Cultivating Special Education Teachers' Implementation of Writing Instruction Through On-Going Coaching Professional Development

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A dissertation

submitted in partial fulfillment

of the requirements for the degree of

Doctor of Philosophy

University of Washington

2019

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Program Authorized to Offer Degree:

College of Education

University of Washington

Abstract

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Writing skills are an area of instruction that can be particularly challenging to teach to students with low-incidence disabilities. Providing teachers with professional development through ongoing coaching may improve their knowledge and implementation of meaningful writing instructional strategies, potentially leading to students with low-incidence disabilities' acquisition and improvement of writing skills. This dissertation examined a coaching model of professional development to support special education teachers' writing instruction. Teachers taught students to use a graphic organizer using task-analyzed steps paired with a system of least prompts. I used a multiple probe across participants design to examine the effects of coaching on the implementation of the EBPs and the effects of these evidence-based practices on students' writing abilities. Results suggest that teachers can improve practice of implementing a system of least prompts during writing instruction and that students with low-incidence disabilities are capable of learning how to use a graphic organizer as a prewriting during writing instruction.

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Acknowledgements

Thank you, Roxanne Hudson, for your wisdom, attention, and patience as you led me through this once-in-a-lifetime journey. You taught and expected me to think, design and write with depth and meaning. I will carry these skills in my endeavor to improve the education of our children. To my committee, I am grateful for your attention, opportunities and expertise you shared with me. To Beth West, I started this journey because of the example you set as a researcher, teacher, and leader in the field of education. Thank you for believing in me and encouraging me to begin this journey. Thank you to all, for your faith in me over these six years. You played a significant role in allowing me to grow and learn as a researcher. I am honored to have worked closely with you and call you "my committee".

To my family and friends, thank you for supporting me through many years of accomplishing this goal. Your encouragement and excitement carried me through the entire process. Your words and acts of kindness (big and small) prove to me that I am truly blessed to call you my tribe.

Dedication

James,

You encourage me to dream big, take risks, and fight hard to achieve. I finished this race because you ran by my side. You let me slow down but never to stop. You reminded me to have faith in myself and do my best. I love you.

James Forest and Mason James,

You are the reason I work to leave this world a better place than when I arrived. I love you.

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Chapter One:

Introduction and Statement of Problem

When given individualized and high-quality instruction, students with low-incidence disabilities (LID) are capable of learning and mastering academic skills (Brown, McDonnell, & Snell, 2015; Brown, Nietupski, & Nietupski, 1976.) Students with LID face significant limitations in academic, behavior, communication, or motor skills that can impact their participation with the general education curriculum (Brown et al., 2015). Historically, teachers of these students have neglected their most basic right of accessing the general education environment and curriculum. Over the past four decades, policies and practices have evolved to a more inclusive approach. Federal law establishes the expectation that all students, including those most impacted with disability, have free and appropriate access to general education and receive a high-quality instruction (ESSA, 2015; IDEIA, 2004.)

High Quality Instruction

High quality instruction is defined by numerous factors, one of which is the use of evidence-based practices (EBPs) (ESSA, 2015) which can improve educational outcomes for students (Spencer et al., 2012). Furthermore, for students with disabilities, IDEA (2004) mandates that teachers provide instruction and monitor student goal progress using "scientifically based instructional practices, to the maximum extent possible". These instructional practices are tools for teachers as they teach skills to students with LID.

Many sources of teacher training promote teaching practices that are considered "best practice" or "research-based." These terms are used loosely and should not be mistaken by what research recognizes as an evidence-based practice (EBP) (CEC, 2014). Teaching practices do not qualify as EBPs simply because they are promoted by experts or are commonly implemented by

practitioners based on experience. Instead, EBPs are specific teaching practices determined to be effective through evidence from research studies (Cook & Cook, 2013; CEC, 2014).

EBPs are organized by various academic content areas, such as mathematics and writing. Specific EBPs are also established for students with certain disabilities, such as those with high incidence disabilities and emotional behavior disorders. As well, there are EBPs for teaching academic skills to students with LID, mostly in the areas of reading and math (Browder, Wood, & Thompson, 2014; Courtade, Test, & Cook, 2014). Of these EBPs, there is limited information on how to teach students with LID writing skills. Without EBPs in teaching writing, teachers are left unsupported in their efforts to deliver high quality instruction in the area of written language skills.

Student with Low Incidence Disabilities

Improving academic outcomes for students with LID is particularly important (Marder & deBettencourt, 2015) because low-incidence disabilities, such as intellectual disability and autism spectrum disorder, can significantly impact the pace of students' learning and their ability to master and generalize skills (Brown et al., 2015). Therefore, students with LID require a more systematic and gradual approach to instruction (Archer & Hughes, 2011; Spooner et al., 2012). Students with LID must graduate high school with skills that will allow them to live as "productively and independently as possible" (Brown et al., 1976, p. 2). There are many functional academic skills that students can master during their school career to prepare them for adulthood, such as recognizing community signs, reading doctor's notes after a visit, time telling, money counting, email communication, and connection to family and friends through social media or texting. Through the implementation of EBPs, research suggests that students with LID can acquire and master these academic skills (Courtade et al., 2014). With limited research on

EBPs for writing skills for students with LID, however, students may not be receiving the most effective instruction on written language skills.

Implementation of Evidence Based Practices

Federal laws support the use of effective teaching practices that are undergirded by empirical evidence (NCLB, 2002; IDEA, 2004). However, many special education teachers do not incorporate these practices in their daily teaching practices (Burns & Ysseldyke, 2009). Despite almost two decades of legal mandates, researchers and practitioners both admit that there is a gap in the implementation of EBPs in classrooms (Cook & Odom, 2013; Hudson et al., 2016). A consequence of this research to practice gap is that students with LID may not receiving the highest quality of instruction to make reasonable progress and academic gains as stated in their IEPs.

The expectation that special education teachers will deliver high quality instruction assumes that teachers are knowledgeable, willing, and capable of implementing these teaching practices. Research suggests the contrary. Special education teachers do not implement EBPs frequently (or at all) for various reasons (Burns & Ysseldyke, 2009), including lack of knowledge, lack of time, inflexibility of the EBPs, limited resources to try new practices, or other pressing district/school issues (Burns & Ysseldyke, 2009; Harn, Parisi, & Stoolmiller, 2013; Hudson et al., 2016; Sindelar, Brownell, & Billingsley, 2010). Providing professional development may alleviate some of these barriers.

Professional Development

Special education teachers are in need of and want continued PD (Bill and Melinda Gates Foundation, 2014). Opportunities for ongoing PD can encourage teachers to feel that they can take ownership of their own learning (Billingsley, 2004). In addition, PD has the potential to

improve quality of special education teachers' implementation of research-based instructional practices (Sindelar et al., 2010). Not all PD is created equal, however. A recent report revealed that teachers are unsatisfied with the current models of PD that include lecture and presentation (Bill and Melinda Gates Foundation, 2014). Teachers express this type of PD lacks engagement, is a waste of time, and feels like another meeting. Ineffective PD coupled with the existing research-to-practice gap does not yield positive results for improvement in teaching practices.

Furthermore, emerging research that examines PD for student special education points out coaching is an effective method of supporting teachers' learning (Brock et al., 2014; Kretlow & Bartholomew, 2010; Leko et al., 2015). Some of these studies focus on teaching teachers to implement academic EBPs. However, none of them focus on implementing writing EBP with students with LID. There is a need to expand the current research in the area of special education teacher PD and writing EBPs in order to best support students with LID.

In closing, students with LID have a right to access high quality academic instruction, in preparation for adulthood. This access is particularly important, as the ability to write can give students with LID opportunities to engage with community (education, leisure, and vocation, health, etc.) that they might not otherwise perform independently. Special education teachers often lack the knowledge and skills to deliver high quality academic instruction. Of the many academic areas, writing skills is an area of instruction that can be particularly challenging to teach. Providing teachers with PD through ongoing coaching may improve their knowledge and implementation of meaningful writing instructional strategies, potentially leading to students' with LID acquisition and improvement of writing skills.

Chapter Two:

Literature Review and Theory of Change

This chapter focuses on following a review of the literature on (a) effective professional development (PD) strategies for special education teachers, (b) evidence-based practices (EBPs) for students with low-incidence disabilities (LID), and (c) graphic organizer instruction for students with disabilities.

Effective Professional Development for Special Education Teachers

Professional development (PD) plays a key role in teacher quality and students' educational experience (Bill and Melinda Gates Foundation, 2014; Darling-Hammond & Richardson, 2009). "Improving teaching practice is an important way to improve student achievement" (Cornett & Knight, 2009, p. 196). High quality PD can have a positive impact on teachers' instructional practices, which in turn can increase students' academic achievement (Desimone, 2011; Koellner & Jacobs, 2015). PD opportunities for teachers are particularly important in the field of special education (Sindelar, Brownell, & Billingsley, 2010), given that Brunsting, Sreckovic, and Lane (2014) suggest that special education teachers are "at increased risk of burnout" (p. 683) because of a variety of reasons, including teaching experience, students' disabilities, conflict and ambiguity in teachers' role, and support from administration (Brunsting et al., 2014).

Typically, teacher burnout can lead to poor quality of instruction on students' individualized education plans (Ruble, Usher & McGrew, 2011) along with other negative outcomes. Research suggests that PD can play a role in alleviating burnout and supporting special education teachers in various ways by providing: (a) opportunities to learn and implement instructional strategies (Billingsley, 2004a; Billingsley, 2004b), (b) a sense of

community support by bringing colleagues together (Billingsley, 2004a; Billingsley, 2004b; Brunsting et al., 2014; Gersten, Keating, Yovanoff, & Harniss, 2001), or (c) a space to address problems of practices specific to special education and each teacher's context (such as IEP writing, behavior management, inclusive practices and curriculum modification) (Billingsley, 2004b, Boudah, Logan, & Greenwood, 2001; Sindelar et al., 2010). Although research on PD specific to special education is minimal, the findings are similar to the research on PD for general education teachers: special education teachers can benefit from quality PD, in hopes of improving instruction, which will increase students' academic achievement (McLeskey, 2011; Sindelar et al., 2010).

The purpose of my review is to examine effective PD strategies implemented for special education teachers. I begin with a discussion of adult learning, a definition of effective characteristics of PD and a review of PD strategies supported by literature from teacher education. After establishing this foundation, I review literature specific to the field of special education.

Adult Learning

To better understand how PD can improve teachers' practice, I discuss adult learning through the lens of sociocultural learning theory. This theory can explain teachers' formation of identity and learning (Kelly, 2006; Lieberman & Friedrich, 2010), which is important because teachers are expected to continuously learn new standards, strategies, and curriculum. Teacher learning happens through social experiences and occurs in one's social context, including educational background, school culture, teaching role, student demographics, and personal experiences (Buysse, Sparkman, & Wesley, 2003; Kelly, 2006; Putnam & Borko, 2000).

This theory of learning is demonstrated through the social processes of teacher PD (Buysse et al., 2003). Specific types of social settings can promote more effective PD. For example, PD that is teacher-centered and grounded in teacher communities (partnerships, small groups, etc.) has been shown to foster more teacher learning (Buysse et al., 2003; McLeskey, 2011) than in isolation from one another. Many teachers report that they prefer learning in collaborative and collegial settings rather than in isolation (Bill and Melinda Gates Foundation, 2014).

Furthermore, each teacher enters PD sessions with his/her own experiences and contexts (Kelly, 2006). PD related directly to teachers' school or classroom context provides teachers with meaningful learning based on their unique settings (Bill and Melinda Gates Foundation, 2014). When PD is related to teachers' contexts, teachers can engage with the information in a meaningful way, such as hands-on practice or modeling activities (Darling-Hammond & Richardson, 2009). These active learning activities can deepen their knowledge and improve their practice (Desimone, 2011). Overall, teacher learning is mediated through their backgrounds, social settings, and context in which PD is presented.

This process of adult learning is important to recognize as we develop and implement teacher PD. In an effort to provide meaningful learning, this study is designed to recognize teachers' individual contexts through teacher-centered and community-based PD. The following is a closer look of specific PD characteristics that promote effective teacher learning.

High-Quality Professional Development

Teacher PD can take many forms, however not all PD strategies have equal impact on teachers (Bill and Melinda Gates Foundation, 2014; Koellner & Jacobs, 2015.) High quality PD is defined differently among researchers, although there are similarities and overlap. Based on

their review of literature, Borko, Jacobs, and Koellner (2010) suggest that high-quality PD incorporates teachers' active participation and collaboration with one another. They also indicate that PD should be focused on students' learning. Similarly, Desimone (2011) lists core features of effective PD, including content foci, active learning, coherence, duration, and collective participation. Several reviews highlight that PD is effective when sustained over a period of time (semester, school year, etc.) (Bill and Melinda Gates Foundation, 2014; Yoon, Duncan, Lee, Scarloss, & Shapley, 2007). In addition, an extensive national survey of teachers reveals that collaborative PD experiences have significant impact on their learning (Bill and Melinda Gates Foundation, 2014).

Despite numerous definitions of high-quality PD, there is consensus that PD is considered most effective when it provides learning experiences that improve teachers' instructional practices which in turn increase students' academic achievement (Avalos, 2011; Darling-Hammond & Richardson, 2009; Desimone, 2011; Yoon et al., 2007). High-quality PD includes the following key characteristics: it is collaborative, inquiry-driven, and sustained over time.

Collaborative. Collaborative PD is perhaps the most important and influential characteristic for teacher learning. Drawing from sociocultural theory of learning, individuals shape themselves and learn in response to their social settings and organizational spheres (Lieberman & Friedrich, 2010). Putnam and Borko (2000) note that, "knowing and learning are situated in physical and social contexts, social in nature..." (p. 24). Simply put, learning happens through and alongside people (Kelly, 2006) and is particularly meaningful for teacher learning. Teachers report that they value collaborative learning as a way to support instructional decision making (Avalos, 2011; Bill and Melinda Gates Foundation, 2014) and research suggests that

learning alongside peers has a positive impact on improving teacher practice (National Research Council, 1999). As a teacher, the social and contextual nature of working with colleagues can lend itself to collaborative learning, which has the potential to generate meaningful learning experiences for teachers (Buysse et al., 2003).

Inquiry-driven. Inquiry-driven PD is composed of two closely related attributes: it is embedded in context and involves active learning. Teacher learning is most meaningful when PD is grounded in teachers' specific context (students, classroom, teaching goals, etc.) (Darling-Hammond & Richardson, 2009; Putnam & Borko, 2000). Working with colleagues in similar context is helpful, too; as Buysse et al. (2003) note, "learning occurs within the context of social relationships with other members of the community who have similar, if not identical, issues and concerns from the realm of practice" (p. 267). Teachers have different needs for PD, based on their students' diverse needs (Putnam & Borko, 2000). For example, students that are English language learners may have different instructional needs than students that are native English speakers. Similarly, students in rural special education settings will have varying needs compared to students in urban special education settings. For example, due to the larger population of an urban setting, a school may have several special education teachers based on specific types of disabilities of students (such as Autism Specialist and Resource Room teacher). Schools in rural settings may have more limited staff and have only one special education teacher for the entire school. Effective PD should be crafted so teachers engage within their context, in hopes of easily transferring the knowledge into their classroom and improve teaching practices (Putnam & Borko, 2000).

Providing a meaningful context can increase one's ability and motivation to learn (National Research Council, 1999). Activities that consider teacher context can take many

shapes, including training at school sites, presenting information through case studies, hands-on participation with a current curriculum, including teachers in designing PD topics, or reflection opportunities at meetings (Steeg & Lambson, 2015).

Teachers' active involvement in PD is important. Active teacher learning is defined as opportunities for teachers to "actively engage with the content" (Brownell et al., 2017, p. 145), which means that teachers are engaging in knowledge in hands-on, interactive activities. Ineffective PD sessions may consist entirely of passive learning, where teachers sit and listen to information. Although passive learning can be a necessary component of PD sessions, Desimone (2011) argues that teachers should have opportunities to get involved, such as observing and receiving feedback, analyzing student work, or making presentations. Examples of PD that incorporates active learning include teachers creating their own learning goals, observing expert teachers, or leading discussions among small groups (Bill and Melinda Gates Foundation, 2014; Finkelstein, 2011). Whatever the activity, the PD should invite and support teachers to apply the newly taught skill/s to their practice (Darling-Hammond & Richardson, 2009).

Sustained over time. One-time workshops are a common form of PD (Bill and Melinda Gates Foundation, 2014). However, in order to ensure that teachers will introduce new knowledge into their practice, PD should be sustained over time (Yoon et al., 2007). Research finds that teachers who spent more hours (over a semester or school year) engaging in PD had higher levels of student achievement (Avalos, 2011; Bill and Melinda Gates Foundation, 2014; Yoon et al., 2007). In fact, studies recommend that teachers should participate in PD that requires at least 20 hours of contact time over 6-12 months (Darling-Hammond & Richardson, 2009; Desimone, 2011).

Many of these elements of effective PD can be found in strategies teacher educators use to influence teachers' practices and increase their students' outcomes. This study incorporated these effective PD characteristics through using a coaching model of PD. Coaching is a flexible form of PD that includes these effective characteristics. The coaching relationship can be a collaborative relationship that is sustained over time, such as several months or school year. The coaching topics can be directly related to teachers' classroom needs. And, with many types of coaching models, the teacher and coach work together to answer specific questions, based on teachers' context. There are several models of coaching in the research literature (Cornett & Knight, 2009). The coaching I used in this study is Cognitive Coaching, a professional learning approach for teachers that incorporates effective PD elements and has promise to help special educators succeed (Costa & Garmston, 2016).

Coaching as Professional Development

Research on teacher learning and PD strategies suggests that coaching is an effective approach to providing ongoing and sustained support for teachers (Cornett & Knight, 2009). Coaching supports teachers in teaching effectively or changing their teaching through a relationship with a teacher mentor (Robbins, 2015). In their review of coaching literature, Cornett and Knight (2009) conclude that teachers who receive coaching PD increase their transfer of knowledge to practice compared to teachers that do not receive coaching. Furthermore, Robbins (2015) points out that coaching "increases the influence of exemplary teaching; and magnifies the collective propensity of schools to be able to provide responsive, high-quality learning experiences to ensure that every student succeeds" (p. 8).

Although there are different definitions for the coaching relationship, I use the definition from Taylor's (2008) description for this study. It describes the role of a teacher leader who is an

instructional coach to other teachers. This is the type of coaching relationship I used in my study. Taylor (2008) states that the coaching relationship is defined as ongoing, collaborative, nonsupervisory, nonevaluative, guiding and instructionally focused. It can be versatile and individualized to meet teachers' needs. The focus of the relationship can vary, based on the teacher's needs. It can also have a specific focus, such as academic content, targeted student, and behavior management strategy, and should be determined by the participants (Diaz-Maggioli, 2004; Knight, 2009).

Effective coaching incorporates characteristics of high quality PD, including context, time, and collaboration (Darling-Hammond & Richardson, 2009; Desimone, 2011). Since coaching takes place in the personalized context of the teacher's practice, it can increase teachers' transfer of knowledge into practice (Cornett & Knight, 2009). In addition, PD that is sustained over time, such as ongoing coaching, has a greater impact on teachers' practices and student achievement (Yoon et al., 2007). The coaching relationship lends itself to being maintained over time, as teacher and coach can schedule meetings throughout the school year (Taylor, 2008). Finally, research indicates that teachers learn through collaborative experiences (Darling-Hammond & Richardson, 2009), and coaching exemplifies this. Although coaching is usually done between two teachers (as opposed to a group of teachers), the foundation of coaching is a collaborative relationship (Taylor, 2008). Given these characteristics, coaching can provide meaningful learning opportunities for teachers.

Cognitive coaching. Cognitive Coaching is a coaching approach that emphasizes self-reflection and self-directed learning (Costa & Garmston, 2016). The role of the Cognitive Coach is to mediate the teachers' goal setting, data collection, and self-reflection. It teaches teachers to

recognize their internal processes of learning and stores of innate knowledge to advance their practice (Wormeli, 2017).

This coaching style has the potential of transforming teachers' beliefs and practices. The coaching relationship establishes an ongoing process for the coach to facilitate the teacher through self-reflection (Ellison & Hayes, 2009). For example, the teacher is encouraged to make her own judgments by given a prompt to complete: "Something I liked about that lesson was…." This type of conversation shifts the locus of control from the coach to the teacher. The coach's goal is to develop teachers that can engage in self-directed learning, independently or in a community (Costa & Garmston, 2016). As Garmston and Linder (1993) state, "the ultimate goal of Cognitive Coaching is teacher autonomy: the ability to self-monitor, self-analyze, and self-evaluate" (p. 58). One style of delivering Cognitive coaching is through a coaching cycle.

Coaching cycle. Before the coach and teacher enter a coaching cycle (described below), the coach must establish rapport (Aguilar, 2013). The coach's initial responsibility is to make a connection and build trust with the teacher (Buysse et al., 2003; Kelly, 2006). This process can be time consuming but is essential for establishing a purposeful relationship (Cape & Dyer, 2003). From there, the coach and teacher can enter a practice-based coaching cycle (National Center for Quality Teaching and Learning, 2014) (see Figure 2.1).

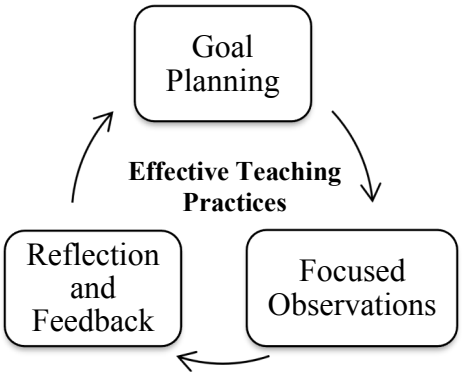

Figure 2.1. Practice Based Coaching Model.

