the case of teacher continuing language-focused instruction when SLP is not in the room, teacher provides evidence of using 1 or more language scaffolding techniques habitually. Use of the technique(s) could be used in a more robust way.	In the case of teacher continuing language-focus instruction when SLP is not in the room, teacher uses a language scaffolding technique without incorporating strategic questions and contingent responses in interaction with students (e.g., acknowledge, praise, corrective feedback).	In the case of teacher continuing language-focused instruction when SLP is not in the room, teacher indicates s/he is thinking about using language scaffolding technique(s), but is not yet implementing.	In the case of teacher continuing language-focused instruction when SLP is not in the room, teacher does not demonstrate an awareness of what language scaffolding technique(s) are or how to implement them.
SLP models and shares language scaffolding techniques	From the beginning to end of the collaboration interval, the SLP poses strategic questions and engages students in highly interactive practice around meaning associated with word, sentence, or discourse level language. SLP provides feedback on student accuracy, including information about nuance. There are few missed opportunities (e.g., nonresponses or moving on following student miscues, accepting incomplete responses, accepting incorrect responses, etc.) and/or few inaccurate attempts when discussing meaning.	From the beginning to the end of the collaboration interval, the SLP poses strategic questions and engages students in highly interactive practice around meaning associated with word, sentence, or discourse level language. SLP provides feedback on student accuracy, including information about nuance. There are some missed opportunities and/or some inaccurate attempts when discussing meaning.	From the beginning to middle of the collaboration interval, the SLP is minimally involved in posing strategic questions and engaging students in highly interactive practice around meaning associated with word, sentence, or discourse level language throughout instruction. SLP provides minimal feedback on student accuracy, including information about nuance. There are many missed opportunities and/or inaccurate attempts at discussing meaning.	Throughout the collaboration interval, the SLP is minimally involved in posing strategic questions and engaging students in highly interactive practice around meaning associated with word, sentence, or discourse level language throughout instruction. SLP provides minimal feedback on student accuracy, including information about nuance. There are many missed opportunities and/or inaccurate attempts at discussing meaning.	Throughout the collaboration interval, there are many missed opportunities (e.g., nonresponses or moving on following student miscues, accepting incomplete responses, accepting incorrect responses, etc.) for discussing meaning.
Gather student outcome data	Desired student outcome data is gathered from the beginning to end of the collaboration	Student data is gathered either in the form of desired student outcome	One partner gathers some progress monitoring data and shares the	One partner gathers some progress monitoring data and does not share the	Neither partners gathers progress monitoring data.

	segment (e.g., pre/posttests, projects, writing samples) for all students AND progress indicators within the segment (e.g., products, documented student responses, observations) for class a whole or selected students. The partners gather the data according to the plans they established, or (if different from the original plan) still meets data-driven instructional needs.	data from the beginning to end of the collaboration segment (e.g., pre/posttests, projects, writing samples) for all students OR progress indicators within the segment (e.g., products, documented student responses, observations) for class as a whole or selected students. The partners gather the data according to the plans they established, or (if different from the original plan) still meets data-driven instructional needs.	performance data with the partner.	performance data with the partner.	
Analyze student outcome data	SLP + Teacher analyze desired student outcome data from the beginning to end of the collaboration segment AND progress indicators within the collaboration segment. Partners jointly determine data what instructional adjustments to make.	SLP + T analyze progress indicators within the segment (e.g., products, documented student responses, observations). Partners jointly determine what instructional adjustments to make.	One partner analyzes some progress monitoring student performance data and shares with the other; jointly determine what instructional adjustments to make.	One partner analyzes, or partners separately analyze, some progress monitoring student performance data without sharing information with the other; one partner informs the other about instructional adjustments he/she will make.	Neither partner discusses *progress monitoring* student performance with the other; there is no discussion about instructional adjustments to make.

APPENDIX G: COLLAB GUIDING STEPS

The COLLAB Guiding Steps

Applied to VST-T+SLP

Steps	Objectives
STEPS 1-5	**C**hoose the process and language focused-content of the partnership.
STEP 6	**O**btain student baseline.
STEPS 7-9 & 11-12 (weekly beyond class)	**L**ay foundations for language focused instruction and support through shared planning.
STEPS 10 & 13 (weekly in class)	**L**aunch the plan.
STEP 14 (weekly beyond class)	**A**ssess student learning and make adjustments according to student needs.
STEP 15	
STEP 16	**B**uild next steps.

STEPS 1a & 1b	***Frequency of evidence/notes on planning sheet***
Choose the process and language focused-content of the partnership. Partners meet before entering into a collaboration.	*One time, at the start of the collaboration. As needed afterwards to make revisions.*

STEP 1a: Teacher & SLP agree to enter into a literacy partnership and establish ground rules.

A. SLP initiates a prospective partnership with a teacher based on needs of students, teachers, and/or school.
B. Partners use a shared definition of collaboration as a shared creation.
C. Partners set agreements and establish a shared vision for the collaboration process and language-focused content of the collaboration.
D. Partners discuss potential costs and benefits of entering into a collaboration.
E. Partners project a time period for the collaboration (or a general timeframe to reassess members' involvement in the collaboration).
F. Partners agree to co-plan classroom activities (e.g., language sensitive demonstration lessons, language intensive small group activities).
G. Partners discuss what kind of professional resources they have and what they need.

STEP 1b: Teacher & SLP agree upon time commitment and schedule and revise the schedule together as needed.

A. Partners set agreed upon parameters regarding time commitment and both perceive the parameters to be doable.
B. Set a schedule for teacher-only instruction using the content to be later reinforced during in-class collaboration activities.
C. Set a schedule for teacher + SLP in class collaboration activities.
D. Discuss times and convenient forums for teacher + SLP beyond class collaboration activities.

STEPS 2-5	***Frequency of evidence/notes on planning sheet***
Choose the process and language focused content of the partnership. Partners meet before entering into a collaboration. Once partners agree to enter into collaboration, they get on the same page.	*One time, at the start of the collaboration. As needed afterwards to make revisions.*

STEP 2: Teacher & SLP develop a shared understanding of language underpinnings and instructional techniques.

A. Partners attend professional learning together or share information from PL, read the same professional articles/books, and/or share resources.
B. Partners interact around professional learning content practice and give each other feedback.
C. Partners together identify trouble spots (e.g., curriculum, standards, assignment) from a language standpoint.

STEP 3: Teacher & SLP set impactful targets for student learning.

A. Partners jointly discuss and set agreed upon impactful targets according to desired student outcomes.
B. Partners select student learning objectives according to state standards, best practices according to research, curriculum, what is likely to be hard for most students, and what is likely to be hard for students who struggle from a language standpoint.

STEP 4: Teacher & SLP plan how to measure student understanding.

A. Partners identify student outcomes to monitor at the word, sentence, and/or discourse levels; agree upon a system to collect baseline and posttest data.
B. Partners select and/or design student summative learning assessment(s) based on a what would be a valid assessment of the content taught (e.g., teacher/SLP created tool, existing curriculum assessment, school/district progress monitoring assessments) after the instructional program. Partners agree on a plan for documenting and analyzing the data.
C. Partners identify a plan for gathering data about student learning during the instructional program (formative assessment). Partners agree on a plan for documenting and sharing their data with each other.

