Specialized Instruction in Co-Taught High School Classes

A Dissertation

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by

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Abstract

Co-teaching, in which a general and special educator collaboratively teach a class comprised of students with and without disabilities, is a common service delivery model school districts employ to increase inclusion of students with disabilities (SWD) in general education. Co-teaching is intended to provide access to the general curriculum for SWD and to provide the specialized instruction they need. However, despite the widespread use of co-teaching in schools and the high cost of placing two teachers in one classroom, there is still no clear, agreed-upon definition in the literature for what co-teaching should look like in practice (what "specialized instruction" means, for example), nor is there evidence of its effectiveness in improving students' academic outcomes.

Using joint outcome production theory as a foundation for the conceptual framework, this study adds to the research base on co-teaching by closely examining specialized instruction in co-taught high school classrooms. According to this theory, as SWD are included in general education classrooms, the demand on teachers' resources increases. Adding a second teacher to the classroom should address that increase and result in a gain in resources that should benefit all students in the class. The question becomes how to best deploy those additional resources – whether the two teachers should be filling different roles in the classroom or doubling up on existing roles. This study employed a concurrent mixed methods design to answer the following research questions: a) What does instruction look like in co-taught high school classrooms? b) What school-level structural factors are in place surrounding co-teaching? and c) What teacher-, classroom-, and school-level factors are related to observed patterns of instruction? To answer these questions, I conducted observations in two rural schools across 10 co-taught classrooms and in corresponding solo-taught classrooms to identify specific examples of specialization. In

addition, participating teachers and three administrators were interviewed to determine their approaches to co-teaching and their experiences with the ways in which it is implemented in their schools. Teachers also completed a survey about their experiences with co-teaching and the details of their daily schedules.

I conducted two or three observations of each individual class using an observational tool called the Classroom Teaching Scan across all 10 teams for a total of 60 observations and 64 hours. Statistics were calculated regarding time use in each classroom, rates of questions and feedback, and amount of time spent in specific instructional practices. Data were also collected and analyzed on the implementation of key instructional practices, in order to compare the methods used to those recommended by the research with regard to effective instruction for SWD. I compared these data across settings and teams to create detailed descriptions of the instruction provided in co-taught classes and its adherence to evidence-based practices. In addition, I used the information collected through surveys and interviews to describe school-level supports the schools provided for co-teaching, such as whether teams had common planning in their schedules and what kinds of training they received. I then analyzed instructional patterns in light of these supports to determine whether certain supports were related to increased specialization of instruction in co-taught classrooms.

The data showed that teachers generally provided very similar instruction in their co-taught classes and in their solo-taught classes, particularly when comparing general education to co-taught settings. There were no clear patterns of attempted specialization or modification in light of the diverse student bodies in the co-taught classes. Teachers had very low rates of questioning and feedback statements across settings, and they primarily used whole-group instruction and independent practice activities in their teaching. They rarely used modeling, nor

did they consistently monitor individual students' understanding; however, they did employ visual aids in most of their lessons.

The teachers in this sample had access to many supports that are theorized to be important to co-teaching. Most of the teams had common planning time in their schedules and had taught together previously. Administrators provided limited training for them, mostly related to use of co-teaching models (e.g., one-teach-one-assist, station teaching, parallel teaching). Administrators at the two schools placed varying levels of importance on teacher input in selection of co-teachers, which resulted in teachers at one school feeling their opinions were not valued. Teachers at both schools expressed concern about finding time to plan together due to excessive non-instructional duties required of the special educators.

The presence or absence of school-level supports did not seem to be related to whether or not teachers modified instruction for their co-taught classes or to the quality of implementation of that instruction. Most teams did not approach instruction any differently in their co-taught classes than in their solo-taught classes, regardless of the supports in place. The teams that made the effort to plan regularly together did alter instruction; however, the changes did not consistently result in more evidence-based instruction for SWD.

The sample in this project is small, making it difficult to generalize findings. However, it is one of the largest observational studies that has been conducted on co-teaching and one of the few to use quantitative data to support conclusions, and it has potentially powerful implications for research and practice. For continued research on co-teaching, a clearer definition of successful implementation of co-teaching must be developed, and features of that definition must be systematically and experimentally studied in light of their effect on student academic or behavioral outcomes. There is strong indication of confusion on the part of both administrators

and teachers about what expectations should be, particularly with regard to the role of the special education teacher, indicating a need for a clearer definition and stronger communication. In addition, teacher commitment to co-planning is likely to be an important factor in whether co-teaching can be implemented well, but it does not seem to be useful on its own – it requires teachers to have knowledge of how to plan and what their roles are in that process, and it also requires support from administration in the form of reduced duties to provide special educators with time to plan with their co-teachers. Co-teaching is a theoretically strong model for providing instruction to SWD, but at this point it is not being implemented with much fidelity, making its cost-to-benefit ratio questionable. The data in this study provide a starting point for examining this implementation, but much more work needs to be done moving forward.

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APPROVAL OF THE DISSERTATION

This dissertation, “Specialized Instruction in Co-Taught High School Classes” has been approved by the Graduate Faculty of the Curry School of Education in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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Nathan Jones

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Dedication

To my Kimberly.

There are no words.

Acknowledgements

It is a cliché, but it is also true that no project this large is accomplished alone. There are many people who have supported and helped me through this past year. Thanks first to the administrators and teachers who so generously opened their schools and their classrooms to me. They were gracious and honest, and I am truly appreciative of all the hard work they do for their students. They could not have been more welcoming.

Acknowledgement and gratitude to Peggy Weiss for helping with concept development, for working with me on the pilot studies for this project, and for being a fellow co-teaching enthusiast willing to sit and talk about co-teaching for hours on end. I cannot wait to work with her again. Thanks to John Romig and Hannah Mathews who helped me organize my thoughts when I was not making any sense and for volunteering time to help with data collection and reliability coding.

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Finally, great appreciation to my advisor and chair Dr. Michael Kennedy, who allowed me to be the first adoptee into his misfit crew. If he had not taken me in, I doubt I would still be

here at all. Because of his big thinking and total lack of fear in tackling large problems, I have the unique observational instrument which I used for this project and believe will open new doors and opportunities moving forward. He supported me wholeheartedly in this endeavor (once he realized I would not take his advice to stick to something simple), and I am forever grateful. I look forward to being his friend and colleague for years to come.

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CHAPTER I: INTRODUCTION

The practice of including students with disabilities (SWD) in general education classes (a practice often referred to as *inclusion*) has grown quickly in recent decades, and now most SWD spend the majority of their school day in general education classrooms (U. S. Department of Education, 2012). One result of this expansion of inclusion is a corresponding increase in the special education service model of co-teaching, in which a general educator and special educator work together to teach a class containing a mix of students with and without disabilities (Kloo & Zigmond, 2008). The growing popularity of co-teaching has caused a significant shift in the job responsibilities of general and special educators because the job of teaching, which has been fairly independently managed in the past, is now often done in cooperation with another professional (Brownell, Sindelar, Kiely, & Danielson, 2010; Friend, Cook, Hurley-Chamberlain, & Shamberger, 2010). Although co-teaching has been in use for more than two decades, the field has not yet identified even the "minimal criteria that predict quality (that is, effectiveness) in such partnerships" (Friend et al., 2010, p. 19).

Statement of the Problem

Gerber and Semmel (1985) proposed a theory of special education related to microeconomics which was the basis for this study's conceptual framework (see Figure 1 for a model of microeconomics with respect to co-teaching). They described classrooms as

environments with limited resources, not only in terms of concrete materials, but "the particular array of skill, procedural knowledge, and experience possessed and embodied by the teacher" (p. 17). Such intangible resources are not easily increased, and this limitation is a daily fact for many teachers. In any classroom, students naturally differ from one another in terms of ability and need, which forces teachers to make choices about where to expend their limited resources to meet the academic demands of their students. The addition of SWD with their unique needs to general education classrooms raises the demand on teachers, making decisions about where to put their resources more challenging. According to Gerber and Semmel's (1985) theory, increased demand combined with a stagnant level of resources will result in students receiving less teacher time and attention, leading to depressed academic achievement for all students in the class. This theory has been used in examinations of school-level responses to inclusion (e.g., Cook, Semmel, & Gerber, 1995) and teacher attitudes toward SWD in their classes (Cook, Tankersley, & Cook, 2000), but to date it has only been theoretically linked to co-teaching (Cook, McDuffie-Landrum, Oshita, & Cook, 2011).

Co-teaching is one way schools have responded to the increase in demand caused by inclusion of SWD in general education classes; the presence of the second teacher theoretically doubles the amount of teacher resources available in a general education classroom (Cook et al., 2011). However, in a field that often struggles for adequate resources, co-teaching is an expensive solution in terms of time and money. School districts must pay two teachers to be in one classroom, and complications of scheduling and planning add to the pressure on administrators' and teachers' time. Therefore, evaluation of the conditions resulting in efficacious co-teaching is essential not only to support students' academic achievement, but also to maximize the returns on this large investment.

Friend et al. (2010) described the purpose of co-teaching as providing SWD access to general education curriculum, while at the same time "increasing the extent to which instruction is tailored to meet individual student needs" (p. 19), including the use of "specialized instructional practices" (p. 11). Therefore, a key outcome of successful co-teaching should be specialized instruction, which should lead to increased student achievement (Friend et al., 2010). One method of providing this individualized, specialized instruction is through implementation of various models of co-teaching instruction (i.e., one-teach-one-assist, alternative teaching, station teaching, team teaching, and parallel teaching), which allow for smaller teacher-student ratios and more purposeful, directed instruction (Friend, 2015). However, it is important to combine these models with evidence-based practices for the content area and for SWD in order to reach the true potential impact of co-teaching. Gerber and Semmel argued that "a core objective for special education should be to assess schools' ability and efforts to accommodate a range of individual differences" (p. 21). This study analyzed schools' efforts and success at accommodating SWD in selected secondary co-taught classrooms by investigating the ways schools support co-teaching and the extent of specialized instruction observed in co-taught classes.

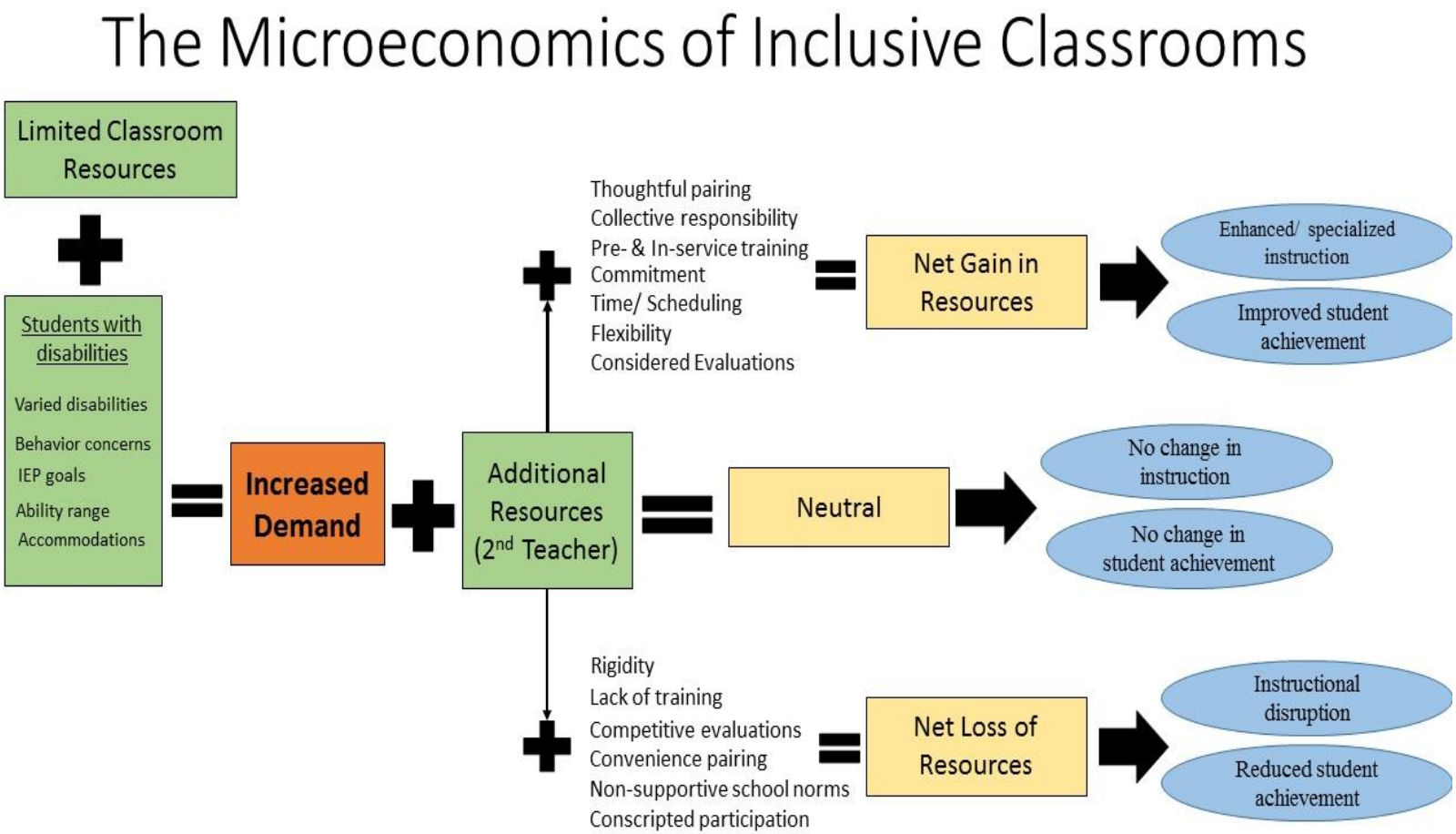

Figure 1. Model of joint outcome production theory applied to co-teaching

Classroom Needs of SWD

The unique needs of SWD increase demand on teacher resources when they are placed in general education classrooms. SWD are a diverse group, but some common characteristics found in this population often challenge teachers' skills. For example, SWD tend to lack the background knowledge and skills their peers have, meaning they often require more scaffolding and preparation before being taught new concepts or skills (Swanson et al., 2014). Additionally, SWD often have slower processing speeds, resulting in a need for more time to practice new skills in order to reach mastery levels (Cirino, Fuchs, Elias, Powell, & Schumacher, 2013). Beyond academics, SWD also frequently struggle with social skills, making peer relationships challenging (McDuffie, Landrum, & Gelman, 2008), and they exhibit more challenging behavior (Farley, Torres, Wailehua, & Cook, 2012), placing added demand on teachers' ability to manage their classrooms.

The additional resources in the form of a second teacher should, in theory, allow teachers to better meet the needs of all students, not just those with disabilities, by providing the flexibility to institute a greater variety of instructional methods and classroom management techniques (Friend, 2015). My conceptual framework laying out this relationship and potential modifying factors, which will be discussed below, can be seen in Figure 2. General and special educators must be able to marry the instructional best practices of their two fields, which requires strong understanding of those best practices, willingness to work together, and the ability to coordinate instruction. Supports in the larger school environment can aid them in this endeavor.

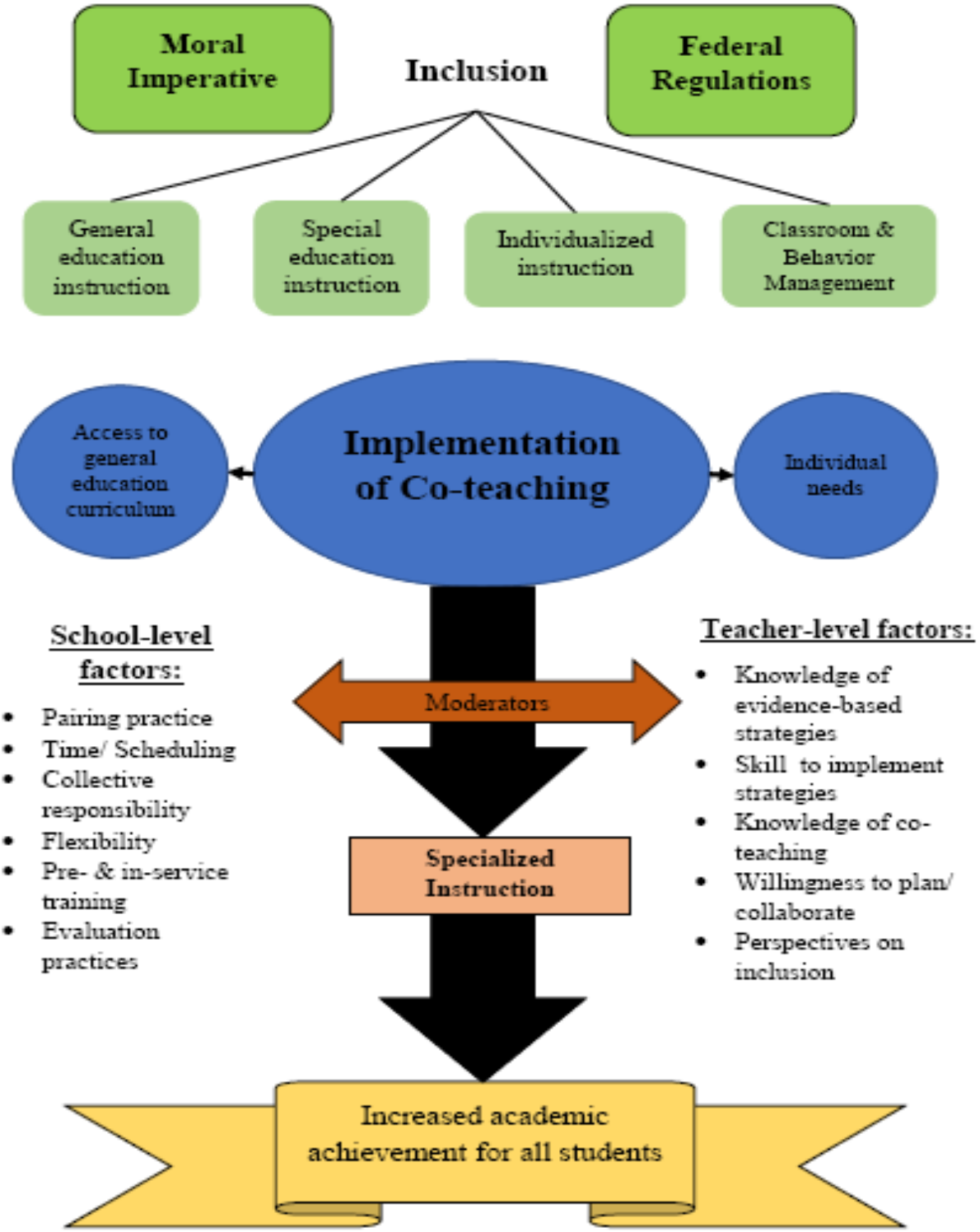

Figure 2. Conceptual framework

School-Level Structural Supports for Co-Teaching

Administrator support in the form of structural provisions that enhance skills and maximize co-teachers' access and resources is emphasized as a vital component of successful co-teaching (Scruggs, Mastropieri, & McDuffie, 2007). Administrator support is most evident in matters related to scheduling and professional development. Studies emphasize the need for thoughtful pairing of co-teachers, considering teachers' interest in co-teaching, their personalities, and their individual strengths (Austin, 2001; Kellems, 2014), and also limiting the number of different co-teachers an individual teacher is assigned to work with in a given year (Weiss & Lloyd, 2002). Researchers universally stress the importance of including common planning time in teachers' schedules, giving them protected time in which they can discuss individual student needs and determine appropriate instructional practices for them (Fenty & McDuffie-Landrum, 2011; Hang & Rabren, 2009; Moin, Magiera, & Zigmond, 2009; Pancsofar & Petroff, 2013; Rice & Zigmond, 2000; Walther-Thomas, 1997). Another scheduling concern is the distribution of students to co-taught classes. Researchers recommend care be taken not to overload those classes with students who have extensive needs so teachers can reasonably provide adequate support (Dieker, 2001; Walther-Thomas, 1997).

Professional development and training is another area in which administrator support is essential. Most teachers report having very little if any training on co-teaching (Scruggs et al., 2007), and this is supported by findings that most school districts do not provide professional development when they institute co-teaching (Nichols, Dowdy, & Nichols, 2010). This is significant because increased amounts of training have been associated with higher self-efficacy and positive attitudes toward co-teaching (Pancsofar & Petroff, 2013). In addition, there is some evidence that even when co-planning time is provided, teachers may not have the knowledge to

use it effectively, making the institution of this support without corresponding training potentially ineffective (Austin, 2001; Bryant Davis, Dieker, Pearl, & Kirkpatrick, 2012; Gürgür & Uzuner, 2011).

As portrayed in the conceptual framework (Figure 2) and hypothesized in joint outcome production theory, the addition of the second teacher to a co-taught class combined with positive school-level supports surrounding co-teaching, should allow the teachers to address the added demands SWD place on classroom resources (Cook et al., 2011). Ideally, this will lead to increased specialization of instruction, resulting in higher student achievement. This study evaluated the first of these theorized outcomes, specialized instruction, in secondary co-taught classes. The next section discusses specific considerations affecting co-taught instruction in secondary classrooms.

Instruction in Co-Taught Secondary Classes

Researchers in the field have proposed that content knowledge of the special education teacher (SET) is a potential factor affecting co-teaching implementation (Fenty & McDuffie-Landrum, 2011; Magiera, Smith, Zigmond, & Gebauer, 2005; Weiss & Lloyd, 2003). Given that the country has an ongoing significant national shortage of teachers certified just in special education (U.S. Department of Education, 2016), it is highly unlikely that the majority of special education teachers also have a dual endorsement in a content area.

Currently, there is no description in the literature of exactly what specialized instruction could or should look like in co-taught classes. For the purposes of this project, I examined evidence-based practices that have been developed and tested for inclusive settings, which are described in detail in Chapter II. By analyzing the nature of instruction in co-taught secondary classes, this project will contribute significantly to the current research base on co-teaching. In

the next two sections, I summarize the current research on co-teaching and discuss how this project addresses some of its limitations.

Current Research and Limitations

There is a wealth of descriptive evidence about the roles SETs play in co-taught classes. We know, for instance, SETs tend to take on an assistant role, working with students individually or performing clerical duties, such as making copies (Ashton, 2014; Bessette, 2008; Brusca-Vega, Brown, & Yasutake, 2011; Fenty & McDuffie-Landrum, 2011; Harbort et al., 2007; King-Sears, Brawand, Jenkins, & Preston-Smith, 2014; Mageira, Smith, Zigmond, & Gebauer, 2005; Moin et al., 2009; Ploessl & Rock, 2014; Rice & Zigmond, 2000). We also know they spend most of their time monitoring and responding to individual students within a whole-group environment, and a substantial amount of time on non-instructional tasks (Bettini, Kimerling, Park, & Murphy, 2015; Harbort et al., 2007; Moin et al., 2009; Murawski, 2006; Vannest, Hagan-Burke, Parker, & Soares, 2011).