The practice based coaching model represents the following phases of the coaching relationship: goal planning, focused observations, or reflection. This cycle can occur over multiple coaching sessions and can occur repeatedly throughout the coaching relationship. These characteristics allow for teachers to have repeated practice to refine their implementation of teaching practices. This cycle can be particularly effective for teachers learning to implement new instructional strategies because the cycle offers job-embedded practice and designated time for reflective practice (Snyder, Hemmeter, & Fox, 2015).

Conversation maps. Coaching sessions can be guided by conversation maps, used as templates to steer conversations through each of the phases. The four possible maps within Cognitive Coaching are on planning, reflecting, problem-resolving, and calibrating (Costa & Garmston, 2016; Ellison & Hayes, 2009). The planning conversation highlights the importance of the planning process. The coach guides the teacher in understanding the significance of and establishing goals for an event. The reflecting conversation highlights the importance of reflection after an event. Although the coach may guide the reflective activity, the teacher takes the lead on practicing self-discovery, pattern finding, and analysis (Costa & Garmston, 2016). Problem-resolving can be the most complex conversation. This type of conversation may happen when the teacher is feeling stuck or facing adversity during the planning or reflecting phases of the coaching cycle. The coach follows a protocol to guide the teacher through the problem and crafting a goal to resolve the problem (Ellison & Hayes, 2009). The final map is the calibrating conversation. This map is designed to walk teachers through making a connection (or calibrating) their work to state or district-established teaching standards.

Research examining Cognitive Coaching indicates positive impact on teacher learning in the areas of writing instruction, reading instruction, collegial communication, and co-teaching

(Batt, 2010; Donahue-Barret, 2014; Edwards, 2016; Hull, Edwards, Rogers, & Swords, 1998; Slinger, 2004). In addition, teachers report that Cognitive Coaching focuses on teachers' individual needs, which increases their ownership of their learning and problem-solving abilities (Edwards, 2016; González Del Castillo, 2015).

Coaching as PD, specifically Cognitive Coaching, is found to support teachers' learning by encouraging personal goal-setting, data collection, and self-reflection. Through this self-directed PD process, teachers report that they are empowered to change their instructional practices that will improve the academic achievement of their students (Donahue-Barrett, 2014; Dougherty, 2000). I used the Cognitive Coaching PD model in this study with special education teachers as they learn and implement new EBPs for teaching writing.

There is minimal representation of special education teachers in studies pertaining to Cognitive Coaching. Given the unique expectations of special education teachers, it is necessary to examine the specific PD needs for these teachers and their classrooms. I extend my review by examining the existing research on PD strategies specific to the field of special education.

Professional Development Strategies in Special Education

Decades of research conclude that teachers can access effective PD focused on improving practice and student outcome. I completed an in-depth examination of research on PD strategies that are found to be particularly effective with special education teachers. Overall, these results show that minimal research exists for supporting PD specific to special education. Only 14 studies were found pertaining to professional development of in-service special education teachers. Of the 14 studies, 11 (79%) of them included a coaching strategy (see Table 2.1). Three of those studies used a multi-component delivery model, which was a combination of coaching

and professional learning communities (PLCs). Topics worth highlighting from these data are teacher perception, PD topics, inclusive special education settings, and technology-based PD.

Table 2.1

PD Strategies Related to Special Education

Author (Year)	Study Design	Participants	Outcomes
Coaching			
Brock, Huber, Carter, Juarez, & Warren, (2014)	Qualitative	456 teachers (GE & SE) and administrators	Overall survey results: teachers were not confident in their abilities to implement EBPs for students with Autism. They also expressed the interest for workshop style PD over coaching model of PD.
Brown, Stephenson, & Carter (2014)	Quantitative	4 SE teachers of students with severe disabilities	A multicomponent training of presentation, coaching, and role play was successful in training to teachers to implement simultaneous prompting to students with severe disabilities.
Coogle, Rahn, Ottley, Storie (2016)	Quantitative	2 SE teachers of students with severe disabilities	Bug-in-ear eCoaching increased teacher's use of modeling strategies with modeling language with students in various settings. Both teachers displayed increase in using modeling strategies with students after receiving eCoaching PD.
Mueller & Brewer (2013)	Qualitative	6 SE teachers of students with Autism Spectrum Disorder (ASD) and 2 speech language pathologists (SLPs)	Among four aspects of a multicomponent PD model (workshops, coaching, parent information meetings, data collection), teachers and SLPs expressed that coaching was the most beneficial aspect to receive PD on how to work with students with ASD.
Ploessl & Rock (2014)	Quantitative	3 co-teach partners, 6 teachers total: 3 SE teachers and 3 GE teachers	Bug-in-ear eCoaching, during co-teaching classroom settings, increased teachers' use of co-teaching models and student-specific accommodations.
Suhreinrich (2011)	Quantitative	20 elementary SE teachers	Teachers received training (workshop, video modeling and on-going coaching) on pivotal response training. They showed improvement in EBP knowledge and implementation after receiving on-going coaching.
Wilson, Dykstra, Watson, Boyd, Crais (2012)	Mixed Methods: Quantitative & Qualitative	6 early childhood SE teachers of students with developmental disabilities (including ASD)	Coaching model had positive impact on teachers learning how to implement the Advancing Social-communication and play intervention program.
Inquiry			
Dana, Pape, Griffin, & Prosser (2016)	Qualitative	23 teachers total: 17 GE teachers and 6 SE teachers	Teacher inquiry professional development to teach math standards using Prime Online PD program. The inquiry process assisted in teachers' learning about teaching math (conceptual and procedural knowledge).

Note. GE is general education; IEP is Individualized Education Plan; PD is professional development; SE is special education.

(continued)

Table 2.1. *(Continued)*

Author (Year)	Study Design	Participants	Outcomes
Peer Coaching			
Babione & Shea (2005)	Qualitative	7 experienced GE and SE teachers and 5 novice SE teachers	Year-long induction mentor relationships. Purpose of mentoring was to increase collaboration between novice teachers and their colleagues. Results of the study show that schools' norms limited novice teachers' opportunities to implement collaboration techniques encouraged by their mentors.
Professional Learning Community (PLC)			
Brownell, Adams, Sindelar, Waldron, & Vanhover (2006)	Qualitative	8 elementary GE teachers with students with disabilities in their classrooms	Teachers in PLC focused on skills to better educatio students with disabilities. Their adoption of skills varied by certain teacher characteristics: knowledge of curriculum, beliefs of behavior management, views of student learning, reflection of student learning, and ability to adapt instruction.
Flannery & Helleman (2015)	Qualitative	18 high school SE teachers	After PLC PD, teachers displayed positive change in how to write several components of the IEP to align with the IEP transition plan.
Coaching + PLC			
Brownell et al. (2014)	Qualitative	5 elementary SE teachers	Teachers were a part of literacy focused learning communities, which included working with a literacy coach. The teachers' abilities to analyze instruction and change their teaching was based on three factors: individual qualities, contextual factors, and PD components. Regarding PD components, most teachers were influenced by the learning community but not the specific input (suggestions for change) by the literacy coach.
Leko, Kiely, Brownell, Osipova, Dingle, & Mundy (2015)	Qualitative	9 elementary SE teachers for students with high-incidence disabilities, 2 separate cohorts of teachers	Teachers were members of learning community and received coaching for two years. The teachers whose discourse consisted of knowledge and inquiry provided more sophisticated learning experiences for group members.
McLeskey, Waldron, & Redd (2014)	Qualitative	1 elementary school with high student achievement scores and inclusive placements of students with disabilities, 480 students, 42 teachers, 2 special education teachers	One of the components that contributed to student success and inclusive placement was teachers' frequent participation in professional development, particularly coaching and learning communities.

Note. GE is general education; IEP is Individualized Education Plan; PD is professional development; SE is special education

Teacher perception. Most of the studies were small scale, qualitative design, exploring the impact of PD strategies on teacher learning. PD strategies used in these studies were coaching, inquiry, peer coaching, PLC, and coaching + PLC. Participation in these studies varied from 2-23 participants, mostly special education teachers. Of these studies, three of them discussed teachers' perceptions (Brownell et al., 2014; Dana et al., 2016; Mueller & Brewer, 2013). Teachers expressed that PD supported their learning and changed their practice. The teachers in Dana et al.'s (2016) study reported that their knowledge of math instruction was deepened due to the inquiry process. Similarly, the teachers in Brownell et al.'s (2014) study expressed that they benefitted most from the collegial community that was created through the PLC. Teachers in Mueller and Brewer's (2013) study felt that the coaching PD was the most beneficial aspect of their PD experiences.

Numerous studies measured impact through teachers' experiences with PD strategies. In Mueller and Brewer's (2013) study, teachers expressed that the most beneficial component of their PD experience was receiving coaching. Babione and Shea's (2005) study discovered that novice teachers felt supported by their peer coaches to overcome the barrier of school climate to collaborate with general education colleagues. In addition, teachers in Brownell el al.'s (2014) study expressed that they were most influenced by the community created through the PLC, as opposed to instructional-focus discourse.

Brock et al.'s (2014) study was the only large-scale study (n=456). They surveyed general education, special education teachers and administrators. Participants were asked about their confidence in implementing EBPs for students with autism, perception of how beneficial different types of PD are, and interest in pursuing different types of PD. Overall, participants responded that they lacked confidence in implementing EBPs. Interestingly, this lack of

confidence did not correlate with participants' desire for more PD. Teachers that expressed lack of confidence in EBPs for autism did not necessarily believe that they needed more PD in this area. They did, however, respond that if they received PD then they would prefer a workshop over coaching. The study highlighted the dissonance between the body of literature on effective teacher PD and teachers' actual experiences with PD (Bill and Melinda Gates Foundation, 2014).

PD topics. PD topics were organized into two groups: special education strategies and academic content areas. Eleven of the 14 studies delivered PD pertaining to special education practices (see Table 2.2). These strategies varied from procedural knowledge (i.e., IEP writing) to broader topics (i.e., inclusive practices) to particular EBPs (i.e., pivotal response training).

Table 2.2 *Professional Development Topics*

Author (Year)	**Special Education Strategies**	**Academic Content Area**
Coaching		
Brock, Huber, Carter, Juarez, & Warren, (2014)	best practices with ASD	
Brown, Stephenson, & Carter (2014)	simultaneous prompting	
Coogle, Rahn, Ottley, & Storie (2016)	modeling	
Mueller & Brewer (2013)	best practices with ASD	
Ploessl & Rock (2014)	co-teaching (inclusion)	
Suhreinrich (2011)	pivotal response training	
Wilson, Dykstra, Watson, Boyd, & Crais (2012)	communication & play skills	
Inquiry		
Dana, Pape, Griffin, & Prosser (2016)		math (procedural & conceptual)
Peer Coaching		
Babione & Shea (2005)	collaborating with GE teachers (inclusion)	

Note. ASD is Autism Spectrum Disorder; GE is General Education.

(continued)

Table 2.2. *(Continued)*

Author (Year)	Special Education Strategies	Academic Content Area
Professional Learning Community (PLC)		
Brownell, Adams, Sindelar, Waldron, & Vanhover (2006)	supporting students with disabilities	
Flannery & Helleman (2015)	writing IEPs	
Coaching + PLC		
Brownell et al. (2014)		literacy skills
Leko, Kiely, Brownell, Osipova, Dingle, & Mundy (2015)		literacy skills
McLeskey, Waldron, & Redd (2014)	inclusive practices (inclusion)	

Note. ASD is Autism Spectrum Disorder; GE is General Education.

All of these studies stated that the PD strategy had a positive impact on teachers' learning. The impact was defined differently, based on the study. In several studies, teachers displayed increased procedural knowledge, such as implementing curriculum, writing IEPs, and providing IEP accommodations (Dana, Pape, Griffin, & Prosser, 2016; Flannery & Helleman, 2015; Ploessl & Rock, 2014; Wilson, Dykstra, Watson, Boyd, & Crais, 2012). Other studies highlighted teachers' increased knowledge of EBP implementation, such as modeling and systematic prompting (Brown, Stephenson, & Carter, 2014; Coogle, Rahn, Ottley, & Storie, 2016; Mueller & Brewer, 2013).

Three of the studies used PD to address specific academic content areas of math and literacy. Teachers in Dana et al.'s (2016) study participated in inquiry cycles related to teaching math. Majority of teacher participants reported increase in knowledge in the areas of procedural or conceptual knowledge of teaching math. Similarly, teachers in Brownell et al.'s (2014) study participated in a PLC and displayed an ability to analyze their current practices in literacy instruction and create new units of study based on their analysis. Leko et al.'s (2015) study examined teachers' characteristics that influenced one another while participating in literacy-

focused PLC. They found that teachers with a background of literacy content knowledge and proficiently participating in inquiry were able to teach and influence other members of the PLC. Overall, these results illustrate that PD strategies can be effectively used to address a variety of topics, depending on teachers' and students' needs.

Inclusive settings. Three of the studies provided PD to teachers regarding inclusive special education settings (see Table 2.2). The purposes and results of the studies varied. McLeskey et al. (2014) determined that the one of the components of successful inclusive experiences for students with disabilities was teachers' involvement in a PLC that included high-quality characteristics. Brownell et al. (2006) found that teachers' responses to PD varied and were categorized into low, moderate, and high adopters of teaching practices, depending on their personal beliefs of teaching and special education. Babione and Shea (2005) revealed that one barrier that novice teachers face is working collaboratively with general education colleagues. The role of a peer coach supported teachers to overcome this barrier. And, in Ploessl & Rock's (2014) study, teachers were coached in real-time (via bug-in-ear technology) during their co-teaching roles. Teachers increased their collaborative co-teach practices. These results show the diverse needs of teachers working in inclusive special education settings and how different styles of PD can support those needs.

Technology-based PD. Three studies reported integrating technology into their PD. One study presented teachers with different styles of PD, including a one-time workshop, video modeling, and on-going coaching (Suhreinrich, 2011). The video modeling was used to show teachers how to accurately implement an EBP. Two other studies used a distinct type of coaching, called bug-in-ear (BIE) coaching, to support implementation of an EBP and inclusive practices. BIE consists of the teacher wearing an earpiece while teaching and receives in-the-

moment training via Bluetooth from a coach. Both video modeling and BIE technologies enhanced the PD experiences by providing a deeper context for teachers. Rather than simply discussing what to do or what was done in the classroom, teachers received real examples through watching video examples or in-the-moment directions.

Connections between research in special education professional development (PD) and the broader literature base on PD. Although there is significantly less of it available, the special education literature on PD supports the findings from the broader literature on PD. There are overlaps and difference between the two bodies of literature. The promising overlap is that most of the studies in this review displayed a positive effect on special education teachers' learning and practices. This is similar to findings in the broader literature that promote coaching, peer coaching, PLCs, and inquiry cycles as effective strategies for teacher learning.

Of the four strategies named above, the coaching model of PD is the most commonly researched PD model with special education teachers (see Table 2.2). The fundamental practice of special education is to provide individualized education to each student. Special education teachers use specific strategies with each student that best fits that student's learning needs, goals, and instructional program. Perhaps the coaching model of PD allows a coach to work with a teacher on these individual needs.

The gap between bodies of research literature in general education and special education is that the PD practices, such as coaching, articulated in the general education literature were not sufficiently represented in the special education literature, nor is there much mention of special education in the broader literature. Reviews and meta-analyses of teacher PD (Avalos, 2011; Borko et al., 2010) did not specify if/how many special education participants were included in the studies.

In addition, the PD topics varied between the general education and special education. Most of special education PD were focused on EBPs and job-specific tasks (e.g. writing Individualized Education Plans). This is not necessarily a negative aspect of the special education literature. EBPs and job-specific tasks play essential roles in the educational experiences of students with disabilities. Therefore, special education teachers should receive PD in these areas if they are to implement them in classrooms and with students.

Of the studies that included special education teachers as participants, there was no specific description on what type of special education teacher (resource room, generalist, behavior support, or low-incidence disabilities). Teachers were described as "general education" and "special education" teachers. This study will focus specifically on coaching special education teachers of students with LID on teaching writing using a combination of strategies.

Academic Evidence Based Practices for Learners with Low Incidence Disabilities

While there are several effective ways to deliver PD to special education teachers, what is being delivered is just as important. I will review the literature on effective practices for learners with low-incidence disabilities (LID). Many sources of teacher training promote teaching practices that are considered "best practice" or "research-based." These terms are used loosely and should not be mistaken by what research recognizes as an evidence-based practice (EBP). Teaching practices do not qualify as EBPs simply because they are promoted by experts or are commonly implemented by practitioners based on experience.

Evidence Based Practices for Students With Low Incidence Disabilities

There is no disability category titled "low-incidence disability". Instead, it refers to the 0.1-1% of general school-aged population that have a severe and profound intellectual disability, multiple disabilities, or are both deaf and blind (Friend, 2014). Students with LID typically have

characteristics such as IQ scores and adaptive scores two standard deviations below the mean, limited oral communication, the need for systematic instruction, and the need to be taught for generalization (Brown et al., 2015; Friend, 2014).

EBPs for students with LID are teaching practices demonstrated to be effective through rigorous research studies (Cook & Cook, 2013; Council for Exceptional Children, 2014). Although group designs are often used to measure efficacy of teaching practices, they focus on the mean. Students with disabilities are typically non-responders (or outliers) in group design. Research design pertaining to learners with LID must have an individualized focus on the non-responders (Horner et al., 2005). Single case research design (SCRD) does just this. Unlike group design, it focuses on individual participants and the effects of intervention on those individuals. This individual focus is especially valuable for learners with LID, where educational programming is based on individual abilities and needs (Courtade, Test, & Cook, 2015; Horner et al., 2005). Since SCRD does not focus on effect size of a large group of participants, a single study does not establish generalization to the larger population. Instead, generalization is established through replicated studies that have similar outcomes (Cook & Cook, 2013; Gast & Ledford, 2014; Horner et al., 2005).

Baer, Wolf, and Risley (1968) established SCRD as a useful and effective research design in social behavior. SCRD has been, since then, recognized as one of the research designs used to establish EBPs. “Single-subject research methods offer a number of features that make them particularly appropriate for use in special education research” (Horner et al., 2005, p. 173). Moreover, SCRD is a practical approach to research when working with individuals with LID. Due to size and participant as single unit of analysis, SCRD is cost effective and also allows for testing in an educational special education setting, which is the natural special education setting

for the participant (Horner et al., 2005). Baer et al. (1968) describe this as the usual social special education setting where social behaviors take place. This is particularly important for learners with LID, as they require explicit instruction on generalizing skills among special education settings (Brown et al., 2015).

Prompting. Prompting has an extensive evidence-base supporting its effective use with teach academics skills to learners with LID (Browder, Wood, Thompson, & Ribuffo, 2014; National Autism Center, 2015; Sam & AFIRM Team, 2015; Spooner, Knight, Browder, & Smith, 2012). Of the different types of prompting, I selected system of least prompts for this study due to its frequency and efficiency of use (Browder et al., 2014; Lee et al., 2016; Mims et al., 2012).

The system of least prompts is an effective EBP when teaching a variety of skills to students with LID and is commonly used to teach academic skills to students with LID (Browder et al., 2014; Spooner et al., 2012). This system requires the teacher to begin with the least intrusive prompt (such as a gestural prompt) and then provide a sequence of more intrusive prompts if the student does not response (such as verbal, modeling, or partial physical) (Brown et al., 2015). The system of least prompts has been shown to be effective in teaching academics to adolescents with LID (Sam & AFIRM Team, 2015; Spooner et al., 2012). Studies find that this type of prompting hierarchy can be used to teach a variety of academic skills, including counting money and reading comprehension (Cihak & Grimm, 2008; Mims, Hudson, & Browder, 2012).

In summary, EBPs are essential to the education of all students, and especially important for students with LID (Marder & deBettencourt, 2015). Teachers alone cannot measure the efficacy of teaching practices. Research can support teachers' practices and shed light on what is working and what is not. Through the inquiry process, researchers can test the efficacy of

teaching practices and establish EBPs that have a positive effect on student outcome (Cook & Cook, 2013; Odom et al., 2005; Wong et al., 2015). From this review of EBP literature, academic instruction paired with prompting has been demonstrated to have a positive impact on student's learning. In addition, one area of need for research is the area of written language skills. Few studies focused on teaching students with LID how to participate in the writing process.

Writing Skills and Instruction for Students with LID

Accessing literacy instruction is a basic human right that empowers individuals to communicate with others (Keefe & Copeland, 2011). This is particularly important for students with LID, as they face great challenges acquiring reading and writing skills along with other academic skills (Brown et al., 2015). Furthermore, writing is a fundamental component to literacy instruction that must be accessible to learners of all abilities. Writing is a complex skill that must be strategically taught to students with LID (Graham et al., 2016; Joseph & Konrad, 2009). Current research on teaching written language skills to this student population is quite limited (Browder et al., 2014).

Writing is a critical component of literacy instruction. Throughout their school careers, students depend on writing to complete classroom activities, participate in school and state exams, and share social correspondence (Berninger, Garcia, & Abbott, 2009). In early years, students' progress in writing skills can strengthen reading skills, and vice versa (Shanahan, 2009). Throughout all the school grades, Common Core standards highlight the importance of writing skills as a form of expression and discourse in various content areas, such as social studies, science and technical studies (Common Core Standards Initiative, 2010). Then, upon high school graduation, students use their writing skills to participate in large-scale assessments

for college entrance and/or to enter the workforce, develop/maintain social relationships, and carry on adult responsibilities.