STEP 5: Teacher & SLP address trouble spots by identifying explicit instruction techniques and language scaffolds to implement.

A. Partners decide on which knowledge, skills, and strategies to teach and which techniques to use.
B. Partners clarify teacher roles (ex- explicit teaching, language sensitive scaffolding, large group and facilitated peer groups).
C. Partners clarify SLP roles (ex- explicit teaching, language intensive scaffolding demonstration lessons, small group intensified instruction).

STEP 6	***Frequency of evidence/notes on planning sheet***
Obtain baseline data.	*One time, before the intervention program begins.*

A. SLP and teacher gather student baseline data according to the plan they established.
B. SLP and teacher analyze student baseline data according to the plan they established.
C. SLP and teacher determine what instructional adjustments to make based on baseline data.

STEPS 7-9	*Frequency of evidence/notes on planning sheet*
Lay foundations for language focused instruction and support through shared planning.	*Weekly, for each new vocabulary unit cycle*

STEP 7: Teacher & SLP prepare to teach content with a language focused instructional technique.

A. Partners anticipate trouble spots and brainstorm how to scaffold to support the trouble spots.
B. Partners troubleshoot, decide upon demonstration lessons, select impactful targets, plan language sensitive and language intensive class activities.
C. Partners familiarize themselves with the content students will be learning during the session.
D. Partners determine lead and support roles on shared day (e.g., for demonstration teaching).

STEP 8: Teacher & SLP make grouping decisions based on students who struggle.

A. Partners discuss potential groupings from ongoing student performance and/or student pretest assessments.
B. Partners determine who needs intensified instruction.
C. Partners determine how many students should be in the small group with the SLP.

STEP 9: Teacher & SLP plan logistics of the in-class instruction activities.

A. Partners confirm SLP and teacher scheduling plans.
B. Partners confirm set up of their materials (SLP and teacher materials: how materials will be displayed on overhead, what will be displayed on overhead, what will be written on the whiteboard, classroom visuals related to the content, etc).
C. Partners confirm organization of student materials.
D. Partners determine a system for using/organizing any data collection sheets.
E. Partners decide on a way to introduce the SLP and the SLP's role to the students in the class.

STEP 10	*Frequency of evidence/notes on planning sheet*
Launch the plan. Teacher implements teacher-only portion of instruction. Teacher provides direct, explicit instruction with some language scaffolding for the large group.	*Weekly; teacher-only class sessions for each new vocabulary unit cycle*

A. Teacher implements the teacher-only portion of Step 5 as planned.

STEPS 11-12	*Frequency of evidence/notes on planning sheet*
Lay foundations for language focused instruction and support through shared planning. Teacher & SLP prepare to teach content with a language focused instructional technique.	*Weekly, for each new vocabulary unit cycle*

STEP 11: Teacher informs SLP about instructional session(s) prior the related in-class collaboration activities to follow.

A. Teacher lets SLP know about in class instruction.
B. Partners discuss what was covered what was not covered.
C. Partners discuss what most students/struggling students seem to understand.
D. Partners discuss what most students students/struggling students seem to have difficulty with.

STEP 12: Teacher and SLP make adjustments (review Steps 7-9 to guide adjustments if needed).

A. Make language-intensive adjustments for the in-class collaboration activities to follow based on instructional day(s) if needed.
B. Make language-intensive adjustments to daily classroom instruction experiences for the students who struggle.

STEP 13	*Frequency of evidence/notes on planning sheet*
Launch the plan. Partners implement in-class collaboration activities. SLP and teacher provide direct, explicit instruction language intensive scaffolding.	*Weekly; partners' in-class collaboration sessions for each new vocabulary unit cycle*

A. Implement teacher + SLP collaborative plan from Step 5.

STEPS 14-15	***Frequency of evidence/notes on planning sheet***
Assess student learning and make adjustments according to student needs.	*Step 14: Weekly debriefing/assessing/adjusting/planning* *Step 15: One time, after the intervention program ends*

STEP 14: Partners engage in beyond class time collaboration activities. SLP and teacher debrief, reflect, and plan after the shared review day(s).

A. What worked well and what could be improved?
B. How did the SLP and teacher feel about their explicit instruction and scaffolding? Each partner give an example of a scaffold used from the language scaffolding plan (or tips sheet) each partner used and one that they would like to focus more on.
C. What were indicators of student learning or student confusion? If possible, give specific examples documented from sessions.
D. What data do partners have? What data would partners like to get?
E. Review data and adjust instruction for the next week. Keep a running list of language-intensive adjustments to daily classroom instruction experiences for the students who struggle (STEP 12B).
F. Repeat STEPS 7-9 for the next week.

STEP 15: Partners gather summative posttest data.

A. SLP and teacher gather student posttest data according to the plan they established.
B. SLP and teacher analyze student posttest data according to the plan they established.
C. SLP and teacher determine what instructional adjustments to make based on posttest data.

STEP 16	***Frequency of evidence/notes on planning sheet***
Build next steps. Decide next steps at the projected end date (or review date) of the collaboration. SLP and teacher discuss the language focused collaboration intervention and make decisions.	*One time at the agreed upon review date of the collaboration assessment. Repeated as needed if the collaboration continues.*

A. Partners check in with administrator(s) about the success or needs of the partnership and the findings about student learning.
B. Partners have a discussion about the value of the collaboration.

APPENDIX H: LANGUAGE SCAFFOLDING TECHNIQUES

System of Language Scaffolds

(Beck et al., 2013; CAST, 2011; Ehren, 2016; Kim & Hannafin, 2011; Nelson et al., 2004; Silliman et al., 2000; Ukrainetz, 2006)

Scaffolding Foci	Language Scaffolds
Intentionality and engagement	• Anticipates trouble spots; identify words that students who struggle may not know or are having a hard time with. • Conducts mini lessons on specific types of morphological variations. • Plans and implements many guided encounters at the sub-word, word, and sentence level. • Activates or supplies background knowledge. • Provides explicit and detailed advance and post organizers to situate learning which may include visual schedules.
Exploring, questioning, and problematizing	• Facilitates highly interactive practice with explicit teaching; models and guides practice of a variety of scenarios. • **Engages in metalinguistic interactions (*game of catch analogy)*** • Provides informative and corrective feedback in a timely fashion to students having difficulty. • Clarifies vocabulary, syntax, and structure. • Highlights patterns, critical features, big ideas, and relationships*)* • Incorporates components of robust vocabulary instruction (deep processing rather than surface processing). • Teaches word consciousness. • Uses graphic organizers to depict meaning relationships.
Tailored assistance (building upon the other foci)	• Guides information processing, visualization, and manipulation. • Focuses on additional modeling for students who need it. • Works with smaller groups of students to ensure active engagement of students who are struggling. • Identifies the nature of errors/misunderstandings and uses that analysis to provide additional information, prompts or questions. • Provides the kind of guidance students who are struggling need to understand and use the targeted words. • Facilitates increasing independence and withdraws scaffolding as appropriate. • Maximizes transfer and generalization.
Discussion, reflection, and feedback	• Provides feedback within interactions. • Collects and analyzes student data. • Engages in more meta conversation about the role of the word in making meaning, providing language to talk about the words. • Conducts more practice with meaning manipulation including more examples and non-examples. • Provides additional information to the classroom teacher on word learning with targeted words with which students are having difficulty. • Engages students in monitoring their vocabulary learning

In-the-Moment Language Scaffolding Tips

(Beck et al., 2013; Ehren, 2016; Nelson et al., 2004; Silliman et al., 2000; Ukrainetz, 2006)

Zoom-in on scaffolded interactions and think of the interactions as a game of catch!