However, we do not know much about the actual instruction provided in co-taught classes. Most studies that do address instruction focus on whether activities were modified or adapted (Dieker, 2001; Murawski, 2006). Two observational studies have specifically focused on instructional practices used in high school co-taught classes; both were conducted in science classes. One (King-Sears et al., 2014) consisted of four observations of one co-teaching team. Researchers found the SET employed alternate forms of questioning and supplemented whole-class instruction with visuals and diagrams. The general educator (GET) primarily used lecture, questioning, and modeling as methods of instruction. The researchers did not compare instruction to other settings, so there was no indication of how specialized the instruction in these classes was compared to business as usual.

The largest observational study on instruction in co-taught classes was conducted by Moin et al. (2009). They completed more than 50 observations in nine co-taught classrooms across schools. They took field notes which they then coded according to instructional practices observed. They compared their findings to those of previous observational studies of general education high school science classes and found little, if any, difference. Instruction in observed classrooms was primarily language-based with a heavy emphasis on textbook learning, and limited time was spent on lab activities and collaborative activities; these findings were comparable to what researchers found in general education settings. No curricular adaptations were observed in any classes; essentially, the instructional practices in co- and solo-taught classes were identical, making the only difference the extra set of hands in the co-taught classes.

Moin et al. (2009) conducted follow-up interviews with participants about school structural supports and their approaches to co-teaching. In these interviews, co-teachers described a lack of administrative support. For example, co-teaching teams were unstable, changing significantly from year to year, and co-teaching pairs were not provided common planning time. In addition, all teachers reported that they received little or no training in co-teaching, most SETs reported a lack of science content knowledge, and GETs reported a lack of knowledge about curricular adaptations and evidence-based practices for SWD.

In an observational study conducted in high school mathematics classes, Mageira and colleagues observed 10 co-teaching teams, noting the roles each teacher took on and the general instructional practices they used. The researchers found students spent the majority of class time engaged in independent skill practice while both teachers circulated, providing assistance and support. They did not describe any other specific instructional methods, nor did they compare this instruction to that in solo-taught classes. This project addressed both of those limitations.

Purpose of the Current Study

This project replicated aspects of some of the work described above and extends the literature base in significant ways. I employed a convergent mixed methods design consisting of a questionnaire, observations, and interviews to examine the instruction provided in high-school co-taught classes and school-level factors related to co-teaching. I observed and conducted interviews with 10 co-teaching pairs in two high schools. To establish the extent of specialization of instruction, I also observed corresponding classes taught by the GET alone and, when available, corresponding self-contained classes taught by the SET. For teams that reported planning together, I observed one planning session. In addition, I collected data on school-level structural supports related to co-teaching from administrator interviews and teacher questionnaires. This study expanded on previous work by using not only qualitative field notes but also a quantitative observational tool (the Classroom Teaching Scan) to identify and measure teacher use of evidence-based practices for SWD.

CHAPTER II: REVIEW OF THE LITERATURE

The following literature review opens with a discussion of the history and implementation of co-teaching, starting with its theoretical beginnings in response to the increasing inclusion of SWD in general education classrooms. I then describe the intended purposes of co-teaching and how it should be implemented, according to recommendations of experts in the field. In doing this, I will revisit my conceptual framework (Figure 2), describing specialized instruction, the mechanism through which co-teaching should theoretically result in improved student outcomes, and the potential moderating factors that might influence teachers' ability to plan and implement this specialized instruction.

Finally, I evaluate the current state of research on the implementation and outcomes of co-teaching. In this section, I summarize major findings from previous research and identify weaknesses in the research base, both in the topics that have been studied and in the methodological approaches that have been taken.

History and Implementation of Co-teaching

The Inclusion Movement

As represented at the top of my conceptual framework (Figure 2), there are two main causes behind the increase in inclusion for SWD: a moral imperative and federal regulations. Beginning in the 1960s, advocates for SWD argued that they should be included in general

education classes for moral and ethical reasons. Segregation of SWD was compared to racial segregation, and advocates held up the Brown v. Board Supreme Court decision from 1954 as evidence that all students should be educated together (Winzer, 2006). This call was strengthened in the 1970s and codified in PL 94-142 (the Education for All Handicapped Children Act) which first required SWD to be educated in the "least restrictive environment" (1975).

At its core, "operationalized, inclusive schooling aims to rid education of stubborn, long-standing inequalities through a revisualization of the organizational structures of schools" (Winzer, 2006, p. 31). However, restructuring of schools is no small feat, and inclusion remains more popular in concept than in practice due to the complexities of enacting it (Winzer, 2006). One of the most difficult logistical challenges of inclusion is the added demands SWD place on general education teachers' time, energy, and resources. SWD are an extremely diverse group, so no description can be comprehensive, but many SWD struggle academically, require longer time to process new information, have difficulty with social skills and peer relationships, and require accommodations to access materials and assessments (Hallahan, Kauffman, & Pullen, 2012). The extra pull on general educators can make it difficult for them to meet the needs of all students, both those with and without disabilities (Gerber & Semmel, 1985).

One of the most popular ways school districts have attempted to answer these increased demands is with co-teaching. Collaboration has a long history as a critical component of special education, but at first it almost exclusively occurred in separate settings away from general education classes (Friend et al., 2010). Originally passed in 1974, the education legislation PL 94-142 introduced the concept of "least restrictive environment" (LRE), emphasizing the need to avoid segregating SWD when possible. This requirement gained new traction with the

reauthorization of PL 94-142 in 1990, known as the Individuals with Disabilities Education Act (IDEA), and parent advocacy and resultant court cases have continued to expand understanding of this requirement (Hallahan et al., 2012). The argument for inclusion was particularly strengthened in 2001, when Congress passed the No Child Left Behind Act (NCLB). NCLB included requirements that all students be taught by a "highly qualified" teacher and that nearly all students, including those with disabilities, must meet the same minimum academic standards in order to graduate. In addition, if SWD failed to reach the benchmarks, schools were threatened with sanctions and the loss of federal funds (Friend et al., 2010).

Co-teaching was an intuitive response to these new requirements. It came into use in larger numbers after the passage of IDEA in the early 1990s and has expanded exponentially since NCLB (Friend et al., 2010). Co-teaching allows schools to place SWD in general education classrooms with content-certified teachers and access to the general curriculum. However, these students were still in need of individualized instruction and accommodations, so to provide this additional support, a special educator would be assigned to work in the general classroom as well.

Enactment of Co-teaching

As described above, the purpose of co-teaching is to add resources to the classroom to address the added demands placed on teachers by the inclusion of SWD and to provide a way for SWD to receive the individualized instruction they need. The ways in which those resources are used is what separates successful co-teaching from non-successful. Friend et al. (2010) expressed it this way: "The intent of co-teaching is to make it possible for students with disabilities to access the general curriculum while at the same time benefitting from specialized instructional

strategies necessary to nurture their learning" (p. 11). Experts in the field have described how this purpose should be enacted in classrooms.

Teacher roles. The common conception is that the GET should serve as a content expert, analyzing the curriculum for its essential parts, designing a logical sequence of instruction, and identifying background knowledge and skills that are required for learning a new concept or skill. The SET should serve as a learning expert, getting to know individual student needs and designing ways to adapt or modify the GET's usual methods and instruction to make the curriculum more accessible for SWD and incorporating instruction based on students' IEP goals or identified areas of weakness (e.g., Cook et al., 2011; Friend, 2015). In short, the two teachers should fill different roles in the classroom, not simply double up all the same work (Beninghof, 2016).

The way co-teaching teams can effectively plan and implement grouping models and specialized instruction is by developing a strong sense of teamwork and shared responsibility and respect. Experts in the field have proposed multiple ways to build these qualities, which generally focus around discussions prior to working together about pet peeves, classroom policies, educational philosophies, and manner of working (Dieker & Murawski, 2003; Friend, 2015; Murawski & Dieker, 2004). Another common area of focus is on co-planning for individual classes. Most recommendations are that teachers should identify instructional goals and plan for instruction, specifically noting the responsibilities and duties of each teacher (e.g., Murawski, 2012). This should ensure both teachers have input into the instruction of the class and are actively involved in implementing that instruction for students.

Grouping models. By far, the co-teaching feature that receives the most attention is grouping models. One purported benefit of co-teaching is that it reduces the student-to-teacher

ratio, allowing teachers to monitor student learning more closely and provide more immediate, individualized feedback (Sweigart & Landrum, 2015). There are six commonly identified grouping models co-teachers can use: one-teach-one-assist, one-teach-one-observe, parallel teaching, team teaching, alternative teaching, and station teaching. A brief definition and example of recommended use for each are presented in Table 1. By purposefully using and varying grouping models, co-teachers can more easily differentiate instruction and incorporate review or enrichment as needed for student achievement (Dieker & Murawski, 2003; Sweigart & Landrum, 2015).

The final part of Friend et al.'s (2010) definition of co-teaching includes a reference to "specialized instructional strategies." The intent of this specialization is to incorporate teaching practices and activities that address individual needs and that increase accessibility to the general curriculum for SWD. This necessitates that teachers plan carefully, weighing curricular demands and overall class achievement with individual student needs and remediation challenges. I address this in more detail in a later section, but there are some general ideas about how specialization can fit with general content instruction. It is not an easy task, but it is possible. For example, the special educator can add scaffolds or visual supports to assignment directions or incorporate instruction of learning strategies into the GET's presentation of new material (Beninghof, 2016). Co-teachers can also strategically use the various grouping models to group students who would benefit from a particular teaching method or assignment (Friend, 2015). If co-teaching is implemented thoughtfully and in accordance with the above recommendations, it should result in more responsive instruction and better student outcomes for all students, not just those with disabilities. In the next section, I present the conceptual model of co-teaching that drives the proposed project.

Table 1

Co-Teaching Grouping Models and Uses

Model	Definition	Used For
One-teach-one-assist	One teacher instructs the whole class on a concept while the other teacher circulates, helping students as needed.	Explicit teaching of concepts that do not tend to be too challenging for students or lessons that involve extensive guided practice.
One-teach-one-observe	One teacher instructs the whole class on a concept while the other strategically observes and collects data on a student, multiple students, or the instruction.	Collecting data on students' IEP goals or on student understanding of a concept. Teachers can also observe the class as a whole for problem-solving purposes (e.g., determine why transitions are taking so long).
Team Teaching	Both teachers instruct the whole class on a concept, teaching simultaneously.	Demonstration of a concept; debate of two sides of an issue
Parallel Teaching	The class is split in half; each teacher takes one half and provides instruction in the same or complementary topics.	Teaching topics that tend to be difficult for students; smaller group allows more frequent participation and more opportunities for teachers to provide feedback. Groups tend to be heterogeneous.
Alternate Teaching	One teacher instructs the majority of the class on a concept. The other teacher pulls aside a small group of students to provide instruction or review.	Small group of students needs additional practice to reach mastery, or teachers determine a review of prior knowledge will assist students in learning future topics. Groups tend to be homogenous.
Station Teaching	Students are split into small groups and circulate between 3-6 "stations," each with different assignments. Teachers either circulate between stations or stay with one specific station to deliver instruction.	Alternate assessments, practice with content-area discourse, engagement with a topic in multiple modalities. Stations can also include review activities or can be designed specifically for differentiation. Groups can be either heterogeneous or homogeneous.

Note: Models and definitions are adapted from Friend (2015)

Conceptual Framework of Co-teaching

Co-teaching does not operate in a vacuum; many factors contribute to the effectiveness of co-teaching relationships within a school. The individual teachers, of course, have a tremendous

impact, but contextual factors surrounding those teachers can either support or tear down those teachers' efforts. My conceptual model of co-teaching highlights the purposes of co-teaching and the relationship of key contextual factors to the eventual success of co-teaching.

The microeconomics of co-teaching. My conceptual framework for co-teaching (see Figure 2) is based on joint outcome production theory, a theory that comes from the field of microeconomics and which was described in a special education context by Gerber and Semmel (1985) and in a co-teaching specific context by Cook et al. (2011). According to joint outcome production theory, the classroom is an environment with limited resources, not only physical materials such as textbooks and desks, but "more importantly, the particular array of skill, procedural knowledge, and experiences possessed and embodied by the teacher" (Gerber & Semmel, 1985, p. 17). Focusing on this latter definition, it is clear that teachers have naturally limited time, energy, and knowledge, which in any classroom are not sufficient to fully meet the demands of every student. Thus, teachers must make decisions almost constantly about where to spend their resources (Kellems, 2014) – generally, these decisions come down to whether teachers prioritize reducing variability in student achievement (i.e., spending more resources on the lower-achieving students to bring them closer to their peers) or increasing the class mean achievement (i.e., spending more resources on higher-achieving students to raise overall scores; Gerber & Semmel, 1985).

The expansion of inclusion has further complicated this scenario by introducing SWD into the equation. The unique needs of these students raise demands on a teacher significantly, making it even more difficult for them to meet the needs of all students. The only way to attempt to balance this equation is to add more resources. As discussed earlier, many schools and school districts have opted to increase resources by instituting co-teaching, which ideally should double

the amount of teacher resources available to students (Cook et al., 2011). Presumably, the SWD do not fully double the demand, meaning the addition of a second teacher should theoretically result in a net gain of resources, allowing for specialized instruction that should result in increased achievement for all students.

This may seem to be an unnecessarily calculated approach to classrooms, but the truth is that co-teaching is an expensive proposition (Cook et al., 2011). Already cash-strapped schools are paying two teacher salaries when they could only pay one. Therefore, it makes logical sense to consider co-teaching in light of whether it produces a positive return on this significant investment; one way to assess this return is to examine "schools' ability and efforts to accommodate a range of individual differences" (Gerber & Semmel, 1985, p. 21). Theories abound about how to implement effective co-teaching, such as that co-planning is important or that co-teachers should employ multiple grouping models, but there is no research testing whether these factors actually impact students' academic outcomes.

The argument for inclusion is often a moral one (e.g., Ashton, 2014), but the argument for co-teaching is essentially a practical one – by increasing a certain type of classroom resources (i.e., teacher skill, energy, and time), schools will get a significant return on their investment in the form of higher student achievement (Gerber & Semmel, 1985). It could be argued that having highly-trained SETs spend half of their time in class "monitoring" (Harbort et al., 2007), and if the presence of the additional adult does not improve key outcomes for students (Sweigart & Landrum, 2015), co-teaching is a waste of valuable resources. However, successful classrooms are a product of many different factors, not just teacher resources. Contextual factors (presented in Figure 2 as moderators between implementation of co-teaching and its outcomes) surround teachers, some of which they have little control over but which can substantially affect their

success in co-teaching. The next two sections of this chapter describe specialized instruction for SWD in inclusive settings, which is the outcome of interest in the proposed project, and the contextual factors that are hypothesized to impact that outcome.

Specialized Instruction for SWD in Inclusive Classrooms

The question at the center of this project is what specialized instruction looks like in co-taught classrooms when it is combined with traditional general education instruction. In this section, I summarize the research on recommended instruction in inclusive classrooms which I used to construct the content of the observational instrument. Although there are many individual intervention strategies that have been tested, I focused on larger principles of instruction, specifically those associated with explicit instruction, which have a large research base proving their effectiveness for SWD (Archer & Hughes, 2011; Gersten, Chard, Jayanthi, Baker, Morphy, and Flojo, 2009; Vaughn, Gersten, & Chard, 2000). Given that one purpose of inclusion, and by extension, co-teaching is to increase access to the general education curriculum for SWD, the practices described below, which have been proven effective for SWD, should be seen with regularity in co-taught classes in which a substantial portion of students have disabilities.

Explicit instruction has been defined in various ways. In their meta-analysis of effective mathematics instruction, Gersten and colleagues (2009) calculated an effect size of 1.22 for explicit instructional practices, defined as having three essential components: a) presentation of a step-by-step strategy or plan for solving a problem, b) use of the presented plan for a specific problem type, and c) requirement that students enact the plan on their own following the teacher presentation. Ebbers and Denton (2011) describe explicit instruction as having eight requirements: a) statement of the lesson objective, b) modeling, c) examples and non-examples, d) guided practice, e) specific feedback, f) independent practice, g) teaching for generalization,

and h) “periodic cumulative review” (p. 93). I describe these and other features of explicit instruction below, structured according to the recommended lesson sequence described by Archer and Hughes (2011). One important note about the practices described in this section is that most, if not all, of them have been shown to benefit students without disabilities as well, but they are particularly important for SWD (Vaughn et al., 2000). Because of this, they are practices that should definitely be seen in co-taught classes, if not their general education counterparts. If co-teaching teams are planning lessons together, these practices are the ones SETs should be insisting upon including in the instructional plans.

Lesson Opening

Advance organizer. An explicit lesson should begin with the teacher gaining students’ attention in a ritualized way, then presenting an advance organizer for students so they understand what the rationale is for learning about this topic and what the academic learning goal is (Archer & Hughes, 2011; Ebbers & Denton, 2008). Advance organizers present information verbally and/or visually, “putting it within a more general framework” (Friend & Bursuck, 2006) and allow students to “’hook’ or ‘ground’ new knowledge within existing knowledge (Bender, 2012). The advance organizer should include information about why the skill or topic is relevant to the students, and it should “demonstrate what success criteria look like at the end of learning” (Hattie & Yates, 2014, p. 115). In a meta-analysis of special education interventions in secondary content areas, Scruggs, Mastropieri, Berkeley, and Graetz (2010) found that study aids, which included advance organizers, had an effect size of 0.94 on student achievement. They are particularly good for students who have gaps in background knowledge and may help motivate students to actively participate in their own learning (Friend & Bursuck, 2006).

Activation of prior knowledge. Hattie and Yates (2014) identified prior knowledge as being one of the most powerful predictors of acquisition of new information: "New information that cannot be related to existing knowledge is quickly shed" (p. 114). Teachers need to identify prerequisite skills required in order to master the new skill or topic during their lesson development and spend time at the beginning of class assessing whether students have those skills through a review of the material. This review needs to include activities designed to "verify that all students know how to perform" the skills (Archer & Huges, 2011, p. 26).

This step is particularly important for SWD, many of whom have deficits in working memory (Cirino, Fuchs, Elias, Powell, & Schumacher, 2013; Willcutt et al., 2013). These deficits make it difficult for students to process and work with new information because when working memory gets overloaded, "crucial information that is needed to guide the ongoing activity . . . is lost" (Gathercole & Alloway, 2013, p. 46). The more often working memory gets overloaded, the less learning occurs (Gathercole & Alloway, 2013). Therefore, one common recommendation for special educators is to design lessons and activities that reduce the load on students' working memory (Fuchs, Fuchs, Powell, Seethaler, Cirino, & Fletcher, 2008). One way to do this is to activate information in long-term memory first, thereby reducing dependence on working memory. It is essential when conducting the review that teachers use methods designed to assess every student because students with deficits in working memory are known to volunteer to answer questions and participate in group discussion less often than their peers (Gathercole & Alloway, 2013). Methods to enhance student participation are discussed in a later section.

Modeling

During the instructional part of the lesson, teachers should demonstrate how the task is done while conducting a think-aloud describing what they are doing and *why* they are doing it

using clear and consistent language. Modeling should be done as long as necessary and after an initial demonstration; it can include some student input, although the teacher should still be doing the bulk of the mental work (Archer & Hughes, 2011). The general idea of the instructional sequence is that the teacher gradually releases the academic load to the students in stages as he or she assesses whether they are ready for more (Rupley, Blair, & Nichols, 2009). Teachers also need to provide a range of purposefully-chosen examples and non-examples to demonstrate the topic or skill, which helps students apply the skill to different contexts (Friend & Bursuck, 2006). Hattie and Yates (2014) suggest that all learners benefit from instruction that is multi-modal and that the best learning happens "when words and images are combined" (p. 115).

Guided Practice

During guided practice, students are responsible for doing the majority of the academic work as the teacher prompts them with reminder cues. The reminders should be designed to cue students to do their own think alouds as they work (Brownell, Smith, Crockett, & Griffin, 2012), so they could be questions like "What will you do next? Why?" Cues or prompts can be physical, verbal, or visual, depending on the task, and they should be gradually removed as students gain proficiency (Archer & Hughes, 2011). The goal for guided practice is for students to experience high levels of success (Archer & Hughes, 2011), so teachers must give frequent feedback to students during this process and monitor their understanding closely. If they find themselves having to give extensive amounts of corrective feedback due to student misunderstandings or mistakes, they "should consider remodeling" (Brownell et al., 2012).

Independent Practice

During independent practice sessions, students work independently to solve problems or complete tasks. These activities should be student-driven, but teachers must closely monitor

students' progress to ensure they are not practicing procedures incorrectly. Teachers, in fact, should not provide independent practice opportunities until they are certain students will be able to perform them with a high level of accuracy and success (Archer & Hughes, 2011), and the independent practice activity should match the examples provided during modeling and guided practice as closely as possible (Brownell et al., 2012). During independent practice, teachers should observe and provide feedback to students as they work. This is important because SWD often need more practice opportunities than other students, so they may not have reached the same level of proficiency during guided practice as the other students and may need more instructional time; re-learning is also difficult for them, so it is essential to ensure they are practicing the skills correctly so they do not internalize poor habits or incorrect techniques (Friend & Bursuck, 2006).

Lesson Closing

Teachers should end class with a short but clear closing. This should begin with a quick review of the material students learned in the lesson and end with a preview of what will be accomplished the next day (Archer & Hughes, 2011). If independent practice is being assigned for homework, this assignment should take place during the closing as well.

Other Practices

Other practices I collected information on during observations are instructional practices that are known from previous observations to occur in classrooms and therefore need to be included in descriptions of instruction. These practices are not considered part of explicit instruction; however, there are methods of implementing them that make them more effective for SWD. Those methods are discussed in this section.

Cognitive strategy instruction. Not only should teachers provide explicit instruction to students on new concepts, they should also teach students about general strategies (also referred to as heuristics) that can be used for a variety of different problems (Friend & Bursuck, 2006; Fuchs et al., 2008; Gersten et al., 2009; McKenna et al., 2015). The goal of teaching cognitive strategies "is teaching students how to learn rather than the mastery of specific content information" (Gajria, Jitendra, Sood, & Sacks, 2007). Cognitive strategy instruction has strong evidence of effectiveness, receiving high effect sizes (all above .75) in meta-analyses that have been conducted across content areas (Gajria et al., 2007; Gersten et al., 2009; Hughes, Witzel, Fries, & Kanyongo, 2014; Jitendra, Edwards, Sacks, & Jacobson, 2004). In fact, its effect sizes are some of the strongest of any of the practices described in this section, making cognitive strategy instruction particularly important for teachers to incorporate in co-taught classrooms. Examples of cognitive strategies include techniques for approaching word problems, drawing diagrams, identifying the main idea, self-regulated strategy development (SRSD) for writing, and semantic feature analysis. Skilled teaching of cognitive strategies can increase students' self-regulation of their learning and can equip them to tackle related problems or situations in other settings (Soltero-González & Klingner, 2010).