As important as writing skills are, sufficient instructional time is not always guaranteed in the classroom (Applebee & Langer, 2011; Troia, Lin, Monroe, & Cohen, 2009). In fact, research suggests that deliberate writing instruction time varies greatly based on contexts, such as grade level taught, teacher's style of instruction, pedagogical knowledge and competing classroom priorities (Zumbrum & Krause, 2012). Students are expected to write in schools, but not always given specific instruction on how to write (Gallagher, 2009). This lack of consistent instruction often yields struggling writers (Troia, 2014). Furthermore, teaching writing can be particularly challenging to students with LID, as written language is closely related to cognitive factors, such as oral language and communication skills (McCutchen, 2003; Shanahan, 2006). For this reason, students with LID are even greater risk of not mastering writing skills (Brown et al., 2015).

Evidence Based Practices for Writing Instruction

Research on teaching writing skills suggests that using instructional strategies that are thoughtful and explicit can improve students' written language skills (Gallagher, 2009; Graham et al., 2012; Graham et al., 2016). There are now over 30 EBPs to support students in learning and mastering written language skills (Troia, 2014). Research supports the use of a variety of EBPs to teach students how to write, including prewriting activities, word processing, planning, and goal setting (Graham, McKeown, Kiuhara, & Harris, 2012; Kiuhara, Graham, & Hawken, 2009). More specifically, there are EBPs that can be particularly effective with students with disabilities, including word processing, graphic organizers, and vocabulary instruction (Graham, Olinghouse, & Harris, 2009; Troia, 2014). For this study, I investigated writing EBPs specifically for students with LID.

Of all students with disabilities, students with LID have the most difficulties in academic achievement and can have significant delays in processing and communication (Brown et al., 2015). Despite these limitations, students with LID can, indeed, learn how to write (Joseph & Konrad, 2009; Pennington, 2017; Pennington & Delano, 2012; Pennington & Koehler, 2017). There is much to be learned about teaching students with LID how to write, as research is limited and emerging. I considered the broader literature on writing instruction and learning disabilities to make connections with potential instruction for students with LID. From this literature, I drew conclusions on what may be effective writing EBPs for students with LID. The first step in the writing process is the prewriting phase. For this reason, I narrowed my focus in this study on teaching students with LID how to successfully participate in the prewriting phase. General education literature indicates that students' active participation in the writing process (including prewriting) is an essential part of effective writing instruction (Kiuhara et al., 2016; Zumbrum & Krause, 2012). Furthermore, studies find that students' participation in prewriting activities, such as brainstorming, improve students' overall quality of writing (Graham et al., 2012).

One specific type of prewriting activity is the use of a graphic organizer (GO). Using a GO during prewriting can improve students' ability to form and organize ideas (Dexter & Hughes, 2011). It provides a visual representation to an otherwise abstract idea of sentence and paragraph formation. A GO provides a structured approach to prewriting that guides students through brainstorming ideas for their written work. This can be particularly beneficial for students with LID, as they learn best from structured and systematic instruction (Archer & Hughes, 2011; Brown et al., 2015). For these reasons, I will examine the extant literature on GOs and their role in students' learning of writing skills.

Graphic Organizers

The initial step of the writing process is brainstorming during the prewriting phase (Graham et al., 2016). Tools such as GOs are found to guide students through the prewriting phase (Bromley, 1999; Troia, 2014). GOs are tools to encourage students' with and without disabilities gathering and planning ideas during prewriting (Dexter & Hughes, 2011; Troia, 2014). For example, Regan et al. (2017) discovered that the use of a computer-based GO improved middle school students' quality and quantity of narrative essay writing. Clark, Jones, & Reutzal (2013) also discovered that primary students' use of graphic organizer assisted them in collecting information in preparation for writing informational text.

Similarly, special education literature suggests that GOs are a flexible tool to use during the prewriting phase of the writing process (Dexter & Hughes, 2011). They can be used in a variety of settings, including content classes (English, science, math class), wide range of grade bands (elementary-high school), and different writing purposes (researching, organizing information, paragraph composition) (Dexter & Hughes, 2011; Gillespie & Graham, 2014).

Current research on using graphic organizers with students with LID. Research suggests that the use of GOs can improve the writing skills of students with LID (Cannella-Malone et al., 2015; Pennington & Delano, 2012). Considering students' limited written language skills, the GO can encourage idea formation and organization (Cannella-Malone, Konrad, & Pennington, 2015). For example, Cannella-Malone and colleagues (2015) suggest that with teachers' explicit instruction, students can learn to use GOs while planning and drafting their writing. Pennington and Delano's (2012) literature review found that the use of GOs during prewriting was an intentional writing intervention for students.

Table 2.3 displays the 17 studies that examined using GOs during writing instruction with to students with disabilities. All studies suggested improvement in participants' written language

skills. Thirteen studies were single case research designed, which included small sample sizes of participants (n≤12). Of these studies, seven reported increase in word count, five reported increased use of transition words, and seven reported more organized paragraphs structure (introduction, supporting details, and ending). Three studies were experimental design study with larger number of participants (n=16-35). These studies reported that students' writing increased in overall writing quality, accuracy of paragraph organization, and use of writing conventions.

Table 2.3

Studies Using Graphic Organizers as Part of Intervention with Students with Disabilities

Author (Year)	Study Design	Total Participants	Disability (Number of Participants)	Age Group	Outcome
Asaro-Saddler (2014)	SCRD	3	ASD	Elementary	Increase in story elements, higher scores on overall quality, and word count
Asaro-Saddler & Bak (2014)	SCRD	6	ASD	Elementary	Increase in essay elements
Bishop et al. (2015)	SCRD	3	ASD	Middle School	Improvement in word count, correct writing sequence, and overall rubric scores
Englert et al. (2007)	Experimental	35	LD (11) ID (2) EBD (2) Other: ASD, HI (5)	Elementary	Improvement in organization of writing and writing conventions
Evmenova et al. (2016)	SCRD	10	ADHD (1) ASD (3) EBD (4) LD (2)	Middle School	Increase in word count, number of sentences written, use of transition words, and overall quality of essays
Lienemann & Reid (2008)	SCRD	4	ADHD	Elementary	Positive effect, essays were longer and more complete

Note. ADHD is Attention Deficit Hyperactivity Disorder; ASD is Autism Spectrum Disorder; EBD is Emotional Behavior Disorder; HI is Health Impairment; ID is Intellectual Disability; LD is Learning Disability; MD is Medical Disability; SLD is Specific Learning Disability; TBI is Traumatic Brain Injury.

(continued)

Table 2.3 (*Continued)*

Author (Year)	Study Design	Total Participants	Disability (Number of Participants)	Age Group	Outcome
MacArthur & Philippakos (2010)	SCRD	6	LD (3)	Middle School	Improvement in text structure elements and overall writing quality
Mason et al. (2010)	SRSD	5	EBD	Middle School	Improvement in writing quality, quantity of parts, word count, and overall writing quality
Mason et al. (2013)	SCRD	3	EBD	High School	Improvement in writing quality, quantity of parts, and word count
Mastropieri et al. (2014)	SCRD	12	EBD	Middle School	Improvement in topic sentences, counterarguments, conclusion, length of paragraphs, and use of transition words
Park et al. (2017)	SCRD	3	ID	Middle School	Improvement in words spelled correctly, correct word sequence, grammar, and transition words
Patel & Laud (2009)	Action Research	3	LD (2)	Middle School	Improvement in length of writing, number of story elements, number of images, mechanics, organization and overall writing quality
Reid & Lienemann (2006)	SCRD	3	ADHD	Elementary	Positive effect on length, completeness, and holistic quality of essays
Saddler & Asaro (2007)	SCRD	3	LD	Elementary	Longer essays, improved grammar, and increased time spent on planning stories
Saddler et al. (2017)	SCRD	6	EBD	Elementary	Improvement in written summaries
Woods-Grove et al. (2013)	Experimental	16	ASD (4) LD (1) SLD (3) ID (7) TBI (1)	Post-Secondary	Increased length, accurate introductory sentence, inclusion of summary/conclusion, and main ideas with supporting details.
Woods-Grove et al. (2014)	Experimental	19	ASD (8) LD (2) ID (8) MD (1)	Post-Secondary	More concise and higher quality essays

Note. ADHD is Attention Deficit Hyperactivity Disorder; ASD is Autism Spectrum Disorder; EBD is Emotional Behavior Disorder; HI is Health Impairment; ID is Intellectual Disability; LD is Learning Disability; MD is Medical Disability; SLD is Specific Learning Disability; TBI is Traumatic Brain Injury.

The studies can be grouped by writing genre: persuasive, narrative, and expository. See Table 2.4 for details. Six of the studies taught persuasive essay writing. These studies included different types of writing activities, including essay writing and quick writes. In studies requiring students to write essays, students increased their word count, number of sentences, and overall quality of topic sentences and counterarguments (Bishop et al., 2015; Evmenova et al., 2016; Mastropieri et al., 2014). Similarly, students that used a GO during quick writes improved their

Table 2.4

Types of Graphic Organizers in Studies

Author (Year)	**Number of Participants**	**Instructional Practice**	**GO Type**	**GO Use**
Asaro-Saddler (2014)	3	SRSD	Mnemonic	GO in prewriting for story writing
Asaro-Saddler & Bak (2014)	6	SRSD	Mnemonic	POW+ TREE GO in prewriting for persuasive essay writing
Bishop et al. (2015)	3	GO	Individualized	Prewriting for persuasive essay
Englert et al. (2007)	35	CBGO	TELE-Web	CBGO in prewriting
Evmenova et al. (2016)	10	CBGO + SRSD	Mnemonic	CBGO created in Microsoft Word in prewriting of persuasive essays
Lienemann & Reid (2008)	4	SRSD	Mnemonic	POW-TREE GO in prewriting for expository essays
MacArthur & Philippakos (2010)	6	SRSD	Mnemonic	Prewriting for compare & contrast essay
Mason et al. (2010)	5	SRSD	Mnemonic	POW + TREE GO in prewriting for persuasive 10-minute quick writes
Mason et al. (2013)	3	SRSD	Mnemonic	POW and TREE GOs in prewriting for persuasive 10-minute quick writing
Mastropieri et al. (2014)	12	SRSD	Mnemonic	POW + TREE GO in prewriting for persuasive essay writing in inclusive setting
Park et al. (2017)	3	CBGO	Hamburger paragraph	CBGOs in SOLO suite for paragraph writing

Note. SRSD is Self-Regulated Strategy Development; CBGO is Computer Based Graphic Organizer.

(continued)

Table 2.4 (*Continued)*

Author (Year)	Number of Participants	Instructional Practice	GO Type	GO Use
Patel & Laud (2009)	3	SRSD + Visualizing & Verbalizing	Mnemonic	WWW and What2 How2 GOs in prewriting for narrative writing while using a five-step writing process
Reid & Lienemann (2006)	3	SRSD	Mnemonic	POW and WWW GOs in prewriting for narrative writing
Saddler & Asaro (2007)	3	SRSD	Mnemonic	POW and WWW GOs in prewriting for narrative writing
Saddler et al. (2017)	6	SRSD	Mnemonic	WIN GO in prewriting for writing summaries
Woods-Grove et al. (2013)	16	Explicit Instruction + Modeling	Mnemonic	ANSWER GO in prewriting for narrative essays
Woods-Grove et al. (2014)	19	Strategic Instruction	Mnemonic	ANSWER GO list of steps as in prewriting for writing essay tests

Note. SRSD is Self-Regulated Strategy Development; CBGO is Computer Based Graphic Organizer.

quality of written responses, increased word count, and increased quantity of paragraph components (Mason et al., 2010; Mason et al., 2013).

Five of the studies taught students to write narrative stories. Students used GOs during the prewriting process to develop elements of narrative writing, including characters, setting, and plot. Overall, results show that students improved their use of grammar, increased time spent on planning stories, improved overall organization of stories, and increased word count (Asaro-Saddler, 2014; Patel & Laud, 2009; Saddler & Asaro, 2007).

Three studies taught students to write expository essays or paragraphs. In these studies, students wrote summaries of non-fiction information. The GOs provided an outline of how to sort the information and in what order to put facts. In these studies, students' writing showed an improvement in use of writing conventions, organization of ideas, text structure, and an overall improvement in quality of written summaries (Englert et al., 2007, MacArthur & Phillippakos,

2010; Saddler et al., 2017). In all three genres of writing, students used GOs during the prewriting phase to brainstorm and organize ideas. All studies reported improvement in students' overall writing,

GOs were used among a variety of student ages and grade levels, ranging from elementary-age students to post-secondary school (ages 7 years to 24 years old). In all grade levels, students used GOs to guide their paragraphs and essay planning. Students as young as 7 years old used GOs to write narrative paragraphs, improving their overall quality of written work and increasing their word count (Asaro-Saddler, 2014). The oldest student participants were in the post-secondary special education setting, at 24 years of age. These students used GOs to support their responses on essay-style tests. The results show that GOs prompted students to write more concise and higher quality essay answers (Woods-Grove et al., 2013; Woods-Grove et al., 2014). These studies illustrate that GOs can be applied to students in all grade levels.

Fourteen studies used the GOs as part of another instructional intervention. Twelve of the studies used GOs with an instructional practice called self-regulated strategy development (SRSD) and two studies paired GOs with explicit instruction. Only three of the studies used the GO as the primary intervention. In Bishop et al.'s (2015) study, teachers taught students how to use the GO using modeling and guided practice. Students completed the GO then used it to transfer ideas into a draft essay. Researchers found that after the using the GO, students improved their writing skills by increasing word count and correct sequence of ideas. In Englert et al.'s (2007) study, students used a computer-based GOs to respond to self-selected expository topics. Researchers found that students that used the GO wrote more words and better organized supporting details that their peers who did not use a GO. Similarly, students in Park et al.'s (2017) study used a computer-based GO to respond to writing prompts. Researchers found that

students improved their quality of writing by adhering to the topic, spelling words correctly, and accurately sequencing words.

Overall, 11 of the 17 included participants with close-to-grade-level academic abilities and had basic knowledge of sentence and/or paragraph completion. Five studies included student participants with emotional and behavior needs. Ten studies included students who received special education services in inclusive general education special education settings or resource room models. And, two studies included students in post-secondary education special education settings where students were completing essay-style writing assignments. All of whose writing abilities were slightly below grade level. I did not locate a single study using GOs in writing with participants with significant academic and/or cognitive deficits.

Using a GO for a visual structure aligns with extant literature on using visual supports as a teaching strategy for students with disabilities (Browder et al., 2014; Wong et al., 2015). There is emerging research suggesting using GOs with students with LID to teach summarizing details in social studies (Browder et al., 2014) and story templates for narrative writing (Pennington & Koehler, 2017). There is, however, no research examining the use of a GO for teaching writing skills with students with LID. This study contributes to the research base in this area.

Theory of Change

I suggest a theory of change that can improve teacher's implementation of high-quality writing instruction for students with LID (see Figure 2.2). Providing teachers with an effective model of PD on how to use graphic organizers using system of least prompts can improve their practice of teaching writing and increase students' with LID written language skills.

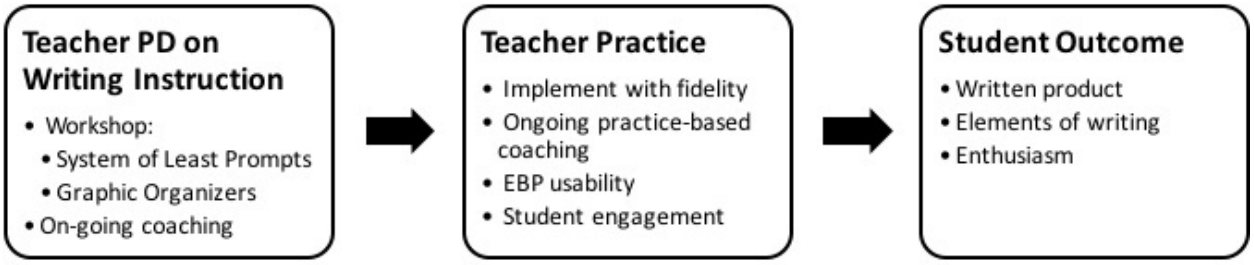

Figure 2.2. Theory of change to improvement implementation of EBPs.

Teacher professional development on writing instruction. Teacher PD on writing instruction includes a combination of two components: a small-group workshop and the on-going practice based coaching sessions.

Workshop. PD begins with a one-time group workshop with the coach and each teacher. This style of initial PD ensures that all teachers receive the same information about EBPs. The curriculum includes a brief overview of how EBPs are established, the system of least prompts as an effective teacher strategy for students with LID and GOs as an accessible prewriting activity. The system of least prompts is a commonly used strategy to teach academic skills (Browder et al., 2014). And, GOs is a writing strategy that can support students with disabilities during prewriting (Dexter & Hughes, 2011). Combining these two EBPs has the potential to improve students' with LID writing skills.

Throughout the workshop, teachers participated in active learning activities that are collaborative and context-based (Brownell et al., 2017). They needed time to process the knowledge on EBPs and relate it to the specific needs of their target student. They also have the opportunity to reflect on how the information relates to their current practices of teaching writing instruction (Desimone, 2011). During this meeting, I can use specific coaching strategies to build trust with the teachers, including listening, asking questions, and validating (Aguilar, 2013).

Practice based coaching. Recent studies indicate that coaching can have a positive effect

on special education teachers' learning and implementation of EBPs. The coaching relationship has the potential to inform teacher practice and increase student academic achievement (Costa & Garmston, 2015). After leading the small-group workshop, I can meet individually with each teacher to continue the coaching relationship. I approach the relationship using Cognitive coaching approach. With this approach, I design our first coaching session to establish rapport and support the teachers in goal setting as they plan their instruction using system of least prompts and GOs. At the end of the initial coaching sessions, teachers have an implementation plan of the newly learned EBPs.

Teacher practice. After participating in all the initial PD, teachers have time to practice using system of least prompts and GOs during their instruction. During teaching practice, I continued to coach the teachers as they refined their practice. The individualized attention and coaching paired with teachers' self-reflection on their implementation of EBPs can helpe improve teachers' practice of teaching students writing skills.

Continued coaching supports teachers as they refined their instruction of system of least prompts and GOs. The on-going practice cycle encourages discourse and mentorship between individual teachers and myself during the implementation process. Teachers have opportunities to practice while I observe and gather data on their goal. After observations, I can share the data and facilitate constructive conversations. These conversations focus on self-reflection, success with implementation and what can be done differently to improve. Throughout all the coaching sessions, I can respond to each teachers' needs and strengths. This individual attention allows for the PD to be uniquely tailored

As teacher implementation of system of least prompts and GOs improves, students become increasingly engaged in writing activities. This student engagement and enthusiasm

improves students' participation in writing activities and hopefully reinforce teachers' implementation of EBPs.

Student outcome. As teachers improve their instructional practices, students will improve their writing skills. First indication of improvement will be students' writing production. For some students, written expression maybe be a newly acquired skill. Perhaps this is the first time they have constructed written word. For others, improvement may come in the quantity of written work produced. For example, first time student has composed multiple sentences about a single topic. The second indication of improvement is the students' use of specific elements of writing, including proper use of grammar, increased vocabulary, or sentence variety. The third indication of improvement is in students' enthusiasm. Not only will students learn the mechanics of writing, but they have the desire to express themselves through written language. Improvement in writing skills not only opens doors to academic opportunities on the school campus, but it empowers students to become increasingly independent and expressive. This theory of change proposes a pathway to give students with LID a gateway into a form of communication and self-expression.

Purpose of Study

The purpose of this study is to extend the research in the field of PD for special education teachers through an experimental study. This study will provide special education teachers with a PD experience on how to implement a system of least prompts while teaching adolescents with LID to use a graphic organizer during writing instruction. This study will answer the following research questions:

1. Does the training and coaching model of professional development for system of least prompts increase teacher's implementation fidelity during writing instruction?

2. Does a teacher's accurate implementation of system of least prompts increase a student with low-incidence disabilities completion of graphic organizers as a writing activity?
3. How do special education teachers view the effectiveness of training and coaching model of professional development and system of least prompts?
4. How do students with low-incidence disabilities view the effectiveness of using graphic organizers and function of writing?

Chapter Three:

Research Methodology

This chapter describes the research method used in this study to examine professional development for special education teachers on the implementation of evidence-based practices to teach student to write.

Setting

This study took take place in three high schools from one suburban school district located in the Pacific Northwest region. Each classroom was from a district-wide special education program designed for students with LID. The study's PD package and data collection took place in each of teachers' classrooms during writing instruction. The district's course objective for English classes for this population of students focused on functional skills related to reading and writing. The learning outcomes included reading comprehension of a news article, typing address and phone number, reading fluency of short fiction, simple sentence grammar, and word recognition of community and vocational words. Time spent on writing instruction varied based each school's length of class period, teachers' decisions on prioritizing learning outcomes, and students' specific IEP needs.

Participants

Dyads

Teacher and student participants in each high school were grouped into dyads. Each dyad included a teacher and a student from that teacher's English class. Inclusion criteria for teachers were: (a) full-time employment as special education teacher, (b) teach in a high school special education program, (c) teach students with LID, (d) teach writing skills, (e) are not using system of least prompts during writing instruction, (f) at least 3 years of experience (as to avoid

recruiting novice teachers), and (g) willing to participate in study. All teachers taught English class and delivered this study's intervention during English classes. Even though days and times of the English classes varied by bell schedules, all teachers had class at least three times a week.