Objectives of this document are to:

a. Provide a common language and procedure the collaborators can use *before* and *during* their sessions as a handy clipboard document.
b. Serve as a reflection guide/checklist *after* collaborators' VST sessions.
c. Serve as a reflection guide for language-scaffolded instruction in general (not just VST sessions).

Throw focused questions to the student(s).

Purpose	Student-Centered Questions
Frame the aspect of learning with what you want the student to pay attention to. Set up inquiry and problem-solving.	• Ask *focused questions* that guide students to attend to previously undetected connections. • Language focused questions require problem-solving connections between language choices and intended meaning. • Examples of focused questions in the VST include questions prompting students to determine the meaning of targeted words in scenarios, generate synonyms, provide example sentences, use morphological variations, and recognize non-examples/nuance.

Catch what seems right or off.

Purpose	Student-Centered Reflection
Listen and process whether the student's response is accurate. Your hypothesis about *why* a student's response if off will impact your response to the student.	• If no verbal response: Recognize blank faces and quiet after allowing some processing time as a clue that student needs you to explicitly give the answer or give another clue (ex- a clue anchored in his/her experiences). • If student responds with an answer: Decide if the student's response was correct (on base!), incorrect/incomplete (*in* the ballpark or totally *out* of the ballpark), or whether you're unsure about whether the student's answer captures the essence and nuance of the word's meaning. • Reflect on why a student seems confused or may be missing the essence of the word's meaning. • Model self-talk (Ex- "I'm thinking about your answer. I'm asking myself, does that make sense and sound right?") • If needed, refer to the word vocabulary prep sheet for the student friendly definition and teacher/SLP nuanced meaning descriptions.

Throw back corrective and informative feedback.
Show interest in, and confusion about, the student's meaning.

Purpose	Choices for Student-Centered Responses
Show the student where you are "tripping up" over his/her answer. Help the student think meta-linguistically about word forms and word meanings.	If the student did **not respond**: • Model or tell the answer and give a rationale. Follow-up with the same question, and have the student repeat the answer back. • Give a hint (ex- memory anchor); see choices for responding to correct or incorrect responses below. If you're confident student's answer is **correct**, inquire into the student's thinking. • Follow-up with *Why?* or *How did you know*? etc. when applicable. If the student's reasoning is off, see steps for providing feedback for incorrect answers below. If you're confident the student's answer is **incorrect or incomplete**, provide informative feedback. Apply any of the choices below that apply to the situation: • Show your confusion (Ex- "I'm confused about…I'm not understanding…") • Tell the student whether something s/he said was inaccurate or incomplete and explain why. • Ask the student to give you more information to expand on incomplete answers. • Acknowledge the meaning the student was trying to convey, give him/her the word(s) for that, give him/her an explanation about why his/her example didn't quite work. • Provide visual supports to show word relationships. • Model the correct use of the word in a similar context as the student's example if possible. Ex- "Hmm, we that but it didn't work. How about if we try this…" • Give the student choices to pick from. • Model or tell the answer and give a rationale. Follow-up with the same question, and have the student repeat the answer back.

If you're unsure about whether the student's answer captures the essence and nuance of the word's meaning, that's okay! Use a think-aloud to show your meta process (thinking about language).

- Example: "Hmm. That doesn't sound quite right to me. Let me think on that and get back to you."

- Explain your thinking about anything specifically that seems off (the essence of the word, the form of the word, etc).

Repeat the catch and throw-back choices cycle. The scaffolding discourse is communication, not simply correction.

Stick with a student through incorrect attempts until his/her confusion is resolved or you have explained that you will revisit any questions about the student's answer at a later time.

APPENDIX I: TIER TWO VOCABULARY WORDS MENU

Tier Two Vocabulary Words Menu

Instructions: Please rate each word based on both the familiarity scale *and* usefulness scale.

Familiarity Scale: On the familiarity scale (1-4), circle the number that corresponds to how likely you think most students in your class know each word.

1- Most of my students likely have not seen or heard of the word.
2- Most of my students have likely seen or heard of the word, but don't know what it means.
3- Most of my students likely have a partial understanding of the word; they may not be able to use it correctly.
4- Most of my students likely know the word well and are able to use it correctly.

Usefulness Scale: On the usefulness scale (1-4), circle the number that corresponds to how useful you think each word is for your students to know and use.

1- The word would not be useful for my students to know and use at this time. They would likely have a hard time understanding the words to describe this concept. They would not need to understand or use this word in third grade academic contexts.
2- The word may be a little useful for the students to know and use at this time. Students would get a little bit of leverage or "mileage" in other contexts from learning this word.
3- The word would be somewhat useful for my students to know and use at this time. They would get some leverage or "mileage" in other contexts from learning this word.
4- The word would be very useful for my students to know and use at this time. They would get a great deal of leverage or "mileage" in other contexts from learning this word.

		Familiarity Scale				Usefulness Scale			
1.	abruptly	1	2	3	4	1	2	3	4
2.	abundance	1	2	3	4	1	2	3	4
3.	accused	1	2	3	4	1	2	3	4
4.	adapt	1	2	3	4	1	2	3	4
5.	anticipating	1	2	3	4	1	2	3	4
6.	assume	1	2	3	4	1	2	3	4
7.	assured	1	2	3	4	1	2	3	4

8.	astonishment	1	2	3	4	1	2	3	4
9.	attained	1	2	3	4	1	2	3	4
10.	avoid	1	2	3	4	1	2	3	4
11.	baffle	1	2	3	4	1	2	3	4
12.	category	1	2	3	4	1	2	3	4
13.	cease	1	2	3	4	1	2	3	4
14.	clever	1	2	3	4	1	2	3	4
15.	collision	1	2	3	4	1	2	3	4
16.	contribution	1	2	3	4	1	2	3	4
17.	confidence	1	2	3	4	1	2	3	4
18.	cooperate	1	2	3	4	1	2	3	4
19.	debated	1	2	3	4	1	2	3	4
20.	deceives	1	2	3	4	1	2	3	4
21.	defiantly	1	2	3	4	1	2	3	4
22.	desires	1	2	3	4	1	2	3	4
23.	detest	1	2	3	4	1	2	3	4
24.	devise	1	2	3	4	1	2	3	4
25.	devoured	1	2	3	4	1	2	3	4
26.	dispute	1	2	3	4	1	2	3	4
27.	disruption	1	2	3	4	1	2	3	4
28.	doubt	1	2	3	4	1	2	3	4
29.	dreadful	1	2	3	4	1	2	3	4