Discussion. Ford-Connors and Paratore (2015) conducted a review of research literature on vocabulary instruction, including productive use of discussion for learning. Based on this review, they identified characteristics of discussion that make them particularly useful for student learning. One of these is that there are ample opportunities for student talk created by open-ended questions. Another is extensive uptake of student responses by teachers, meaning they refer back to what students have said, use students' language in future questions, and

encourage students to respond to one another. Questions should be planned so the discussion has a clear goal, and the questions should also be authentic to the topic and to students' experiences.

Group work. Whole-group and teacher-led instruction has been shown to be the most effective for SWD when learning new concepts (Friend & Bursuck, 2006), but there are times when SWD benefit from working with their peers as long as the group activities are carefully structured and monitored. When creating group work assignments, teachers should ensure there are structures in place that require individual participation and hold individual students responsible for their contributions (Bryant, Smith, & Bryant, 2008). Directions need to be clear, and if they are complex, teachers should provide visual supports to help students remember and follow them (Gathercole & Alloway, 2013). Teachers should closely monitor students during the activity to ensure they are participating and to assess their understanding, and in the end teachers should pull the class together to debrief what they accomplished and learned from the activity (Bryant et al., 2008).

Review. Teachers need to incorporate extensive opportunities for SWD to practice what they have learned. This is separate from the independent practice that occurs immediately after instruction. Students also need distributed review opportunities, which are short, direct activities to refresh their understanding (Archer & Hughes, 2011). They also require cumulative reviews that are interwoven with new learning to help them with retention and to help them transfer knowledge to new contexts and differentiate when certain types of knowledge are called for (Archer & Hughes). As with most other instructional practices, SWD require extensive interaction with teachers, including multiple opportunities to respond and frequent specific corrective feedback during review. Because these are so important to SWD's learning, they are discussed separately below.

Interactions

Opportunities to respond. During learning and review, SWD require multiple opportunities to respond (OTRs) to the material. OTRs are opportunities for students to "say, write, or do things" (Archer & Hughes, 2011, p. 131), and they have multiple benefits. They increase student engagement and reduce negative behavior; they also allow teachers to closely monitor student learning and understanding (Archer & Hughes, 2011; MacSuga-Gage & Simonsen, 2015). There are multiple ways teachers can increase students' rate of response, including incorporating group responding techniques like choral responses or use of response cards or using peer responding through activities like think-pair-share (Brownell et al., 2012). For the purposes of this project, I focused on teacher-directed OTRs. In a review of research on teacher-directed OTRs, MacSuga-Gage and Simonsen (2015) found that response cards were more effective than waiting for individual volunteers in increasing student academic outcomes and that more frequent rates of OTRs resulted in higher student achievement. Based on this review, they recommend a rate of 3.00 to 5.00 OTRs per minute as being the most beneficial for student learning, with lower rates being more realistic when using techniques like response cards. They also noted that most of the included research took place at the elementary level, so guidelines for secondary instruction may be different.

Feedback. The importance of specific corrective feedback (FB) was discussed briefly earlier with regard to independent practice. In a review of research, FB was associated with a strong effect size of 0.73 (Hattie & Yates, 2014). At minimum, FB should indicate whether a student's response was correct or not. However, often more specific FB is useful to indicate *why* the response was correct or incorrect, particularly when student responses are hesitant or incorrect for any reason (Archer & Hughes, 2011). The latter essentially uses FB as another

opportunity for instruction, and this type of FB should continue until students master the learning goal (Friend & Bursuck, 2006). Generalized praise, such as "Good work" should be minimalized in favor of FB that is specific and corrective. It should "be tied to reality, justified by the context, and appreciated by the recipient" (Hattie & Yates, 2014, p. 225). FB used this way helps students self-regulate their learning more effectively and helps them bridge the gap between where they are currently and the learning goal (Hattie & Yates, 2014).

Research has shown that the practices described above are effective in improving academic outcomes for SWD. Therefore, in a co-taught class in which a large percentage of the students have disabilities, teachers should theoretically be using more of them than they necessarily would in a general education class. In my conceptual framework (Figure 2), these practices would be considered part of specialized instruction, the mechanism through which co-teaching results in higher academic outcomes for students. However, there are moderating factors that may interfere with the extent to which co-teachers are able to plan and implement this type of specialized and explicit instruction, including the way they are paired, the amount of common planning time they have, and the types of students who are placed in co-taught classrooms. The next section discusses the research on implementation of co-teaching and those potential moderating factors

Research on Co-Teaching

According to research studies on co-teaching, the realities of co-teaching in action are not always in line with theory. Research on co-teaching generally has focused on three areas: teacher roles and relationships, school-level logistical context, and student outcomes (Friend et al., 2010). This section presents the research base on each of these three areas.

Teacher Roles and Relationships

In almost all studies, even those with supposedly strong co-teachers, the GET is seen as the one in charge, and the general curriculum dictates the pace and content of the class (Ashton, 2014). We know also the predominant co-teaching model used by teams is the one-teach-one-assist model, with the GET in the lead teaching role and the SET serving as an assistant, helping students stay on task or even performing clerical or housekeeping duties in the classroom (Ashton, 2014; Bessette, 2008; Brusca-Vega et al., 2011; Fenty & McDuffie-Landrum, 2011; Gürgür & Uzuner, 2010; Harbort et al., 2007; King-Sears et al., 2014; Moin et al., 2009; Ploessl & Rock, 2014; Rice & Zigmond, 2000). There is some indication this might be more true of secondary classrooms than elementary, probably due to the special educator's lack of comfort with content (Bessette, 2008; Rice & Zigmond, 2000; Scruggs et al., 2007; Weiss & Lloyd, 2002).

Regarding instruction in co-taught classes, we have less information, but we can describe general patterns. Most instruction in co-taught classes is delivered whole-group, with very little peer interaction, group work, or behavioral instruction (Bryant Davis et al., 2012; Cook et al., 2011; Fenty & McDuffie-Landrum, 2011). Murawski (2006) found no significant differences in instruction used across co- and solo-taught high school English classrooms. One study's (Dieker, 2001) findings contradicted these observations, but the participants were volunteers for the study who had chosen to co-teach and were nominated by their administrators, so they were arguably not demonstrative of co-teachers as a whole.

Despite these discouraging findings about implementation of co-teaching, multiple studies report that teachers have positive associations with it; they believe it is beneficial for their teaching practice and for all students in the classes as well (Austin, 2001; Brusca-Vega et al., 2011; Cook et al., 2011; Cramer & Nevin, 2006; Friend et al., 2010; Keefe & Moore, 2004;

Moin et al., 2009; Rice & Zigmond, 2000; Walther-Thomas, 1997). One caveat is that most SETs believe maintaining a continuum of services for SWDs is important, that co-taught settings are not appropriate for all SWDs (Scruggs et al., 2007).

School Logistical Context

Classroom-level factors. Classroom-level factors may influence teacher implementation of specialized instruction, largely through aspects of the classroom that may increase or decrease the demand placed on teachers. The classroom factor that appears less frequently in the research than scheduling of common team planning time (discussed below) but is still likely to be important is the distribution of students to co-taught classrooms. In one large study, co-teachers expressed the need for student schedules to be carefully planned both to cluster SWD to allow for efficient use of special educators' time and also "to ensure that heterogeneity was maintained in classrooms and that adequate support could be provided for students and teachers" (Walther-Thomas, 1997, p. 403). Putting multiple SWD in the same class enabled special educators to focus their efforts, but an excessive number of students with unique difficulties in the same class placed undue burden on the teachers and undermined the school's inclusion efforts. Researchers noted that to ensure the ideal proportion of students, scheduling often had to be accomplished by hand rather than by use of the computer, making it a source of resistance from other staff members and a prime example of the importance of administrator support (Nierengarten, 2013; Walther-Thomas, 1997).

School-level factors. School-level factors are the supports and structures administrators put into place in relation to co-teaching. Most of these center on administrators' decisions about scheduling and evaluating co-teaching teams. Research has not experimentally established the importance of these factors, but qualitative studies indicate they can greatly influence at least the

perception of co-teaching's success or failure in a school. Qualitative data support the idea that administrators' knowledge, support, and beliefs play an important role in the success of co-teaching (Kamens, Susko, & Elliott, 2013; Moin et al., 2009; Rice & Zigmond, 2000; Scruggs et al., 2007; Walther-Thomas, 1997). This section presents research and theory on the most commonly discussed factors: common planning, pairing, collaboration, training, and evaluation.

*Common planning***.** Nearly every study on co-teaching emphasizes the need for shared planning time, and teachers complain often of not having enough time to plan with their partners (Austin, 2001; Fenty & McDuffie-Landrum, 2011; Hang & Rabren, 2009; Scruggs et al., 2007; Walther-Thomas, 1997). This is complicated by program policies that assign SETs to work with multiple (i.e., up to eight) GETs in the same semester and sometimes in more than one class during the same block (Weiss & Lloyd, 2002).

When teachers do have common planning time, they report that it strengthens their communication and working relationships as well as the quality of instruction they can provide. In a longitudinal study of implementation of co-teaching in elementary and middle schools, teachers reported that finding planning time was one of the most difficult aspects of co-teaching. They said they needed about one hour of common planning per week, although this time decreased as partners continued to work together over multiple years (Walther-Thomas, 1997). There is some evidence co-teachers will find time to plan together even if they do not have common planning time, but this can add to their stress level and impacts their other responsibilities (Rimpola, 2014).

Thoughtful pairing. In studies of co-teachers, the majority of them report that they did not volunteer to work in inclusive classrooms; they were assigned to it by administration (Austin, 2001; Moin et al., 2009). Assignments most often were made on the basis of schedules and

credentials, with consideration of how well the two people might work together as a secondary concern (Kamens et al., 2013; Kellems, 2014). This is contrary to teacher opinion, which holds that co-teaching should be voluntary and that teachers should have a say in who their partner is (Rice & Zigmond, 2000; Scruggs et al., 2007). In a review of the research on co-teaching, Pugach and Winn (2011) found teachers who volunteered to co-teach were more satisfied, had more respect for their partners, and reported fewer arguments over ownership than non-volunteers.

Moin et al. (2009) suggested two ways supportive administrators aid co-teachers are by scheduling common planning time and keeping successful pairs together multiple years in a row so they can build their relationship. There is evidence that lack of a strong professional relationship can result in ambiguity in teacher roles and lack of commitment to the success of co-teaching (Gürgür & Uzuner, 2011). On the other hand, strong relationships can lead to deeper reflection on teaching, more thoughtful co-planning, and willingness to make changes in instruction (Embury & Dinnesen, 2012).

Collaboration. The presence or absence of a collaborative climate and an atmosphere in which all staff take ownership for all students in a school, rather than assuming SWD are the sole responsibility of special educators, could potentially impact co-teaching. Beginning SETs report that poor relationships with their general education colleagues can add significant levels of stress to their jobs. One of the most common concerns they expressed in studies on induction was the challenge of working with GETs who were resistant to SWD being in their classes (Gehrke & Murri, 2006; Jones, Youngs, & Frank, 2013). Many found the task of advocating for their students by building supporting relationships with GETs to be much more challenging than they

had expected due to widespread reluctance among GETs to work collaboratively (Youngs, Jones, & Low, 2011).

Administrative support for collaboration is essential in helping SETs feel connected to the rest of the faculty. Without it, SETs often reported feeling isolated and unsupported, leading to feelings of being overwhelmed and unsure what was expected of them (Billingsley, Carlson, & Klein, 2004; Guteng, 2005; Schlicte, Yssel, & Merbler, 2005; Youngs et al., 2011). On the contrary, schools with fewer scheduling problems and issues providing classroom support "did not view co-teaching as an enterprise belonging solely to special education" (Walther-Thomas, 1997, p. 403). Walther-Thomas (1997) found that in schools where district administrators were actively involved in the implementation of inclusion and co-teaching initiatives, these initiatives were maintained and even strengthened over the course of the three-year study. When district administrators were not involved, the initiatives tended to flounder and shrink.

Training. Training for co-teachers is vital because effective co-teaching "requires teachers to step out of traditional teaching roles and reconceptualize their responsibilities" (Cook et al., 2011, p. 155). This shift in thinking and approach to teaching does not always come naturally to teachers; therefore, explicit training is often needed (Friend et al., 2010; Moin et al., 2009). Unsurprisingly, teachers of all kinds who reported receiving more pre-service and/or in-service training on co-teaching also reported more confidence, positive attitudes, and interest in this service model (Pancsofar & Petroff, 2013).

However, most teachers have not received much training on co-teaching (Scruggs et al., 2007), and veteran GETs are the least likely to have had such training (Pancsofar & Petroff, 2013). There is some indication that even when teachers have the time to co-plan, they either do not use it or do not have the skills to do it effectively (Austin, 2001; Bryant Davis et al., 2012;

Gürgür & Uzuner, 2011), making the value of providing co-planning time questionable unless related training is provided as well. Unfortunately, staff development is often not seen as an essential component of implementing a co-teaching initiative. In a survey involving 24 school districts, Nichols et al. (2010) found all 24 had implemented co-teaching, but only three of them provided staff development prior to initiating co-teaching in their district. Of those three, only one included school administrators in the staff development. Teachers who have co-taught for a few years are often looked at as "experts" in co-teaching and are asked to provide training for their coworkers, but some of these teachers were uncomfortable with this role, indicating there was a lot they did not know about co-teaching and would like more training themselves (Walther-Thomas, 1997). Topics teachers have reported wanting extra training on include: co-planning, co-teaching, writing and monitoring IEPs, incorporation of accommodations, and communication skills to strengthen teamwork (e.g., conflict resolution, problem solving; Walther-Thomas, 1997; Wischnowski, Salmon, & Eaton, 2004). This lack of focus on training is unfortunate, but there is some evidence that individual coaching with teams can result in significant changes in instructional practice (Embury & Dinnesen, 2012). Without this focus on training, some have concluded that districts are only using co-teaching as a way to comply with legal requirements rather than a way to improve student achievement (Nichols et al., 2010).

Evaluation. Another way administrators might be able to communicate the importance of collaboration is through constructive evaluations that value collaborative skills. This factor has not been specifically studied in the research on co-teaching, but given what we know about the importance of social relationships, Johnson (2015) theorizes that competitive evaluative methods (e.g., value added models) that assess teachers by comparing them to each other individually might detract from collaboration and a desire or interest among faculty members to work

together more generally, which could only have negative impacts on the strength of co-teaching relationships.

Outcomes of Co-teaching

As noted above and in the conceptual framework for this study (Figure 2), if co-teaching is implemented in accordance with expert recommendations, it should produce a net gain in resources, resulting in specialized instruction and improved student achievement for all students, not just SWD. Teachers should be able to more closely monitor students' progress and provide more frequent and individualized feedback. Research on co-teaching does not provide strong evidence of outcomes (Cook et al., 2011; Friend et al., 2010), but we can draw some preliminary conclusions from the work that has been done.

Measures. The majority of studies on co-teaching have relied on field notes taken from observations (e.g., Fenty & McDuffie-Landrum, 2011; Mastropieri, Scruggs, Graetz, Norland, Gardizi, & McDuffie, 2005; Moin et al., 2009; Murawski, 2006; Weiss & Lloyd, 2002). Other common measures are other qualitative tools such as interviews or focus groups, often in combination with observations or surveys (e.g., Boudah, Schumacher, & Deshler, 1997; Brusca-Vega et al., 2011; Casale-Giannola, 2012; Dieker, 2001; Embury & Dinnesen, 2012; Embury & Kroeger, 2012; Gerber & Popp, 1999; Keefe & Moore, 2004; Kellems, 2014; King-Sears et al., 2014; Moin et al., 2009; Weiss & Lloyd, 2002). One researcher combined teacher interviews with student drawings of their co-teachers (Bessette, 2008). Some researchers have created their own observation instruments or surveys (Austin, 2001; Conderman & Johnson-Rodriguez, 2009; Hang & Rabren, 2009; Harbort et al., 2007; Kamens et al., 2013; King-Sears & Bowman-Kruhm, 2011; Mageira & Zigmond, 2005; Nichols et al., 2010; Pancsofar & Petroff, 2013; Wilson & Michaels, 2006; Wischnowski et al., 2004). Others included document reviews of materials such

as classroom activities or teacher lesson plans (Bryant Davis et al., 2012; Walther-Thomas, 1997; Wischnowski et al., 2004).

Very few studies have used validated quantitative instruments. Two studies used classroom assessments (Almon & Feng, 2012), one of which also incorporated two measures of teacher self-efficacy (Rimpola, 2014); another used peer ratings and three student and teacher questionnaires related to perceptions and self-concept (Vaughn, Elbaum, Schumm, & Hughes, 1998); and a third measured student achievement using state standardized test results (Brusca-Vega et al., 2011). Surprisingly, only two single-case studies could be found that counted actual rates of occurrence of target behaviors (Ploessl & Rock, 2014; Scheeler, Congdon, & Stansbery, 2010). From the studies using these measures, it is possible to draw some general conclusions about co-teaching in practice, but there is still much that is unknown.

Teacher and student perspectives. In contrast to the findings that co-teaching is often not enacted in accordance with theory, most students in co-taught classes reported liking that setting. They said it helped them be more organized, improved their grades, and allowed them to get help more quickly. The only negatives reported were that it could be confusing when teachers disagreed with each other and that they could not get away with things because someone was always watching (Gerber & Popp, 1999; King-Sears et al., 2014; Moin et al., 2009; Scruggs et al., 2007; Wilson & Michaels, 2006). One study found contradictory information from SWDs, who said they did not receive individualized instruction in co-taught classrooms and valued at least having some access to small group or one-on-one instruction (Leadfstedt, Richards, LaMonte, & Cassidy, 2007). This finding deserves further study.

Student achievement. Findings on academic or behavioral outcomes for students are few and often mixed; in other words, there is little conclusive about them (Friend et al., 2010). A

recent synthesis of quantitative and qualitative research concluded that there is not enough evidence at this point to call it an evidence-based practice but not enough negative evidence to say it is definitely not (Cook et al., 2011). There are very few studies on student outcomes of any kind, and even fewer high-quality ones.

Conflicting ideas on teachers' roles. The focus for years in co-teaching implementation was on ensuring SETs were respected equally with GETs, and this has led to the notion that "good" co-teaching is when both teachers lead whole-group instruction about the same amount of time (Friend, 2015). This often means GETs and SETs are doing essentially the same job, and in fact, many administrators believe that in an ideal co-taught classroom, they should not be able to tell from observing which teacher is the SET and which is the GET (Beninghof, 2016; Kamens et al., 2013). Experts in the field are pushing back on that idea, arguing that a co-taught classroom "needs to be a place where new professional identities are conceptualized" (Ashton, 2014, p. 59) and in which "co-teachers are redefining the professional relationship" (Friend, 2015, p. 21). The problem is this is a very different way of viewing co-teaching than has been seen in practice up to this point. This study does not look specifically at the roles the two teachers play in the classroom, but rather at the instruction they provide for their students, which is something that has received much less attention in the literature and arguably could make more of an impact on students' academic outcomes.

Present Study: Research Questions

This project compared high school instruction in three settings: general education, co-taught, and (to a lesser extent) self-contained. It also described school-level contextual factors surrounding co-teaching in the participating schools to provide a larger context in which to place the instructional comparisons. As discussed above, two factors theorized to impact the successful

implementation of co-teaching in classrooms are the roles teachers take on within the class and the purposeful use of the varied grouping models presented in Table 1. Therefore, I collected data on the enactment of these two factors in the observed co-taught classrooms in the course of the observations to descriptively connect the extent of their enactment to the intended outcome of specialized instruction.

Other factors theorized to impact the successful implementation of co-teaching are school-level logistical supports. These include how co-teachers are paired, how teacher and student schedules are created (i.e., whether special educators work with multiple general educators, whether co-teachers have common planning time, and whether student distributions are accounted for). I collected information on these potential moderators by interviewing three administrators who oversaw co-teaching at the participating school and by collecting scheduling information through a teacher questionnaire (see Appendix A for administrator interview questions and Appendix B for teacher questionnaire).

One important intended outcome of co-teaching is that students in co-taught classes receive specialized instruction blending evidence-based practices of special and general education and incorporating instruction designed to meet the specific needs of the SWDs in the classes. I collected data on this intended outcome through observations of instruction. I observed not only the co-taught classes themselves but also corresponding solo-taught classes, both the general education course taught by the general educator alone and the self-contained class taught by the special educator alone (if there was one). By comparing instruction across settings, I can better describe the extent of specialization and enhancement being provided in the co-taught classroom.

Research Questions

1. What does instruction look like in co-taught high school classrooms?
    a. How is it different from or similar to instruction in solo-taught classes taught by the general and special educators?
    b. To what extent is the instruction in co-taught classes enhanced or specialized for SWD?
2. What are the school-level structural factors surrounding co-teaching?
    a. How are co-teachers paired and scheduled?
    b. How are students assigned to co-taught classes?
    c. How are co-teachers trained and evaluated?
3. What teacher-, classroom-, and school-level factors are related to observed patterns of instruction in general education and co-taught classes?
    a. What is the relationship between teacher factors (e.g., self-efficacy, experience, attitudes, relationships) and their instruction in co-taught classrooms?
    b. What is the relationship between classroom factors (e.g., percentage of students with disabilities, number of students, types of disabilities) and teachers' instruction in co-taught classrooms?
    c. What is the relationship between the presence of supportive school-level factors and the level of specialization in co-taught classes as compared to solo-taught classes?

CHAPTER III: METHODOLOGY

This study employed a convergent mixed methods design, with quantitative, qualitative, and combined methods. In designing the study, I employed the definition provided by Johnson, Onwuegbuzie, and Turner (2007), in which mixed methods research "is the type of research in which a researcher . . . combines elements of qualitative and quantitative research approaches . . . for the broad purposes of breadth and depth of understanding and corroboration" (p. 123). I identify two primary rationales for selecting a mixed methods design: triangulation to increase the validity of my results, and complementarity to "increase the interpretability and meaningfulness of results by elaborating, enhancing, illustrating, and clarifying the results from one method with the results from the other method" (Greene, Caracelli, & Graham, 1989, p. 259). The use of varied data sources allows for triangulation of findings in that I collected field notes and Classroom Teaching (CT) Scan data from class observations, and I can use observations of planning sessions and interviews to explore inconsistencies. Collection of interview data also allows me to enhance and elaborate on findings from classroom observations by adding context and purpose for the instruction provided by teachers.

More specifically, within the field of mixed methods, I used a concurrent (QUAN + QUAL) design, in which I collected the qualitative and quantitative data at the same time and compared and merged the findings to allow for deeper, broader conclusions (Plano Clark &

Ivankova, 2016). One advantage of concurrent designs is that they "can produce well-validated and substantiated findings" through the use of complementary data (Plano Clark & Ivankova, 2016, p. 120). The study design is portrayed visually in the diagram in Figure 3. In this chapter, I explain how I collected and analyzed the data for this project.