The following inclusion criteria was used to select each student participant: (a) had an evaluation that qualifies student as having significant impairment in cognitive and/or adaptive skills (score at least two standard deviations below the mean on a norm-referenced assessment in the area of cognitive or adaptive skills) (Schalock et al., 2010), (b) regular attendance at school (at least 4 days/week) within the last month of school, (c) had an Individualized Education Plan (IEP) that documents qualifying area of specially designed instruction in writing, and (d) parental consent and assent to participate in the study. These students received writing instruction but had not used a graphic organizer (GO) during writing instruction prior to this study. To keep anonymity of participants, all school, teacher and student names used in this study are pseudonyms.

Dyad A. Ms. White taught at Dogwood High School. She identified as female and Caucasian, was 43, and taught for 19 years. Her student in this study is Megan. Megan was 18 years old and identified as a White female. She had limited verbal ability and typically spoke in one-word statements. She qualified for special education services under the disability category of Intellectual Disability (ID). Her cognitive and adaptive scores were two standard deviations below the mean, as evidenced by Test of Nonverbal Intelligence, 3rd Edition, and Adaptive Behavior Assessment System, 2nd Edition (Brown, Sherbenou, & Johnsen, 1997; Harrison & Oakland, 2003). Her writing abilities fell in the category of "extremely low", as evidenced by the Adaptive Behavior Assessment System, 2nd Edition (Harrison & Oakland, 2003). For this study, Megan used words and picture symbols to organize her ideas within the GO. She selected words

from a bank of words presented to her for each section of the GO (topic, main idea, and supporting detail).

Dyad B. Ms. Stapleton taught at Elliot High School. She identified as female and Caucasian, was 50, and taught for 24 years. Her student in this study is Sheila. Sheila was 16 years old and identified as a White female. She communicated through speech. She qualified for special education services under the two disability categories of Autism Spectrum Disorder (ASD) and Attention Deficit Hyperactivity Disorder (ADHD). Her cognitive and adaptive scores were two standard deviations below the mean, as evidenced by the Wechsler Intelligence Scale for Children, 4th Edition, and Adaptive Behavior Assessment System, 2nd Edition (Harrison & Oakland, 2003; Wechsler et al., 2009). Her writing abilities fell in the category of "very low", as evidenced by the Wechsler Individual Achievement Test, 3rd Edition (Wechsler, 2009). For the study, Sheila used a mobile device and text-to-speech to write her answers. Text-to-speech is her preferred assistive technology tool, as she often did not know how to spell words.

Dyad C. Ms. Betty taught at Willow High School. She identified as female and Caucasian, was 57, and taught for four years. Her student in this study was Henry. Henry was 17 years old and identified as an Asian male. He had limited verbal communication and spoke in short statements. He qualified for special education under the category of multiple disabilities (ID and ASD). His cognitive and adaptive scores were two standard deviations below the mean, as evidenced by the Comprehensive Test of Nonverbal Intelligence, 2nd Edition, and Adaptive Behavior Assessment System, 2nd Edition (Hammill, Pearson, & Widerholdt, 1996; Harrison & Oakland, 2003). His writing abilities fell in the category of "very low", as evidenced by the Woodcock Johnson Tests of Achievement, 3rd Edition (Woodcock, McGrew, & Mather, 2001). For this study, Henry handwrote his answers into the GO and asked for help with spelling.

Researcher

The researcher was the provider of the PD. I am a nationally board certified teacher in K-21 exceptional needs, have a master's degree in special education, 13 years of teaching experience, and am a sixth-year doctorate student. I also have five years of experience supporting special education teachers through in-service trainings and coaching.

Consenting Procedures

Upon approval from the university's human subjects division, I applied to the school district's school board to receive permission to conduct a research study within the district. Upon approval from human subjects division and the school district, I emailed the schools' principals and prospective teachers to invite them to participate in the study (Appendix A). Once teachers agreed to participate, they signed and submitted consent forms (Appendix B). I shared inclusion/exclusion criteria for student participants with teachers and they selected a student for the study. I then emailed the teachers consent forms for the students' parents and assent forms for the students (Appendix B and C). After receiving approval from principals and consent from teachers and parents, and assent from students, I arranged initial meetings with each teacher based on her availability. At this initial meeting, we reviewed details of the study, scheduled classroom visits, and discussed questions the teachers had.

Intervention (Workshop and Coaching)

Each teacher participant received a PD package that consisted of two parts: workshop training and ongoing, individual coaching (see Figure 3.1). This coaching included two components: initial coaching session and on-going coaching support.

Part 1: Workshop

For the first phase of intervention, each teacher attended a workshop. Teachers invited their paraeducators to join the workshop. Workshops were scheduled with each school team on a staggered schedule. This meeting provided an introduction of EBPs and in-depth training on system of least prompts and GOs EBPs. Prior to any instruction at the workshop, teachers completed the social validity pre-study survey. The training curriculum included components of Browder and colleagues (2014) *Evidence Based Practices for Students with Disabilities* as the curriculum for the overview of EBPs and Sam and AFIRM's (2015) *EBP Brief Packet* that pertains to system of least prompts. Supporting research and examples of GOs were based on Dexter and Hughes' (2011) and Gillespie and Graham (2014) meta-analyses of GOs. Appendix K provides a detailed agenda.

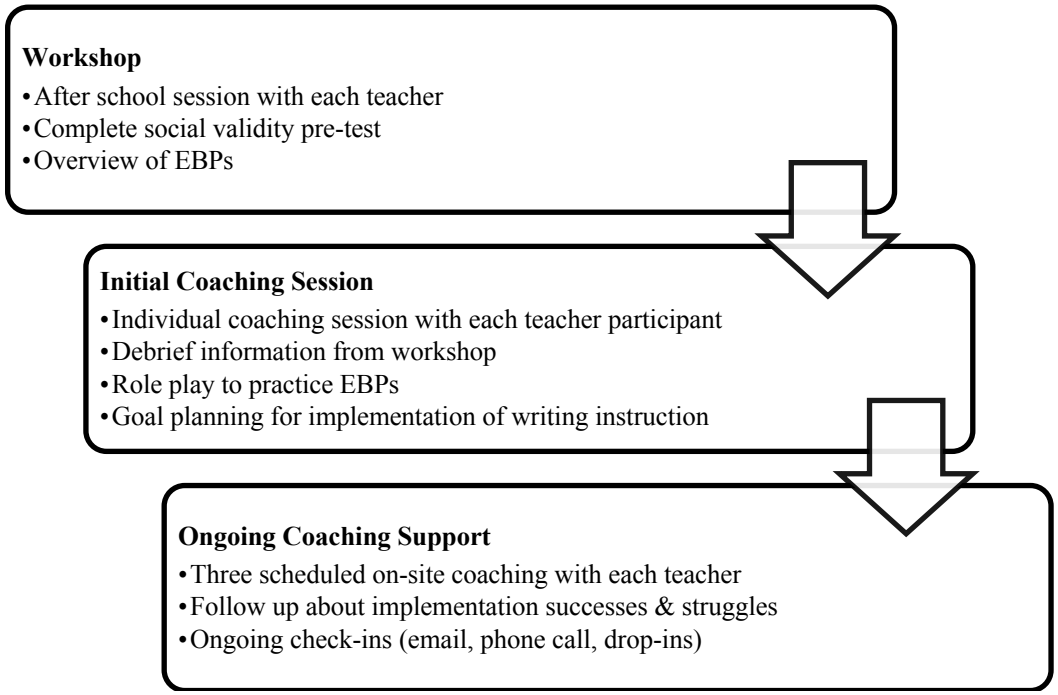

Figure 3.1. Professional development for teachers.

The workshop supported effective PD strategies by encouraging teachers and paraeducators to participate in active learning activities, such as role-play and discussion. The

purpose of this workshop was to inform teachers and paraeducators of the foundations of EBPs, system of least prompts, GOs, and their ability to improve student achievement through EBP implementation. Teachers also received printed versions of the workshop material for future reference. This training provided teachers with the foundational knowledge on the system of least prompts and GO EBPs to begin designing and planning their writing lessons with their students.

Part 2: Initial Coaching Session

The second phase of intervention included the individual coaching. Each teacher and I had an initial coaching session after attending the workshop. This coaching relationship supported teachers to transfer the knowledge they learned from workshop to implementing it into their practice. This session lasted 60 minutes and occurred either after school or during teachers' prep periods, in the teachers' classrooms. The purpose of this session was to build trust with the teacher and initiate goal-planning for EBP implementation (Costa & Garmston, 2016). I kept in mind enrollment-focused questions and conversation starters, taken from *The Art of Coaching* (Aguilar, 2013, p.80): "What do you enjoy about your position?" and "How do you feel that you learn best?" The session included time to build rapport, debrief information from workshop and practice role-playing the system of least prompts.

The teacher and I role-played using system of least prompts while teaching to use a GO. The purpose of the role play was to allow the teacher to practice and to give me a chance to assess if the teacher was demonstrating knowledge of system of least prompts. I assessed using specific criteria that the teacher: (a) could articulate sequence of prompts, (b) could demonstrate different types of prompts (gesture, verbal, model), (c) understood the response interval determined for the student, (d) could provide reinforcement after correct response, (e) was

confident in providing system of least prompts to student participant, and (f) was confident in teaching GO to student participant.

If the teacher did not meet these criteria, I focused my coaching conversation to address the area of need. If the teacher did meet the criteria, I no longer assessed for mastery and shifted my focus of coaching conversation to teacher's goals and feedback from observations.

The second part of the coaching session focused on goal setting for EBP implementation and student writing. The planning conversation map guided my questioning during the goal setting (Costa & Garmston, 2016). I asked questions such as "What is your goal for writing instruction?" and "How will you know if you have accomplished your goal?" Appendix L includes detailed meeting agenda.

Part 3: Ongoing Coaching

Individualized ongoing coaching sessions were provided throughout the study once teachers begin implementation of the EBPs. These coaching sessions allowed the teachers to receive 1:1 guidance and feedback on their writing instruction. Two more coaching sessions were scheduled throughout the intervention phase, starting a week following the initial coaching session. The coaching sessions were designed to build capacity in each teacher as a leader within his/her classroom and school community (Ellison & Hayes, 2009). Based on the practice-based coaching model, each coaching session was one of three types: goal planning, observation, or reflection and feedback (National Center for Quality Teaching and Learning, 2014). We went through at one cycle over the course of the intervention phase.

Coaching conversations with teachers were aimed to empower teachers to believe that they had the skills to make positive change in their classrooms (Ellison & Hayes, 2009). Through the Cognitive Coaching conversation maps, teachers were guided on how to self-monitor

progress and make data driven instructional decisions to influence students' successes (Costa & Garmston, 2016; Robbins, 2015).

During our meetings, I assessed teacher's ability to implement system of least prompts and GOs. I responded with individualized support, based on teachers' individual needs. Conversation maps guided teachers to evaluate their progress based on data and examined factors that supported or hindered progress. If teachers faced challenges during implementation and they could not seem to overcome these challenges, I used the problem resolving conversation map to guide the teacher through the process. This type of conversation supported the teacher by providing resources and ideas to transfer from a problem-state to a desired-state. See Appendix M for detailed coaching strategies.

The last coaching session included a more reflective conversation about the teachers' experiences with the EBP implementation, the overall coaching relationship, and students' progress in written language skills. Teachers were encouraged to expand the application of the EBPs with other students, other writing activities, or other academic content areas. They also completed the social validity post-test.

Generalization. I asked teachers during the social validity post-study survey if they plan on using these EBPs with other students for writing instruction or in other content areas. I also conducted maintenance probes, once every two weeks. During these observations, I asked teachers if they were using the EBPs in other settings.

Intervention (System of Least Prompts and Graphic Organizer)

System of Least Prompts

Prior to starting intervention, I determined a prompting hierarchy to be used with all teachers (Figure 3.2). In addition, the teacher determined a reasonable wait time for the student

to respond to the prompts (5-10 seconds for this study). At the first level, the student was given an opportunity to complete the task with independence. The next three levels were prompts, from least to most intrusive: gesture, verbal, and verbal + gesture. The last prompt is the controlling prompt, modeling. Modeling prompt is provided when student does not respond to other prompts and teacher can ensure the correct response. If the student responded by completing the task with independence within the predetermine wait time, the teacher provided a social praise as a positive reinforcer. If the student responded incorrectly, the teacher interrupted the incorrect response and gave the next level of prompt. She continued through the prompting hierarchy until student completed the task correctly then provided a positive reinforcer. If student did not complete task even after gesture + verbal prompt, the teacher provided the controlling prompt by modeling what to write in the GO. This process was repeated for each step in completing the GO.

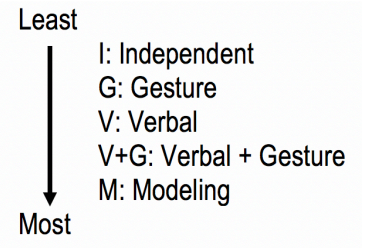

Figure 3.2. Prompting hierarchy.

The primary data collected were: event recording of teachers' fidelity of implementation of the system of least prompts while teaching students to use a GO and duration of lesson (event recording). The teacher followed task-analyzed prompts that instructed the student on how to use the GO (see Table 3.1).

Table 3.1

Steps of Completing Graphic Organizer

1. Prepare writing materials	8. Write/select/dictate supporting detail #2B
2. Write/select/dictate topic	9. Write/select/dictate idea #3
3. Write/select/dictate idea #1	10. Write/select/dictate supporting detail #3A
4. Write/select/dictate supporting detail #1A	11. Write/select/dictate supporting detail #3B
5. Write/select/dictate supporting detail #1B	12. Write/select/dictate idea #4
6. Write/select/dictate idea #2	13. Write/select/dictate supporting detail #4A
7. Write/select/dictate supporting detail #2A	14. Write/select/dictate supporting detail #4B

Graphic Organizer

The GO used for this study was a web-style. The terms used for this GO were: topic, main idea and supporting details (Figure 3.3). The center circle represented the topic. The main ideas were the circles directly connected to the topic. Then, there are spaces for two supporting details for each main idea.

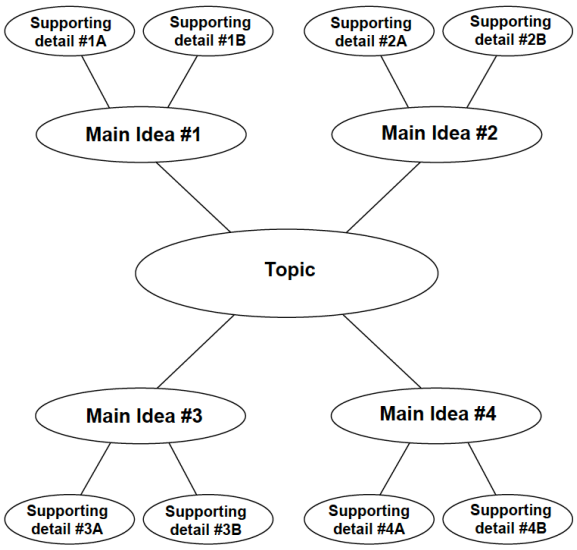

Figure 3.3. Example graphic organizer.

Writing lessons. The lesson plans were provided for the teachers a list of tasks and an optional script. The first lesson consisted of introducing the GO to the student (Appendix D).

Implementation data were not collected on this lesson. Instead, it was used to introduce the GO to students. The primary purpose of this lesson was to teach the student the format and use of the GO. The teacher introduced each section of the GO and guided the students through completing it using an example topic.

The following lessons taught students to use the GO to answer writing prompts about his/her IEP Transition Plan (Appendix E). Data were collected on teaching these lessons. Prior to completing the GO, teachers encouraged students to get their writing materials ready, introduced the prompt and brainstormed with the student about their ideas. After that, teachers followed the GO step (Table 3.1) and followed the system of least prompts hierarchy for each step. At the end, the teacher and student reviewed the student's writing in its entirety and then asked the student for final input on his/her work.

The narrative writing prompts asked students to "describe" or "tell" about different areas of the IEP Transition Plan: recreation, vocation, independent living, preferences, strengths, personal responsibility, community, health, and home and family (Appendix F). These writing prompts were selected because students could answer with their preferences and the finished product was relevant to students' IEP transition planning.

The location of lessons varied based on each classroom setting. The time of day also varied, based on schools' bell schedules and students' class schedule. Due to the busy nature of a special education classroom, there were other staff and students present in the room during writing instruction. Students participated in writing lessons using their usual form of response (typing, dictation, text-to-speech, hand writing). These accommodations were documented in students' IEPs.

Coaching Intervention Fidelity

Each of the coaching sessions was audio-recorded and kept in a password protected folder on my computer. A research assistant listened to these recordings and used the form to measure how accurate my coaching conversations were based on the specific conversation maps: Planning Conversation or Reflection/Feedback Conversation (Appendices M and N). Implementation fidelity was measured by the percentage of how many components of the conversation map was covered during the coaching conversation. For example, I addressed 7 of the 7 items of the Planning Conversation Map, my coaching implementation fidelity was (7 ÷ 7) x 100 = 100% accuracy. I also took notes during and after the sessions on teacher progress, observation data, and next steps. Table 3.2 displays the fidelity of the coaching conversations.

Table 3.2

Coaching Conversation Fidelity

Conversation Map	*Participants/* Percentage		
	Ms. White	*Ms. Stapleton*	*Ms. Betty*
Initial	100%	100%	100%
Planning	100%	100%	100%
Reflective	100%	100%	100%

Coaching sessions notes were coded with open coding based on the direct readings of the data (Miles & Huberman, 1994). These codes were recorded directly into the margins of the notes. For example, when a teacher expressed that she is going to "find a similar GO for reading comprehension", I coded that as "other GOs". Another example, when a teacher stated she is wants to modify the GO to only have to main ideas instead of four, I coded that as "GO modification".

Different coding themes were generated based on the open codes. From this coding activity, I organized the recurring open codes into themes (Ryan & Bernard, 2003). For example, I created a theme called "GO usability" for the open codes "other GOs" and "GO modification." Data were grouped and entered into a matrix of themes (Table 3.3). The matrix provided visual support for which themes were represented most and were prevalent in specific dyads.

Table 3.3

Coaching Conversation Data Matrix

GO Knowledge	SLP Knowledge	GO Usability	SLP Usability	Problem Solving	Empowerment	Prompts	Independence

Dependent Measures

There were two dependent measures, one for teacher's implementation of system of least prompts and one for students' use of GOs. The primary outcome measured teachers' implementation of a system of least prompts while teaching how to use a GO in writing. This outcome is a direct measurement of the effect of this study's PD intervention. The secondary outcome measured students' ability to use a GO as a prewriting tool.

I captured video of each writing lesson, using the probe schedule. The teacher and target student were both video recorded. All recordings were uploaded to my computer after each writing lesson into a password-protected folder. Student work was physically collected or I took a picture and emailed it to myself. I saved all media files on my password protected laptop. During film review sessions, I reviewed the film multiple times. First, I focused data collection on the teacher's implementation of the system of least prompts. Then, I focused on student's participation with the GO. The pictures of students' written were scored.

Teacher Fidelity of Implementation

The primary data collected were: event recording of teachers' fidelity of implementation of the system of least prompts while teaching students how to use a GO, latency of amount of wait time given after each prompt, each prompt given (event recording), duration of lesson (event recording).

I recorded how the teacher prompted the student for each step of the GO. If the student completed the step independently, that was marked as such. Once prompting began, I kept track of which prompts were given for each step. For every correct prompt level that was given, I marked that prompt level as "correct". If the teacher went out of order or skipped a prompt level from the hierarchy, I marked the next prompt level as incorrect (see Appendix G for data sheet). In addition, I kept track of positive reinforcement given after every step the student completed successfully. If teacher did not provide positive reinforcement, I marked that step as incorrect.

Implementation was measured by the percentage of correct prompts and positive reinforcement given by the teacher. Accuracy was calculated by the number of steps completed correctly divided by the total number of steps required for that lesson. For example, if a teacher provided the correct prompts and reinforcement for 20 out of 28 opportunities, her implementation fidelity was (20 ÷ 28) x 100 = 71% accuracy. Teachers reached mastery in implementation once they displayed 90% accuracy or more for four consecutive data points.

Latency was defined by the time (in seconds) between when the teacher provided a prompt and when the student responded. It was tracked by simply checking a mark on the data sheet for each lesson if the teacher honored the predetermined response time. The response time between the teacher's prompt and student's response was determined by students' individual abilities, based on their verbal processing abilities. Megan needed 10 seconds wait time and both

Sheila and Henry needed only 5 seconds. If the student did not respond within the pre-determined time frame, the teacher moved onto the next prompt in the sequence. Teachers' waited the accurate amount of response time on 100% of the lessons.

Duration was recorded in minutes of how long the student spent completing the writing assignment. The total time of the lesson was recorded by taking note of start and end times of the lesson.

Student Use of a Graphic Organizer

Students' use of a cluster-type GO was the secondary data collected. This GO mapped out the topic, main ideas, and supporting details that would help students prewrite their response to a specific prompt. The data collected were the components of the written product (permanent product). Students' performance on the activity varied, based on individual needs. For example, Megan selected pre-print words and symbols from a bank of words and symbol cards. She placed them in different areas of the GO. She was able to complete two main ideas and a supporting detail for each. Sheila and Henry completed the entire GO. Sheila dictated her responses into a mobile device to use the text-to-speech tool. Henry wrote out his ideas directly onto the GO. Each of these response styles were discussed with the teacher prior to the start of data collection. Their written work was collected and graded after the lesson.