30. envious	1	2	3	4		1	2	3	4
31. errors	1	2	3	4		1	2	3	4
32. examine	1	2	3	4		1	2	3	4
33. exclude	1	2	3	4		1	2	3	4
34. fierce	1	2	3	4		1	2	3	4
35. fortunate	1	2	3	4		1	2	3	4
36. gather	1	2	3	4		1	2	3	4
37. glared	1	2	3	4		1	2	3	4
38. gloating	1	2	3	4		1	2	3	4
39. grave (“serious”)	1	2	3	4		1	2	3	4
40. gradual	1	2	3	4		1	2	3	4
41. hesitated	1	2	3	4		1	2	3	4
42. hovers	1	2	3	4		1	2	3	4
43. humble	1	2	3	4		1	2	3	4
44. indulge	1	2	3	4		1	2	3	4
45. informed	1	2	3	4		1	2	3	4
46. inquire	1	2	3	4		1	2	3	4
47. insisted	1	2	3	4		1	2	3	4
48. inspiration	1	2	3	4		1	2	3	4
49. intended	1	2	3	4		1	2	3	4
50. limit	1	2	3	4		1	2	3	4
51. locate	1	2	3	4		1	2	3	4

52. massive	1	2	3	4		1	2	3	4
53. maneuvering	1	2	3	4		1	2	3	4
54. meander	1	2	3	4		1	2	3	4
55. motivates	1	2	3	4		1	2	3	4
56. observation	1	2	3	4		1	2	3	4
57. obvious	1	2	3	4		1	2	3	4
58. perseverance	1	2	3	4		1	2	3	4
59. persuaded	1	2	3	4		1	2	3	4
60. plummet	1	2	3	4		1	2	3	4
61. ponder	1	2	3	4		1	2	3	4
62. predictable	1	2	3	4		1	2	3	4
63. prevent	1	2	3	4		1	2	3	4
64. protested	1	2	3	4		1	2	3	4
65. unrecognizable	1	2	3	4		1	2	3	4
66. recommend	1	2	3	4		1	2	3	4
67. refrain	1	2	3	4		1	2	3	4
68. refuse	1	2	3	4		1	2	3	4
69. regret	1	2	3	4		1	2	3	4
70. reliable	1	2	3	4		1	2	3	4
71. remarked	1	2	3	4		1	2	3	4
72. reside	1	2	3	4		1	2	3	4
73. resisted	1	2	3	4		1	2	3	4

74.	scatter	1	2	3	4	1	2	3	4
75.	speculate	1	2	3	4	1	2	3	4
76.	suspect (verb)	1	2	3	4	1	2	3	4
77.	thwart	1	2	3	4	1	2	3	4
78.	valuable	1	2	3	4	1	2	3	4
79.	wield	1	2	3	4	1	2	3	4
80.	wobbles	1	2	3	4	1	2	3	4

APPENDIX J: PROFESSIONAL LEARNING MODULES

Appendix J1: VST-GE16 Module

Online Phase (2 hours)

Title	Intent	Materials	Where to Access Materials
The big picture PPT	Provides an advance organizer, learner objectives, and talking points for the entire module.	• Non-narrated PowerPoint (not narrated)- Enhanced Vocabulary Learning VST-GE16	Mod 1A: *Big Picture Start/End Here* folder
The *why* PPT	Answers "*Why* am I doing this?" Provides the rationale and research behind the module topic.	• Separate narrated PPT- Robust Vocabulary Instruction: Rationale & Research	Mod 1A: main folder
The *what* PPT	Answers "*What is the it* I'm supposed to be doing?"	• Separate narrated PPT- Essence of Ideal Implementation of VST-GE16 (Ehren, 2010; Spielvogel 2011)	Mod 1A: *What* folder
The *how* tutorial PPT	Answers "*How* do I do it?" Gives a walk-through of step-by-step protocols with opportunities for reflection; sets the stage for interactive practice.	• Separate narrated tutorial PowerPoint- VST-GE16 • Step-by-step protocol • Example vocab prep sheet & vocab poster (TREK) • Materials list • Learning objectives visual	Mod 1A: *How* folder

Oh yeah, and…talking points	Provides a way for Mary to share additional tips and reminders.	• The big picture PowerPoint (not narrated) • Attendance log • Activities log • Classroom word wall "exhibit" ideas	Mod 1A: *Big Picture Start/End Here* folder
Check for Understanding (on own)	Serves as a checkpoint for participants to check their understanding of content presented in the online portion of the module.	• Check for Understanding questions • Practice word for interactive practice and student practice (WANDERING)	Mod 1A: *Big Picture Start/End Here* folder

Interactive Practice Phase (1 hour)

Title	Intent	Materials	Where to Access Materials
Discussion	Discuss any questions or misunderstandings from Check for Understanding, reflections, talking points, etc.	• Check for Understanding answers • Your reflections	Bring your answers and reflections.
Application	Apply your learning through role playing and receive researcher's coaching and feedback. Practice assessing your own fidelity using the fidelity checklist.	• Step-by-step protocol • VST-GE16 fidelity checklist	Mod 1A: *How* folder
Q & A Wrap Up	Answer remaining questions and concerns. Review the GO schedule.		Write dates of GO schedule in the binder.

Appendix J2: VST-T+SLP Module

Online Phase (2 hours)

Title	Intent	Materials	Where to Access Materials
The big picture PPT	Provides an advance organizer, learner objectives, and talking points for the entire module.	• Non-narrated PowerPoint- Enhanced Vocabulary Learning VST-T+SLP	Mod 1B: *Big Picture Start/End Here* folder
The *why* PPT	Answers "*Why* am I doing this?" Provides the rationale and research behind the module topic.	• Separate narrated PPT- Robust Vocabulary Instruction: Rationale & Research	Mod 1B: main folder
The *what* PPT	Answers "*What is the it* I'm supposed to be doing?"	• Separate narrated PPT- Essence of Ideal Implementation of VST-T+SLP (Ehren, 2016; Mitchell et al., 2017)	Mod 1B: *What* folder
The *how* tutorial PPT	Answers "*How* do I do it?" Gives a walk-through of step-by-step protocols with opportunities for reflection; sets the stage for interactive practice.	• Separate narrated tutorial PowerPoint- VST-T+SLP • Step-by-step protocol • Example vocab prep sheet & vocab poster (TREK) • Materials list • Learning objectives visual • Data collection sheet (optional)	Mod 1B: *How* folder
Oh yeah, and…talking points	Provides a way for Mary to share additional tips and reminders.	• The big picture PowerPoint (not narrated) • Attendance log • Classroom word wall "exhibit" ideas	Mod 1B: *Big Picture Start/End Here* folder

Check for Understanding (on own)	Serves as a checkpoint for participants to check their understanding of content presented in the online portion of the module.	• Check for Understanding questions • Practice word for interactive practice and student practice (WANDERING)	Mod 1B: *Big Picture Start/End Here* folder

Interactive Practice Phase (1 hour)

Title	Intent	Materials	Where to Access Materials
Discussion	Discuss any questions or misunderstandings from Check for Understanding, reflections, talking points, etc.	• Check for Understanding answers • Your reflections	Bring your answers and reflections.
Application	Apply your learning through role playing and receive researcher's coaching and feedback. Practice assessing your own fidelity using the fidelity checklist.	• Step-by-step protocol • VST-T+SLP fidelity checklist	Mod 1B: *How* folder
Q & A Wrap Up	Answer remaining questions and concerns. Review the GO schedule.		Write dates of GO schedule in the binder.