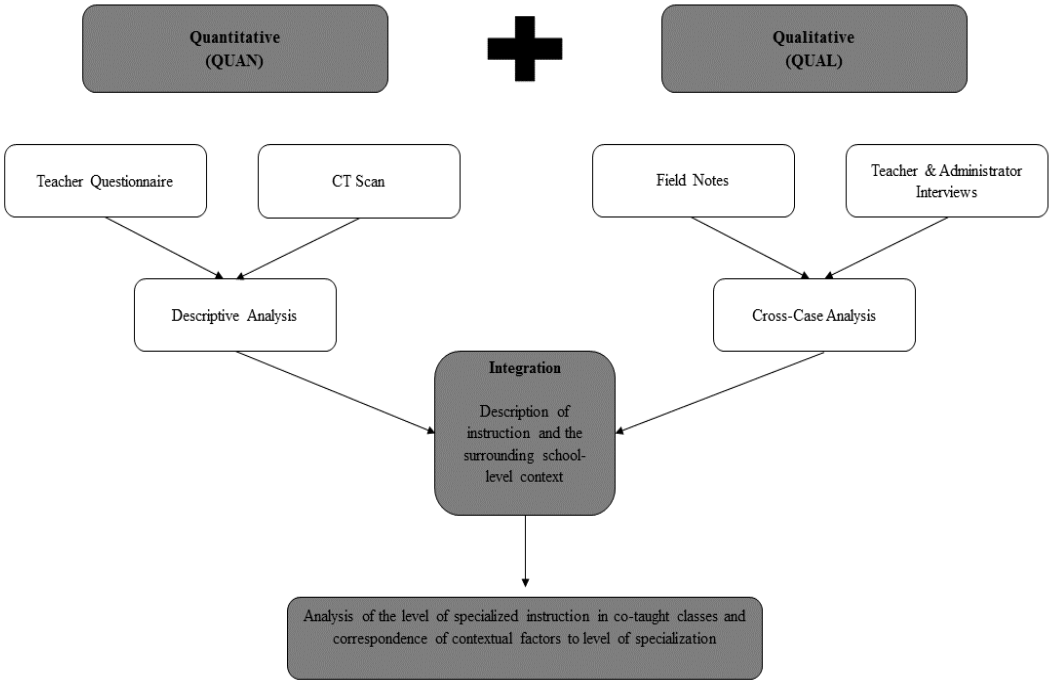

Figure 3. Procedural diagram of research activities

Data Collection

The data for both methodologies were collected simultaneously over the course of the fall semester 2016. All data were stored to U.Va. Box and restricted so only necessary project personnel were able to access it.

Sample

The participants for this study consisted of 10 teams (20 teachers) who co-taught in high school content area courses (see Table 3 for participant information). After receiving approval from U.Va's IRB, I contacted school district administrators across the central part of the state to

explain the project and request consent to approach school administrators. I secured such approval from two districts and subsequently received permission from two high schools, one in each district, to recruit teachers. I then scheduled meetings at each school with all the co-teachers to present the details of the study and request their participation. Teams that agreed to participate completed consent forms. Initially 11 teams agreed to participate, but I later had to drop one team from the study because I was unable to conduct sufficient observations due to teacher absences.

To be included in the study, participants had to meet the following two criteria: a) both teachers were either fully or provisionally licensed in their respective areas (i.e., the content area and special education); and b) one or both of them taught the same content in a solo-taught class. The final sample was composed of two English, two mathematics, three social studies, and three science teams. Demographic information about the participating teachers is presented in Table 2. (All names of schools and teachers are pseudonyms to protect identities; teachers selected their own pseudonyms.)

I also interviewed three administrators who identified themselves as having supervisory roles over the implementation and evaluation of co-teaching in their schools: two from Palladia (an assistant principal and a lead special education teacher) and one from Independence. The administrator from Independence, Carter Morrie, was a history teacher at Independence before becoming assistant principal. She had co-taught with one of the teachers in the sample, Betty Smith. At the time of this study, she was pursuing her doctorate in educational leadership and planned to study administrative approaches toward co-teaching for her dissertation work. The assistant principal at Palladia, Sarah McCarthy, had formerly worked as a special education teacher at Palladia, then had left to teach general education math in a neighboring district. After a

year there, she moved to a position with her state Department of Education and concurrently received her doctorate in Curriculum and Instruction before returning to Palladia. The lead special education teacher at Palladia, Julia Dickinsen, had worked at Palladia for more than 30 years. She was a special education teacher there and served as the district's first co-teacher in the late 1980s before becoming the lead teacher in the mid 1990s. As lead teacher, she oversaw the special education department and reported directly to central office rather than the building administration. I opted to interview both Ms. McCarthy and Ms. Dickinsen because they served complementary roles in supervising the co-teachers at Palladia.

Setting

Palladia and Independence had similar demographics (see Table 2). They were both rural districts with a majority White/ Caucasian student body.

Table 2

School Information

School	Enrollment	Economically Disadvantaged	% Students with Disabilities	% White
Palladia	1,455	14.4%	10.8%	86.7%
Independence	1,246	30.0%	14.8%	67.8%

Note: Enrollment information is based on 2016-2017 enrollment data obtained from the state's Department of Education website.

Table 3

Participant Information

Team	Subject Taught	School	Teacher	General/ Special Education	Age	Gender	Race/ Ethnicity	Years Teaching	Years Co-teaching	License
E-1	English 10	Palladia	Tess Durbeyfield	General	38	F	White	16	7	Full
			Parsnip Barnstable	Special	38	F	White	11	5	Full
E-2	English 10	Palladia	Nate Dominico	General	*	M	White	3	3	Full
			Gaptooth Fish	Special	62	F	*	10	10	Full
M-1	Algebra I	Independence	Bailey Hughes	General	52	F	White	5	2	Full
			Minerva Sprout	Special	36	F	White	9	8	Full
M-2	AFDA**	Palladia	Sue Hills	General	54	F	White	29	19	Full
			Jessica Fletcher	Special	40	F	White	14	11	Full
H-1	World History II	Independence	Claire Fraser	General	34	F	White	13	4	Full
			Betty Smith	Special	52	F	White	9	8	Full
H-2	US History	Palladia	Daniel Smith	General	34	M	White	11	11	Full
			Jake Kelly	Special	46	M	White	19	15	Full
H-3	US History	Palladia	Owen Gregory	General	47	M	White	14	13	Full
			Erwin Helm	Special	44	M	White	14	14	Full
S-1	Earth Science	Palladia	Reese Roberts	General	37	M	*	9	5	Full
			Michael Jordan	Special	34	M	White	9	9	Full
S-2	Earth Science	Palladia	Dawn Beach	General	49	F	White	23	20	Full
			Taylor Jones	Special	23	F	White	2	2	Provisional
S-3	Earth Science	Independence	Mr. Brian	General	37	M	White	11	8	Full
			Helen Lair	Special	24	F	White	2	2	Full

* No response/ Prefer not to respond

** Algebra Functions and Data Analysis

Instrumentation

Quantitative data. Quantitative data were collected though a teacher questionnaire and classroom observations of teaching using a quantitative instrument.

Teacher questionnaire. The questionnaire consisted of questions about the teachers' demographic and contextual information (e.g., number of years teaching, subjects taught). In addition, teachers responded to questions about their certification (level and subject areas), how many co-teachers they work with, planning for their co-taught class, including whether they have common planning time scheduled and whether or not they plan together. These data were used to establish representativeness of the sample and provide additional context about the school environments in which the teachers worked.

Additionally, the questionnaire included two sets of questions designed to capture teachers' perceptions of their self-efficacy and the collective responsibility in their schools for students with disabilities. Teacher self-efficacy is defined as "a judgment of [a teacher's] capabilities to bring about desired outcomes of student engagement and learning" (Tschannen-Moran & Woolfolk Hoy, 2001). The self-efficacy questions were taken from the Teacher Self-Efficacy Scale – Short Form (TSES; Tschannon-Moran & Woolfolk Hoy, 2001). The TSES Short Form consists of 12 statements that teachers rate according to their belief about how much control they have over different scenarios with on a Likkert Scale of 1 (Nothing) to 9 (A Great Deal). The TSES produces an overall self-efficacy score that has been positively correlated with other measures of self-efficacy.

The questions on collective responsibility were adapted from items used in a previously-conducted study looking at collective responsibility among general education teachers (Jones, Youngs, & Frank, 2013; Qian, Youngs, & Frank, 2013). The five items on the original scale

were adapted slightly in terms of wording, and two additional questions were added that referred specifically to students with disabilities. The full questionnaire is included in Appendix B.

Classroom Teaching (CT) Scan. This section details the functionality of the observation instrument the Classroom Teaching (CT) Scan and how it was used for this project. Its aim is to narratively describe what teachers are doing rather than rate the quality of their teaching with overall scores. The CT Scan falls under the umbrella of a cross-content observational tool because it is designed to be used in any content area. Although it can be used in both general and special education classrooms, it was initially conceived as a tool for inclusive classes and specifically privileges instructional practices known to be evidence-based practices for SWD. The following paragraphs present the Assessment Framework of the CT Scan and discuss its main constructs, specifically in relation to this proposed project.

Conceptual framework. In the conceptual framework for the CT Scan, the classroom is portrayed as a structural building (see Figure 4), which functions as a metaphor for components influencing students' academic success. The framework includes three conceptual factors that affect student learning: instructional practices, student-teacher relationships, and environmental factors. Instructional practices, such as strategies, methods, delivery, and assessment, serve as the structure holding the classroom together and making it strong. From the research literature, we know some instructional practices are more effective for certain types of students (described in Chapter II). It follows that without knowledge and skill to implement these practices, teachers will be less effective in increasing student achievement than they could otherwise be.

Another vital factor to the success of a classroom is teacher-student relationships; if a teacher uses effective practices but is not able to build positive relationships with students, their instruction, no matter how strong, will likely not be as effective as it could be. To extend the

above metaphor of the classroom as a building, student-teacher relationships would form the center, or core of the building, around which a strong structure of instructional support is built. Without that center, the classroom may be strong, but ultimately it is empty and will even fall flat. Teachers who are able to build strong relationships with students need to also be able to provide that structure of effective practices.

A third factor influencing success is the environment surrounding the classroom. This environment has two pieces – the school environment as a whole and the students' home environment. Just as a building cannot influence what happens outside in the atmosphere around it, teachers often have little, if any, control over these environmental spaces, and what happens in these spaces can either be positive or negative. However, architects can build features into a structure to help it withstand some of the outside pressures and take advantage of natural supports. Strong relationships and use of effective instructional practices can do the same, helping mitigate difficulties caused by negative environmental features and building on the positive ones.

The CT Scan is designed to descriptively capture the first of these three factors, instructional practice. This is not to belittle the importance of the others – in order to capture the greatest detail, it is necessary to limit the scope. In addition, there are already other instruments designed to specifically evaluate teacher-student relationships and school climate (e.g., the Classroom Assessment and Scoring System, the Classroom Climate Survey), and the CT Scan would have little to add to those. Instruction, however, lacks a sufficiently detailed measure, particularly one that can be specifically designed to use in special education settings and is descriptive rather than evaluative.

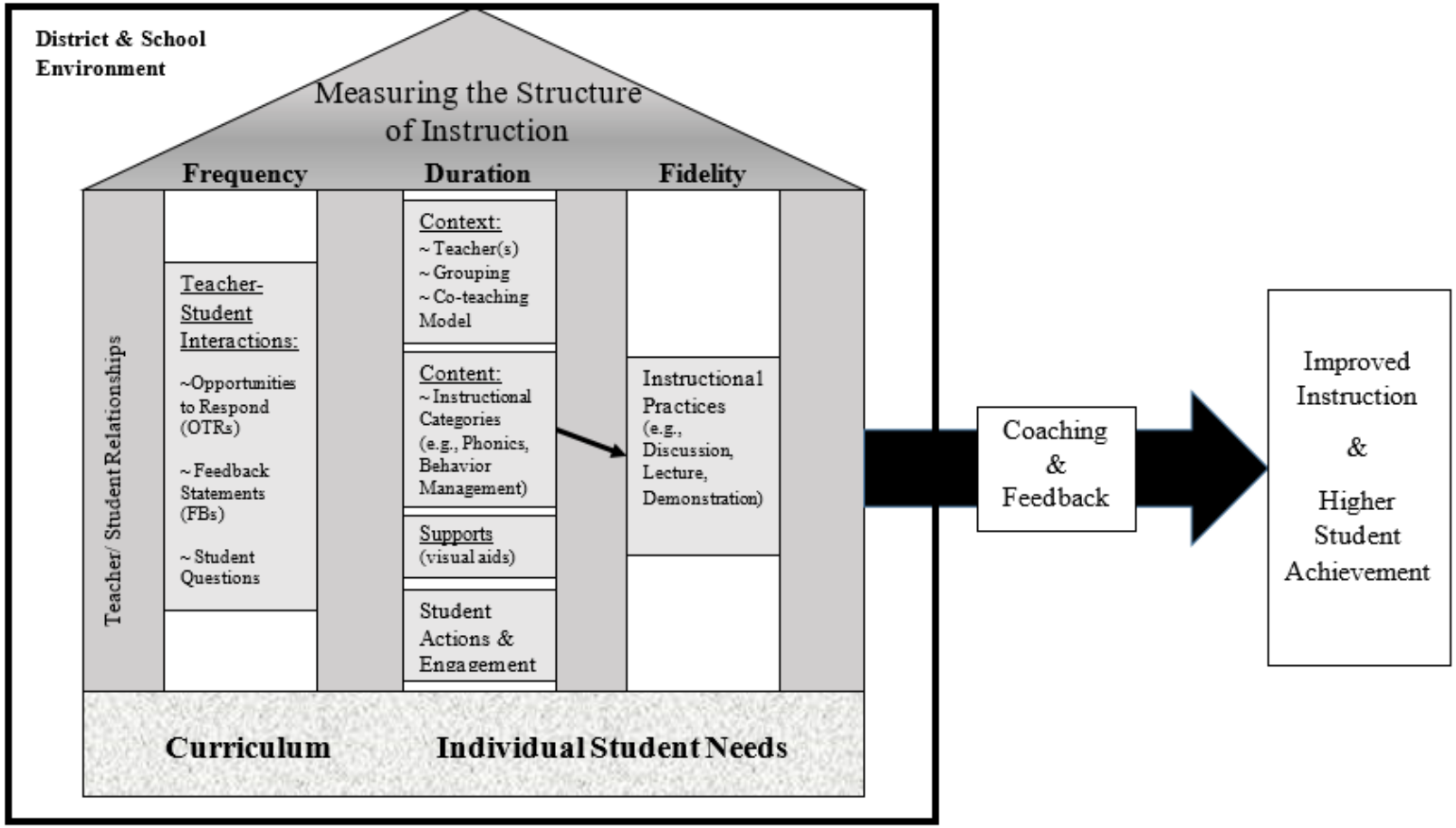

Figure 4. Conceptual framework for the CT Scan

The CT Scan's descriptive nature is intended to keep the focus on effective instruction, not on judgments of the teachers themselves. The tool is meant to be used formatively to inform professional development and learning (Henry & Guthrie, 2016; Papay, 2012), not retention decisions. In an attempt to distinguish between "teach*ing* quality and teach*er* quality" (Jones & Brownell, 2014, p. 113), the CT Scan does not assign a quality score and instead focuses only on the implementation of teaching practices, not on more general teacher quality. Quality scores are useful in teacher evaluation, but the intent of the CT Scan is to support discussions on the mechanics of teaching – the "nuts and bolts" of instruction.

For this project, I focused on instruction in co-taught classes. In doing so, I configured the CT Scan to capture the following elements: use and implementation of instructional practices, instructional time, co-teaching grouping model, opportunities to respond, and feedback statements. In the following paragraphs, I present a rationale and description of the data that were collected for each of these elements.

Evidence-based practices for SWD. As discussed in Chapter II, research demonstrates more explicit presentations of content and opportunities for guided practice to mastery are essential. Based on my review of the literature on effective practices for inclusive environments, I created a list of instructional practices and corresponding implementation markers (IMs) that reflect research-based guidelines for providing instruction to SWD in inclusive classrooms. IMs are descriptions of how practices should be implemented in order to be most effective. The list of instructional practices with their IMs is presented in Table 4. Definitions and examples for each practice and marker are included in Appendix C.

Table 4

Instructional Practices and Implementation Markers Used in Classroom Observations

Instructional Practice	Implementation Markers
Activates prior knowledge	Provides cue Relevance Monitors student understanding Adjustments/ Response to student needs
Anticipatory set	Provides cue Clarity/ consistency Provides rationale States goal
Closes lesson	Monitors student understanding Provides feedback
Demonstration	Organization Logical sequence Clarity/ consistency Student engagement Monitors student understanding
Discussion	Authentic Planned questions Range of students called on Student talk and evidence Uptake of student responses
Explains instructional activity	Clarity/ consistency Chunked appropriately Clear target Conceptual and/or stated purpose Monitors student understanding Prompts strategy use for generalization
Facilitates student demonstration/ presentation	Provides feedback Questioning Smooth transitions
Facilitates group work	Clear directions Individual student participation and responsibility Instructional level Monitors student understanding Debriefs/ provides feedback
Facilitates independent practices or fluency-building activity	Clear directions Stated goal or purpose Instructional level Provides feedback Adjusts/ Differentiates/ Scaffolds

Guided practice	Organized Consistent Frequent monitoring Provides feedback Requires high success rate
Instruction on new topic – general	Clarity/ consistency Makes connections Repeats essential information Includes examples and non-examples Modeling Think aloud Visual aids/ scaffolding Monitors student understanding
Instruction on a cognitive strategy	Clarity/ consistency Repeats essential information Specifies situations Modeling Think aloud Visual aids/ scaffolding
Reads from book/ reading passage	Avoids "popcorn" reading Checks for understanding Refers to text structures/ supports Visual aids/ scaffolding
Reviews (or re-teaches) previously learned material	Student participation Monitors student understanding Provides feedback

Instructional time. One of the key goals of federal special education legislation, as discussed earlier in this chapter, is to increase SWDs' access to the general curriculum. One way this has been framed is as opportunity to learn, defined as "the degree to which a teacher dedicates instructional time and content coverage to the intended curriculum objectives emphasizing high-order cognitive processes, evidence-based instructional practices, and alternative grouping formats" (Elliott, 2015, p. 59). Through use of the CT Scan, I captured the amount of time spent on instruction as opposed to non-instructional tasks such as behavior management, the instructional practices used, and the grouping formats employed.

Co-teaching grouping model. As discussed in Chapter II, grouping models receive a lot of attention in the literature on co-teaching. Research shows that teachers primarily use the one-teach-one-assist model (Cook et al., 2011), and experts in the field frequently recommend using more varied approaches (e.g., Friend, 2015; Murawski & Dieker, 2004). No research to date, however, has empirically studied the ways in which teachers employ other models or whether the use of varied models impacts student achievement. This project provides information about the first of these. Because I tracked instructional practices and other teacher actions within grouping model, I was able to examine differences in instruction occurring within models.

Opportunities to respond (OTRs) and Feedback (FB) statements. For the purposes of this study, I used the definition of OTRs provided by Scott, Hirn, and Alter (2014), which defined OTRs as "teacher initiated events that provide students with an occasion to engage with both the teacher and the curricula content" (p. 591). In a comprehensive review of the literature on OTRs, MacSuga-Gage and Simonsen (2015) noted that the literature base on OTRs is quite small (only seven studies), but nearly all studies on OTRs found positive outcomes, including increased student engagement and an increased number of correct responses. Using the CT Scan, I was able to track teachers' OTRs and then calculate the rate of OTRs they averaged per minute. Given the importance of quick, specific, corrective feedback (Hattie & Yates, 2014), I also tracked the number of verbal FB statements teachers provided and calculated the average rate per minute. I tracked both general FB (e.g., "Good job") and the specific FB that is known to be particularly effective for SWD (e.g., "I like the way you used what you know about cell walls to answer that question."; Archer & Hughes, 2011).

Function of the CT Scan. The main observation screen of the CT Scan is separated into sections (see Figure 5 for an annotated screen shot). The options in the left-hand column capture

basic contextual information, such as the teacher who is leading instruction and the grouping and co-teaching models being used. Below that, there is a menu of potential student actions and a place to estimate student engagement levels. The upper middle section of the screen contains a menu of instructional categories (e.g., Reading Comprehension, Vocabulary, Mathematics, Classroom Management); these menus are customizable and can be used in any configuration desired. For the purposes of this study, I employed the following categories: General Content Instruction, Observing/ Assessing, Classroom Management, and Non-Instructional Activities. An additional category was added to capture times when the teachers' behavior was uncertain, mainly for use with video coding.

When a menu is selected in the Category section, a corresponding menu of individual practices within that menu appears in the Practices box. These are also customizable by the user and may either be broad or detailed, depending on the purposes of the observation. When an observer selects a practice, a corresponding list of IMs appears, which are derived from the research literature and represent expert recommendations or proven elements for implementation of those practices. In this study, I collected implementation information for the general content instruction practices (see Table 4); tracking teacher use of other practices provided a more comprehensive picture of classroom time use. In Figure 5, the General Content Instruction category is selected, the practice being used is Discussion, and the four IMs associated with facilitating a discussion appear in the blue box. Below the instructional practices, there is a list of visual aids that can be selected and a box for qualitative notes. Along the bottom are counters for the interactional elements (i.e., OTRs and feedback statements).