The permanent product was graded to measure how much of the GO the student completed correctly. Each section of the GO was considered a separate step, as listed in Table 3.1. If a student wrote the correct content in the correct section of the GO (for example, main idea in the main idea circle), then that step was marked as correct. Conversely, if a student wrote an answer in the incorrect section (for example, main idea in a supporting detail circle), then that step was marked as incorrect. Students' work was measured by how many ideas they wrote in

the correct sections of the GO. This was calculated by dividing the number of steps done correctly by the total number of steps. For example, if there were 14 steps total and a student completed 10 of those steps correctly, his score was (10 ÷ 14) x 100 = 71%. See Appendix H for example data sheet.

Interobserver Agreement

To ensure reliable data collection on the dependent measures, a second observer watched the video recorded sessions to collect data for 30% of the classroom observations during baseline and treatment conditions (Gast et al., 2014). The second observer collected teacher data from the video recordings and graded the student permanent product data afterward by reviewing the student participants written work. The secondary observer and I met to compare data and calculated interobserver agreement (IOA). The acceptable IOA rate for this study was 80% and was calculated using the gross method: (agreements/(agreements + disagreements))*100 = % of agreement (Ayres & Ledford, 2014).

I trained the second observer on how to observe teacher behavior, grade the students' GOs, how to record the scores on the data sheets. I then explained the data sheets and reviewed a sample lesson. The second observer watched a recorded observation session with me and practiced collecting data. After the observation, we reviewed the data sheet to check its accuracy. In addition, we graded a students' GO and compared scores. During this training period, we compared all data sheets for agreement and continued practicing until agreement was at 100%. Tables 3.4 and 3.5 display the IOA for teacher and student data.

Table 3.4

Interobserver Agreement for Teacher Participants

Condition	*Participants/* Percentage of Sessions Scored			*Participants/* Percentage of Agreement of Fidelity of EBPs		
	Ms. White	*Ms. Stapleton*	*Ms. Betty*	*Ms. White*	*Ms. Stapleton*	*Ms. Betty*
Baseline	40%	50%	38%	100%	100%	100%
Intervention Post-Workshop	50%	40%	67%	100%	96%	100%
Coaching	43%	33%	40%	97%	99%	98%

Table 3.5

Interobserver Agreement for Student Participants

Condition	*Participants/* Percentage of Sessions Scored			*Participants/* Percentage of Agreement of GO Completion		
	Megan	*Sheila*	*Henry*	*Megan*	*Sheila*	*Henry*
Baseline	40%	50%	38%	100%	100%	100%
Intervention Post-Workshop	50%	40%	67%	100%	100%	100%
Coaching	43%	33%	40%	100%	100%	100%

Social Validity

Teachers completed pre- and post- social validity surveys to measure the social importance of training and coaching PD, system of least prompts EBP, and using GOs as a writing activity (Horner et al., 2005). Teachers completed the questionnaire regarding EBPs and PD package during the initial workshop (see Appendix I). Students also completed a questionnaire that asked about their experiences and feelings writing (see Appendix J). The student questionnaire was modified based on students' reading, writing, and communication abilities. For the three student participants, the teacher read the survey questions and pointed to the answer options. The students pointed or circled their responses. Student participants completed the pre-survey on the first day of baseline data collection and the post-survey during the last follow-up probe data collection.

Experimental Design

A single case research of multiple probe design across participants was used to evaluate the effects of the training plus coaching model of PD on teachers' implementation of system of least prompts (Gast, Lloyd, & Ledford, 2014). This design allowed multiple teachers to participate in the study. Due to the irreversible nature of gaining knowledge through PD, a teacher cannot return to their baseline state after learning about EBPs. In addition, since multiple baselines are extended over time, I used probe data for the teachers who are not yet in baseline phase as an alternative to continuous baseline measurement (Horner & Baer, 1978). For this reason, a multiple probe technique demonstrated experimental control by delivering the PD across several participants over time (Gast et al., 2014; Horner & Baer, 1978). Since the teachers have reported that they are currently not using system of least prompts nor graphic organizer during writing instruction, the researcher assumed, a priori, that the baseline will be stable. Therefore, there was no need for daily baseline data and multiple probe technique was used (Horner & Baer, 1978).

Data Collection Schedule

Probes occurred intermittently, with no more than 1 week in between sessions (Gast, et al., 2014). In order to demonstrate experimental effect, I collected at least three consecutive baseline probes to establish a pattern of behavior prior to intervention for each participant (Kratochwill et al., 2013). Intervention phase started on a staggered timeline for each teacher. See Table 3.6 for schedule. I began each teachers' coaching intervention after collecting at least three data points in the post-workshop phase for the prior teacher, even if there is no immediate change in teachers' behavior after the workshop. If there was immediate change, I waited until

there was a stable data, less than 70% accuracy of implementation. Intervention conditions yielded six phases among the three participants and at least eight data points for each participant (Kratochwill et al., 2013). Intervention phase varied in data points, depending on the data (teachers' need for more coaching, roadblocks in implementation, more time needed, etc). Exact dates of visits were determined on a week-by-week basis with each teacher and varied based on teachers' and students' availability, school closures (i.e. holidays or inclement weather), and schedule changes (i.e. assemblies or emergency drills). Probes took take place February 2018-May 2019. Data collection and intervention was scheduled to end in May.

Baseline condition. Baseline conditions consisted of what the teacher was currently teaching in the classroom regarding writing instruction and student written work that was produced. This baseline data was necessary, in order to compare data with the same lessons during the intervention condition (Horner et al., 2005). Data collection took place in the natural setting of the classroom during writing instruction (Horner et al., 2005). Teachers' and students' location in the classroom were the same locations as they normally would be, regardless of the study. The teachers were not asked to create a special lesson for the baseline phase. Students were not expected to produce extra written work or use a graphic organizer for the sake of the baseline. The researcher observed and collected teacher and student data during the writing instruction using the data collection measures for system of least prompts and using a GO (Appendices G and H).

Baseline phase continued until a stable pattern of behavior was established (Horner et al., 2005). Each tier had at least five probes of baseline data collected, three of which were consecutive sessions prior to intervention (Kratochwill et al., 2013). Baseline probes continued in classrooms that had not yet received the intervention (Horner & Baer, 1978).

Intervention: workshop. In order to demonstrate experimental control, the intervention was introduced to each classroom on a staggered timeline (Horner et al., 2005). As previously described, teacher participants received a PD package consisting of two parts: workshop training and ongoing, individual coaching. After workshop training, dependent variable data were collected until the following conditions were met: stable trend of at least 3 data points and fidelity below 70%. Then the coaching phase began for that dyad.

Intervention: individual coaching. Individual coaching occurred using the designated coaching model. Coaching continued until the following conditions were met: stable trend of at least 5 data points and consistent mastery of the teaching method as demonstrated by 4 consecutive data points above 90%. Then the maintenance phase began for that dyad.

Maintenance. Maintenance phase began once a teacher reached 90% accuracy or more for 4 consecutive data probes of at least 90% accuracy (Gast et al., 2014). Data probes were taken once every two weeks during this phase.

External Validity

To enhance external validity, the study had clear operational definitions and sufficient number of participants. The definitions of teacher and student participants, baseline conditions, and interventions are clear and descriptive (Horner et al., 2005). The more descriptive the conditions, the more accurately the study can be repeated. In fact, Gast (2014) recommends paying particular attention to the description of the baseline condition, suggesting that the effectiveness of an intervention can be predicted if the environmental conditions of the individual are similar to the study's baseline conditions (p. 120). Without well-defined descriptions and the ability to replicate, this study would have little relevance to other participants outside of this study (Horner et al., 2005).

Table 3.6

Baseline and Intervention Schedule

Participant	Baseline Phase	Intervention Phase 1	Intervention Phase 2		
Dyad	**Baseline Probes**	**Workshop**	**Initial Coaching**	**On-Going Coaching**	**Maintenance**
A	February 25, 26, 28 March 5, 7	March 8	April 3	April 15, 22	May 6, 21
B	March 5, 6, 7, 8, 9	April 1	April 22	April 23, 24	May 13
C	April 15, 16, 17, 18, 19	April 23	April 30	May 7, 10	n/a

Horner et al. (2005) also suggest that external validity can be strengthen when effects are shown with at least three participants. This study includes three dyads: one teacher and one student per dyad. Since there is a risk of attrition in single case studies, four participants were initially be recruited in preparation of potential attrition during the study (Horner et al., 2005).

Internal Validity

Key factors of internal validity were considered in the design of this study. First, the teacher participants were recruited from different schools. This physical separation can safeguard the teachers' independence from one another by limiting opportunities of the teachers influencing one another's teaching practices regarding system of least prompts (Gast et al., 2014). Second, in an effort to demonstrate inter-condition replication, three teachers/students (participants) across schools (condition) were recruited to demonstrate experimental effect (Kratochwill et al., 2013). Third, intervention introduction was on a staggered timeline (Gast et al., 2014). This timeline allowed some teachers to maintain baseline behaviors while a select teacher received the PD intervention. Similarly, this timeline displayed baseline behaviors for students not yet receiving intervention. Maintaining baseline with each teacher and student, then

demonstrating immediate effect after intervention established strong effect (Horner et al., 2005). This was particularly important, as maturation can be a threat to internal validity (Gast et al., 2014). The natural course of a teachers' school year includes collaborative and/or individual PD. Teachers may have received PD on system of least prompts from another source prior to receiving this study's intervention. Similarly, students could have received instruction on using GOs from another teacher or class. Lastly, procedural reliability was measured through frequent monitoring by a second observer during baseline and intervention phases (Horner et al., 2005).

Chapter Four:

Results

The purpose of this study was to provide special education teachers with a professional development (PD) experience on how to implement a system of least prompts while teaching adolescents with low-incidence disabilities (LID) to use a graphic organizer during writing instruction. Data were collected by observation of writing lessons, teacher and student interviews, and students' writing samples. The following research questions were asked:

1. Does the training and coaching model of professional development for system of least prompts improve teacher's implementation fidelity during writing instruction?
2. Does a teacher's accurate implementation of system of least prompts improve a student with low-incidence disabilities' completion of graphic organizers as a writing activity?
3. How do special education teachers view the effectiveness of training and coaching model of professional development and system of least prompts?
4. How do students with low-incidence disabilities view the effectiveness of using graphic organizers and function of writing?

This chapter addresses the results of the study in four sections. The first section describes the data analyses used in the study. The second section reports the results of workshop and coaching intervention to implement the system of least prompts during writing instruction. The third section reports the results of the use graphic organizer by students with low-incidence disabilities during writing instruction. The fourth section of this chapter describes the teachers' perceptions of the coaching model of professional development and implementing evidence-based practices, and students' experiences with the writing instruction.

Data Analyses

Writing instruction and graphic organizer completion. Teacher's writing instruction and students' writing skills were analyzed using visual data analysis. The graphs allowed for visual analysis of the relationship between the professional development package and teachers' implementation of evidence-based practices, and the relationship between the teachers' use of the graphic organizer (GO) and students' writing skills (Kratochwill et al., 2013). Using line graphs to display teacher and student data presented a summary of their behavior during baseline and intervention phases (Spriggs, Lane, & Gast, 2014). It also provided a clear picture of the length of data in each setting and phase.

Several terms are used throughout this chapter to discuss results: length, level, trend, variability and percentage of non-overlapping points.

Length. Length refers to how many data points are within each phase (Gast & Spriggs, 2014). The length of each phase was determined by the stability of data. For example, the length of baseline phase included five stable consecutive data points prior to introducing the workshop intervention. Similarly, the length the post-workshop phase was determined by the stability of the data after teachers participated in a workshop. Lastly, the length of the coaching phase was determined by how long it took teachers to reach implementation mastery, which was 90% implementation accuracy for four consecutive probes.

Level. Level refers to the mean performance during each phase (Horner et al., 2005). This is particularly important when analyzing data after an intervention was introduced. If the level changed after phase change, then the intervention had an immediate effect. Level change was examined after workshop was introduced and again after coaching was introduced.

Trend. Trend refers to the rate of increase or decrease of the data (Horner et al., 2005). In this study, if teacher's data had an upward trend, it meant they were improving their implementation fidelity. If students had upward trend in their data, it meant they were completing GOs with increasing accuracy. Downward trend meant the opposite: teachers were decreasing their implementation fidelity and/or students were completing GO with decreasing accuracy. Trendlines were analyzed during each phase after each probe and prior to each phase change.

Variability. Variability refers to the degree to which "performance fluctuates around the slope during a phase" (Horner et al., 2005, p. 171). Variability is noticed when comparing the actual data points to the trendline on the line graph. Variability was examined in each phase. During baseline phase, less variability meant that teachers were consistently not using system of least prompts and students were consistently not using a GO. During intervention phases, the less variability in data meant the more the teachers were consistent with implementing the system of least prompts. The same applied to students. The less variability in students' data meant the more consistent they were in completing a GO correctly.

Percentage of non-overlapping data. Percentage of non-overlapping data (PND) is a calculation that measures effect size of a single case research study (Scruggs & Mastropiero, 1998). The effect size is represented by a percentage of how many data points in treatment phase are not overlapping with the highest point in baseline phase (Scruggs & Mastropiero, 1998). PND can also be used between two treatment phases. For this study, PND was calculated between baseline phase and both intervention phases combined. In addition, PND was calculated for any participant who had coaching data probes return back to post-workshop phase.

Social validity surveys. Social validity surveys were administered to teachers and students. Data tables are used to display and compare participant data (Spriggs et al., 2014). Data were analyzed by looking for patterns in responses and any changes in perception between the beginning and end of the study.

Results

Research Question 1: Teacher Implementation After Workshop and Coaching Professional Development

The first research question was, "Does the training and coaching model of professional development for system of least prompts improve teacher's implementation fidelity during writing instruction?" Three teachers participated in this study. During the coaching intervention, all teachers reached mastery in implementing the system of least prompts with a graphic organizer during writing instruction, with an effect size of 100% of non-overlapping data points.

Table 4.1 displays the average duration of writing lessons using the EBPs during each phase of study: baseline, post-workshop, and coaching. Lesson duration was consistent within each dyad. Dyads A and C had similar lesson durations. Dyad B had longer lessons. Overall, the lessons took longer in the coaching phase than the post-workshop phase.

Table 4.1

Lesson Duration Mean Minutes Across Conditions

Dyad **(Teacher/Student)**	**Baseline** ***M***	**Post-Workshop** ***M***	**Coaching** ***M***
Dyad A Ms. White/Megan	0	10	12
Dyad B Ms. Stapleton/Sheila	0	29	39
Dyad C Ms. Betty/Henry	0	12	14

Table 4.2 displays the average accuracy of the teacher's implementation during each phase of the study: baseline, post-workshop, and coaching. All teachers had 0% accuracy at baseline. After the initial workshop, teachers' accuracy increased, then increased again after ongoing coaching was introduced. All teachers reached mastery during the coaching phase, which was 90% accuracy over four consecutive data probes.

Table 4.2

Teacher Implementation Mean Accuracy Across Conditions

Teacher	Baseline *M*	Post-Workshop *M*	Coaching *M*
Ms. White	0%	75%	90%
Ms. Stapleton	0%	50%	92%
Ms. Betty	0%	54%	88%

Figure 4.1 shows a more detailed representation of each dyad's data. It shows the percentage of teacher's implementation fidelity and student's accuracy of GO completion across three phases: baseline, post-workshop, and intervention. Coaching sessions are also indicated. Based on visual analysis of these data, the teachers' accuracy of implementation increased after receiving a workshop training and ongoing coaching on system of least prompts while teaching students how to use a GO.

Baseline condition. During baseline phases, teachers displayed 0% implementation accuracy. Data patterns were consistent across all teacher participants (Kratochwill et al., 2013). Teachers were not using system of least prompts nor a GO during writing instruction. After establishing a stable trend from 5 consecutive data points for each teacher, workshop intervention was introduced.

Post-workshop phase. At the onset of this phase, teachers received a one-time workshop on how to implement the EBPs. No other intervention was introduced during the length of this

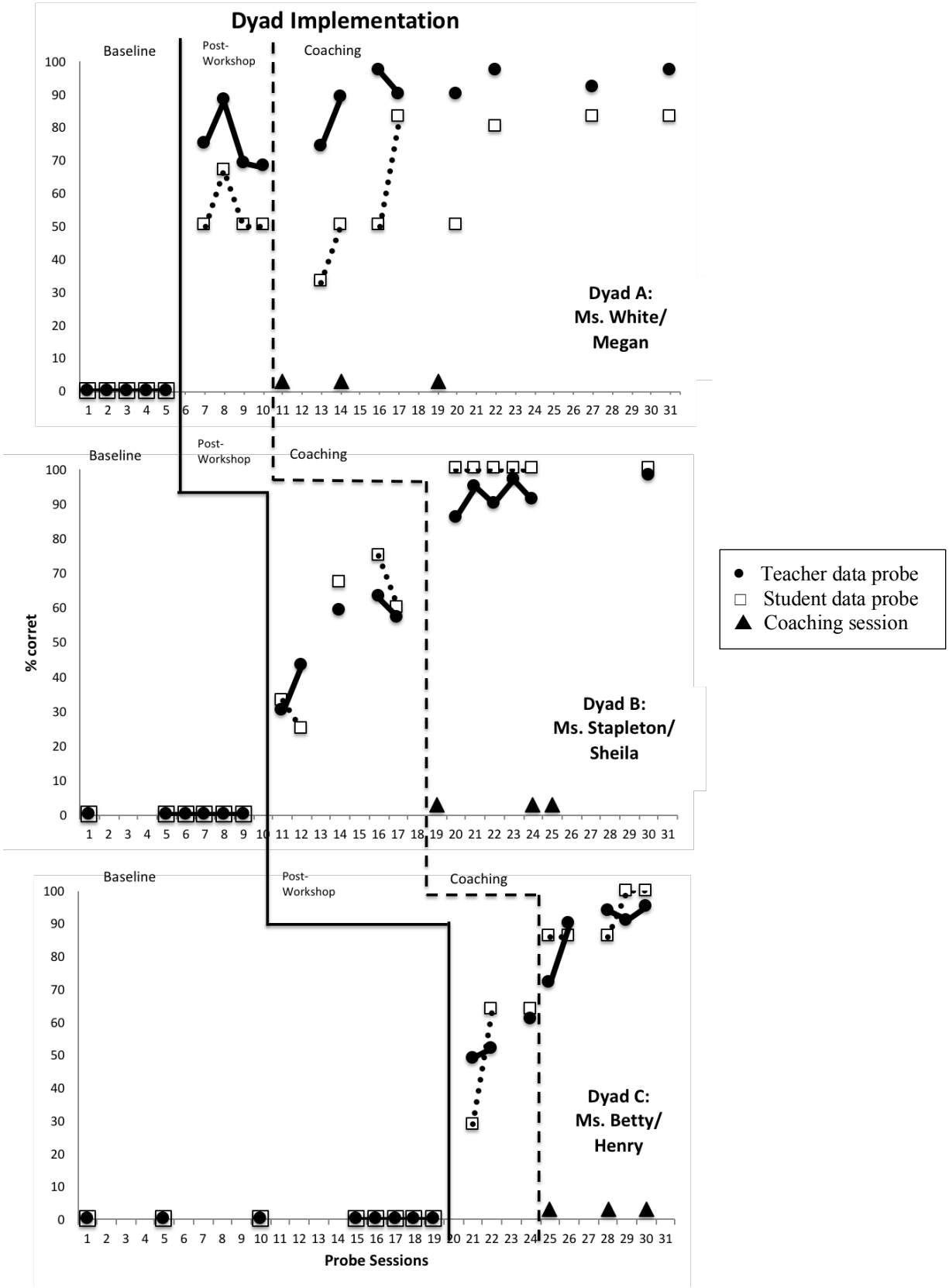

Figure 4.1. Dyad implementation data.

phase. In examining level change and trend through visual analysis, there was a change in level for all teachers during this phase change. Teachers' accuracy of EBP implementation increased after they participated in the workshop.

Ms. White. Ms. White's data had an immediate and large level change after the workshop was introduced, increasing from 0% to 75% accuracy. Over the length of this phase, her accuracy varied but maintained a downward trend. The percentage of non-overlapping data points is 100%, a very large effect.

Ms. Stapleton. Ms. Stapleton's data displayed an immediate and large level change after the workshop, increasing from 0% to 50% accuracy. She showed an upward trend with a change in direction at the end of this phase. There is some variability over the length of the phase. The percentage of non-overlapping data points is 100%, a very large effect.

Ms. Betty. Ms. Betty's data also displayed an immediate and large level change, increasing from 0% to 30% accuracy. The length of her phase was the shortest, with three data probes. The decision to move to coaching was due to her low level of mastery (<70%) and stable trend. The data had an upward trend with little variability. The percentage of non-overlapping data points is 100%, a very large effect.

Overall, all participants had a steady trend during this phase with no return to baseline. They were implementing the system of least prompts with varying levels of accuracy and there was a large effect due to the workshop. However, the percentage of implementation did not reach the level of mastery as defined by 90% accuracy over consecutive data probes.

Coaching phase. Trend line analysis reveals that each teacher improved her EBP implementation after ongoing coaching was introduced with no return to baseline.

Ms. White. Since Ms. White's level change was quite large during post-workshop phase, there was an immediate, but slight level change when coaching began. Her data had an upward trend and there was less variability in this phase than there was during the previous one. The percentage of non-overlapping data points between the workshop phase and coaching phase was 86%, and between baseline and coaching was 100%.