Appendix J3: Collaboration Module

Online Phase (2 hours)

Title	Intent	Materials	Where to Access Materials
The big picture PPT	Provides an advance organizer, learner objectives, and talking points for the entire module.	• Everything PowerPoint (not narrated)- Enhanced Vocabulary Learning Collaboration	Mod 2: *Big Picture Start/End Here folder*
The *why* PPT	Answers "*Why* am I doing this?" Provides the rationale and research behind the module topic.	• Separate narrated PPT- Collaboration: Rationale & Research	Mod 2: main folder
The *what* PPT	Answers "*What is the it* I'm supposed to be doing?"	• Separate narrated PPT- Essence of Ideal Implementation of The COLLAB Protocol (Mitchell et al., 2016)	Mod 2: *What* folder
The *how* tutorial PPT	Answers "*How* do I do it?" Gives a walk-through of step-by-step protocol with opportunities for reflection; sets the stage for interactive practice.	• Separate narrated tutorial PPT- COLLAB Tutorial • The COLLAB Protocol and Guiding Steps • The COLLAB Protocol step-by-step planning/debriefing sheets (examples you can adapt for your partnership)	Mod 2: *How* folder
Oh yeah, and…talking points	Provides a way for researcher to share additional tips and reminders.	• The Big Picture PowerPoint (not narrated)	Mod 2: *Big Picture Start/End Here* folder
Check for Understanding (on own)	Serves as a checkpoint for participants to check their understanding of content presented in the online portion of the module.	• Check for Understanding questions • Partner agreements documented in COLLAB planning sheets for Steps 1-5	Mod 2: *Big Picture Start/End Here* folder

Interactive Phase (1 hour)

Title	Intent	Materials	Where to Access Materials
Discussion	Discuss any questions or misunderstandings from Check for Understanding, reflections, talking points, etc.	• Check for Understanding answers • Your reflections	Bring your answers and reflections
Application	Apply your learning through discussion and preparation for collaboration activities for Week 1 of the Intervention week.	• Step-by-step protocol (planning/debriefing sheets) • COLLAB fidelity (essence of ideal implementation of COLLAB)	Mod 2: *How* folder
Q & A Wrap Up	Answer remaining questions and concerns. Review the GO schedule.	• Stages of Concern Questionnaire (SoCQ) • Whatdjathink?	Mod 2: *Big Picture Start/End Here* folder Write dates of GO schedule in the binder.

Appendix J4: Language Scaffolding Module

Online Phase (2 hours)

Title	Intent	Materials	Where to Access Materials
The big picture PPT	Provides an advance organizer, learner objectives, and talking points for the entire module.	• Big Picture PowerPoint (not narrated)- Enhanced Vocabulary Learning: Language Scaffolding	Mod 3: *Big Picture Start/End Here* folder
The *why* PPT	Answers "*Why* am I doing this?" Provides the rationale and research behind the module topic.	• Separate narrated PPT- Language Scaffolding: Rationale & Research	Mod 3: main folder
The *what* PPT	Answers "*What is the it* I'm supposed to be doing?"	• Separate narrated PPT- Essence of a Language Scaffolding System • System of Scaffolds Overview	Mod 3: *What* folder
The *how* tutorial PPT	Answers "*How* do I do it?" Gives examples of how to use word study language scaffolds with opportunities for reflection; sets the stage for interactive practice.	• Separate narrated PPT- Language Scaffolding Techniques to Share and Model • On-the-Spot Scaffolding (metaphor- game of catch) • COLLAB Step 7A Examples of anticipated trouble spots and scaffolding plans	Mod 3: *How* folder
Oh yeah, and…talking points	Provides a way for researcher to share additional tips and reminders.	• The Big Picture PowerPoint (not narrated)	Mod 3: *Big Picture Start/End Here* folder
Check for Understanding (on own)	Serves as a checkpoint for participants to check their understanding of content presented in the online portion of the module.	• Check for Understanding questions	Mod 3: *Big Picture Start/End Here* folder

Interactive Phase (1 hour)

Title	Intent	Materials	Where to Access Materials
Discussion	Discuss any questions or misunderstandings from Check for Understanding, reflections, talking points, etc.	• Check for Understanding answers • Your reflections	Bring your answers and reflections
Application	Apply your learning through discussion with researcher. Practice assessing your contingent responses using the in-the-moment scaffolding guide. Develop an action plan for sharing and modeling language scaffolding techniques with teacher partner.	• Step-by-step protocol of VST-T+SLP • Step-by step protocol planning sheets COLLAB framework (Steps 7-14) • On-the-spot scaffolding like a game of catch	Mod 1B *How* folder Mod 2 *How* folder Mod 3 *How* folder
Q & A Wrap Up	Answer remaining questions and concerns. Review the GO schedule.	• Whatdjathink?	Mod 3: *Big Picture Start/End Here* folder Write dates of GO schedule in the binder.

APPENDIX K: VOCABULARY OUTCOME MEASURES

Appendix K1: SYN Posttest

Task #1 Directions: A synonym is a word or group of words that has almost the same meaning as another word. Read each underlined word and circle a word that has almost the same meaning.

1st example: **wish**
- a) have
- b) break
- c) want
- d) give

2nd example: **choose**
- a) decide
- b) find
- c) remember
- d) fall off

Your turn!

1. insisted
- a) mentioned
- b) said firmly
- c) suggested
- d) hinted

2. hovers
- a) spreads out
- b) hides
- c) stays in one place
- d) spills

3. refrain
- a) to continue an action
- b) to repeat an action
- c) to not do an action
- d) to start an action

4. debated
- a) got ready
- b) walked slowly
- c) slept deeply
- d) talked about

5. ponder
- a) think about
- b) ask about
- c) give information
- d) know well

6. attained
- a) stopped
- b) returned
- c) found
- d) achieved

7. persuaded
- a) continued
- b) talked into
- c) complained about
- d) asked for

8. cease
- a) stop
- b) go quickly
- c) go slowly
- d) repeat

9. desire
- a) a mistake
- b) a wish
- c) a gift
- d) a correction

10. intended
- a) participated in
- b) said firmly
- c) planned
- d) took care of

11. **reside** a) change sides b) live c) decide d) build	**12.** **perseverance** a) continuing b) starting c) changing d) stopping
13. **baffles** a) confuses b) informs c) laughs d) cries	**14.** **exclude** a) give a reason b) be polite c) apologize d) keep out
15. **detest** a) try hard b) look closely c) do again d) strongly dislike	**16.** **plummet** a) roll b) fall quickly c) stay in one place d) rise in the air
17. **meander** a) arrive b) go together c) leave d) wander	**18.** **hesitated** a) paused b) waited a long time c) continued d) started
19. **assured** a) listened b) promised c) lied d) held	

Appendix K2: WIC Posttest

Task #2 Directions: Complete the sentences using the word box choices for each group of sentences. Choose the ***best*** word from the list of answer choices and draw a line from your word choice answer dot to the sentence dot.