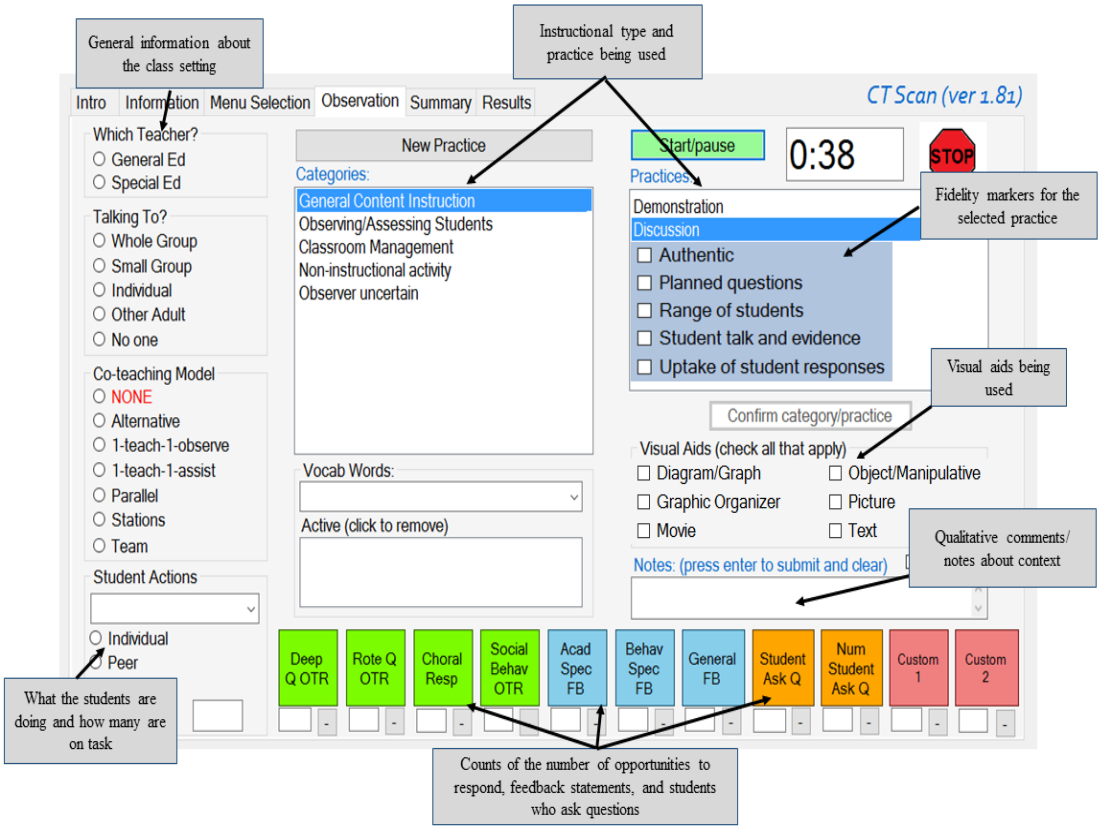

Figure 5. Annotated screen shot of the CT Scan observation screen

Psychometric properties. The CT Scan has been used to date solely in a pilot capacity; therefore, psychometric data on it are limited. A secondary goal of this project was to add to these data. Some evidence of content validity has been collected through expert reviews of the practices and IMs associated with those practices. In a pilot single-case design study conducted using the CT Scan in Fall 2015 (Kennedy, Rodgers, Romig, Lloyd, & Brownell, 2017) observers reached 87% agreement on one outcome of the study (time spent on vocabulary instruction). On a second outcome (number of vocabulary practices used with fidelity), observers came to 60% exact agreement and 85% adjacent agreement. These numbers are promising, but they are far from comprehensive. This project was the first time reliability has been calculated for multiple

aspects of the observations, so it provides important information about the reliability of the CT Scan in collecting data about classroom instruction.

Qualitative data. Qualitative data were collected with observational qualitative field notes and semi-structured interviews with teachers and administrators.

Field Notes. All observations except those for one teacher were observed live and video recorded. Ms. Fletcher's self-contained class took place during the same block as her co-teacher Ms. Hill's solo-taught class, so they could not both be observed live on the same day. In discussions with the teachers, we decided I would observe Ms. Hill's class live while Ms. Fletcher recorded hers because Ms. Fletcher felt I would be more of a distraction in her self-contained class, which had only three students. During the first one or two live observations of each team, I recorded field notes about aspects of the interactions and environment that cannot be readily captured on camera. The focus of these field notes was not on instructional practices, as these were captured by the CT Scan, but on specific questions and feedback content and aspects of class-wide student engagement and behavior that is difficult to capture on video. I also recorded a physical description of the classroom as a whole and watched for indicators of student-teacher rapport and relationships. Field notes were collected using a two-column template, included in Appendix D. In accordance with recommendations of Lofland, Snow, Anderson, and Lofland (2006), the left-hand column was used for notes on "important components of observed scenes or interactions" (p. 110), and "concrete sensory details" (p. 110). The right-hand column was used for more personal evaluative notes, such as "general impressions and feelings" (p. 110) and any memories or connections that are triggered by events in the classroom. Prior to uploading field notes, I checked to ensure no student names appeared

in the document, instead using an initial or simply S1, S2, and so on to indicate different students.

In addition, two teams that reported planning together (E-1 and S-1) video taped one planning session each. I did not observe those live because we were concerned that my presence would be detrimental to their planning process. One team (H-1) did not share a planning block, so they invited me to sit in on a planning session they held during their mutual lunch time. Another team (M-1) also did not share a planning block; they indicated to me that they do most of their planning virtually over email and Google Docs. I met with them to discuss their system and audio recorded that meeting. They also provided me with copies of their emails and access to their shared Google Doc.

Interviews. I conducted semi-structured interviews with all teachers and with three school administrators individually. Interviews ranged from just under 30 minutes to an hour and a half, based on participants' schedules and the length of their responses. All interviews were audio recorded and transcribed in preparation for analysis.

The questions used for these interviews are included in Appendix E. Teacher interviews included questions about their approaches to co-teaching and co-planning, how they handle disagreements, and their decision-making process behind activities observed during instruction. I also asked about their impressions of co-teaching generally (what its benefits and drawbacks are and what factors influence its success) and about the support they received from their administrators related to co-teaching and what types of training they have received on how to co-teach.

The administrator interview included questions about her responsibilities related to co-teachers (scheduling, observation, evaluation) and how she envisions co-teaching playing out in

a classroom. I asked what the administrator looks for when observing a co-taught class and what training they have had or would like related to supervising co-teachers. I also asked about more general school-level supervision of co-teaching, specifically how schedules for teachers and students are developed and what types of professional development the school or district offers for co-teaching.

Procedures

Preparation. I met (in person) with one administrator at each participating school prior to the start of teacher observations to finalize the list of potential participants and study requirements and to schedule the administrator interview. I met with all teachers who met the inclusion criteria to present the details of the study and request their consent to participate. At Palladia High, I met with the teachers all at once; at Independence High, I met with teachers during their planning blocks. The consent forms are included in Appendix F. Teachers were informed verbally that the study was extended to all subject areas, not just mathematics.

Questionnaire. The questionnaire was managed through the Qualtrics website, which allowed teachers to complete the survey on their laptops or mobile devices, managed reminders, and compiled and presented the results. As soon as I received consent from both members of a co-teaching team, I sent them a link to the questionnaire from Qualtrics and emailed them to schedule the first observation. I sent follow-up emails approximately every two weeks to teachers who had not completed the questionnaire. In the end, 19 out of the 20 teachers completed the questionnaire. The final teacher received six requests by email and two in-person requests but never completed it.

Observations. Each class was observed two or three times between October 7 and December 1, 2016. I observed the co- and solo-taught classrooms on the same (or adjacent) days

to ensure the teachers were implementing similar lessons in both. I scheduled observations in advance with the teachers to ensure they took place during instruction rather than testing or other non-instructional activities. To try to limit the chances that teachers would plan instruction that was different from their usual instruction, I typically scheduled them very close to the date I wanted to visit. During the first one or two observations of teach class, I completed field notes following the structure presented in Appendix D. All classes were video recorded; classes in which I took field notes were coded later using the CT Scan. The videos were also used for reliability coding.

I attempted to observe teachers' planning sessions. However, most teams were not able to tell me in advance when their next planning session would be, despite numerous in-person and emailed requests. Therefore, I provided the option for teachers to video record their planning sessions to allow for spontaneity. Two teams (E-1 and S-1) scheduled planning sessions in advance but requested to record them because they were concerned my presence would disrupt their dynamic. Teams M-1 and M-2 did not share a common planning block and did not plan together in person, but they described their method of planning through email and Google Doc. None of the other teams scheduled planning sessions with me in advance, nor did they video record their planning. Therefore, because I was not able to secure observations of planning sessions for the majority of the teams, I did not rely heavily on those for analysis. I reviewed the videos and audio recordings of the planning sessions for information that was relevant to the quantitative findings, but I did not code or analyze them in detail.

Interviews. Interviews were conducted after the final observation of a team's classes, and each interview was conducted individually at times that were convenient for the participants. All interviews were conducted between November 21, 2016, and January 10, 2017. All the

interviews I conducted were done in person and were audio recorded using the Voice Memo app on my phone. One of the schools is the same school where I taught until 2013 (see discussion of this in the Limitations section below); therefore, I have personal friendships with some of the participants. Another researcher conducted the interviews with those teachers by phone or video conference platform. I transcribed all interviews using the program Transcribe and sent the transcriptions to the teachers to review for member checking. The recording for the interview with Nate Dominico was incomplete due to a recording error so I supplemented it with handwritten notes I had taken during the interview itself. Michael Jordan requested responding to the interview questions in writing, so I provided him with the interview protocol, then emailed him follow-up clarification questions.

Data Analyses

Data were analyzed for each research question; all quantitative analyses were conducted using Stata 14.2, and qualitative coding was completed using Dedoose. One important note is that comparison measures across settings are not established in the field of co-teaching, so I am interpreting all statistical findings from this project cautiously and somewhat subjectively to form hypotheses rather than to inform conclusions of fact. This subjective approach to data interpretation is acceptable in fledgling research fields and is even espoused as necessary in order to evaluate findings "in the context of the study and in the larger context of knowledge" (Trusty, Thompson, & Petrocelli, 2004). When interpreting the data, rather than relying solely on statistical comparisons, I attempted to identify distinctions between classes that have clinical significance, "the practical or applied value or importance" (Kazdin, 1999, p. 332) – in this context, factors that would likely make a difference in students' education. Future studies will

determine the true clinical significance by examining the effects of those factors on student outcomes (Kazdin, 1999; Onwuegbuzie & Leech, 2004).

Research Question 1: Co-teaching instruction

To answer my first research question, I descriptively analyzed observation data from the CT Scan to provide a summary of the instructional practices and time use in the co-taught settings. Then I compared that instruction to that of the general education classes and examined the differences using a measure designed to capture the degree of specialization in the instruction.

Description of co-teaching instruction. For the main question (What does instruction look like in co-taught high school classrooms?), I looked at the percentage of time spent in each co-teaching model and the proportion of time spent in each instructional category and practice overall and by team. I also examined the number and type of questions asked and feedback statements given. In this analysis, I looked for patterns and discrepancies across teachers and subject areas.

Comparison of instruction. The first sub-question beneath the main question was: How is instruction in co-taught classes different from or similar to instruction in the general education classes? To answer this question, I contrasted eight factors of instruction, both overall for all the teams and individually for each team. I looked at the rate of OTRs and FB statements per minute and the percentage of time spent in the six most-commonly-used practices. To test for clinical significance overall, I conducted Wilcoxon signed-rank tests comparing the values of these factors from the co-taught classes to the values in the general education classes. Wilcoxon signed-rank tests were more appropriate than *t*-tests due to the non-parametric nature of the data.

Specialization of instruction. The second sub-question in research question 1 was: To what extent is the instruction in co-taught classes enhanced or specialized for SWD? I employed a number of methods to answer this question.

An important metric of specialization was the percentage of implementation markers (IMs; see definition and examples in Chapter II and Appendix C) that were in evidence for each instructional practice. The percentage of IMs observed represents the degree of fidelity with which the teachers implemented the practices, which I refer to in this project as the *fidelity percentage* or *percent fidelity* for a given instructional practice. Because the IMs were created from research on effective practices in inclusive classrooms, I hypothesized that a higher percentage of them would be present in co-taught classes than in solo-taught general education classes due to the added knowledge and skill of the special educators in planning instruction, giving them a higher fidelity percentage. To calculate the fidelity percentage for each class, I assigned each IM a value of 1 if it was observed in the instruction and 0 if it was not observed. Then, I averaged across all IMs for each instance of a practice and calculated an overall average across each practice within each class. To combine these for an entire class, I weighted each practice's fidelity percent by the proportion of the class spent in that practice, then I added the weighted percentages together. Because academic learning time is so essential for student learning (Archer & Hughes, 2011; Gettinger & Seibert, 2002), I calculated the proportion of each practice based on the total class time, not total instructional time. This way, fidelity percentage was reduced for classes in which a large portion of the class was spent in non-instructional activities. An illustration of the calculation of weighted fidelity is presented in Figure 6. Weighted fidelity appears as a proportion but is interpreted as a percentage. Therefore, a

weighted fidelity value of .47776 indicates that the practices were implemented using 47.776% of the total possible IMs.

Class X Information:

Total time: 4210 seconds
Practices that took place:

Practice	**Class time**	**Proportion of class time (rounded)**	**Fidelity %**
Explains activity	820 seconds	.19477	60
Discussion	1650 seconds	.39192	20
Facilitates group work	987 seconds	.23444	100
Closes lesson	253 seconds	.06010	80

Weighted fidelity = (.19477*.6) + (.39192*.2) + (.23444*1) +(.06010*.8) =
.11686 + .07838 + .23444 + .04808 = **.47776**

Figure 6. Sample calculation of weighted fidelity for Class X

I then conducted a paired-sample *t*-test to determine whether the average weighed fidelity score in the co-taught classes was different than that of the general education classes. I first tested the assumptions associated with paired-sample *t*-tests (see Chapter IV for details), then I conducted a test comparing the weighted fidelities from the co-taught classes with those from the solo-taught and self-contained courses. The null and alternative hypotheses being tested were:

$$H_0: \mu = \mu_0$$

$$H_a: \mu \neq \mu_0$$

in which μ is the mean of the weighted fidelities for the co-taught class, and μ_0 is the mean of the weighted fidelities for the general education class. I also descriptively analyzed individual IMs

for the six most-common instructional practices overall and by team to determine whether there were patterns in which markers teams consistently incorporated and those they did not.

Research Question 2: School-level structural factors

To determine the school-level structural factors in place surrounding co-teaching, I used results of the teacher survey and information provided in interviews. There were three sub-questions about the school-level factors: a) How are co-teachers paired and scheduled? b) How are students assigned to co-taught classrooms?, and c) How are co-teachers trained and evaluated? Survey data contributed to the first of these; interview data related to all three.

Survey data. Data from the teacher survey were downloaded from Qualtrics in an Excel file and imported into Stata for cleaning and analysis. These data were analyzed descriptively to provide additional context for observational and interview data.

Interviews. My analysis of the interviews focused on patterns, themes, and discrepancies related to the research questions. I uploaded the interview transcripts into the Dedoose program (www.dedoose.com) for analysis and processing. The information is password-protected, only accessible by me and invited researchers who helped with reliability. I used a combination of deductive and inductive coding. I drafted a list of codes *a priori* which were based on the research questions and the research literature on co-teaching, then added to or changed them as needed during the coding process. The final list of codes and their definitions is presented in Appendix G.

To analyze the data, I created a role-ordered matrix (Miles, Huberman, & Saldaña, 2014) to compare and contrast interview responses of the teachers and the administrators related to the codes on the list. Each participant's responses related to the codes were summarized. There is one line per participant, with the teachers grouped into one section and the administrators in

another. The final, completed matrix is presented and discussed in Chapter V. I looked for patterns within and across roles and examined outliers carefully. I describe linking the interviews to instruction in the next section and methods for strengthening the confirmability, dependability, and credibility later in this chapter.

Research Question 3: Relationship of school factors to instruction

To determine whether teachers purposefully changed instruction in their co-taught classes to be more considerate of the needs of SWD, I evaluated data in two ways. I first performed regression analyses based on the factors addressed in each sub-question (described below) to determine the impact those factors had on the degree of specialization based on the level of fidelity to evidence-based practices teachers had. Second, due to the variability in data across teams, statistical analyses of instructional patterns was unenlightening, so I opted to evaluate select individual cases of teams. I chose five teams that, based on visual inspection of graphs of their instructional practices, represented different patterns of instruction and specialization across their classes, and I descriptively analyzed the instruction from each day of observations and connected what I saw in their instruction to their survey and interview responses to get a sense of the ways in which they thought about instruction and co-teaching.

Regressions. For each sub-question, I conducted regression analyses examining the effect of theoretically important quantitative factors on the weighted fidelity scores using individual class observations as the unit of analysis. I tested one or more models per sub-question. I opted to run small models for each question individually rather than a large model including all potential variables because my sample was too small to support the addition of multiple covariates. In addition, this work is still very much in the exploratory phases, so these small models allow me to analyze the relationships between individual variables with the level of

specialization more purely, which will help inform hypotheses moving forward as I collect more data. I describe the models and below in relation to each sub-question.

Teacher-level factors. The teacher-level factors I tested using regression models were years of experience co-teaching and strength of self-efficacy. Both of these predictor variables were continuous, and a dummy variable was added to determine whether there was a difference between fidelity percentages for the general education and co-taught classes based on these predictor variables. I chose co-teaching experience as a predictor variable because research shows teachers who believe SWD should be educated solely in self-contained environments may be less inclined to modify their instructional practices to accommodate them in inclusive classes (Desimone & Parmar, 2006). It is also true that experience can influence attitudes; teachers who have worked in inclusive classrooms have been shown to have a more positive attitude toward working with SWD than teachers who have not (McCleskey, Waldron, So, Swanson, & Loveland, 2001); therefore, I hypothesize years of experience co-teaching would influence whether teachers were able and willing to change their instruction based on the presence of SWD.

I also included a measure of self-efficacy in the model. The strength of a teacher's self-efficacy has been connected to openness to new ideas, willingness to work with SWDs, use of student data to inform instruction, and overall job satisfaction (Bettini, Park, Benedict, Kimerling, & Leite, 2016; Tschannen-Moran & Woolfolk-Hoy, 2001; Viel-Ruma, Houchins, Jolivette, & Benson, 2010). A recent study found that SET self-efficacy was not significantly related to student engagement, behavioral incidents, or reading achievement (Bettini et al., 2016), but that study was conducted with SETs in self-contained classes, so it may be possible that self-efficacy functions differently in a co-taught class. In addition, very little research has

been done connecting self-efficacy with teaching quality (Bettini et al., 2016); theoretically, this connection could be important, given what we know about the relationship between self-efficacy and teachers' feelings about their jobs.

I tested two models for this question, with the difference being the addition of the self-efficacy variable. I chose not to test a model with efficacy on its own because I have no reason to believe that efficacy would have an influence on behavior outside of experience and because differences in efficacy scores were relatively low, so I anticipated it would not have a very strong relationship with fidelity. The two models I tested for this sub-question, therefore were:

$$\text{Model 1: } F = \beta_0 + \beta_1 Co + \beta_2 ExpC + \varepsilon$$

$$\text{Model 2: } F = \beta_0 + \beta_1 Co + \beta_2 ExpC + \beta_4 Eff + \varepsilon$$

In these models, F represents weighted fidelity, Co represents the dummy variable indicating the class is co-taught, $ExpC$ is years of experience co-teaching, and Eff is the strength of the teacher's self-efficacy based on survey responses.

I first ran the models as they are written above, then I examined the studentized residuals to identify potential outliers, considering observations with values above 2 or below -2 as the indication of outliers (Gordon, 2010). I also calculated Cook's d and DFFITS values to identify observations that exerted undue influence on the regression results. I examined observations that had DFFITS values above 2 or below -2 and/or Cook's d values above 4/*n*. (Field, 2013; Gordon, 2010). To determine the model that best fit the data, I examined adjusted r^2values, *F*-statistics, and the Akaike's and Bayesian Information Criterion scores (AIC and BIC; Field, 2013; Gordon, 2010). If I identified outliers that were also identified as influential, I ran the model without those observations and examined the differences to determine whether they should be included or not in the final analysis.

Classroom-level factors. The classroom-level factors that were tested for this question were the number of students in the class as a whole and the percentage of those students who had disabilities. Therefore, the model tested for sub-question b was:

$$\text{Model 3: } F = \beta_0 + \beta_1 Co + \beta_2 St + \beta_3 SWD + \beta_4 Co * SWD + \varepsilon$$

in which St represents the number of students in the class, SWD represents the percentage of students with disabilities in the class, and $Co * SWD$ represents the interaction between whether the class is co-taught and the percentage of students with disabilities. I included the interaction term with co-taught and percentage of students because I hypothesize this percentage of SWD in a class might affect fidelity differently in a co-taught than in a general education class. Based on joint outcome production theory, which formed the underlying framework for this study, I hypothesized that higher concentration of SWD in a general education class might increase the cognitive load on the GET, making it harder for him or her to provide high-quality instruction generally, but particularly the intense instruction required by these students. However, a higher concentration of SWD in a co-taught class might serve as a motivation for the SET to take more ownership in the class and for the GET to rely more heavily on the SET for input when planning. Therefore, I believed it was important to evaluate this potential interaction of setting and percentage of SWD. I analyzed this model the same way as Models 1 and 2, but because there is only one model for this question, I did not consider model fit statistics such as the AIC and BIC.

School-level factors. Two school-level factors were considered for sub-question c. One was whether or not the co-teaching team was allotted common planning time in their schedules, and the other was the degree of collective responsibility the teachers felt from the school as a whole related to students with disabilities. Therefore, the model for this sub-question was:

$$\text{Model 4: } F = \beta_0 + \beta_1 Co + \beta_2 Pl + \beta_3 CR + \varepsilon$$

in which Pl represents a dummy variable equal to 1 if the team had co-planning time and 0 if they did not, and CR represents the teacher's sense of collective responsibility as measured by the survey instrument as described in an earlier section. I analyzed this model the same way I analyzed Model 3.

Individual case analysis. Finally, to present a more in-depth picture of how all of these factors come together in the experiences of individual teams, I integrated the quantitative and qualitative data to present case studies of five teams. I visually and descriptively analyzed quantitative data from all of the teams, considering their instruction across settings and the fidelity of implementation of that instruction. Based on that analysis, I chose five teams that represented different patterns of instruction and specialization (the patterns are described in Chapter VI). For each team, I evaluated the quantitative instructional data for each observed class and probed interview data and qualitative field notes for information that provided more detail about teachers' actions within their classrooms and their approaches to planning and implementing instruction. Using the combination of these types of data, I present a description of each team's history, instructional patterns and anomalies across each of their observations, and relevant quotes and data which add context related to the factors analyzed in Research Question 3.

Reliability of Observational Data

Eighteen percent of the classroom videos were double-coded for reliability. Half of those videos were chosen based on convenience in scheduling (times when another observer was able to conduct live observations, and I watched and coded the videos of those classes). The others were selected randomly from the videos that remained. Two other doctoral students who had previously been trained to use the CT Scan and had used it extensively in a previous study

conducted the reliability observations. They met with me and were trained on use of the specific menus employed in this study. I discussed all practice definitions and IMs, focusing on the ones that were different than those they had used in previous studies. I provided examples and non-examples of teacher behaviors that would fall under each practice and fidelity marker. For purposes of analysis, I used the results of my observations as the master coder for this study (see below). Reliability was calculated two ways, based on the type of data produced by the CT Scan.

Counted data. For data on the number of OTRs and FBs, I employed an interval calculation of reliability. I split each observation into 30-second intervals and calculated the percentage of intervals in which the two observers agreed on the number of OTRs and FBs that occurred in that interval out of the total number of intervals in the observation.

Percentage data. For percentage of time spent in various instructional practices and categories, I calculated total time each observer indicated that a practice occurred. Reliability was calculated by dividing the smaller total time by the larger total and multiplying by 100 (Wyatt, Callahan, & Michael, 1985). Calculating reliability of fidelity percentages was more difficult because it is inextricably linked to the reliability on practices, particularly with regard to the weighted fidelity measure. For instance, if two coders disagree on the amount of time spent in a practice that will also affect their agreement on the weighted fidelity. Therefore, there is a risk that reliability would be underestimated for this metric. I calculated reliability the same way as for the practice percentages, dividing the smaller value by the larger and multiplying by 100. I only considered fidelities for practices the coders agreed occurred during the class. I then visually analyzed responses to the IMs to determine whether any patterns could be identified that would explain discrepancies.