Ms. Stapleton. Ms. Stapleton had an immediate and large change in level during this phase. Her accuracy increased considerably after the first coaching session to 90% accuracy. She maintained a steady upward trend with little variability during the length of this phase. The percentage of non-overlapping data points between workshop and coaching phases is 100% as it is between coaching and baseline, showing a very large effect of coaching on this teacher's implementation.

Ms. Betty. Ms. Betty also showed an immediate but small level change after coaching was introduced. Her data maintained an upward trend with some variability and no return to post-workshop phase. The percentage of non-overlapping data points between workshop and coaching phases is 100% as it is between coaching and baseline, showing a very large effect of coaching on this teacher's implementation.

Overall, all teachers reached mastery after coaching intervention was introduced and maintained a steady upward trend over the course of the coaching cycle.

Maintenance phase. Maintenance data were collected for Ms. White and Ms. Stapleton two weeks after they reached mastery. During this phase, teachers no longer received ongoing coaching supports. Ms. White maintained mastery level accuracy over the course of two probes. Ms. Stapleton maintained mastery during the one probe.

In summary, teachers were not using system of least prompts nor GO evidence-based practices (EBPs) for writing instruction prior to this study. Once teachers attended the workshop, they implemented system of least prompts for writing instruction with students. During the post-workshop phase, all teachers were implementing EBPs with varied levels of accuracy. Once ongoing coaching was introduced, teachers' implementation increased to a mastery level. The coaching PD sustained teachers' mastery over the course of the study. Two teachers maintained implementation mastery weeks after the coaching PD ended.

Research Question 2: Student Writing Skills

The second research question was, "Does a teacher's accurate implementation of system of least prompts increase a student with low-incidence disabilities' completion of graphic organizers as a writing activity?" Three students participated in this study. During the intervention phases, all students increased their accuracy in completing a GO as a prewriting activity during writing instruction, with an effect size of 100% of non-overlapping points.

Table 4.3 displays the average accuracy of student's correct completion of a graphic organizer during each phase of the study: baseline, post-workshop, and intervention. All students had 0% accuracy at baseline, as none of them were using GO during writing lessons. After the workshop, students' accuracy of completion increased, then increased again after coaching was introduced to the teachers.

Table 4.3

Student Accuracy of Graphic Organizer Completion Across Conditions

Student	Baseline *M*	Post-Workshop *M*	Coaching *M*
Megan	0%	54%	61%
Sheila	0%	52%	100%
Henry	0%	52%	92%

Based on visual analysis of data from Figure 4.1, students' accuracy completion increased after their teachers received workshop training and ongoing coaching on system of least prompts while teaching how to use a GO. During baseline phases, each student displayed 0% implementation accuracy. Data patterns were consistent across all participants (Kratochwill et al, 2013). None of them were using a GO for prewriting. After establishing a stable trend from 5 consecutive data points for each student, post-workshop intervention was introduced.

Post-workshop phase. In examining level change and trend through visual analysis, there was a change in level for each student during this phase, with no return to baseline. Students' accuracy of GO completion increased after their teachers participated in workshop PD.

Megan. Megan's data had an immediate and large level change after the workshop, from 0% to 50% accuracy. There is some variability and a downward trend over the length of this phase. The percentage of non-overlapping points is 100%, a very large effect.

Sheila. Sheila's data had an immediate and large level change after the workshop, from 0% to 33% accuracy. She showed an upward trend with a change in direction at the end of this phase. There is some variability over the length of this phase. The percentage of non-overlapping points is 100%, a very large effect.

Henry. Henry's data also displayed an immediate and large level change, from 0% to 29% accuracy. The data had an upward trend with little variability. There is some variability over the length of this phase. The percentage of non-overlapping points is 100%, a very large effect.

Overall, all three students displayed an immediate level change after their teachers were introduced to the workshop on system of least prompts and GOs. In addition, two of the three students (Sheila and Henry) had an upward trend of accuracy during this phase.

Coaching phase. Trend line analysis reveals that each student displayed increased level change after coaching was introduced to their teachers.

Megan. Megan's data has an immediate decrease in level during this phase. Although her data maintained an upward trend, there was great variability between probes. Her data did not increase beyond the post-workshop phase until the fourth data probe, then decreased at the fifth data probe. The percentage of non-overlapping data points between the workshop phase and coaching phase was 43%, and between baseline and coaching was 100%.

Sheila. Sheila had an immediate and large level change during this phase. After her teacher was introduced to coaching, Sheila's data reached a steady trend of 100% accuracy over the length of this phase, with no variability. The percentage of non-overlapping points is 100%, a very large effect.

Henry. Henry also showed an immediate but small level change. His data had a steady upward trend with some variability during the length of this phase. The percentage of non-overlapping points is 100%, a very large effect.

Overall, all three students increased in their accuracy of completing a GO after their teachers were introduced to coaching and received ongoing coaching throughout the coaching phase. Their data did not return to baseline phase, and only Megan's data returned to post-workshop phase for four data probes.

Maintenance Phase. Maintenance data were collected for Megan and Sheila two weeks after their teachers reached mastery. Megan's data were consistent with the previous probe of 83% accuracy. One maintenance probe was collected for Sheila, at 100% accuracy. No maintenance data were collected for Henry, as the study ended soon after the last data points were collected for Dyad C.

In summary, students were not using GO as a prewriting activity during writing lessons prior to this study. Once their teachers attended a workshop, they began using a GO and were completing it with partial accuracy. Once their teachers received ongoing coaching on how to teach the GO, two students (Sheila and Henry) were completing the GO with 100% accuracy over the length of the coaching phase. One student (Megan) made improvements, but did not display consistency in her ability to complete it correctly.

Teacher and student data comparison. Based on visual analysis of these data, the students' rate of learning how to use the GO is similar to the rate of teachers' implementation fidelity. While the teachers improved their practice of using system of least prompts during writing instruction, the students increased their outcome of completing the GO.

Research Question 3: Teacher Social Validity

The third research question was, "How do special education teachers view the effectiveness of training and coaching model of professional development and system of least prompts?" A pre- and post-study survey was given to teachers before and after the study. All three teachers completed the surveys. The survey asked questions about their perceptions of the coaching relationship, EBPs in general, and the EBPs used in this study with a likert based agreement scale and open-ended questions.

Table 4.3 displays a detailed version the surveys and teachers' responses prior to and after the intervention. The surveys also included open-ended questions about their overall experience.

Pre-study. Teachers agreed or strongly agreed with all statements in the survey before the study began. They believed that the coaching relationship expands their instructional practices and improves student outcomes. They also expressed interest in participating in

coaching PD. Similarly, teachers agreed or strongly agreed with belief statements about EBPs. They believed that EBPs can improve student outcome and were confident in implementing the system of least prompts and a GO.

The open-ended questions of the survey allowed teachers to further express their thinking. When asked about the EBPs and the overall workshop, teachers shared different perspectives. Ms. White and Ms. Stapleton both expressed their excitement about receiving teaching materials for writing instruction. Ms. White wrote, "I am excited to use this writing instruction with a student in my class. Writing materials for this level of student is severely lacking so this is a great instructional tool to use." She also asked, "Will this [intervention] work with nonverbal students?" Ms. Betty had a similar response, "I like that I have materials on graphic organizers and writing prompts." Ms. Stapleton emphasized the need for relationships and collaboration when implementing new teaching strategies, "I need to be with a team who is utilizing them [EBPs] so that I can model after them." Ms. Stapleton also shared that "[the workshop] allows for great discussion about envisioning better writing opportunities and skill development for my students."

Post-study. After the study, teachers completed the same survey as the pre-test with additional open-ended questions reflecting on the coaching relationship and the EBP implementation. In the post-study survey, teachers once again answered that they agreed or strongly agreed with the statements (Table 4.4). Ms. Stapleton self-reported the most growth by answering "strongly agree" to three of the questions she previously answered as "agree". The statements were about the coaching relationship and her confidence in implementing the system of least prompts. All three teachers responded that they strongly agree with the statement about continuing to use GOs with the system of least prompts.

Table 4.4

Teachers' Perceptions on EBPs and Coaching

	Pre-Study					***Post-Study***				
Statement	Strongly Agree	Agree	Neither Agree/ Disagree	Disagree	Strongly Disagree	Strongly Agree	Agree	Neither Agree/ Disagree	Disagree	Strongly Disagree
I believe coaching can expand my teaching practices	Betty White	Stapleton				Stapleton White Betty				
I believe that a coaching relationship can help me improve student outcomes.	Betty Stapleton White					Stapleton White Betty				
I am interested in participating in coaching relationship to learn new teaching strategies.	Betty White	Stapleton				Stapleton White Betty				
I believe EBPs can improve student academic outcomes.	Betty Stapleton White					Stapleton White Betty				
I feel confident in using system of least prompts with students to teach writing.	Betty White	Stapleton				Stapleton White Betty				
I feel confident teaching students how to use GOs during writing lessons.	Betty Stapleton White					Stapleton Betty	White			
I feel confident using other EBPs in other areas of instruction.						Stapleton Betty	White			
I will continue to teach graphic organizers using system of least prompts after this study.						Stapleton White Betty				

In the open-ended questions, teachers had overwhelmingly positive comments to make about coaching and the EBPs. All three commented on the coaching style PD as being a helpful form of learning. Ms. White wrote that she liked getting having access to someone to brainstorm problem solving and then being able to implement changes soon after. Ms. Stapleton stated that

during the study, she wanted more in-the-moment feedback with the system of least prompts, but "learned to trust my own knowledge of the process." And, Ms. Betty feels that the coaching "set [me] up well to continue with graphic organizer and prompts with other students."

The teachers shared their ideas about the EBPs, as well. Ms. White stated that she feels comfortable using a GO in her writing class with other students during prewriting. She also wrote that she would need continued coaching to teach her non-reading students to transfer their GO ideas to a paragraph. In regards to the system of least prompts, Ms. White wrote, "I thought it was fun to see my student begin to understand what we were doing and need less prompting from week to week. It showed me that even my 'non-writers' can learn to use a graphic organizer and put thoughts together for a writing assignment." Ms. Stapleton expressed a similar delight in promoting student independence. She stated that she likes that the system of least prompts focuses on students' independence as much as possible and does not feel like there is enough coaching work done in schools to teach teachers how to implement prompting EBPs. Ms. Betty shared an overall reflection that the EBPs she implemented broadened her student's writing abilities.

Research Question 4: Student Social Validity

The fourth and last research question was, "How do students with low-incidence disabilities view the effectiveness of using graphic organizers and function of writing?" Answering opinion and open-ended questions can be difficult for students like Henry and Megan, who have intellectual disabilities and limited verbal abilities. Sometimes, their answers to questions are inconsistent or unclear. However, I felt that it was important to honor their voice and promote self-advocacy by providing a survey. A pre- and post-study survey was given to each student to gather their thoughts about writing skills. Tables 4.5 and 4.6 reflects students'

responses to the survey prior to and after the study. Table 4.5 reflects statements that were presented with yes/no answer option for students. Table 4.6 displays students' answers to open-ended questions about how writing is useful: at school, at home, and in the community.

Table 4.5

Students' Perceptions of Writing and Using GO

Statement	***Pre-Study*** Agree	Disagree	***Post-Study*** Agree	Disagree
1. I like writing	Henry Megan	Sheila	Henry Megan Sheila	
2. I can share my ideas by writing them.	Henry Megan	Sheila	Henry Sheila	Megan
3. I am good at writing.	Henry	Megan Sheila	Henry Megan Sheila	
4. My teacher helps me learn how to write.	Henry Megan Sheila		Henry Megan Sheila	
5. The graph was helpful for writing.			Henry Megan Sheila	

Table 4.6

Student Pre- and Post-Study Open Ended Answers

	Megan		**Sheila**		**Henry**	
	Pre-	*Post-*	*Pre-*	*Post-*	*Pre-*	*Post-*
When do you need to use writing **at school?**	(no response)	Clean tables, vacuum	Class	Almost all the time	Pencil, English, Math	English, Writing, Jobs
When do you need to use writing **at home?**	(no response)	(no response)	Texting	I write stories at home	homework	homework
When do you need to use writing **in the community?**	(no response)	(no response)	You need it to work	If I was taking a driving test or applying for a job	(no response)	I don't know
What else?	(no response)	(no response)	Commas are important	I think I've progressed quite a bit actually. Compared to a year ago.	(no response)	(no response)

Pre-study. When asked about writing, Henry was the only student who expressed that he likes writing and is good at writing. Megan stated that she likes writing but is not good at it. Sheila stated that she does not like writing and is not good at it. All three students, however, agreed that "My teacher helps me learn how to write."

When asked open ended questions, Megan did not respond to these questions, as communication is challenging for her. Sheila and Henry were able to provide responses. They identified uses of writing at school and home. Sheila also identified the need for writing for a job and that "commas are important".

Post-study. At the end of the study, students were asked the same questions as pre-study, in addition to one more: "The graph [GO] was helpful for writing". Megan, Sheila, and Henry all agreed with that statement. Sheila reported the most growth on this survey by answering "yes" to the statements she previously answered "no": I like writing, I can share my ideas with writing, and I am good at writing. Her perception of writing and her confidence as a writer both improved over the course of this study. In the open-ended questions, Megan answered the first question about when she writes at school. She responded with "clean table, vacuum." Although she did not answer the question accurately, she made a connection to her writing. One of the first writing prompts for the study was "Tell me what jobs you do after school." When she completed the GO for that prompt, she identified cleaning tables and vacuuming as her on-campus jobs. Henry's responses were similar to the pre-study. He articulated the function of writing during his school day and that he uses writing at home to complete homework.

Sheila answered much more in the open-ended questions during the post-study survey compared to the pre-study survey. She recognized that writing skills are required throughout the school day. When asked about writing at home, she stated that she writes stories at home. She

identified that she will need writing skills to access the community as a young adult. And, when asked what else she would like to share, Sheila reflected on her writing abilities by stating, “I think I’ve progressed quite a bit…compared to a year ago.”

Chapter Five:

Discussion

The results of this study suggest that the teacher professional development (PD) package of providing a workshop and ongoing coaching demonstrated positive outcomes for teachers and students with low-incidence disabilities (LID). This study extends the literature on both special education teacher professional development and writing instruction for students with LID by providing a professional development package tailored specifically for teachers of students with LID. Teachers who participated in this study increased their implementation of the system of least prompts during writing instruction. And, students who participated in this study increased their ability to organize their thoughts by using a graphic organizer (GO). Furthermore, this study resulted in high social validity results. Teachers expressed that they like the coaching style of PD and that they could expand their knowledge of teaching writing. Students identified with liking the GO to help them communicate their thoughts.

Teacher Professional Development

This study extends the research on coaching as a form of PD, more specifically, the coaching of special education teachers to improve their implementation of evidence-based practices (EBPs) during writing instruction. Current research indicate that coaching is an effective PD practice to support special education teachers (Brock et al., 2014; Brown et al., 2014; Mueller & Brewer, 2013). Coaching can provide special education teachers with collaborative and inquiry-driven learning experiences that are sustained over time (Cornett & Knight, 2009). Results from this study support this PD model and extend it to special education teachers of students with low incidence disabilities. There is some evidence to suggest they have a unique experience in educational systems, making them an important population to investigate

in PD studies (Hudson et al., 2016). By providing these this unique group of teachers with a workshop and ongoing coaching, the teachers increased their EBP implementation.

Workshop. The workshop provided a foundation for teachers. It was presented prior to the coaching PD and provided an opportunity for the teachers to learn about the two instructional strategies they were going to implement in their classrooms. The session was designed with adult learning in mind. The workshop provided teaching materials related to the teachers' contexts and invited teachers to actively participate (Darling-Hammond & Richardson, 2009; Jacobs & Koellner, 2010). They expressed that the workshop was beneficial because they received lesson plans, teaching materials, and practiced prompting hierarchies.

Knowledge. The initial workshop-style PD provided teachers with foundational knowledge of the system of least prompts and how to use it with a student while teaching writing. After the workshop, teachers scored themselves as feeling confident in implementing this EBP. The workshop was a successful form of PD to share information and lay the groundwork for designing a new style of instruction. With new knowledge and materials, teachers designed their writing lessons and planned for implementation.

During the post-workshop phase, teachers implemented the prompting hierarchy with minimal success. Ms. White had the highest level of implementation accuracy, with an average of 75%. Although they were given teaching materials and had an opportunity to interact with the information, they did not completely transfer their knowledge into their teaching practice. Research reports this as a common occurrence among teachers, that they will learn information at conferences or workshops but fail to integrate the new learning into their teaching practice (Bill & Melinda Gates Foundation, 2014).

The post-workshop phase was an opportunity for teachers to practice the skills they learned. However, as the data show, they needed more support. This need is consistent with existing research, which suggest PD should be ongoing and sustained over time (Darling-Hammond & Richardson, 2009; Desimone, 2011; Yoon et al., 2007). In fact, several times throughout this phase, the teachers reached out to me asking for feedback on how they were doing. Although I refrained from providing coaching or feedback, teachers clearly wanted to engage in the coaching relationship. The desire for a collaborative relationship is reflective of the extent literature of coaching PD that teachers' prefer a collegial relationship rather than learning in isolation (Bill & Melinda Gates Foundation, 2014; Darling-Hammond & Richardson, 2009). Two of the teachers expressed disappointment when I explained that we were not starting coaching until future sessions. Not only did the teachers recognize that they needed more training to improve their practice, they asked me for the training. In congruence with the extant literature on teacher PD, teachers expressed their preference of learning through a collaborative experience to improve their teaching practice (Bill and Melinda Gates Foundation, 2014). They could have referred to a text, the handouts from the workshop, or an online module on the EBPs. Instead, they reached out to the person with whom they had an established and trusting relationship about this topic.

Coaching. Once coaching was introduced, the teachers and I engaged in practice-based coaching cycles. Each teacher and I completed one cycle of goal planning, focused observation, and reflection and feedback during the coaching phase. Just as Cornett and Knight (2009) explains about the coaching relationship, this collaborative relationship supported teachers in transferring their knowledge from the workshop into practice. More specifically, research on practice-based coaching model suggest that using this cycle of coaching support teachers who

are implementing new instructional strategies in their classroom, as it allows for job-embedded practice and time for reflection (Snyder et al., 2015). Evidence from this study supports these claims. During the coaching phase, teachers improved their practice and reached implementation fidelity mastery. All teachers implemented the EBPs with 90% accuracy after the second coaching session and were able to maintain this level of fidelity until the end of the study.

Consistent with the coaching PD research, one theme that arose from observation and coaching conversation data is teacher empowerment (Costa & Garmston, 2016). Participation in the coaching cycles shifted teachers' mindset to empower them as instructional leaders and decision-makers (Garmston & Linder, 1993). Often times, special education teachers have consultants or other service providers in their classrooms providing feedback on specific students' needs. The teachers in this study were used to be told how to change their practice, as opposed to being asked. This was apparent during the coaching conversations. In the goal setting meetings, I asked questions such as, "What is your goal for implementation?" and "What will be indicative of a successful lesson?" Initially, they were unsure how to answer. Ms. White's response was "Well, I was expecting you to tell me how I should do it." And, Ms. Betty stated, "I'm used to a coach telling me, not asking me."

The Cognitive Coaching conversation maps prompted the teachers to take ownership of their own learning (Costa & Garmston, 2016; González Del Castillo, 2015). The planning conversation map (Appendix M) allowed for a deeper conversation with teachers as they focused on the purpose of their instructional goals, instead of the immediate task of completing a lesson. Ms. White articulated that her goal for Megan was to increase her self-advocacy by teaching her to choose her own answers for the GO. Ms. Stapleton decided to focus on teaching Sheila how to plan her words before writing a paragraph, as her paragraphs typically consisted of a running

record of her thoughts, with little organization. Ms. Betty's goal was to teach Henry how to get his thoughts into written word. Teachers learned to participate in personal goal-setting conversations, based on their own professional needs and students' writing needs (Donahue-Barrett, 2014).

Similarly, during the observations, Ms. Betty and Ms. Stapleton asked, "How am I doing?" and "Am I doing it right?" Ms. White also asked if she was doing what I "expected her to do." Teachers assumed that I would tell them what they did correctly and/or incorrectly. Instead, I reminded them that they will have a chance to unpack their own teaching data during the feedback and reflection coaching sessions. During those meetings, I asked questions from the reflection conversation map (Appendix N) such as, "What does the evidence say?" and "Do you have any new insights from the data?" Asking these questions established them as the agent of power and change. Through these coaching conversations, teachers had autonomy of their learning. And, as research explains, teachers who participate in self-directed PD report that they feel empowered to change their instructional practices (Donahue-Barrett, 2014; Dougherty, 2000).

Edwards (2016) reports that teachers who participated in Cognitive Coaching PD improved their problem-solving skills. This growth was evident in the teachers from this study. By the end of these conversations, teachers felt empowered as competent implementers of EBPs and were independently articulating what they wanted to improve or change. Ms. Stapleton's body language was more confidence and she thanked me for asking for her opinion instead of telling her what to do. Ms. Betty expressed that she wished she could "get this type of support with other areas of instruction and behavior management." During our last coaching session, Ms.

White initiated a brainstorm on how to introduce the GO for writing instruction to another student, based on what she learned during this coaching cycle.

Writing Instruction

This study also extends the research on teaching writing skills to students with LID. Research on teaching students with LID indicate that using the system of least prompts can be an effective strategy for academic instruction, such as writing (Sam & AFIRM Team, 2015; Spooner et al., 2012). Furthermore, emerging research on teaching writing to students with LID recommend using a GO as a tool to support students' idea formation and organization (Pennington, 2016; Pennington & Koehler, 2017). Results from this study extend these research findings. The data show that when students with LID are taught with the system of least prompts and given a narrative prompt related to their IEP transition plan, they can improve their writing skills by organizing their thoughts into GO.