 **Example**

Answer Choices	
dig •	• **Example 1)** I _____ I had $100!
choose •	• **Example 2)** The teacher will _____ two people to help pass out lunches.
spill •	
wish •	

 **Your turn!**

Answer Choices	
envious •	• **1)** The river has a(n) _____ amount of fish.
astonished •	• **2)** I am _____ of my older brother because he gets to stay up later than me.
gradual •	
abundant •	• **3)** The _____ boy said, "Oh my goodness! I can't believe a raccoon is standing on that alligator's back!"
suspected •	

Answer Choices	
speculates •	• **4)** My sister said she _____ going to my aunt's house because she thinks my aunt's dog will chase her.
dreads •	• **5)** My grandfather _____ that my arm is sore because I threw the baseball a lot yesterday.
resides •	• **6)** The clever girl in the book _____ plans to rescue animals.
devises •	
scatters •	

Answer Choices	
indulged •	• **7)** The students were annoyed with their classmate who _____ when he finished first.
astonished •	• **8)** I _____ about the instructions because I did not understand what we were supposed to do.
gloated •	• **9)** My friends and I _____ in ice cream sundaes at the sleepover.
inquired •	
resided •	

Answer Choices

- **inspiration**
- **protest**
- **envy**
- **abundance**
- **contribution**

- **10)** The principal listened to the student's _____ and agreed to meet with the student to discuss what the student thought was unfair.
- **11)** My talented sister is my _____ for wanting to play music.
- **12)** Our teacher thanked me for my _____ to the class performance.

Answer Choices

- **maneuvers**
- **remarks**
- **fierceness**
- **disputes**
- **regrets**

- **13)** It took a few careful _____ to get the toy unstuck.
- **14)** The brothers have loud _____ about whose turn it is to clean the dishes.
- **15)** The students made playful _____ about their teacher's crazy socks.

Answer Choices

- **scattered**
- **humble**
- **grave**
- **persuasive**
- **deceiving**

- **16)** Our teacher explained that the moment of silence is a(n) _____ event and that we are not to joke around.
- **17)** The pieces of paper I tore up are _____ on the floor beneath my desk.

Answer Choices	
abundantly •	• **18)** I was surprised when the television turned off _____ in the middle of the show without any warning.
enviously •	• **19)** The sun disappeared bit by bit and the sky _____ became darker.
humbly •	• **20)** "Thank you for this award," the winner of the contest said _____ .
gradually •	
abruptly •	

Appendix K3: NON-EX Posttest

Task #3 Directions:

- Write your first and last name on the paper.
- There are three sentences written for each item, but only two of them are written in a way that makes sense. Put an X next to the one sentence that does NOT make sense. Do not mark anything next to the sentences that are correct.

1st Example:

_____ I **wished** for a puppy for my birthday.
_____ My birthday **wishes** for a puppy.
_____ My **wish** for a puppy came true!

2nd Example:

_____ Which color should I **choose**?
_____ My little brother usually **chooses** green.
_____ My brother told me to hurry up and make a **choose**.

Your turn!

1)	_____ My mom **speculates** that the hole in my sock came from my cat's teeth. _____ Anytime I can't find my pink sock, I **speculate** that my cat has something to do with it. _____ I looked down the hall at my cat and **speculated** her chewing a hole in my sock!
2)	_____ My grandma **insisted** me with brushing my teeth longer. _____ My grandma kept **insisting** that I brush my teeth longer so I did. _____ My dentist **insists** that I brush my teeth two times a day.
3)	_____ My teacher said sometimes students **dread** doing new things in school. _____ Giving a presentation on animals is a **dreadful** idea, because I love animals! _____ I **dread** talking in front of the class, so I am not looking forward to presenting.
4)	_____ Have you ever **desired** to go to the beach? _____ My sister doesn't like the ocean and **desires** she will never go swimming in it. _____ I have a **desire** to spend all summer at the beach.

5)	_____	My sister and I **devised** a plan for washing the dishes in only two minutes!
	_____	I hope the **devising** plan will work so we can finish our chores quickly!
	_____	My mom listened to us while we were **devising** our plan.
6)	_____	I took a picture of a butterfly **hovering** above a flower.
	_____	I wonder why the butterfly always **hovers** around these flowers.
	_____	The butterfly landed on a pink flower that was **hovered** on the ground.
7)	_____	My uncle **assured** me that he would definitely go fishing with us.
	_____	I **assure** the fishing trip with my uncle.
	_____	I can believe my uncle when he **assures** me that he will come along.
8)	_____	My **gradual** feet grew too big for my shoes.
	_____	**Gradually**, my feet grew too big for my shoes.
	_____	The change in my feet was **gradual**, so I didn't notice they had changed.
9)	_____	I **baffled** at the hard math problem.
	_____	The teacher wants to help if a math problem **baffles** her students.
	_____	The **baffling** math problem made me so frustrated!
10)	_____	My teacher makes the homework star **attainable** for everyone in the class.
	_____	I **attained** my homework all week, which means I will get a homework star this week!
	_____	I **attained** a homework star for doing my homework all week!

11) _____ I was **inspired** to paint tomatoes after I helped my grandmother pick tomatoes in her garden.

_____ My **inspiration** to paint tomatoes came from my grandmother's garden.

_____ I painted the **inspired** tomatoes from my grandmother's garden.

12) _____ I was walking with my dog and she stopped **abruptly** when something caught her attention.

_____ I was walking with my dog when something caught my **abrupt** dog's attention.

_____ My dog's **abrupt** stop made me look around to see what caught her attention.

13) _____ My babysitter **refrains** from turning on the television when she watches children.

_____ I **refrained** from accidentally spilling my drink.

_____ I really want to eat another dessert, but I will **refrain** from doing it.

14) _____ When I'm not sure about the answer, I **hesitate** before I talk.

_____ I knew the answer so I said the answer without **hesitating** when it was my turn to talk.

_____ I knew the answer so I **hesitated** to share the answer with my team.

15) _____ I noticed the net was missing from the soccer goal, so I **inquired** about it.

_____ My gym teacher thanked me for my **inquiry** and she told me the net was getting fixed.

_____ I **inquired** about my gym teacher, "Where is the soccer goal net?"

16) _____ My classmate and I **gloated** our bridges.

_____ When my classmate is **gloating**, I try to ignore her.

_____ My classmate sometimes **gloats** when she thinks her projects are the best.

17) _____ The kids **excluded** to each other in the group.

_____ The **excluded** girl's feelings were hurt.

_____ It is not polite to **exclude** others when they ask to play with you.

18) _____ The **astonished** passengers on the boat took pictures of the whale.

_____ I will show my classmates the **astonishment** pictures of the whale.

_____ I could not hide my **astonishment** when I saw the whale from the boat.

Appendix K4: Administration Scripts

Task #1 Synonyms Script

Example Think-Aloud Script

Note: you do not have to build in the pause time for yourself for the example items.

The directions for Task #1 say, *"A synonym is a word or group of words that has almost the same meaning as another word. Read each underlined word and circle a word that has almost the same meaning."*

I'll try the first example. I will look at the underlined word. The underlined word is *wish*. The answer choices say *have, break, want, and give*. Hmm, I think the choice that has almost the same meaning of *wish* is *want*. I'm circling *want* as my answer. Circle *(c)* and the word *want*. **Give me a thumbs up if you were thinking the same thing. Great! Now you circle *want* too.**

Let's try one more example together. Look with me at the underlined word. The word is *choose*. The answer choices say *decide, find, remember, fall off*. Hmm, I think the choice that has almost the same meaning of *choose* is *decide*. I'm circling *decide* as my answer. Circle *(a)* and the word *choose*. **Give me a thumbs up if you were thinking the same thing. Yahoo! Now you circle *decide* too.**

Now it's your turn to think about the answers for each question.