Reliability results. Reliability of OTRs and FB statements was calculated using an interval system. Each observation was split into 30-second intervals, and I calculated the percentage of intervals in which the two observers agreed on the number of OTRs and FB statements that occurred. Across all double-coded observations, the percentage of agreement for OTRs was 87.0% and for FB statements was 89.7%.

Reliability values for instructional practices ranged widely. Observers had an 89.1% agreement rate on the amount of time spent in the General Content Instruction category, which corresponds to the amount of time spent in instruction generally. I examined agreement for the top six most common practices. It was highest for the top three: instruction in new content (81.8%), facilitates independent practice (83.7%), and facilitates group work (83.5%). These three practices accounted for more than 50% of the overall class time.

Reliability was lower for the less-often used practices – reviews previously-learned material (43.8%) and explains activity (57.2%) – and there was no agreement on guided practice. There are two reasons why these latter agreements were so low. One is that the method of calculating agreement I used does not take into account the size of the numbers, so small amounts from a practical standpoint end up creating a large difference in the agreement. For example, in one observation, one observer coded 1.9 minutes of explains activity, and the other coded this practice for 3.9 minutes, resulting in an agreement percentage of 48.7%. However, from a practical standpoint, this represents only two minutes of class time, which is relatively insignificant. In addition, fidelities in general were lower when practices occurred for very short periods of time (i.e., under five minutes). When calculating fidelity after removing instances where practices occurred for under five minutes, fidelity rates increase to 65.6% for reviews and 81.4% for explains activity.

The lack of agreement on guided practice is disappointing but not entirely unexpected. Given the fact that teachers across the board were not engaging in the traditional sequence of explicit instruction, beginning with modeling and gradually releasing responsibility to the students, it was quite difficult to distinguish guided practice from regular instruction. In fact, true guided practice as described in the literature was not observed; some coders selected guided practice when they saw approximations of it. In future projects, I will hone the definitions and examples provided for guided practice and investigate other methods of calculating reliability that do not so harshly penalize lower-occurring practices.

Regarding fidelities, agreement on the weighted fidelity metric was understandably low due to the connectedness of reliability on practices and fidelity of those practices discussed in the previous chapter. Overall, agreement on the weighted fidelity measure was 55%. Fidelity agreements for individual practices varied but were around the same low level. I investigated individual IMs but discerned no patterns, so the problem did not appear to be particular IMs. This low percentage of agreement masks an overall point, however, which is that all observers agreed fidelities across the board were low. No observer had a weighted fidelity score of more than 44%, either for the teams overall or for either setting.

The main reason reliabilities as a whole were so low is likely due to flaws in training. Due to time and budgetary constraints, training was not particularly rigorous. I relied on the second coders' extensive experience with the CT Scan and did not consider the large difference having a new instructional menu would create. Previous studies had only used IMs for vocabulary instructional practices, not general ones. Therefore, although the coders had used similar practices before, such as explains instructional activity or general instruction, they had never been required to evaluate the implementation of those practices using the CT Scan before.

Because of this, for purposes of analyses, I used data from my own coding; given that I created the instructional menus and thus was more comfortable with them, my data are almost certainly more valid in terms of the ways in which I define the constructs. However, due to these low fidelities, the quantitative analyses presented in Chapter IV should be interpreted with caution.

Confirmability, Dependability, and Credibility of the Qualitative Data

Confirmability has to do with the amount of researcher bias in the research, similar to external validity in quantitative research (Miles et al., 2014). To enhance the confirmability of these data and analyses, I have attempted to describe my process of collection and analysis in detail. There is a large potential for bias in this project due to the fact that I worked at Palladia High School and knew 13 of the study participants. Although it is likely impossible to remove all bias, I have attempted to mitigate its impact in a number of ways. I had another researcher conduct interviews with the teachers I worked most closely with and have personal relationships with. I conducted member checking by sending each participant his or her interview transcript and asking them to provide clarifications or suggest changes if they felt their viewpoints were not well represented. I also had another researcher review my coding definitions and sample quotes to ensure they were clear and consistent.

Dependability is similar to reliability in quantitative research. Strong reliability in qualitative research requires the process to be consistent, with strong integrity (Miles et al., 2014). I have ensured reliability of this study by keeping my analysis closely tied to my research questions, and conducting inter-coder agreement checks and member checks as described above.

Credibility of this study, similar to validity in quantitative research, has to do with the verisimilitude or authenticity of the findings – whether or not they truly represent the reality of the situation they are trying to describe or explain (Miles et al., 2014). I believe my findings are

accurate for a number of reasons. First, I triangulated my methods by combining observations with interviews and the survey, and I saw consistency across in most areas. Where there was divergence, I attempt to provide an explanation for this. In addition, my findings are in line with previous research on co-teaching, and there were distinct patterns across participants, which adds to the trustworthiness of the findings. I closely examined outliers and negative evidence as described in Chapter V.

Limitations

There are several limitations to the design of this study which primarily impact its generalizability. First, although the proposed sample size is larger than most other observational studies of co-teaching, it is still quite small. Therefore, it is highly questionable whether conclusions based on these data are generalizable beyond the sample itself. Another sampling limitation is that the participants were volunteers, meaning that they may have varied in significant ways from teachers who did not volunteer. However, in so far as the findings are consistent with those of previous studies, they can be presumed to accurately reflect the experiences of a larger population. In addition, future studies will be able to substantiate or extend them.

Reflexivity

In keeping with recommendations on conducting qualitative research (Marshall & Rossman, 2011), it is important that I analyze my position as the researcher in this environment and consider my own biases and how they might impact my interpretation of collected data. I do not have personal connections with most of the participating schools or teachers, so I do not have pre-existing expectations. However, I taught in one of the participant high schools, so I know the administrators and 11 of the participating teachers. This could easily introduce bias in my

interpretations of interview responses and teachers' instruction. It could also influence their actions or responses because they would be attempting to do or say what they thought I wanted to see or hear. In addition, I worked as a co-teacher in high school mathematics and English classes for 11 years, and I have spent the last three years reading deeply into the research on co-teaching; therefore, I have extensive personal experiences and preconceived notions about co-teaching and instruction for SWD more generally that could cloud my perceptions of the data. These experiences could impact the things I noticed during observations (and, by extension, the things I did not notice) and the way I interpreted data. Also, because these are my research questions and this project and topic are important to me, being the primary observer and data analyst opens up opportunities for my bias to strongly influence the findings.

I undertook a number of measures to combat this bias. First, I did not share my hypotheses or details of the research with anyone involved so they did not know what I hoped to find. They knew I was comparing instruction in solo- and co-taught classes, but they did not know exactly what I was measuring or tracking during my observations. Secondly, a second observer coded 20% of the videos using the CT Scan to determine agreement rates. Third, when examining observations and interviews for themes, I created and defined coding constructs *a priori* and had a second researcher evaluate my definitions along with example quotes I pulled from the interview to ensure my personal biases did not unduly influence the findings. Fourth, I conducted member checks by sending interview transcripts to the teachers and administrators to ensure their intentions were accurately represented. Finally, the collection of interviews, observations, and surveys provided a degree of triangulation, allowing me to see themes across settings and to determine whether different players have similar perceptions related to co-teaching.

CHAPTER IV: INSTRUCTION IN CO-TAUGHT CLASSES

This chapter presents findings and discussion in response to the first research question: What does instruction look like in high school co-taught classrooms? To answer this question, I present findings about the rates of interactions and percentage of time spent in general categories and specific instructional practices for all the teams together then for individual teams. Within this, the first sub-question addressed how this observed instruction differed across settings, so I present the findings on select variables from co-taught classes and compare them to those from general education and self-contained classes. Finally, the last sub-question asked about the degree of specialization found in the co-taught classes with relation to evidence-based practices for SWD. To analyze this, I used the weighted fidelity metric discussed in Chapter III. I compared implementation of specific practices across settings, practices, and teams, and I investigated individual implementation markers (IMs) to determine whether there were patterns in teachers' implementation of the most commonly used practices.

Summary of Instruction

Instruction in co-taught classrooms varied across co-teaching teams in terms of the amount of time spent in different models of co-teaching and the time devoted to specific instructional practices. Table 5 summarizes the overall instructional averages across all co-taught classes. There was wide variability for each metric, as evidenced by the relatively large standard

deviations when compared to the means. Some general patterns are evident, however. The general educator played the lead role in instruction the majority of the time, by a factor of about 3:2. The teams primarily used the one-teach-one-assist co-teaching model, with “none” holding the second-most-common spot, meaning one of the teachers was either out of the room or was not engaging directly with students in any capacity. Rates of OTRs and FBs were relatively low across the co-taught classes, with teachers asking about two questions every three minutes and providing one feedback statement about every two minutes. Teachers managed class time so about 80% of the time was spent in instructional activities, with the other 20% being taken up with transitions between activities, assessments, or non-instructional activities.

The next step was to break down the General Content Instruction segments of the classes into individual practices. The average length of each observation was 63.1 minutes. Table 6 contains the percentage of time spent in each practice, as a function of the total class time in order from most- to least-frequently observed practice. The most common practices teachers used by far were facilitating independent activities (26.7%) and providing instruction on a new topic (19.7%), with reviewing being the third most frequent activity (9.6%). Teachers very rarely activated prior knowledge (1.2%), provided anticipatory sets (0.8%), purposefully closed lessons (0.2%), provided instruction on cognitive strategies (0.6%), performed demonstrations (0.1%), facilitated student presentations (1.3%), or read with their students (0.5%). It is possible I would have observed more student presentations if I had conducted more observations; I specifically requested to schedule observations on days the teachers would be providing instruction of some type.

Table 5

Time Use across All Co-Taught Classes

		Mean per class (SD)
Time in lead role (% of class)	General Educator	60.8 (29.8)
	Special Educator	38.5 (29.6)
Co-teaching Model (% of class)	One-Teach-One-Assist	60.7 (21.0)
	Parallel	5.3 (16.0)
	Alternate	.29 (1.5)
	Team	14.4 (15.0)
	Station	-
	No model	16.8 (15.5)
Rate of Interactions (number per minute)	OTRs	.67 (.55)
	FBs	.46 (.36)
Time Use by Category (% of class)	General Content Instruction	82.1 (10.0)
	Classroom Management (Transitions)	8.0 (5.4)
	Observe/ Assess	5.2 (7.7)
	Non-instructional Activity	4.5 (5.3)

Table 6

Percentage of Time Spent in Individual Instructional Practices in Co-Taught Classes

Practice	**Mean (SD)**	**Practice**	**Mean (SD)**
Facilitates independent practice/ fluency activity	26.7 (25.1)	Facilitates student demo/ presentation	1.3 (3.4)
Instruction on a new topic – general	19.7 (20.7)	Activates prior knowledge	1.2 (1.7)
Reviews/ reteaches previously learned material	9.6 (15.5)	Anticipatory set	0.8 (1.3)
Facilitates group work	7.3 (14.7)	Instruction on a cognitive strategy	0.6 (3.0)
Guided practice	6.9 (14.6)	Reads from a book/ reading passage (or facilitates group reading)	0.5 (2.6)
Explains instructional activity	4.5 (4.3)	Closes lesson	0.2 (0.9)
Discussion	2.8 (8.9)	Demonstration	0.1 (0.8)

Tables 7 and 8 break down this instruction to the team level to demonstrate some of the variability in instructional practices. Table 7 presents the same information as Table 5 but by individual team, and Table 8 does the same for Table 6. In Table 7, the first column shows the overall time of the observation, and the second is the percentage of time spent in instructional activities as opposed to non-instructional activities. This percentage ranged widely across teams from 60.9% to 90.4%. The two math classes had the highest time spent in instruction, with 88% and 90.4%.

The second section shows the percentage of time in which each teacher served in the role of lead instructor, meaning they lead the instruction for the majority of the students. In most teams, the general education teacher took the lead role most often, with four notable exceptions. Two teams, E-1 and S-1, were nearly even in terms of being in the lead, partially due to frequent changes in lead instructor and to use of the parallel teaching model. The two math teams were

led almost exclusively by the special educators. This is highly unusual within co-teaching literature and is discussed in more detail in the Discussion section of this chapter.

The second section of Table 7 shows the amount of time each team used each of the co-teaching models. Station teaching is not represented in the table because I did not observe its use at all. One-teach-one assist was the most commonly used model for all the teams, but the proportion of the class spent in that model ranged from 35.7% to 79.4% across teams. After one-teach-one-assist, teams varied in the second-most common model. Team S-1 used the parallel teaching model about one-fifth of the time. Three teams, S-2 and M-1 and M-2, used team teaching as their second most-common model, using it about one-quarter of the time. One note about this statistic is that I used the team teaching code somewhat differently than it is usually defined in the literature. Normally, it is defined as the two teachers teaching together, such as when doing a demonstration (Friend, 2015). However, I expanded that definition to include times when students are working in groups or individually, and both teachers are working equally to monitor and support them. In the observations represented in this study, all instances of team teaching are the latter type. For the remaining six teams -- S-3, all three history teams, and both English teams – the no co-teaching model was the second-most common, which means that one (or both) teacher(s) was not actively engaged with students or was out of the room during that time. This was the case for between 10% and about 33% of the time, depending on the team.

The fourth section of Table 7 represents the average number of OTRs and FB statements teachers provided per minute. These also ranged widely from a low of .08 to a high of 1.83 for OTRs and .08 to 1.16 for FB statements. No teacher reached the recommended level of OTRs, which is between 3 to 5 per minute (MacSuga-Gage & Simonsen, 2015). There was no statistical difference for subject areas or setting on this outcome, but interestingly, the teachers at Palladia

High provided nearly three times the number of OTRs and twice the FB statements than the teachers at Independence High, which was a statistically significant difference (OTRs: .83 and .30; FBs: .57 and .23, respectively; $F(1, 85) = 19.90$, $p < .01$). No clear reason for this was evident. I examined the percentage of FB statements that were specific and related to academic performance, which are the type known to be the most important for student outcomes (Hattie & Yates, 2014). Overall, 19% of the total FB statements were specific rather than general. This ranged across teams as well, with Team S-2 having the lowest at 10% and Team E-1 having the highest at 31%. Interestingly, Team E-1 had one of the lower rates of FB statements overall. The two teams with the highest overall rate of FB statements, H-3 and M-2, also tended to provide more general ones, with only 14% and 11% of them being specific, respectively.

The final section of Table 7 lists the time use by category for each team's co-taught classrooms. The General Content Instruction time is the same as the instructional time discussed earlier. For most of the teams, the majority of the remainder of the time was spent in Classroom Management, almost all of which was transitioning between activities. Percentage of time devoted to transition ranged from 3.0% to 12.9%. Team S-3 spent about the same about of time transitioning as they did in non-instructional activities. Team E-2, which had the lowest instructional time overall, spent about one-quarter of their class time in the Observe/ Assess category, which was a combination of quizzes and miscellaneous talking with students.

Table 7

Instructional Averages by Team

	Team	Total Time (min)	Instr. Time (%)	Teacher in the lead role		Co-teaching Model					Interactions per minute		Time Use by Category			
				GET	SET	1T1A	Par.	Alt.	Team	None	OTR	FB	Gen. Instr.	CM	Obs	Non-Instr.
Science	S-1	73.2	85.3	56.3	43.7	52.5	19.5	-	16.7	10.5	.41	.26	85.3	8.1	2.5	4.1
		(31.0)	(3.3)	(18.0)	(18.0)	(27.5)	(33.8)		(28.8)	(4.9)	(.12)	(.09)	(3.3)	(4.7)	(0.8)	(1.4)
	S-2	39.2	86.4	75.7	24.1	63.3	-	-	28.3	7.4	.53	.33	86.4	12.9	-	0.5
		(2.7)	(16.7)	(14.4)	(14.3)	(29.7)			(21.1)	(9.4)	(.33)	(.04)	(16.7)	(15.8)		(0.7)
	S-3	79.5	78.3	91.8	8.1	79.4	-	-	-	16.9	.08	.08	78.3	10.0	0.7	10.9
		(5.8)	(13.3)	(14.2)	(14.1)	(17.9)				(16.3)	(.14)	(.14)	(13.3)	(5.5)	(0.6)	(10.8)
History	H-1	67.3	85.1	71.0	28.7	64.2	-	3.8	10.5	21.0	.19	.17	85.1	4.3	9.0	1.6
		(3.5)	(3.0)	(2.8)	(3.2)	(0.0)		(5.4)	(14.9)	(9.6)	(.01)	(.02)	(3.0)	(1.7)	(1.0)	(2.3)
	H-2	86.6	75.6	69.6	29.9	62.0	-	-	13.6	23.9	.57	.47	75.6	11.7	4.1	8.5
		(2.3)	(8.8)	(7.6)	(7.0)	(3.4)			(11.3)	(8.0)	(.15)	(.14)	(8.8)	(5.4)	(1.8)	(6.3)
	H-3	44.8	81.5	70.0	26.5	75.3	-	-	9.2	10.1	1.33	.88	81.5	7.0	10.8	0.7
		(0.3)	(2.2)	(12.2)	(7.6)	(25.6)			(15.8)	(7.2)	(.71)	(.49)	(2.2)	(3.5)	(4.8)	(0.7)
Math	M-1	65.1	88.0	27.0	72.8	49.1	8.2	-	29.8	9.3	.59	.39	88.0	6.8	2.6	2.4
		(16.9)	(4.5)	(4.4)	(4.3)	(9.5)	(14.1)		(6.6)	(2.5)	(.25)	(.20)	(4.5)	(4.2)	(3.6)	(2.9)
	M-2	43.5	90.4	0.0	99.8	70.5	-	-	22.7	6.3	1.83	1.16	90.4	6.2	3.4	-
		(0.8)	(.94)	(0.0)	(0.2)	(11.1)			(1.9)	(8.9)	(.10)	(.18)	(0.9)	(0.1)	(0.9)	
English	E-1	55.7	84.7	51.6	47.2	35.7	18.6	-	14.7	30.4	.45	.35	84.7	3.0	3.9	8.2
		(15.1)	(2.7)	(39.0)	(37.8)	(17.7)	(32.2)		(1.3)	(20.6)	(.18)	(.22)	(2.7)	(2.6)	(3.5)	(3.8)
	E-2	63.0	60.9	94.3	5.5	59.6	-	-	-	32.6	1.06	.70	60.9	6.2	27.6	5.2
		(22.8)	(34.4)	(5.3)	(5.2)	(36.5)				(44.4)	(.00)	(.08)	(34.4)	(3.8)	(34.0)	(4.3)

Note: Percentages may not add exactly to 100% due to the nature of the CT Scan instrument in that the first few seconds of the class are not always captured in real time.
Instr=Intructional; GET=general educator; SET=special educator; 1T1A=one-teach-one-assist; Par=Parallel; Alt=Alternative; OTR=opportunities to respond; FB=feedback; Gen. Instr.=general content instruction; CM=classroom management; Obs=Observe/ Assess; Non-Instr.=non-instructional activity

Table 8

Percentage of Time Spent in Individual Instructional Practices – Averages by Team

	Team	Act PK	Ant Set	Close	Demo	Disc	Expl	Fac. IP	Fac. Grp	Fac. St. Dem	GP	Inst. New	Inst. Cog Strat	Read	Rev.
Science	S-1	0.6 (1.1)	1.7 (3.0)	-	-	-	2.2 (1.2)	18.6 (32.2)	13.0 (22.6)	-	1.4 (2.3)	38.6 (20.2)	4.3 (7.5)	-	4.9 (4.7)
	S-2	4.0 (3.2)	-	-	-	-	10.1 (2.4)	38.8 (28.7)	-	-	6.0 (8.4)	27.5 (2.0)	-	-	-
	S-3	-	3.2 (1.8)	-	2.0 (3.5)	-	6.2 (3.2)	48.0 (35.0)	6.5 (11.3)	-	-	2.4 (4.2)	-	-	9.9 (7.5)
History	H-1	0.4 (0.5)	0.4 (0.6)	-	-	-	1.4 (0.2)	0.8 (1.1)	18.9 (4.3)	7.0 (10.0)	-	56.3 (3.3)	-	-	-
	H-2	-	0.5 (0.9)	-	-	-	10.0 (5.9)	20.7 (9.4)	23.9 (8.0)	.57 (.15)	9.9 (17.2)	15.4 (13.3)	-	-	19.2 (19.5)
	H-3	-	1.6 (2.3)	-	-	2.9 (5.0)	3.9 (4.2)	0.4 (0.7)	9.3 (16.2)	5.3 (9.2)	-	11.5 (20.0)	-	-	46.5 (21.2)
Math	M-1	0.5 (0.9)	-	-	-	-	1.2 (1.7)	14.5 (18.5)	19.0 (23.8)	2.2 (2.3)	7.0 (8.8)	33.2 (14.4)	-	-	10.5 (10.0)
	M-2	2.9 (1.0)	-	-	-	-	2.0 (2.9)	24.2 (1.2)	-	-	1.9 (2.7)	59.4 (1.4)	-	-	-
English	E-1	2.0 (1.8)	0.3 (0.5)	-	-	-	5.9 (4.0)	47.2 (15.3)	-	-	7.3 (12.6)	7.5 (7.3)	7.2 (10.4)	1.7 (3.0)	5.6 (9.7)
	E-2	-	2.3 (1.7)	1.5 (2.1)	-	29.4 (3.2)	3.4 (3.7)	8.9 (12.6)	5.9 (8.4)	-	4.5 (6.4)	-	-	-	4.9 (2.7)

Note: Percentages do not add to 100% because categories other than General Content Instruction are not shown.
Act PK=activates prior knowledge; Ant Set=anticipatory set; Close=closes lesson; Demo=demonstration; Disc=discussion; Expl=explains instructional activity; Fac. IP=facilitates independent practice; Fac. Grp=facilitates group work; Fac. St. Dem=facilitates student demonstration; GP=guided practice; Inst. New=instruction on new concept; Inst. Cog Strat=instruction on a cognitive strategy; Read=reads from book or reading passage; Rev.=reviews previously-learned material

Specific instructional practices used in the co-taught classes are listed in Table 8. Practices used varied across teams but generally represented similar patterns. One finding of note is that very few teams engaged in the following practices: closing the lesson, demonstrating a concept, leading a discussion, reading, or providing instruction in the use of cognitive strategies. Closing a lesson, performing demonstrations, and instructing in cognitive strategies are all identified as evidence-based practices within explicit instruction (Archer & Hughes, 2011; Friend & Bursuck, 2006). The instructional practices used most frequently were new instruction on a topic, facilitating independent practice, and reviewing previously learned material. A few teams also used group work often. The strength of implementation of these practices will be discussed in a later section.

Comparison to Solo-Taught Classes

Figure 7 depicts the proportion of time spent in each instructional practice by setting across all teams. The general education and co-taught classes' instruction were very similar. Co-taught classes spent slightly more time reviewing previously learned material and slightly less time in group work, but these differences were not practically significant. There were two instances of cognitive strategy instruction in co-taught classes and none in the general education classes. I did not observe any cognitive strategy instruction in the self-contained classes.