Perhaps for students with LID, filling out a GO is the final step in their writing process. The goal of writing is to express one's ideas in an organized fashion (Keefe & Copeland, 2011). The GO is a tool that students use to articulate and organize their ideas (Troia, 2014). Although the GO is typically as a prewriting activity, it can be the final written product for students with LID who are learning to use written language as a form of communication. This study showed that students with limited verbal and literary abilities can use the GO to express their interests and desires through the use of written word.

System of least prompts. Although there is minimal research on using the system of least prompts to teach writing, there is research on using it to teach academic skills, such as mathematics and reading comprehension (Cihak & Grimm, 2018; Mims et al., 2012). This study

adds to the broader research by presenting data that the system of least prompts can be used to teaching writing skills to students with LID.

Implementing this EBP did not come naturally to the teachers. They did not implement this EBP with mastery from simply attending a workshop. In fact, during post-workshop phase, I observed two common mistakes across all teachers: skipping over the less intrusive prompts in the hierarchy of prompts and forgetting to provide positive reinforcement after each step. This means that prior to coaching phase, students were not expected to try each step of the GO with independence or a less intrusive prompts and that students were not being properly reinforced for the steps they were completing.

Once coaching began, teachers paid closer attention to the prompting hierarchy. During the lessons, teachers were expecting the students to complete the GO steps with more independence and were consistently providing students with positive reinforcements after completing each step (Brown et al., 2015).

Graphic organizer. Research on GOs for students with LID report that teaching how to use a GO can be paired with an evidence-based instructional strategy (Delano, 2007; Pennington & Delano, 2012). Teachers in this study paired the system of least prompts with a GO to teach students to organize and write their ideas. With the appropriate prompting and positive reinforcement, students learned to use the GO to answer questions about their IEP transition plans. Each student learned to determine a topic, main idea and at least two supporting details for each idea. Also, as the research on GOs suggests, teachers in this study found the GO to be flexible enough to individualize based on students' unique abilities (Dexter & Hughes, 2011). For example, Megan could only complete two main ideas and four supporting details based on her verbal abilities while Sheila and Henry completed four main ideas and eight supporting

details. Another example, for two of the prompts, Sheila added more circles to the GO, as she had more supporting details to write.

Once teachers mastered delivering the system of least prompts, students' use of the GO also improved significantly. Overall the course of the study, students learned to identify or create the topic of their web. Sheila and Henry learned where to write their main ideas and Megan placed her picture card in the main idea circle. A common mistake among all the students was with the supporting details. Megan often times placed her picture card in an incorrect circle. Similarly, Henry would speak an idea for a supporting detail but would not remember where to write it. Sheila often asked what she was supposed to write in the supporting details circles.

By the end of the study, when teachers had mastered implementing the EBPs, the students also showed great success in using the GO. Sheila and Henry completed some GOs with 100% accuracy. Megan's accuracy varied, but also maintained an upward trend. Just as Dexter and Hughes (2011) discussed, students' data from this study demonstrate that the GO is a helpful tool for the students to organize and express their ideas in written form.

Usability of evidence-based practices. On the post-study survey, teachers reported that they felt confident using the system of least prompts and GO after this study. During the study, they reported mixed input about the usability of system of least prompts and GOs.

System of least prompts. Ms. Stapleton explained that the positive aspects of using the system of least prompts during writing instruction was that she can "focus on student doing things independently and not over-prompting." Ms. Betty said, "Sometimes I feel like I'm prompting too much. This system forces me to let the student do it first before I prompt." Another insight was how cumbersome using a prompting hierarchy could be for writing instruction. Ms. White explained that if she did not have enough paraeducator support in her

classroom, she could not have spent so much one-on-one time with Megan on this writing instruction. The lessons required the teachers to attend to the student for every step of the GO completion.

Graphic organizer. Current literature explains that GOs are a flexible tool and can be used in a variety of settings and purposes (Gillespie & Graham, 2014). Evidence from this study supports this claim of GO usability. Over the course of the study, the teachers independently made decisions to use GOs for other things. All three teachers used the GO lessons beyond this study. Ms. Betty used this study's GO for social skills lesson with Henry. He was trying to express his negative feelings towards upcoming high school graduation. Through the use of the GO, Henry and his teacher problem solved his feelings and the reasons for them. Ms. Betty stated, "He has the thoughts and ideas, it's just a matter of helping him communicate it. This GO is helping with that." She also used a different GO during current events lessons by asking students to collect information from the text to record into GO. She stated that she got this idea from learning about GOs in this study.

Another example was when Ms. Stapleton used the study's GO and writing prompts for her entire English class. She taught the GO during whole group instruction to six students. They used the GO as a prewriting activity, then used the information to create sentences. Students typed sentences onto slide decks and presented their IEP Transition Plans.

Student experience. Students with LID have significant academic deficits, particularly in written language skills (McCutchen, 2003; Shanahan, 2006). Although this study highlighted this deficit area, students willingly participated and engaged with their teachers for every session. The pre- and post-study surveys encouraged the students to self-advocate about writing skills and using GOs. Overall, they stated that writing was a difficult skill for them, identified uses for

writing during their school and home settings, and that the GO was a helpful tool. The one belief on which all students agreed on both surveys was that their teachers help them learn how to write. Above any tool or strategy, the students highlighted the most meaningful influence in improving their writing skills: their teachers. This evidence adds value what the research so firmly suggests, "Improving teacher practice is an important way to improve student achievement" (Cornett & Knight, 2009, p. 196).

Teacher and student outcome. Overall, this study adds to the body of literature on teacher PD. Over a decade of research on teacher PD explain that high quality PD can increase teacher quality, which can then improve student academic outcome (Desimone, 2011; Koellner & Jacobs, 2015). In this study, teachers received workshop and coaching PD which improved their implementation of the system of least prompts and GOs during writing instruction. This change in teaching practice improved students' knowledge and ability to use a GO to communicate with writing. Furthermore, the impact of the PD may continue, as the teachers began implementing the EBPs in their teaching practices outside of the study.

Limitations of Study

Even though this study displayed positive outcomes for teachers and students, limitations should be considered.

As research suggest, not all teachers focus their literacy instructional on developing writing skills (Applebee & Langer, 2011; Troia, Lin, Monroe, & Cohen, 2009). The teachers that were recruited were those that were willing to participate in a study focused on implementing new EBPs in the classroom. This means that the teacher participants were willing to learn new teaching strategies and change their instructional practice. This mindset is not always the case with teachers. In addition, the teachers were willing to teach writing using new strategies.

Another limitation was the workshop portion of the PD package. The treatment fidelity of the workshop could not be measured. Although I followed the same agenda, presentation and protocol, there is no audio or video recording to confirm or deny the consistency among the three workshops.

Additionally, the PD package in this study was provided over a shorter amount of time than what is recommended. Research suggest that effective PD should be provided over a period of time of 6-12 months (Darling-Hammond & Richardson, 2009; Desimone, 2011). This study was only provided over 8 weeks.

Finally, the researcher's role can be a limiting factor in interpreting the effects of the intervention. I was both the researcher and the coach in this study. There is a possibility that the teachers performed well for the sake of the study and wanted to do their best for the researcher/coach. Furthermore, I was present in the classrooms for the filming of all the writing lessons. The teachers may have made an extra effort to pay attention to the lesson plans and implementation because they knew I was watching. Perhaps if I were not present to film, they would not have paid as close attention to their implementation.

Implications for Future Research

This study provided special education teachers with a workshop and ongoing coaching PD package in an effort to improve teacher practice during writing instruction. Despite the previously discussed limitations, this study advances the research on special education teacher PD. Future research should further examine how this style of PD can be used with paraeducators and with a more robust writing curriculum.

Research can expand the coaching PD to train classroom teams of teachers and paraeducators of students with LID. This study's intervention required teachers to work one-on-

one with students. This is unfeasible in most classrooms where there is one teacher and several paras for a class full of students. Training paraeducators on implementing EBPs can support teachers in providing high quality education to a wider range of students in the classroom.

Teachers from this study expressed that they wished they had time to teach their students to convert the ideas from their webs into paragraphs. This study only focused on the prewriting phase of the writing process. Future research can examine the use of this style of PD to support teachers in implementing a more robust writing program that involves students' with LID participation in the entire writing process.

Implications for Practice

This study also has implications for practitioners. Professional development providers and teachers can advance their practices based on the evidence presented in this study.

Professional development provider. Professionals providing PD for special education teachers should consider Cognitive Coaching style and conversation maps when designing their PD. This model encourages coaches to be facilitators and teachers to take the lead as the "expert". Special education teachers frequently work with outside professionals, related service providers, and/or administrators. As revealed in this study, teachers are not used to self-directing their learning and being asked questions such as, "What do you think you should do?" This shift in PD practice can have meaningful impact on special education teacher learning, as the focus is on the long-term goal of teaching teachers to be self-sufficient in setting goals and making data-based decisions.

In addition, when coaching teachers, PD providers should ground their work on making data-based decisions. This will allow teachers to think about what student data is meaningful to them and how to unpack the data with their coach. Keeping the conversations data-based allows

for objective and student-focused discussion. This is particularly important when discussing teaching students with LID, as these students have exceptional and complicated needs.

Special education teacher. Writing instruction can, indeed, occur with students with LID (Brown et al., 2015). Writing is a form of communication, self-expression and self-advocacy (Keefe & Copeland, 2011). As clearly stated from all the students in this study, the teacher is the most powerful tool in the students' instructional experience. The teachers in this study learned how to successfully teach the first step of the writing process to students with limited writing abilities.

Instruction may look different than that of their typically developing peers' access or peers less impacted by disability. As displayed in this study, writing instruction can happen if the instruction is based on evidence-based practices and individualized to meet the students' specific communication and cognitive abilities.

Over several coaching sessions, teachers from this study learned how to implement EBPs during writing instruction. The ongoing coaching relationship provided teachers with consistency and accountability as they implemented their new learning. This data suggest that teachers should seek out collaborative opportunities to support their learning, such a coaching or collaborative group. This type of PD can encourage teachers to take charge of their learning, set meaningful goals to improve practice, and commit to ongoing self-reflection.

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Appendix A: Recruitment/Invitation Materials

A-1 (Email) Invitation to Principal

University of Washington
College of Education
Box #353600
Seattle, WA 98195-3600

November 10, 2018

Dear [insert principal name],

I am writing to ask you to take part in a research study. I received your name and contact from the district's special education administration team. The goal of this study is to provide special education teachers with a meaningful PD experience on how to implement an evidence-based practice while teaching adolescents with LID to use graphic organizers as a prewriting exercise. I am planning to conduct this study in middle and high school special education programs that serve students with low-incidence disabilities.

I am undertaking this study as part of doctoral dissertation studies at the University of Washington. In this study I hope to provide your special education teacher with professional development through a training workshop and coaching relationship and observe him/her and a selected student with disabilities between January and March 2019. In order to gain a deep understanding, I would like to collect data using observation of lessons. First, I would like to observe how the teacher implements the EBP. Second, I would like to observe how students respond to the instruction. Third, I would like to survey your teacher and student. The study is not, in any way, evaluative of your school, special education program, or teacher's classroom, and it will hopefully inform your teacher as to how to implement an EBP during writing instruction. I will take steps to ensure that the study is not intrusive for the teacher or students.

Taking part in this study is voluntary. Participants can stop at any time, and all information is confidential. If the results of the study are published or presented, I will not use the names of people, names of schools, or any other information that would identify participants, the school, or the district.

Thank you for considering this opportunity. Should you have any questions or concerns, please feel free to contact me by phone (425) 408-7678 or via email at npullen@uw.edu.

Yours sincerely,

Natalie Pullen, MA, NBCT
College of Education
University of Washington

Appendix A: Recruitment/Invitation Materials

A-2 (Email) Invitation to Teachers

University of Washington
College of Education
Box #353600
Seattle, WA 98195-3600

November 10, 2018

Dear [insert teacher name],

I am writing to ask you to take part in a research study. I received your name and contact from the district's special education administration team. The goal of this study is to provide special education teachers with a meaningful PD experience on how to implement an evidence-based practice while teaching adolescents with LID to use graphic organizers as a prewriting exercise. I am planning to conduct this study in middle and high school special education programs that serve students with low-incidence disabilities.

I am undertaking this study as part of doctoral dissertation studies at the University of Washington. In this study I hope to provide you with professional development through a training workshop and coaching relationship and observe you and a selected student with disabilities between January and March 2019. In order to gain a deep understanding, I would like to collect data using observation of lessons. First, I would like to observe how you implement an EBP. Second, I would like to observe how students respond to the instruction. Third, I would like to survey you and your student. The study is not in any way evaluative of your school, special education program, or your classroom, and it will hopefully inform you as to how to implement an EBP during writing instruction. I will take steps to ensure that the study is not intrusive for you or students.

Taking part in this study is voluntary. Participants can stop at any time, and all information is confidential. If the results of the study are published or presented, I will not use the names of people, names of schools, or any other information that would identify participants, the school, or the district.

Thank you for considering this opportunity. I will be contacting you shortly by phone to discuss this with you further. Should you have any questions or concerns, please feel free to contact me by phone (425) 408-7678 or via email at npullen@uw.edu.

Yours sincerely,

Natalie Pullen, MA, NBCT
College of Education
University of Washington

Appendix B: Consent Forms

B-1 Participant Consent Form: Teachers

Investigator: Natalie Pullen
College of Education
Special Education
npullen@uw.edu
Phone: 206-931-6781
Faculty Advisor: Dr. Roxanne Hudson
rhudson@uw.edu

Investigator's Statement

I am asking you to be in a research study. The purpose of this consent form is to give you all the information you will need to help you decide whether or not to be in the study. Please read the form carefully. You may ask questions about the purpose of the research, what I would ask you to do, the possible risks and benefits, your rights as a volunteer, and anything else about the research or this form that is not clear. When all your questions have been answered, you can decide if you want to be in the study or not. This process is called "informed consent." I will give you a copy of this form for your records.

PURPOSE OF THE STUDY

The purpose of this study is to examine how coaching professional development can influence teachers' implementation of evidence-based practices and students' with low-incidence disabilities writing skills. I would also like to gain understanding on teachers' perspectives of the coaching model of professional development and the students' perspective of learning how to write using a graphic organizer.

PROCEDURES

If you choose to be in this study, I would like to offer a workshop style professional development session, then meet with you 5-7 times for individual coaching sessions. The workshop will be 2-hours long and will take place in the first week of the study. I will follow up with coaching sessions. Each coaching session will be approximately 1-hour. I will also ask you and your students to complete a pre- and post-survey on your experiences. The study will last 8 weeks.

In addition to the coaching sessions, I would like for you to teach writing lessons using the evidence-based practices taught in the workshop and coaching. The lessons can be with a single student. Since I will not attend every writing lesson, I would like to ask you to film the lessons, so I can watch at a later time and collect data on my observations. Data will consist of your implementation of the writing instruction, students' written works, and your and students' input on the survey. Data will be recorded in written and typed notes, during and after the observation of videos, grading of student work, and review of survey answers.

All written and typed data will identify you by a pseudonym only. Only my research assistant and I will have access to the video recordings, which will be kept in a secure location.

RISKS, STRESS, OR DISCOMFORT

Some people feel that providing information for research is an invasion of privacy. I have addressed concerns for your privacy in the section below. Some people feel self-conscious when notes are taken or interviews are recorded.

BENEFITS OF THE STUDY

You may not directly benefit from taking part in this research study. One benefit of this study is the possibility of developing new insights about the nature of coaching professional development and writing instruction for special education teachers of students with low incidence. I am using information from this study as a foundation for my doctoral dissertation.

OTHER INFORMATION

Taking part in this study is voluntary. You can stop at any time. Information about you is confidential. I will assign you a pseudonym and code the study information. I will keep the link between your name and the pseudonym code in a separate, secured location until April 2023. Then I will destroy the information linking your information to the pseudonym. If the results of this study are published or presented, I will not use your name, or any other identifying information.

Government or university staff sometimes review studies such as this one to make sure they are being done safely and legally. If a review of this study takes place, your records may be examined. The reviewers will protect your privacy. The study records will not be used to put you at legal risk of harm.

I may want to re-contact you for future related studies. Please indicate below whether you give me permission to re-contact you. Giving me permission to re-contact you does not obligate you in any way.

If you have any questions about this research study, please contact Natalie Pullen at the telephone number or email listed at the top of this form. If you have any questions about your rights as a research subject, please contact Dr. Roxanne Hudson at the University of Washington College of Education, rhudson@uw.edu.

_____

Signature of investigator Printed Name Date

Participant's statement

This study has been explained to me. I volunteer to take part in this research. I have had a chance to ask questions. If I have questions later on about the research, I can ask the investigator listed above. If I have questions about my rights as a research subject, I can email Dr. Roxanne Hudson at the University of Washington College of Education, rhudson@uw.edu. I will receive a copy of this consent form.

____ I give permission for this researcher to videotape my lessons.
____ I do NOT give my permission for the researcher to videotape my lessons.

_____ I give permission for this researcher to observe my classroom instruction.
_____ I do not give permission for this researcher to observe my classroom instruction.

____ I give permission for the researcher to re-contact me to clarify information.
____ I do NOT give permission for the researcher to re-contact me to clarify information.

_____

Signature of participant Printed Name Date

Copies to: Investigators' file
Participant

Appendix B: Consent Forms

B-2 Participant Consent Form: Parents

Investigator: Natalie Pullen
College of Education
Special Education
npullen@uw.edu
Phone: 206-931-6781
Faculty Advisor: Dr. Roxanne Hudson
rhudson@uw.edu

Investigator's Statement

I am asking you for your child to participate in a research study. The purpose of this consent form is to give you all the information you will need to help you decide whether or not your child will be in the study. Please read the form carefully. You may ask questions about the purpose of the research, what I would ask your child to do, the possible risks and benefits, you and your child's rights as a volunteer, and anything else about the research or this form that is not clear. When all your questions have been answered, you can decide if you want your child to be in the study or not. This process is called "informed consent." I will give you a copy of this form for your records. Upon your approval, I will explain the study to your child. If s/he agrees, I will ask him/her to sign an assent form. You will receive a copy of that form, as well.

PURPOSE OF THE STUDY

The purpose of this study is to examine how coaching professional development can influence teachers' implementation of evidence-based practices and students' with low-incidence disabilities writing skills. I would also like to gain understanding on teachers' perspectives of the coaching model of professional development and the students' perspective of learning how to write using a graphic organizer.

PROCEDURES

If you choose for your child to be in this study, I would like to ask your student about his/her experiences with learning writing skills. The survey will take no more than 10 minutes to complete and will be during the class in which I observe him. For example, I will ask your child, "I like writing in school" and students will have to circle an answer on a scale.

In addition to the survey, I would like to observe 5-7 writing lessons (over an 8-week period). The observations will focus on the student working one-on-one with his/her teacher on how to use a graphic organizer to gather and organize his/her ideas. Data will consist of how the teacher teaches the lesson and what your child writes. Data will be recorded in written and typed notes, during and after the observation of videos, grading of student work, and review of survey answers. I will identify your child and teacher by a pseudonym only in all notes.

With your permission, I would like to film the lessons, so I can watch at a later time and collect data on my observations. Only I and teacher will have access to the recording, which will be kept in a secure location. If you would like a copy of the film, I will gladly provide you with one.

RISKS, STRESS, OR DISCOMFORT

Some people feel that providing information for research is an invasion of privacy. I have addressed concerns for your child's privacy in the section below. Some people feel self-conscious when notes are taken or interviews are recorded.

BENEFITS OF THE STUDY

Your child may not directly benefit from taking part in this research study. One benefit of this study is the possibility of developing new insights about the nature of coaching professional development and writing instruction for special education teachers of students with low incidence.

OTHER INFORMATION

Taking part in this study is voluntary. Your child can stop at any time. Information about your child is confidential. I will assign your child a pseudonym and code the study information. I will keep the link between your child's name and the pseudonym code in a separate, secured location until April 2023. Then I will destroy the information linking your information to the

pseudonym. If the results of this study are published or presented, I will not use your child's name, or any other identifying information.

Government or university staff sometimes review studies such as this one to make sure they are being done safely and legally. If a review of this study takes place, your child's records may be examined. The reviewers will protect your privacy. The study records will not be used to put your child at legal risk of harm.

I may want to re-contact you for future related studies. Please indicate below whether you give me permission to re-contact you. Giving me permission to re-contact you does not obligate you in any way.

If you have any questions about this research study, please contact Natalie Pullen at the telephone number or email listed at the top of this form. If you have any questions about your child's rights as a research subject, please contact Dr. Roxanne Hudson at the University of Washington College of Education, rhudson@uw.edu.org.

_____

Signature of investigator Printed Name Date

Participant's statement

This study has been explained to me. I volunteer for my child to take part in this research. I have had a chance to ask questions. If I have questions later on about the research, I can ask the investigator listed above. If I have questions about my rights as a research subject, I can call Dr. Roxanne Hudson at the University of Washington College of Education, rhudson@uw.edu. I will receive a copy of this consent form.

____ I give permission for this researcher to videotape my child's writing lessons.
_____ I do NOT give my permission for the researcher to videotape my child's writing lessons.

_____ I give permission for this researcher to observe my child in classroom instruction.
_____ I do not give permission for this researcher to observe my child in classroom instruction.

____ I give permission for the researcher to re-contact me to clarify information.
____ I do NOT give permission for the researcher to re-contact me to clarify information.