Script for each items 1-19

Point as you read aloud each underlined word and answer choices.

Touch Number ___ . The underlined word says _____ (TARGET WORD).

The answer choices are…CHOICE 1, CHOICE 2, CHOICE 3, CHOICE 4
Circle your answer. *Pause 10 seconds.*

Repeat for each item in that section.

After reading all questions to students, see if anyone needs a minute to double check their answers. If so, make sure there is no talking during this time. If not, move on to Task 2.

Great job everyone! Now we will move on to task #2.

Check off Task #1 from the visual schedule you wrote on the board.

Task #2 Words-in-Context Script

Example Think-Aloud Script

Note: you do not have to build in the pause time for yourself for the example items.

The directions for Task #2 say, "Complete the sentences using the answer choices for each group of sentences. Choose the *best* word from the list of answer choices and draw a line from your word choice answer dot to the sentence dot."

I'll try Example Sentences 1 and 2, which are in the rectangle group. The answer choices in the word box go with each group of sentences in this rectangle group. There are more choices than I need in each answer choice box. I will use some words once and some words not at all. The answer choices in the box say *dig, choose, spill,* and *wish.*

Now I will read Example Sentence 1. It says, "I *(pause and gesture drawing a line with your hand)* **I had $100. Hmm, which word choice do I think fits this sentence the best?**

- *Read the answer choices. Point as you read each answer choice.* ***Dig, choose, spell, wish.***
- **I think the best choice is *wish*. That will make the sentence say, "I wish I had $100. I think that sounds right.**
- **I will draw a line from the dot beside *wish* to the dot beside Example Sentence 1.** *Draw the line.* **Give me a thumbs up if you thought the best answer was *wish* too. Excellent! I want you to draw a line from the dot beside *wish* to the dot beside Example Sentence 1 like I did. Make sure your line touches the two dots.**

Next, I will read Example Sentence 2. It says, "The teacher will *(pause and gesture drawing a line with your hand)* **two people to help pass out lunches. Which word choice do I think fits this sentence the best?**

- *Read the answer choices. Point as you read each answer choice.* ***Dig, choose, spell, wish.***
- **I think *choose* sounds right. That will make the sentence say, "The teacher will *choose* two people to help pass out lunches."**
- **I'm going to go ahead and draw my line from the dot beside *choose* to the dot beside Example Sentence 2.** *Draw the line.* **Give me a thumbs up if you thought the best answer was *choose* too. Groovy! I want you to draw a line from *choose* to Example Sentence 2 like I did. Make sure your line touches the two dots.**

Now it's your turn!

Script for questions 1-20 (next page)

Step 1: **Look at the _____ (shape) above the next group.**

Step 2: **Put your pencil on each word as I read through the choices.** *Read each word in the answer choice in word box and point to each answer choice as you read.*

Step 3: **Think about which word will fit best in Sentence # ___.** *Point to the sentence number and read the sentence. Read the whole sentence and pause where there is a blank- use your hand to gesture drawing a line.*

Step 4: **The answer choices are…***Read each word in the answer choice in word box and point to each answer choice as you read.*

Step 5: Read the sentence once more and pause where there is a blank- use your hand to gesture drawing a line.

Step 6: **Draw your line.**

Step 7: *Pause for 8 seconds while students draw their lines.*

Repeat Steps 3-7 for each of the remaining questions in the shape group.

Repeat Steps 1-7 for each new shape group.

After reading all questions to students, see if anyone needs a minute to double check their answers. If so, make sure there is no talking during this time. Collect the papers from students who are finished.

I am so proud of how you are all working! Next we will take a quick stretch break at our seats. Then we will do our last task.

Check off Task #2 from the visual schedule you wrote on the board.

Collect everyone's papers (no student helpers)
Pass out task #3 (no student helpers)

Task #3 Script

Example Think-Aloud Script

Note: you do not have to build in the pause time for yourself for the example items.

First, write your first and last name on the top of this new task. *Pause for the students to write their names.* **The directions for Task #3 say: "There are three sentences written for each item, but only two of them are written in a way that makes sense. Put an X on the line in front the one sentence that does NOT make sense. Do not mark anything on the line before the sentences that are correct."**

I will do the first example with your help. Follow along with me as I read each sentence.

- **The top sentence says…[*read example*]. That seems right.**
- **The middle sentence says…[*read example*]. That doesn't seem quite right. I will put an X on the line.** *Mark an X on the line.*
- **The bottom sentence says…[*read example*]. That seems right so I will stick with my answer.**

The middle sentence is the sentence in the group that does not make sense. Give me a thumbs up if you were thinking the same thing. Woohoo! Put an X on the line beside the middle example sentence like I did.

Next I will do the second example with your help. Follow along with me as I read each sentence.

- **The top sentence says…[*read example*]. That sounds right.**
- **The middle sentence says…[*read example*]. That sounds right too.**
- **The bottom sentence says…[*read example*]. That doesn't sound quite right. I will put an X on the line.**

The bottom sentence is the sentence in the group that does not make sense. Give me a thumbs up if you were thinking the same thing. Yes! Put an X on the line beside the bottom example sentence like I did.

Now it's your turn!

Script for items 1-20

Touch #___. Follow along as I read each sentence. *Read the sentences aloud while pointing to the top blank, middle blank, and bottom blank respectively. Read all of the words in the sentence.*

Put an X on the line beside the sentence that does not seem to make sense.

Here are the sentences one more time. *Read the sentences aloud once more while pointing to the top blank, middle blank, and bottom blank respectively. Read all of the words in the sentence.*

Pause for 8 seconds. Repeat for each question.

After reading all questions to students, see if anyone needs a minute to double check their answers. If so, make sure there is no talking during this time. Collect the papers from students who are finished.

We're all done!

Check off Task #3 from the visual schedule you wrote on the board.

Collect everyone's papers (no student collector helper)

APPENDIX L: EXIT INTERVIEW & BRANCHING INTERVIEW QUESTIONS

Appendix L1: Exit Interview

Only the questions about the COLLAB Protocol were discussed with the collaborators. All other questions were discussed with the Comparison teachers as well.

Participant:	**Date:**
Forum:	**Time:**

Purpose of interview: Provide one more data source of: (a) evidence that you used the COLLAB Framework during the study and (b) your perspectives about the process. Another purpose is to gain a sense of collaboration culture at your school.

Branching interview (Hall & Hord, 2015)

1. Did you use the COLLAB Protocol? (If *yes*, ask #2; if *no*, LoU 0, I, II)

2. Did you make any changes in your use of the COLLAB Protocol? (If *yes*, user oriented LoU III; if *nothing unusual*, LoU IVA; if *impact-oriented*, LoU IVB, V, VI)

3. Did you coordinate your use of the innovation with other users, including another not in your original group of users? (If *yes*, LoU V; if *no*, LoU IVB, V)

4. Did you explore making major modifications or replacing the innovation? (If *yes*, LoU VI; if *no*, LoU IVB or V)

Clarification re: VST and collaboration fidelity

- Routine for classroom word wall exhibit for extra hour/week display?
- Generalization practice- specific plan or teachable moments? Ex- When students used or brought up target words they had seen/heard
- Extra adults in room during VST sessions- educational assistant, sped teacher, others? What did they do during the VST instruction? During VST intro days only?
- Decision-making that went into selecting the collaboration condition
- Any prep for posttest beyond the regular VST routine?