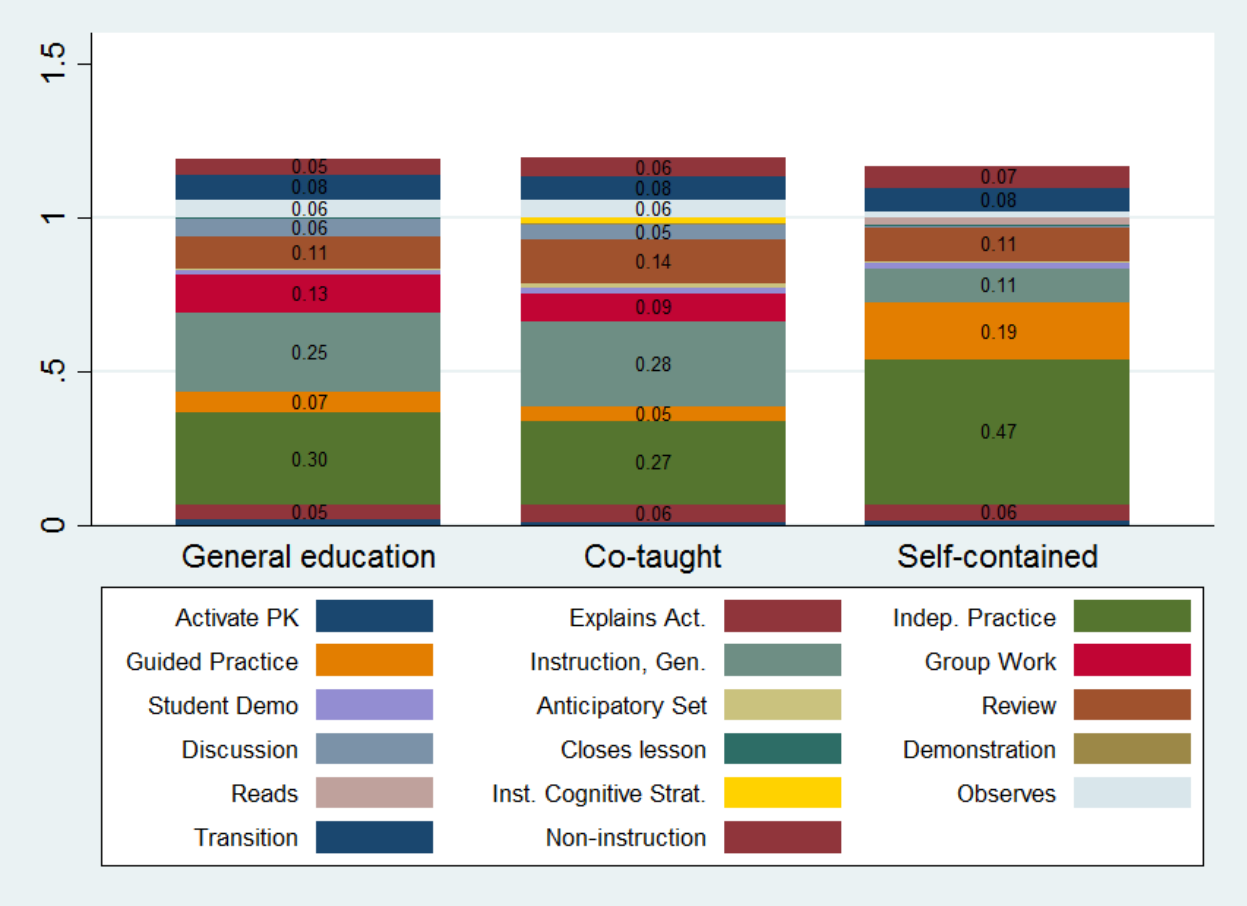

Figure 7. Proportion of time spent in instructional practices across settings

There were more significant differences in the instruction provided in self-contained classes. These results should be interpreted somewhat cautiously because only four SETs taught self-contained classes in the same subject area they co-taught, so the sample for this setting is smaller than in the other two. Teachers in self-contained classes tended to use more guided practice (18%) and independent practice (40%) than they did in other settings. They did this instead of class-wide teacher-led instruction (9%) and class discussion (2%). This indicates teachers prefer to work with students one-on-one in those settings rather than facilitating whole-class instruction and activities.

Table 9 presents the values for the general education and co-taught classes for the eight factors that are most likely to indicate differences because they were the most common features seen across all settings: 1) OTRs, 2) FB statements, and percentage of time spent in 3) instruction in a new concept, 4) independent practice, 5) group work, 6) guided practice, 7) reviews previously-learned material, and 8) explains instructional activity. I conducted Wilcoxon signed-rank tests comparing these values from the general education classes to those in the co-taught classes. None of the tests were significant, even at the .10 level, indicating that as a whole, teachers did not significantly change or modify their instruction for their co-taught classes.

Table 9

Rates of Interactions and Percentage of Time Spent in Select Practices in Co-Taught and General Education Classes

Setting	Rate per minute		Percentage of Overall Class Time					
	OTRs	FBs	Instr. New	Fac. IP	Fac. Grp Work	GP	Rev.	Expl
General Educ.	.67 (.67)	.47 (.45)	20.7 (21.7)	24.7 (25.9)	10.6 (18.6)	5.2 (10.8)	8.6 (15.0)	4.0 (3.6)
Co-Taught	.67 (.55)	.46 (.36)	23.5 (22.0)	22.8 (23.8)	7.4 (13.2)	3.9 (7.8)	11.5 (17.0)	4.7 (4.2)

OTRs=opportunities to respond; FBs=feedback statements; Instr. New=instruction in new content; Fac. IP=facilitates independent practice; Fac. Grp Work=facilitates group work; GP=guided practice; Rev.=reviews previously-learned material; Expl.=explains instructional activity

Specialization in Co-Taught Classes

To examine the degree of specialization in the co-taught classes as compared to general education settings, I conducted a paired-sample *t*-test on the weighted fidelity metric for the overall instruction in both settings overall. Then I visually compared the IMs for the most-used

practices in those settings: facilitating independent practice, instruction in a new topic, review of previously-learned material, facilitating group work, guided practice, and explaining an activity.

First, I tested the four assumptions required for the paired-sample *t*-tests (Laerd Statistics, 2016). The first assumption is that the dependent variable is continuous. This assumption is inherent in the study design. The second is that the independent variable is categorical and has two groups. This assumption is also inherent in the study design. The third assumption is that there are no significant outliers in the differences between groups. I tested this assumption by creating a variable equal to the difference in weighted fidelity in the general education setting and the co-taught setting. I then created a box-and-whisker plot for the values of this variable, evaluating it for any values greater than 1.5 box-lengths from the edge of the box (Field, 2013). The box plot is presented in Figure 8 and shows there are no outliers for this variable; therefore, the assumption is met.

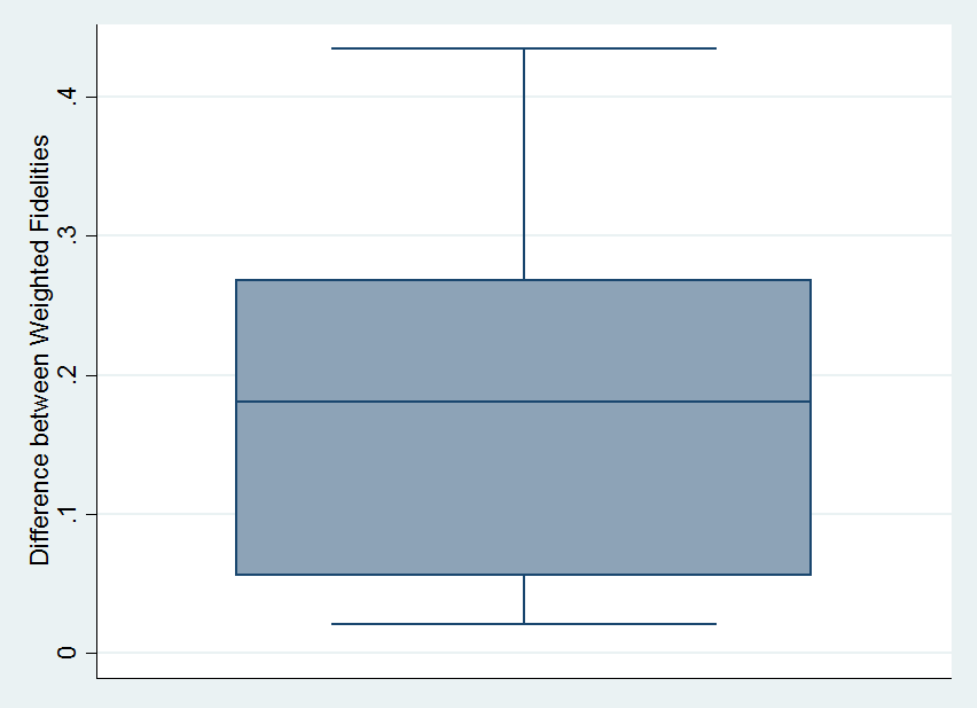

Figure 8. Box plot of difference between weighted fidelities

The fourth assumption is that the distribution of the differences between groups is approximately normally distributed. I tested this assumption using the Shapiro-Wilk test of normality, in which non-significant values of *p* indicate normal distribution (Field, 2013). I also visually examined the histogram and Normal Q-Q plots of the data to evaluate the findings of the Shapiro-Wilk test. The Shapiro-Wilk test indicated a non-normal distribution ($p < .01$). The skewness was .434, which is within acceptable levels (Field, 2013). The kurtosis was slightly higher than acceptable levels, at 1.941. The histogram showed that the distribution was approximately normally distributed, with the smallest group slightly larger than would be expected, indicating the differences between fidelities were mostly rather small. The Normal Q-Q plot also showed this abnormality at the tail end, but it was fairly slight. Because the paired-sample t-test is relatively robust to abnormalities in the distribution (Field, 2013; Laerd Statistics, 2016) combined with the minor appearance of the abnormality, I opted to run the t-test on the data as is rather than running a transformation.

The average fidelity for the general education classes was 0.511 with a standard deviation of 0.232, and the average fidelity for the co-taught classes was 0.519 with a standard deviation of 0.234, indicating a difference of 0.008. The paired-samples *t*-test showed that this difference was not significant, $t(45)=0.476$, $p > .10$.

Overall weighted fidelities by team and setting are shown in Table 10. This reveals high variation, in that they range from .22 to .79, explaining the lack of significance in the overall values. Moreover, when looking by setting, there is no clear benefit of the addition of a special educator. Some teams, including S-2 (which was the lowest-scoring overall) and M-2, had much higher fidelity in their co-taught classes. Other teams such as S-1 and S-3 had much higher

fidelities in their general education classes, indicating a potential negative impact of the special educator on instruction. Meanwhile, the highest-scoring team overall, H-3, did not show much difference at all in fidelities across settings.

Table 10

Mean Weighted Fidelity Percentages by Team and Setting

Team	**Overall Fidelity**	General Ed.	Co-taught	Self-Contained
S-1	**.52**	.59	.44	-
	(.22)	(.23)	(.21)	
S-2	**.22**	.08	.30	-
	(.12)	(.09)	(.01)	
S-3	**.52**	.56	.46	.53
	(.18)	(.19)	(.06)	(.29)
H-1	**.52**	.59	.48	-
	(.08)	(.07)	(.06)	
H-2	**.54**	.49	.57	-
	(.11)	(.16)	(.08)	
H-3	**.79**	.77	.81	-
	(.12)	(.20)	(.08)	
M-1	**.65**	-	.57	.83
	(.19)		(.18)	(.06)
M-2	**.60**	.41	.72	.54
	(.17)	(.02)	(.16)	(.03)
E-1	**.49**	.47	.47	.54
	(.16)	(.28)	(.13)	(.10)
E-2	**.36**	.38	.35	-
	(.21)	(.27)	(.23)	

To examine the differences in fidelity for the top six practices across the two settings, I looked at the non-weighted fidelity percentages to get a clearer understanding of the pure level of fidelity with which each team implemented each practice. These percentages are shown overall and by team in Table 11. In looking at the overall percentages, it is clear that the fidelity of implementation of these practices with regard to evidence-based practices for students with disabilities is about the same across settings. The only practice which has a large difference is

reviewing previously-learned material, which was higher in the general education classes than the co-taught.

Table 11

Fidelities by Team and Practice

	Instruction on New Topic		Independent Practice		Group Work		Guided Practice		Reviews		Explains	
	Gen	Co	Gen	Co	Gen	Co	Gen	Co	Gen	Co	Gen	Co
Overall	**44 (22)**	**46 (19)**	**56 (30)**	**54 (26)**	**57 (24)**	**63 (26)**	**47 (23)**	**48 (39)**	**53 (31)**	**47 (31)**	**39 (28)**	**38 (25)**
S-1	63 (35)	28 (8)	83 (24)	87 (0)	60 (28)	20 (0)	-	60 (0)	67 (-)	42 (29)	40 (20)	30 (15)
S-2	13 (18)	28 (4)	5 (4)	31 (3)	20 (-)	-	-	0 (0)	-	-	0 (0)	47 (38)
S-3	38 (-)	50 (0)	50 (33)	28 (23)	53 (-)	40 (0)	-	-	36 (27)	56 (34)	46 (21)	43 (40)
H-1	53 (4)	50 (0)	58 (12)	67 (0)	80 (0)	60 (0)	-	-	33 (-)	-	80 (-)	35 (40)
H-2	42 (12)	44 (7)	56 (8)	69 (15)	20 (-)	-	53 (39)	100 (-)	37 (34)	42 (10)	31 (25)	40 (0)
H-3	67 (19)	75 (0)	100 (-)	33 (0)	60 (-)	100 (0)	-	-	81 (27)	81 (15)	80 (-)	65 (6)
M-2	38 (0)	75 (14)	-	83 (19)	60 (-)	-	40 (28)	0 (0)	-	-	60 (-)	20 (0)
E-1	31 (9)	46 (5)	53 (35)	42 (20)	-	-	43 (24)	40 (0)	-	67 (0)	40 (40)	39 (7)
E-2	38 (-)	-	71 (18)	50 (0)	80 (-)	60 (0)	60 (-)	100 (0)	-	0 (0)	20 (0)	10 (11)

Individual teams varied in their ability to implement these practices with fidelity. Team S-1 almost always implemented them with more fidelity in the general education setting, but the other teams had mixed results. To better evaluate this question, I examined individual IMs for these practices to determine whether there were any patterns in implementation. Table 12 shows the strength of fidelity to each marker across all teams in the co-taught classes for the six most-

common practices. For each practice, the total number of times the practice was observed being implemented is presented, then below that, each fidelity marker is listed with the percentage of times it occurred when the practice was observed. For example, the first row shows teachers gave instruction on new content in their co-taught classes 94 times, and their language was deemed to be clear and consistent 48.9% of the time. Most of these percentages were relatively close across settings, but not all were. Markers for which there was a discrepancy of more than 10% across settings are noted with symbols as defined at the bottom of the table.

When presenting whole-group teacher-led instruction on a new topic, teachers used visual aids almost 90% of the time, and they were more likely to do so in their co-taught classes than in their general education classes (74%). They did not often provide non-examples, doing so less than a third of the time. Notably, they modeled concepts and monitored understanding less than a third of the time in co-taught classes, which was less often then in general education classes (modeling: 42%; think-aloud: 48%), despite the strength of these practices for SWD. Modeling is, in fact, over-estimated in these observations because teachers were given credit for this marker when they were teaching a concept for which modeling would not be called for because it did not directly lead to completion of a task. Fifteen of these observations were in history classes, for example, which usually did not require modeling. If the history classes were removed, the number of modeling observations goes to 73, and the mean fidelity percentage for modeling goes to 12.3% and for think-aloud to 14%.

Table 12

Mean Percentage of Fidelity to Individual Implementation Markers in the Co-Taught Setting for Most-Commonly-Used Practices

Instruction on New Content (*n*=94)							
Clear/ Consistent	Makes Connec-tions	Repeats Essential Info	Examples & Non-examples	Modeling	Think Aloud	Visual Aids	Monitors Underst-anding
48.9 (50.3)	23.4 (42.6)	45.7 (50.1)	28.7 (45.5)	28.7♦ (45.5)	29.8♦ (46.0)	87.2* (33.5)	26.6 (44.4)

Facilitates Independent Practice (*n*=132)					
Clear directions	Goal/ Rationale	Instructional Level	Monitors Understanding	Provides feedback	Adjusts
47.7 (50.1)	38.6♦ (48.9)	70.5 (45.8)	38.6 (48.9)	43.2 (49.7)	45.5 (50.0)

Facilitates Group Work (*n*=45)				
Clear directions	Individual responsibility	Instructional Level	Monitors Understanding	Provides feedback (debriefs)
40.0 (49.5)	60.0* (49.5)	86.7 (34.4)	80.0 (40.5)	66.7 (47.7)

Guided Practice (*n*=27)				
Organized	Consistent	Frequent Monitoring	Provides feedback	Requires high success
55.6 (50.6)	66.7 (48.0)	44.4 (50.6)	44.4 (50.6)	22.2* (42.4)

Reviews/ Re-teaches Previously-Learned Material (*n*=84)			
	Student participation	Monitors understanding	Provides feedback
	29.8 (46.0)	39.3♦ (49.1)	63.1♦ (48.5)

Explains Instructional Activity (*n*=158)				
Clear/ consistent	Chunked appropriately	Clear target	Conceptual and/or stated purpose	Prompts strategy use
56.3 (49.8)	58.2 (49.5)	40.5 (49.2)	22.8 (42.1)	5.7 (23.2)

** Fidelity was at least 10% higher in co-taught setting*

♦ Fidelity was at least 10% higher in general education setting

When teachers provided students with independent work, they gave them material that seemed to be on their instructional level about two-thirds of the time (see Instructional Menu in Table X for the definition of "instructional level" and how it was determined in observations). They monitored understanding and provided feedback on that work less than half the time, however. The teachers monitored and gave feedback at much higher rates when they assigned group work. Another finding of note related to group work is that teachers only required individual students within the groups to be responsible for part of the work about half the time, which goes against evidence-based recommendations (Bryant et al., 2008). However, they required individual responsibility about twice as often in co-taught classes than in general education (60% and 31%, respectively).

The next practice listed in Table 12 is Guided Practice. In this study, Guided Practice was defined more broadly than it usually is in the literature on explicit instruction. This was necessitated by the almost complete lack of modeling observed. In most cases, teachers were using a guided practice format as the initial instruction on a topic, but I counted it as guided practice rather than instruction because teachers were relying on student responses to guide the pace and steps of the lesson. Even with this broad definition, however, the rate of monitoring and feedback was intermittent rather than frequent (defined as multiple OTRs per minute) about half of the time. Based on recommendations from the literature on explicit instruction (e.g., Archer & Hughes, 2011), one of the most important facets of guided practice is the requirement that students reach a high success rate (typically above 90%) with the material before being given independent work. I saw very little evidence that teachers were holding this expectation for their students in that they were not systematically monitoring individual students' understanding, nor were they adjusting their instruction based on student responses or misunderstandings. They did

so more often in the co-taught classes, but even then I only saw it about a fifth of the time. I never saw evidence of this requirement in the general education classes.

Some teachers spent a lot of class time reviewing previously learned material. For example, team H-3 spent almost half their class time in review. This is due to the fact that they ran their classroom as a flipped class in which students would often view videos of the lecture and take notes on their own, then the teacher(s) would review the information students had learned during class. Across all the observations, teachers gave feedback to students on their responses almost three-quarters of the time. However, they only ensured participation from the majority of their students about a third of the time. Most of the time, teachers would call out questions that would be answered by volunteers or by students calling out responses.

Finally, although the teachers spent a relatively short amount of time explaining activities, it was one of the most frequent practices they engaged in. In a little over half of these instances, directions were clear and chunked in such a way as to be manageable for students to follow. The rest of the time, they were confusing and/or potentially overwhelming with no visual aids to support student retention. Most of the activities were at a basic rather than conceptual level, and teachers very rarely provided a rationale or purpose for the activity. They even more rarely prompted students to utilize any sort of strategy in accomplishing the activity, but given the extreme rarity of cognitive strategy instruction, it is not surprising that teachers did not prompt use of these strategies.

Discussion

The State of Instruction in Co-Taught Classrooms

In this sample, special educators were more inclined to take the lead than what has been shown in other studies in certain teams. This was particularly true for the math teams, which is

unexpected and likely very unusual. The two SETs in the math teams happened to be highly trained and experienced with high school math content (Ms. Sprout is actually certified in both math and special education), which most special educators are not. Although I do not have evidence about the teams at the schools who did not volunteer to participate in this study, I hypothesize that in many of those teams, the SET felt less confident about his/her ability to teach math and thus was uncomfortable being observed. This hypothesis is based on my experiences working with teachers over the years and conversations I had with an SET at Palladia who was co-teaching in an Algebra II course. She refused to participate in the study, saying she did not know anything about Algebra II and thus was not an equal partner in that class and did not want to be observed. I would venture to say her feelings would be more representative of the population of math special education co-teachers than the two in my sample. Therefore, although these findings are interesting and worthy of study, it is likely that they only represent a small segment of the population, particularly in math.

The research questions of this study do not necessarily include quality of instruction because the focus here is on presenting a detailed description of the instruction and looking at its fit with evidence-based practices for SWD in inclusive settings. However, there were indications that instruction in co-taught settings is falling short of what one might hope. For example, interaction rates were quite low across the board. Recommended rates are between three to five per minute (MacSuga-Gage & Simonsen, 2015), and these classes averaged fewer than one. Only three teams averaged more than one OTR per minute, and one team averaged more than one feedback statement per minute. This indicates that teachers may not be monitoring students' understanding closely enough or ensuring high levels of student engagement. When teachers did ask questions, they almost exclusively relied on volunteers to raise their hands or call out

answers rather than systematically use procedures to allow them to monitor all the students. This is critical in co-taught classes, because research shows that SWD are less likely than their peers to volunteer responses (Gathercole & Alloway, 2013).

With regard to instructional time, the average of one-fifth of the class time being spent on tasks other than instruction or learning is similar to what has been found in other studies (e.g., Fisher, 2009). However, given the intense instructional needs that a lot of SWD have, including their need for extensive repeated practice and often significant academic deficits, this essentially wasted time is not ideal. Teachers' instruction generally lacked a sense of urgency, more pronounced in some teams than others, that was manifested in low engaged time and often the use of "breaks" between activities in which students usually engaged in social conversations and/or playing games on their phones.

Findings related to the co-teaching model are in line with previous research in that one-teach-one-assist was the most common model used. In addition, my finding that the vast majority of instruction was provided whole-group, with a substantial portion of the classes devoted to teacher-led instruction or individual practice is also in line with other studies (e.g., King-Sears et al., 2014; Moin et al., 2009). However, this study provides more information than has been available previously about the implementation of these whole-group practices through use of the CT Scan.

One interesting finding from looking at individual IMs is that teachers monitored group activities more regularly than independent ones. I hypothesize this is because the main reason teachers monitored students during activities was to manage students' behavior rather than necessarily to truly monitor their academic understanding. This type of monitoring would likely be more needed during group activities than individual ones. I did not collect data in this project

that could be used to verify or reject this hypothesis, so it is something to consider in a future study.