_____

Signature of participant Printed Name Date

_____

Name of Child

Copies to: Investigators' file
Participant

Appendix C: Student Assent Form

Investigator: Natalie Pullen
College of Education
Special Education
npullen@uw.edu
Phone: 206-931-6781
Faculty Advisor: Dr. Roxanne Hudson
rhudson@uw.edu

Investigator's Statement

I am going to do a study in your classroom about you and your teacher doing writing lessons. I want to make sure I have your permission before I start my study. You can be in the study if you would like but you can also say no. You can always ask questions about it.

PURPOSE AND BENEFITS

I want to do this study to learn more about how your teacher teaches writing lessons and how you learn how to write your ideas. I also want to ask you about what you think about the writing.

PROCEDURES

If it's okay with you, I will visit your classroom two times. I will stay for 1 class period during each visit and ask you to fill out a survey. Your teacher will let you know a few days before, to prepare you for the change in your schedule. I would also like to videotape you and your teacher during writing lessons.

RISKS, STRESS, AND DISCOMFORT

You might feel nervous about the survey or while you are videotaped during writing lesson.

OTHER INFORMATION

I won't tell anyone you took part in this study. Your name will not be used in my reports. You don't have to take part in this study if you don't want to. No one will be mad at you. We will give you a copy of this paper to keep.

_____ _____

Signature of investigator **Date**

Subject's statement:

This research study has been explained to me. I agree to take part in this study. I have had a chance to ask questions. If I have more questions, I can ask my teacher.

_____ _____

Signature of subject **Date**

Copies to:

- Subject/Subject's Parent or Guardian
- Investigator's file

Appendix D: Introduction to Graphic Organizer Lesson Plan

Opening (1 minute)	**Completed**
1. Place student's materials near him/her (writing tool, paper, mobile device, computer, etc.)	☐
2. Sit near student so you are facing him/her during instruction.	☐
3. Tell student you are going to work on writing our thoughts. "Today we are going to start working a new way of writing our ideas."	☐

Introduction to Graphic Organizer (15-25 minutes)	**Completed**
4. Introduce the graphic organizer <<Show student pre-filled chart>> "This is a chart. It's like one that you can use. What do you notice about it?" <<Encourage student to state observations, 'There is a circle in middle', ' words in each section', etc.>>	☐
5. Teach topic "See how this middle section says, 'Animal Grooming'? This is the topic. It means that this entire chart is about Animal Grooming."	☐
6. Teach main ideas "All these other sections are ideas about Animal Grooming. What do you see?" <<Continue conversation with student about main ideas.>>	☐
7. Teach supporting details "For each main idea, we can come up with details. What do you see?" <<Continue conversation with student about supporting ideas.>>	☐

8. Check for understanding. "Let's do one together. The topic is about what you would like to try for work. What do you think we should writing for the topic?" <<Brainstorm with student a blank graphic organizer about what type of work student would like to do. Elicit correct responses.>> <<Let's write that job down in the middle section.>> "What are some things about that job? Let's write those ideas down in the other sections." <<Write down student's first idea as s/he say it and show where the idea gets recorded. If student does not have an idea, brainstorming an idea together.>> 9. Repeat Step 8 two more times, until there are at least 3 supporting ideas.	☐ ☐

Closing (1 minute)	**Completed**
10. Wrap-up "Let's review your work." <<Read through student's writing starting with topic, then each idea and supporting details.>> 11. Thank student for his/her time and hard work. "Great work today! How do you think you did today? I'm looking forward to seeing how much more writing you do this month!"	☐ ☐

Appendix E: Graphic Organizer Lesson Plan

Prompting Hierarchy: System of Least Prompts
Independent: Student responds correctly with no prompt
Gesture: Pointing to instruction cue (wait 5 seconds)
Verbal: Restate instruction cue (wait 5 seconds)
Verbal + Gesture: Restate instruction cue while pointing to cue (wait 5 seconds)
Modeling: Write example words that student can copy

Opening (1 minute)	**Completed**
1. Place student's materials near him/her (writing tool, paper, mobile device, computer, etc.)	☐
2. Sit near student so you are facing him/her during instruction.	☐
3. Tell student you are going to work on transition plan. "Today we are going to start working on your Transition Plan. We are going to brainstorm about [vocational area]."	☐

Writing Prompt and Graphic Organizer (enter time frame, 30 seconds?)	**Completed**
4. Introduce prompt to student. <<Read writing prompt>>	☐
5. Check for understanding. Brainstorm with student. "Can you tell me what this question is asking? What are some of your ideas for this?" <<Continue conversation with student>>	☐
6. Let's start writing down your ideas. <<Show graphic organizer>>	☐
7. Materials "Can you get your writing materials ready? What do you need to get started?" (If student does not respond after 10 seconds, use least to most prompting to elicit response. Give students 10 seconds to respond to each prompt. Provide a positive reinforcement if student responds with correct answer.)	☐

8. Topic "What is the topic for today?" (If student does not respond after 10 seconds, use least to most prompting to elicit response. Give students 10 seconds to respond to each prompt. Provide a positive reinforcement if student responds with correct answer.)	☐
9. Idea #1 "Ok, now that we have the topic, you can write your ideas that you shared with me when we were brainstorming. What's an idea you have about [topic]?"	☐
10. Supporting detail #1a "Can you tell me more about that idea [restate idea]?"	☐
11. Supporting detail #1b "What else can you think of to support [restate idea]?"	☐
12. Idea #2 "What is another idea you have about [topic]?"	☐
13. Supporting detail #2a "Can you say more about that?"	☐
14. Supporting detail #2b "What else?"	☐
15. Idea #3 "What is another idea you have about [topic]?"	☐
16. Supporting detail #3a "What detail can you think of about this idea?"	☐
17. Supporting detail #3b "What is another detail can you think of about this idea?"	☐
18. Idea #4 "What is another idea you have about [topic]?"	☐
19. Supporting detail #4a "What detail can you think of about this idea?"	☐
20. Supporting detail #4b "What is another detail can you think of about this idea?"	☐

21. Wrap-up "Let's review your work." <<Read through student's writing starting with topic, then each idea and supporting details.>> 22. Self-Assessment "Is there anything else you want to add to your writing? What do you think about your work?"	☐ ☐

Data Collection: Prompting			
Steps to Using Graphic Organizer	Prompts? (circle) I: Independent G: Gesture V: Verbal G+V: Gesture + Verbal M: Modeling I, G, V, G+V = CORRECT M = INCORRECT	Positive Reinforcement? (circle) Y: Yes N: No	Correct/ Incorrect (circle) C: Correct IN: Incorrect
• Get writing materials	I G V G+V M	Y N	C IN
• Write topic	I G V G+V M	Y N	C IN
• Write idea #1	I G V G+V M	Y N	C IN
• Write supporting detail #1a	I G V G+V M	Y N	C IN
• Write supporting detail #1b	I G V G+V M	Y N	C IN
• Write idea #2	I G V G+V M	Y N	C IN
• Write supporting detail #2a	I G V G+V M	Y N	C IN
• Write supporting detail #2b	I G V G+V M	Y N	C IN
• Write idea #3	I G V G+V M	Y N	C IN
• Write supporting detail #3a	I G V G+V M	Y N	C IN
• Write supporting detail #3b	I G V G+V M	Y N	C IN

• Write idea #4	I	G	V	G+V	M	Y	N	C	IN
• Write supporting detail #4a	I	G	V	G+V	M	Y	N	C	IN
• Write supporting detail #4b	I	G	V	G+V	M	Y	N	C	IN

Data Collection: Wait Time	**Completed**
Gives wait time (up to 10 seconds) for student to respond to each	▢

Closing (1 minute)	**Completed**
23. Thank student for his/her time and hard work. "I noticed you worked so hard on this today! How do you think you did today? We'll work on this more another day."	▢

Appendix F: Writing Prompts

Transition Area: Vocation

1. Describe somewhere you are interested in working.
2. Tell me about what jobs you do at school.
3. Describe the type of environment you would like to work in.
4. *Transition Area: Recreation/leisure/Interests*
5. Tell me about a hobby or sport you like to do outside of school.
6. Tell me about what you like to do for fun.
7. Tell me about what things are you interested in learning.

Transition Area: Independent living

8. Describe how you go grocery shopping. (Favorite store?, How do you pay?, Types of food?)
9. Tell me about what you cook at home. (Recipes, cooking utensils, appliances)
10. Describe what kind of schedule you use.
11. Tell me about how you use money.
12. Tell me about how you get around in the community.
13. *Transition Area: Preferences*
14. Tell me about how you like to learn in school. (Sounds, location, people, lights, weather)
15. Describe what helps you learn at school.
16. Describe what help you have a good day at school.
17. Describe what do you need to do your work.
18. Describe what types of classes of you like. What do you like about the class/es.

Transition Area: Strengths

19. Describe things that you are you good at doing.
20. Tell me what people like about you.

Transition Area: Personal Responsibility and Relationships

21. Tell me about the people in your life (family, neighbors, friends, staff).
22. Describe people who are your friends.

Transition Area: Community Involvement

23. Tell me about an event you like to do in your community (parade, football games, Special Olympics, Wranglers, park)? What do you like about it?

Transition Area: Physical and Emotional Health

24. Describe your doctor's office (location, name, what type of doctor). What kinds of things do you go to the doctor for?
25. Tell me what kind of exercise do you like to do.
26. Tell me how you manage your emotions/worries.

Transition Area: Home and Family

27. Describe your family. (What is your family like? Who do you live with? Who do you enjoy spending time with? What do you do together?)
28. Tell me about what kinds of jobs do you have in your home.

Appendix G: Teacher Use of System of Least Prompts Data Sheet

Student: _____ Teacher: _____ Observer: _____
Date:_____ Day:_____ Session #:_____ Lesson Duration: _____

Behavior
Teacher will use system of least prompts while teaching student to use graphic organizer.

Legend
I: Independent
G: Gesture
V: Verbal
V+G: Verbal + Gesture
M: Modeling
PR: Positive Reinforcement

Directions
Mark "+" if behavior is observed. Mark "-" if behavior is not observed. If student responded after a given prompt, leave the following prompts blank. If teacher skips prompt/s in a sequence, mark "-" for skipped prompts. Mark "+" in PR column if teacher provides positive reinforcement after student responds to prompt. Mark "-" in PR column if teacher does not provide positive reinforcement after students responds to prompt.

	Prompts					
Steps to Using Graphic Organizer	I	G	V	V+G	M	**PR**
1. Prepare writing materials						
2. Write/select/dictate topic						
3. Write/select/dictate idea #1						
4. Write/select/dictate supporting detail #1A						
5. Write/select/dictate supporting detail #1B						
6. Write/select/dictate idea #2						
7. Write/select/dictate supporting detail #2A						
8. Write/select/dictate supporting detail #2B						
9. Write/select/dictate idea #3						
10. Write/select/dictate supporting detail #3A						
11. Write/select/dictate supporting detail #3B						

12. Write/select/dictate idea #4						
13. Write/select/dictate supporting detail #4A						
14. Write/select/dictate supporting detail #4B						
Total + / Total opportunities	____/____					
x 100	____%					

Appendix H: Student Graphic Organizer Data Sheet

Student: _____ Teacher: _____ Observer: _____
Date:_____ Day:_____ Session #:_____ Lesson Duration:_____

Behavior
Writing Skill: Student will use a graphic organizer to organize ideas as a writing activity.

Duration: Start time _____ Stop time _____ Time elapsed _____

Directions
Accuracy: Mark "+" for each step that the student completed correctly. Mark "-" for each step that the student completed incorrectly.

Prompt Type: Record the type of prompt to which the student responded. Prompts: I: Independent, G: Gesture, V: Verbal, V+G: Verbal + Gesture, and M: Modeling.

Latency: Record the time elapsed (in seconds) from when teacher provides prompt and student responds to the prompt.

Steps to Completing Graphic Organizer	**Accuracy**	**Prompt Type**	**Latency**
1. Prepare writing materials			
2. Write/select/dictate topic			
3. Write/select/dictate idea #1			
4. Write/select/dictate idea #2			
5. Write/select/dictate idea #3			
6. Write/select/dictate idea #4			
7. Write/select/dictate supporting detail A for idea #1			
8. Write/select/dictate supporting detail B for idea #1			
9. Write/select/dictate supporting detail A for idea #2			
10. Write/select/dictate supporting detail B for idea #2			

11. Write/select/dictate supporting detail A for idea #3			
12. Write/select/dictate supporting detail B for idea #3			
13. Write/select/dictate supporting detail A for idea #4			
14. Write/select/dictate supporting detail B for idea #4			
Total correct (+) / Total opportunities (+ and -)	_____/_____		
x 100	_____%		

Appendix I: Teacher Questionnaire On Social Validity

I-1 Pre-study

Please respond to the following statements with what closely reflects your beliefs.

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Overall, I believe a coaching relationship can expand my teaching practices.	☐	☐	☐	☐	☐
I believe that a coaching relationship can help me improve student outcomes.	☐	☐	☐	☐	☐
I am interested in participating in a coach relationship to learn new teaching strategies.	☐	☐	☐	☐	☐
I believe evidence-based practices (EBPs) can improve student academic outcomes.	☐	☐	☐	☐	☐
I feel confident in using system of least prompts with students to teach writing.	☐	☐	☐	☐	☐
I feel confident teaching students how to use using graphic organizers during writing lessons.	☐	☐	☐	☐	☐

What were the beneficial aspects to this workshop?

What can I change/add to make this workshop for the next time I have one?

What thoughts/opinions/questions do you have about evidence-based practices (for writing instruction, prompting, or any other)?

What other information you would like to share regarding the study?

Thank you for your input!

Appendix I: Teacher Questionnaire on Social Validity

I-2 Post-study

Please respond to the following statements with what closely reflects your beliefs.

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Overall, I believe a coaching relationship can expand my teaching practices.	☐	☐	☐	☐	☐
I believe that a coaching relationship can help me improve student outcomes.	☐	☐	☐	☐	☐
If offered in the future, I will participate in a coach relationship to learn new teaching strategies.	☐	☐	☐	☐	☐
I believe evidence-based practices (EBPs) can improve student academic outcomes.	☐	☐	☐	☐	☐
I feel confident in using system of least prompts with students to teach writing	☐	☐	☐	☐	☐
I feel confident teaching students how to use using graphic organizers during writing lessons	☐	☐	☐	☐	☐
I feel confident using other EBPs in other areas of instruction.	☐	☐	☐	☐	☐
I will continue teaching graphic organizers using system of least prompts after this study	☐	☐	☐	☐	☐

What were the beneficial aspects of the coaching relationship?

What were the challenging aspects of the coaching relationship?

What supports would you need to keep the graphic organizer + system of least prompts instruction going after this study?

What thoughts/opinions/questions do you have about evidence based practices (for writing instruction, prompting, or any other)?

What other information you would like to share regarding the study?

Thank you for your input!

Appendix J: Student Questionnaire on Social Validity

Present table to student. Read through each prompt and give student time to respond to each one:

	Agree	Disagree
I like writing.		
I can share my ideas by writing them.		
I am good at writing.		
My teacher helps me learn how to write.		
[Post-intervention] The graph was helpful for writing.		

Ask student following questions:

- *When do need to use writing **at school**?*
- *When do you need to use writing **at home**?*
- *When do you need to use writing **in community**?*
- *What else do you want me to know?*
- *Thank you!*

Appendix K: Workshop Agenda

Title: Evidence based practices for teaching writing
Instructor: Natalie Pullen
School: _____

Objectives

- Orientation to dissertation study and coaching model of Professaionl Development
- Overall introduction to evidence-based practices
- Review of EBPs: system of least prompts and graphic organizers
- Practice implementing system of least prompts
- Collect and/or design graphic organizers

Agenda

3:00pm-3:20pm Introductions: Name? Where do you teach? What is your favorite thing to teach your students?
- Purpose of today's workshop: Orientation to dissertation
  - Practice Based Coaching cycle
  - Consent forms: teacher, student, parent
  - Timeline/time commitment/classroom visits/filming in classroom

3:20pm-3:35pm Social Validity Pre-Test

3:35pm-3:45pm Evidence Based Practices
- What are they? How are they established?
- Reflection: Do you use them? Which ones? Are they valuable?

3:45pm-4:15pm System of Least Prompts
- Description of prompting and system of least prompts
- When can it be used? How is it used?
- Role play
- Teacher Reflection: Connections with your classroom? Can you see this working? What hurdles might you face?

4:15pm-4:30pm Graphic Organizers
- Description of graphic organizers (share examples)
- When can it be used? How is it used?
- Teacher reflection: Connections with your classroom/various curricula? How can you envision this with your students?

4:30pm-5:00pm Next Steps
- Finalize target student, prompting hierarchy and GO
- Schedule individual coaching sessions
- Share online resource http://afirm.fpg.unc.edu/prompting

5:00pm Adjourn

Appendix L: Initial Coaching Session Agenda

Date:
Teacher:
Coach: Natalie Pullen

Today's Purpose

- Enroll teacher participant
- Review information from workshop
- Goal planning
- Assess teacher understanding of system of least prompts

Agenda

- Enrollment:
    - Build rapport
        - What do you think are your strengths?
        - What are your hopes and fears for our work?
        - What do you enjoy about your position?
        - How do you feel that you learn best?
    - Establish coach's and teacher's roles

- EBPs discussion
    - What are your take-aways from the workshop?
    - How do you see these EBPs working with your student/writing instruction?
    - Review student's GO
    - Practice system of least prompts
    - Complete Readiness Criteria and if needed, support areas of need

Readiness Criteria	**Yes**	**No**
Teacher can articulate sequence of prompts		
Teacher can demonstrate different types of prompts (gesture, verbal, model)		
Teacher understands the response interval determined for the student		
Teacher can provide reinforcement after correct response		
Teacher is confident in providing system of least prompts to student participant		
Teacher is confident in teaching graphic organizer to student participant		

- Goal Planning
    - What is your goal for implementation of system of least prompts and GO?
    - Student: What is your goal for student's achievement in writing?
    - What will be indicators of a successful lesson?
    - What strategy/ies will you use during your lessons?

- Next Steps
    - Practice GO and prompting with target student
    - Email/call coach with questions or check-in

Appendix M: Initial/Planning Coaching Procedural Fidelity Form

Teacher:_____ Coach:_____
Date:_____ Session Duration:_____

Enrollment	***Completed***
Build Rapport	
● What do you think are your strengths?	▢
● What are your hopes and fears for our work?	▢
● What do you enjoy about your position?	▢
● How do you feel you learn best?	▢
● Establish coach and teacher roles	▢
EBPs discussion	***Completed***
● What are your take-aways from workshop?	▢
● How do you see these EBPs working with your students/writing instruction?	▢
● Review GO	▢
● Practice system of least prompts	▢
● Complete readiness criteria and, if needed, support areas of need	▢
Goal Planning	***Completed***
● What is your goal for implementation of system of least prompts & GOs?	▢
● What is your goal for student's achievement in writing?	▢
● What will be indicative of a successful lesson?	▢
● What strategy/ies will you use during your lessons?	▢
Closing	***Completed***
● What are your next steps?	▢
● Closing (Thank you for your time, looking forward to catching up soon, etc.)	▢

INITIAL COACHING CONVERSATION STEPS COMPLETED: _____

(____ ÷ 16) x 100 = _____% ACCURACY

Appendix N: Ongoing Coaching Procedural Fidelity Form

Teacher:_____ Coach:_____

Date:_____ Session Duration:_____

Conversation Type (circle one): Planning Reflection/Feedback

Planning Conversation Map	***Completed***
Opening	
● Greeting (Hello, How are you?, etc.)	▢
Planning	
● What is the goal of this lesson?	▢
● What decisions do you anticipate you might you have to make during the lesson?	▢
● How will you measure success?	▢
● What might you mean when you say _____?	▢
● What will self-assessment look like?	▢
● What data can I collect for you during the lesson? What information will be helpful for me to gather that will reflect progress to your goal?	▢
Closing	
● Closing (Thank you for your time, looking forward to catching up soon, etc.)	▢

PLANNING CONVERSATION MAP STEPS COMPLETED: _____

(____ ÷ 8) x 100 = _____% ACCURACY

Reflection/Feedback Conversation Map	***Completed***
Opening	
● Greeting (Hello, How are you?, etc.)	▢
● Thank teacher for opportunity to meet and discuss lesson	▢
Reflecting	
● What worked? What did not work? What does the evidence say?	▢
● Do you have any new insights from this data?	▢
● Emphasize causal factors. Follow-up: "What are your ideas about why that happened?" or if collaboration is needed, "Let's think about why that might have happened."	▢
● What are your next steps?	▢
Problem Solving (Optional conversation map)	
● Empathy: Paraphrase to name emotion "You are feeling…"	▢
● Content: Paraphrase for goals/values/beliefs/assumptions	▢
● Content: Paraphrase for global desired state/goal (eg. "What you want is to be/feel/have ….")	▢
● Pathway: Paraphrase the pathway to attain the desired state/goal	▢
● Pathway: Facilitate teachers to inner resources, focus on choices (eg. "What knowledge, skills, or attitudes might you need to accomplish that?")	▢
● Check for congruence and offer walk-away questions (eg. "What are some questions you are still asking yourself?", "What are some variables still in your control?")	▢
Closing	
● Closing (Thank you for your time, This is hard work, etc.)	▢

REFLECTION/FEEDBACK CONVERSATION MAP **WITH PROBLEM SOLVING** STEPS COMPLETED: _____

(____ ÷ 13) x 100 = _____ % ACCURACY

REFLECTION/FEEDBACK CONVERSATION MAP **WITHOUT PROBLEM SOLVING** STEPS COMPLETED: _____

(____ ÷ 7) x 100 = _____ % ACCURACY