More on background re: language scaffolding

- Past/ongoing ELL training

- Language scaffolding- strategic questions and contingent responses: Learn anything new? Form new habits? Describe…

School culture of collaboration Qs

- Types of collaboration activities with general education teachers you have been involved in in the past year (e.g., "Describe the nature of the collaborations you have had with general education teachers in the past year.")

- What are examples of supports at your school that are provided for students and staff to help students meet rigorous academic demands?

- Before this project, approximately how much time did you typically spend in your partner's classroom *each week*?

Your questions or concerns

Appendix L2: Interview Questions for Principals

1. What do you perceive as benefits and challenges of teachers and language/literacy specialists collaborating at your school?

2. How do you as a principal attempt to foster interdisciplinary collaborations at your school?

3. To what degree do interdisciplinary collaborations play a part of educators' professional evaluations at your school? Are there ways that you assess collaboration effectiveness?

4. What are examples of supports at your school that are provided for students and staff to help students meet rigorous academic demands?

APPENDIX M: STAGES OF CONCERN QUESTIONNAIRE

Stages of Concern Questionnaire (Hall & Hord, 2015)

In order to identify these data, please use the code (color + number) I assigned you for the study.

_____

The purpose of this questionnaire is to determine what people who are using or thinking about using various programs are concerned about at various times during the innovation adoption process. The items were developed from typical responses of teachers who ranged from no knowledge at all about various programs to many years experience in using them. Therefore, *a good part of the items on this questionnaire may appear to be of little relevance or irrelevant to you at this time*. For the completely irrelevant items, please circle "0" on the scale. Other items will represent those concerns you do have, in varying degrees of intensity, and should be marked higher on the scale from "1" to "7".

Please respond to the items in terms of your present concerns, or how you feel about your involvement or potential involvement with the COLLAB Protocol. We do not hold to any one definition of this approach, so please think of it in terms of *your own perceptions* of what it involves. Remember to respond to each item in terms of *your present concerns* about your involvement or potential involvement with the COLLAB Protocol.

Thank you for taking time to complete this task.

0	1	2	3	4	5	6	7
Irrelevant	Not true of me now			Somewhat true of me now			Very true of me now

1.	I am concerned about students' attitudes toward the COLLAB Protocol.	0	1	2	3	4	5	6	7
2.	I now know of some other approaches that might work better.	0	1	2	3	4	5	6	7
3.	I don't even know what the COLLAB Protocol is.	0	1	2	3	4	5	6	7
4.	I am concerned about not having enough time to organize myself each day.	0	1	2	3	4	5	6	7
5.	I would like to help other faculty in their use of the COLLAB Protocol.	0	1	2	3	4	5	6	7

6.	I have a very limited knowledge about the COLLAB Protocol.	0	1	2	3	4	5	6	7
7.	I would like to know the effect of re-organization on my professional status.	0	1	2	3	4	5	6	7
8.	I am concerned about conflict between my interests and my responsibilities.	0	1	2	3	4	5	6	7
9.	I am concerned about revising my use of the COLLAB Protocol.	0	1	2	3	4	5	6	7
10.	I would like to develop working relation-ships with both our faculty and outside faculty using the COLLAB Protocol.	0	1	2	3	4	5	6	7
11.	I am concerned about how the COLLAB Protocol affects students.	0	1	2	3	4	5	6	7
12.	I am not concerned about the COLLAB Protocol.	0	1	2	3	4	5	6	7
13.	I would like to know who will make the decisions in the new system.	0	1	2	3	4	5	6	7
14.	I would like to discuss the possibility of using the COLLAB Protocol.	0	1	2	3	4	5	6	7
15.	I would like to know what resources are available if we decide to adopt the COLLAB Protocol.	0	1	2	3	4	5	6	7
16.	I am concerned about my inability to manage all that the COLLAB Protocol requires.	0	1	2	3	4	5	6	7
17.	I would like to know how my teaching or administration is supposed to change.	0	1	2	3	4	5	6	7
18.	I would like to familiarize other departments or persons with the progress of this new approach.	0	1	2	3	4	5	6	7
19.	I am concerned about evaluating my impact on students.	0	1	2	3	4	5	6	7
20.	I would like to revise the COLLAB								

	Protocol's instructional approach.	0	1	2	3	4	5	6	7
21.	I am completely occupied with other things.	0	1	2	3	4	5	6	7
22.	I would like to modify our use of the COLLAB Protocol based on the experiences of our students.	0	1	2	3	4	5	6	7
23.	Although I don't know about the COLLAB Protocol, I am concerned about things in the area.	0	1	2	3	4	5	6	7
24.	I would like to excite my students about their part in this approach.	0	1	2	3	4	5	6	7
25.	I am concerned about time spent working with nonacademic problems related to the COLLAB Protocol.	0	1	2	3	4	5	6	7
26.	I would like to know what the use of the COLLAB Protocol will require in the immediate future.	0	1	2	3	4	5	6	7
27.	I would like to coordinate my effort with others to maximize the COLLAB Protocol effects.	0	1	2	3	4	5	6	7
28.	I would like to have more information on time and energy commitments required by the COLLAB Protocol.	0	1	2	3	4	5	6	7
29.	I would like to know what other faculty are doing in this area.	0	1	2	3	4	5	6	7
30.	At this time, I am not interested in learning about the COLLAB Protocol.	0	1	2	3	4	5	6	7
31.	I would like to determine how to supplement, enhance, or replace the COLLAB Protocol.	0	1	2	3	4	5	6	7
32.	I would like to use feedback from students to change the program.	0	1	2	3	4	5	6	7
33.	I would like to know how my role will change when I am using the COLLAB Protocol.	0	1	2	3	4	5	6	7

34. Coordination of tasks and people is taking too much of my time. 0 1 2 3 4 5 6 7

35. I would like to know how the COLLAB Protocol is better than what we have now. 0 1 2 3 4 5 6 7

36. What other concerns, if any, do you have at this time? (Please describe them using complete sentences.)

Please complete the following information:

Female_____ Male_____

Age: 20-29_____ 30-39_____ 40-49_____ 50-59_____ 60-69____

Highest degree earned:

Associate_____ Bachelors_____ Masters_____ Doctorate_____

Year highest degree earned:_____

Total years teaching:_____

Number of years at present school:_____

In how many schools have you held full time appointments?

one____ two____ three____ four____ five or more____

How long have you been involved in the COLLAB Framework not counting this year?

never___ 1 year___ 2 years___ 3 years___ 4 years___ 5 years ___ or more__

In your use of the COLLAB Protocol, do you consider yourself to be a:

non user___ novice___ intermediate___ old hand___ past user___

Have you received formal training in the COLLAB Protocol (workshops, courses)?

yes___ no___

Are you currently in the first or second year of use of some major innovation or program other than the COLLAB Protocol?

yes___ no___

If yes, please describe briefly.

APPENDIX N: COPYRIGHT PERMISSIONS

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