Teachers rarely provide non-examples to clarify information, nor do they use modeling or think-alouds very often, both of which are known to be powerful learning tools for SWD (e.g., Archer & Hughes, 2011). They also provide specific goals or rationales for assignments and activities less than half the time. Given that this is a relatively simple thing to do, the fact that it is happening at such a low rate is surprising. These results are true both in the solo- and co-taught classes. I did not collect data that would enable me to determine whether the lack of these practices is due to knowledge or skill gaps, but it does raise the question about how purposefully teachers are planning their instruction at all. Modeling, non-examples, and purposeful activities require teachers to think about their language use and plan for coherent presentation and application of information. It would be interesting to know how many teachers in these samples could articulate clear rationales for each assignment they gave to students; this could point to whether the problem lies in the way teachers approached their planning or whether they just did not understand the need to share these rationales with their students. This is particularly interesting to consider with regard to co-taught classes in which two teachers are intended to plan the instruction together.

Is the Special Educator Impacting Instruction?

Presumably, in a co-taught class, the two teachers plan and implement instruction together. However, across observations, certain practices that are good for SWD were basically missing from co-taught classes. These included closing the lesson with a review of new material, demonstration of concepts or procedures, and, most notably, cognitive strategy instruction. These were largely absent across teams, even those that planned together and changed their instruction

in other ways. Why did the special educators not bring these in? Data collected in this study are not sufficient to answer this question, but it could be a knowledge gap, a skill gap, or a failing of teamwork.

A knowledge gap would indicate that the special educators simply do not know the methods of instruction that are most effective for students with disabilities. It could also be that they know the methods but do not know how to incorporate them into existing general education lesson plans. A skill gap would indicate that even if they do know the practices, they are unable for whatever reason to implement them in an inclusive class. Failings of teamwork would be implicated if the lack of effective practices is due to miscommunication between teachers or perhaps differing and competing priorities influencing how the teachers spend their time. Given that there are certain teams who implemented the practices with fidelity more often than others, it is quite possible this question could be answered by investigating in more depth the team dynamics in those teams that are able to implement and those that are not. However, given that none of the teams employed cognitive strategy instruction very often, part of the problem is also likely due to gaps in skill or knowledge.

Examination of the weighted fidelities by team shows that there is a possibility that in some teams, the SET was useful in improving the quality of implementation of practices for students with disability, but in other teams the SET actually lowered the quality. This will be discussed further in Chapter VI, but based on this descriptive analysis of instructional practices across settings, it is apparent that in many cases, the SET might not be changing the status quo in any significant ways. Viewing these results through the lens of my conceptual framework (Figure 2), it does not appear as though specialized instruction is happening in any kind of systematic way. This would indicate that perhaps the moderating factors associated with teachers

or schools are interrupting that relationship. The next chapter analyzes these potential moderators.

Reflection on Conceptual Framework

According to my conceptual framework (Figure 2), having two teachers in a classroom should result in significantly different and specialized instruction that incorporates practices known to be effective for SWD. As shown in the segment of the framework reproduced in Figure 9, I hypothesize that this specialized instruction is the mechanism through which co-teaching should lead to increased achievement for all the students in co-taught classrooms. Data from this project present a disheartening picture as to whether specialized instruction is actually taking place. Not only did the teachers not change their instruction for their co-taught classes essentially at all, they also did not incorporate practices that are known to be effective, such as activating prior knowledge or cognitive strategy instruction. For the practices they did implement, they largely did so with low levels of fidelity to the recommended guidelines of explicit instruction. For example, they rarely provided non-examples, nor did they model skills using think-alouds. This project was not designed to evaluate the theoretical causal relationship between specialized instruction and student outcomes, but given the strength of these practices, it is reasonable to hypothesize that use of them should result in better academic outcomes, particularly for SWD. The next chapter discusses the functioning of school-level contextual factors in the implementation of co-teaching, factors I hypothesize could impact the degree to which teachers are able to implement specialized instruction.

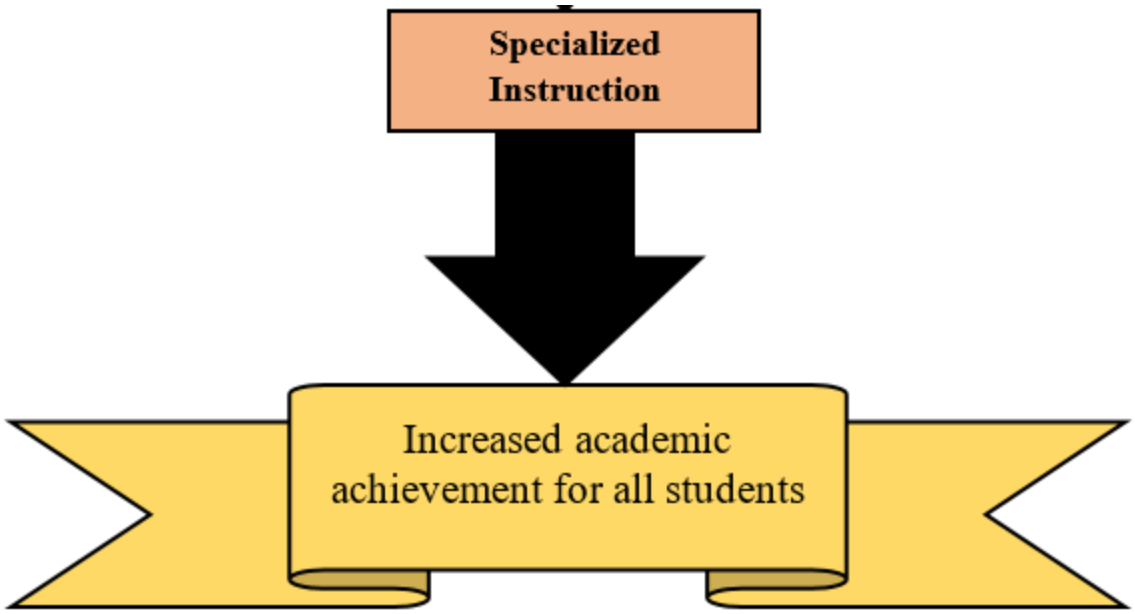

Figure 9. Bottom section of conceptual framework

CHAPTER V: SCHOOL-LEVEL SUPPORTS FOR CO-TEACHING

Palladia and Independence High Schools provided almost all of the supports experts in co-teaching recommend schools provide. Both schools had administrators who had co-taught in the past, so they were sympathetic to the needs of co-teachers. They worked hard to provide the teams common planning time in their schedules, and teams were paired to work together for multiple years in a row in most cases. First, I present an analysis of individual responses related to each factor of interest and note themes and contradictions across participants and settings. Then, I present a role-ordered matrix, which summarizes each participant's responses by role and analyze whether there are any patterns that seem to be influenced by roles.

Teacher Pairing and Scheduling

Pairing

Almost half of the teachers (47%) reported in the survey that they did not have any input in the selection of their co-teacher. About a quarter (26%) said they had a lot of input. Forty-two percent of teachers reported that they believed they were paired with their current co-teacher because they had worked well with that person in the past. There were different philosophies about teacher pairing across the two schools, however.

Ms. Morris, the administrator at Independence, placed great stock in teacher requests for co-teachers. She said teachers come to her frequently to request to co-teach or to request a

specific co-teacher. She spoke of letting her teachers "take ownership" of that process. One thing she said they consider is the willingness of the general educator to co-teach and said they try not to pair new special educators up with general educators who have been teaching for a long time because that can make a special educator feel "her voice [isn't] being heard." This emphasis on teacher input was reflected in conversations with the teachers. One history teacher at Independence, Ms. Fraser, stated in the past administrators had "switched up" co-teachers a lot, but that recently they had done a better job keeping people together. She described her school as "a model" that other schools should follow with regards to that. Her sentiments were echoed by Earth Science teacher Mr. Brian, who said he felt now "administrators realize[d] the importance of continuity . . . [in] building relationships" and "plac[ed] an emphasis on keeping pairs together." Math teacher Minerva Sprout said, "Our administration usually asks me. I'm going to be with a different co-teacher in the spring because . . . I want to try it out with her. I want to see how it goes."

At Palladia, the attitude toward pairing was a little different, and the administrators did not see the process the same way. Administrator Julia Dickinsen said,

> Every year we sit down to do the master schedule, and I don't feel there's thoughtful consideration given to pairing people. I don't think we get their input. . . . We also have to do a better job of, the teams that are working, let's keep them together. . . . Every year, I feel like I'm, 'Why are we separating them? Why are we doing this?' . . . Or I spend a lot of time saying, 'Look, this team isn't working. We need to separate them.' . . . It's just a hit or miss.

Another perspective was provided by administrator Sarah McCarthy, who said, "We try to maintain pairs that are working. . . . People turn in requests, and we try to honor those."

However, in contrast to the policy at Independence, she also said they have stopped keeping some GETs out of co-taught classes and made it a general expectation that all of them will co-teach if "that's what works best in the master schedule." As a result, she noted that "there are some rough pairs this year. I'm not going to lie. We knew they were going to be rough."

Teachers at Palladia felt this lack of coherence from the top. For example, History teacher Daniel Smith said,

> There isn't much debate between teachers and administrators about who they're going to work with in some instances. I mean, it was news to me that I was going to be working with [Kelly]. Which I was fine with, . . . but it's just like, 'You're working with [Kelly] this year.' You know, it was never talked about.

Earth Science teacher Dawn Beach said, "They do ask us if we want to continue to work with people. But they don't always follow that. They don't always follow what you say." She said if she asks, they will explain why they didn't honor her request, but they do not volunteer the information. Two Palladia teachers, Ms. Beach and Ms. Hills, said they suspect sometimes a strong teacher will be paired with a weak one so the strong teacher can shore up the other's weaknesses or serve as a de facto mentor, which they said puts them in an awkward position.

Mr. Smith's co-teacher Jack Kelly focused on the lack of consistency in teaming at Palladia:

> It takes years for good [co-]teaching to really happen. . . . This is what kills me. Because you get these awesome collaborative teams, and they break them up. And it took maybe three years to get where it runs like clockwork, and it's perfect. And so you had something that was hitting on all cylinders, and then you broke it apart. Why did you do that? We invested three years on that, you know?

Another history teacher at Palladia, Owen Gregory, expressed strong frustration with the lack of thoughtful pairing. The previous year, he had taught with Jack Kelly for the first time. He had enjoyed working with him, and their students' state test scores had increased. He was shocked when he saw they weren't working together again this year and said administration really "screwed up." He said he requested an explanation numerous times, but no one could tell him why they had broken up this successful team. Math teacher Sue Hills took a humorous look at the situation, saying, "Never two years in a row. We joke about that. They can't let us work two years in a row." Despite the joking, she called it "defeating" to have to start over with a new co-teacher every year.

Teaching Loads

Administrators in the schools worked to limit the number of classes and co-teachers participants had. All of the GETs in the sample only co-taught with one special educator. The special educators, who naturally have more co-taught classes, had up to three co-teachers. Sixteen percent of them had one, 57% had two, and 27% of them had three.

The schools also worked to limit the number of different content areas in which teachers taught. All the general educators worked in one content area, although 45% of them taught more than one subject within their content area (e.g., US History and World History). The SETs taught in up to two different content areas, although 38% of them were only in one. The most varied schedule was a special educator (Mr. Kelly) who taught Biology, US History, and World History. Another special educator (Ms. Fish) taught all English Language Arts, but she taught two blocks of English 12, one English 10, one self-contained mixed class with students in grades 8-12, and a reading remediation block. The rest had relatively stable schedules across their classes. Notably, however, unlike many of the GETs, none of the SETs taught the same course

through their entire day. Palladia math teacher Jessica Fletcher said she had never had such a difficult time getting a consistent schedule at previous schools and instead had always been able to teach the same course, but at Palladia, she was moved around a lot. She also hinted at some confusion in the scheduling when she said, "For the past three years, my schedule has changed either the week before school started, the week school started, or the week after school started." Ms. Fish told a similar story, talking about one year when she got switched into a new co-taught class halfway through the school year because another team wasn't working out.

Common Planning

Seventy percent of the teachers in the sample shared a common planning time with their co-teacher in their schedules. The other 30% did not. Overall, 77% of the teachers in the sample shared scheduled planning time with at least some of their co-teachers (including the co-teachers who were not in this study), and 23% did not share co-planning with any of their co-teachers. Their use of this scheduled time is discussed in Chapter VI. Administration at both schools emphasized the importance of allotting this common planning. Carter Morrie at Independence said they've "worked to get as many common plannings for our co-teachers as possible, which they love. So now we have to keep trying to hold up our end of the bargain." Sarah McCarthy at Palladia said she advocated strongly for common planning, saying

> [Julia] and I fought for them. Like, we had some knock-down, drag-out battles over the master schedule with other people, saying, 'No, this is not going to happen. They *have* to have common planning. This is a deal breaker for me.'

Given the importance placed on common planning time for co-teachers in the literature (e.g., Fenty & McDuffie-Landrum, 2011; Hang & Rabren, 2009; Scruggs et al., 2007; Walther-Thomas, 1997), it is clear that researchers and teachers alike believe that dedicated common

planning time is essential for successful co-teaching. The administrators in this study had heeded that recommendation and worked hard to provide that planning time for their co-teaching teams. Teacher perceptions and use of their planning time as well as its relationship to the instruction they provide are discussed in Chapter VI.

Scheduling Students in Co-Taught Classes

Palladia High School took a unique approach to scheduling students without disabilities in the co-taught sections of their classes. Dr. McCarthy told me in her interview that she went through the rosters for each co-taught class and removed all students who received 504 services and those who were known to have behavior or academic problems unrelated to a disability. She also ensured that no more than one-third of the students in the class were students with a disability. In explaining her rationale for this, she said, "There's this idea that, 'Oh, it's a collab class – this gen ed kid really needs some help. Let's put them in there.' No, no, no. That defeats the whole purpose of inclusion." This was the first year they so purposefully created rosters for the co-taught classes. As with the teacher pairing, however, there did not appear to be communication between the administration and the teachers that this culling of the rosters had taken place because teachers still complained about the make-up of their classes. Ms. Fish described the students in her class with Mr. Dominico as "mega . . . needy" and said, "With the co-taught class, they tend to put the usual suspects in together year after year. And it's like a river of piranha, and a cow wanders in. It just becomes a frenzy." Mr. Dominico said his co-taught classes are frequently "half special needs" and says having so many students who need so much attention in there harms the other students. When asked if he felt it was so dramatic this year he admitted maybe it was a little better this year, but he did not moderate his stance.

English teacher Tess Durbeyfield complained about a more systemic problem, saying her co-taught classes were almost always majority male whereas the honors classes were almost exclusively female. Ms. Beach was even more harsh, citing a recent district decision to offer Earth Science courses in 8th grade and saying that lowered the academic level generally for students taking the course in 9th grade. She described her co-taught classes as being comprised of students who

> aren't labeled as having a disability who can't read. You know, so you have these 10 kids that . . . have disabilities. Some of them major disabilities . . . And then you have five kids who have IEPs. And then you have five kids that aren't identified but have major issues. And then you have alt ed kids in there, too. . . . I mean, there's no way that you can teach in that kind of environment. It's not good for anybody.

Mr. Kelly, who disclosed in his interview that he, like many of his students, has a reading disability, took a more philosophical approach to this discussion, saying it frustrates him when administrators put students who are on the "failure track" in co-taught classrooms because "it's basically saying, 'Well, Mr. [Kelly]'s students are on the same track anyway.'" He says his students have to work twice as hard as other students in order to be successful and it is not fair to "limit them by putting them in a classroom with a kid that just doesn't care, and if he gets the chance to be a distraction, he's going to be a distraction." Although he admits that those other students might benefit from a second teacher, he says he is "protective" of his students. "They've already been hamstringed by the disability. At what point do they matter? At what point do we step in and say, 'You know what, this isn't the best practice?'"

At Independence High, Ms. Morrie agreed with Mr. Kelly's point, that scheduling all those students in co-taught classes is not best practice. However, she says she is limited in her

ability to change the status quo. The guidance counselors often schedule students who are struggling in the co-taught classes purposely to get them more help, and she acknowledges they are doing it because they want the best for those students. They have just made progress at Independence in getting the counselors to productively contribute to their Response-to-Intervention program, so the administrators are trying not to alienate the counselors by asking them to change their scheduling procedures. She says it is a "challenge that we are really struggling with right now." This challenge is definitely experienced by the teachers at Independence. Mr. Brian described his co-taught classes as being "sky-high" full of students with disabilities, and his co-teacher Helen Lair concurred, saying it is "like a self-contained class with two teachers." Ms. Fraser had a different take on things, preferring the class to be skewed that way. She said,

> I've heard some people complaining about it . . . some of the more challenging, non-IEP kids get put into collab classes because there are two people in there. Now, personally, I prefer that. I think it's a lot less work [when] the group is a little more homogenous in terms of how to plan things.

The two schools handled scheduling students in co-taught classrooms quite differently, but teacher perceptions were similar across the schools. For the most part teachers believed the presence of a preponderance of SWD or students who struggled with academic or behavioral problems in co-taught classrooms had a negative impact on their ability to provide quality instruction. The actual relationship of student distribution on instruction is discussed in Chapter VI.

Teacher Training and Evaluation

Training and Professional Development

Teachers at both schools reported very little pre- or in-service training on co-teaching. Few of the teachers had coursework on co-teaching in their university programs, and those who did said they did not learn much in the courses. Both schools arranged meetings in the beginning of the school year for the collaborative teams, and Independence High was participating in a state-run initiative that identified strong co-teachers and provided additional training for them then supported them as they traveled to state conferences to train other teachers. Participant math teacher Minerva Sprout and one of her frequent co-teachers are part of that initiative and therefore are often put in charge of delivering training on co-teaching to the teachers at Independence. Their coworkers appreciated this training but said they had trouble seeing how the models fit their subject areas. Ms. Smith said she and her co-teacher Ms. Fraser "don't always neatly fit into those [models]." Ms. Fraser expressed some frustration, saying

> It's definitely been challenging because a couple of models like two teachers teaching at the same time – I would love to try it. Figuring out how to make that work – I think I've had more questions than . . . answers. . . . It's something I'd love to explore more.

The only teacher who seemed to feel completely comfortable going into co-teaching was Ms. Lair, who was in her second year of teaching. She expressed that inclusive teaching and co-teaching were "all [she] did in student teaching," and she actually struggled more to figure out her role in her self-contained classes. Her co-teacher Mr. Brian, however, was much less confident. He said,

> I have trouble with the different models that we've been taught. They're great, but I really have a tough time relating them to my subject. . . . They've been introduced to me

> in a way that's convenient, you know, they've been modeled to us. But boy, there's been times I've tried to put them to use but just can't imagine how.

Ms. Morrie said her focus that year was on staying in communication with the co-teaching teams at Independence to make sure things were going well and to help teachers develop the skills to have "courageous conversations" when they were struggling. These goals developed from an experience she had the previous year in which a team she thought was doing very well told her at the end of the term that they had hated working together. After that, she said she has tried to stay keep much stronger tabs on teams' relationships. The teachers acknowledged this effort, saying the administrators gave surveys about their satisfaction and asked how they were doing a lot. Ms. Sprout said, "I don't think you could find a more supportive administration. They want to spread the gospel of co-teaching."

The teachers at Palladia seemed to see their administration as much less involved, more "hands-off." They had the meeting at the beginning of the year, but none of them found it very helpful. They mentioned a training that was coming up mid-year in which they were going to learn about the models of co-teaching by watching a video. The teachers had mixed feelings about that training. Some of the newer, less experienced teachers looked forward to it and were hopeful it would give them more skills; more experienced teachers were less optimistic. Mr. Smith said in relation to the videos,

> they go into the perfect classroom setting, and everybody's raising their hand, and everybody's engaged and collaborative group teaching, and everybody's participating. Then you walk into this [real] class, and it's – four people don't care if they fail, three are sleeping, and so . . . sometimes the activities don't get the same results.

Ms. Barnstable had a similar reaction when asked about her pre-service training on coteaching. She said,

> It's all just theory. And it sounds so good. . . . When you actually live it, and you're dealing with the craziness of planning, SOLs, preassessment, analyzing data – when you're dealing with all that stuff and a caseload, it's not as pretty. . . . It doesn't relate."

Three teachers at Palladia, when asked what training they had received that has been most useful to them as co-teachers mentioned training unrelated to teacher education. Special educator Edwin Helm said before teaching at Palladia, he had worked at a residential outdoor wilderness school where he had a group-leading partner with whom he was basically "raising the group of kids. So it was almost like I took what I learned there to the classroom, how to work with somebody else." Ms. Barnstable had worked at the same residential school Mr. Helm did. She discussed a personality test she and her coworkers had taken there that analyzed working and leadership styles and how people responded to leadership. She said, "It helped us understand each other and ourselves a whole lot better." She suggested schools could use something like that to help in pairing teachers and in building relationships and trust between teachers. Mr. Roberts appreciated the hands-off approach his administrators took, saying they provided him the supports he needed such as common planning time and then trusted him to use the supports and "Make it work." He said the training he had received as part of a mentorship program in which he had coaches and training exercises to help him learn "how to talk to people and address people and work with people, both individually and collectively" was more helpful than any training he had been provided by the school in helping him become a strong co-teacher.

Evaluation

I asked the administrators what they looked for when they observed co-teachers. Ms. Morrie at Independence said she wanted teachers to be living up to the expectations they put forward at the beginning of the year, which is that they "share . . . responsibilities." Her belief was that the content teacher should be setting the goals for what needs to be covered, and the special educator should be "designing instruction for the individual needs [of the students]." She wanted to see how the teachers work together and what they were doing instructionally to meet the needs of the students. She said administrators have used the CT Scan a little bit, mostly looking at the opportunities to respond and feedback statements, but she did not mention how those things would be different in co-taught classes than solo-taught, if they would. At Palladia, Dr. McCarthy said she and the other administrators do frequent walk-throughs in which they make note of which co-teaching models are being used and "opportunities to respond, formative assessment, how are we seeing teaching that is responsive to student needs, differentiation, all those kinds of things." Ms. Dickinsen said she wants to see her special educators providing individualized instruction to students based on their IEP goals and needs, but when she observes a class, "It should be seamless," meaning she shouldn't necessarily be able to tell who is the general educator and who is the special educator. This contradiction will be discussed further in Chapter VII.

Most of the teachers reported having been observed by administration during their co-taught classes. None of them recalled having received feedback from those observations specific to their co-teaching. Only one teacher, special educator Taylor Jones at Palladia, mentioned having been given feedback together with her co-teacher (not the one who participated in this study). The feedback was on the lesson itself, though, and not the way they co-taught

specifically. That was a theme across the Palladia teachers, most of whom did not seem to mind, taking the philosophy that "No news is good news" and assuming if they weren't hearing anything about co-teaching, they must be doing it right. Ms. Beach expressed a strong desire, however, to be evaluated along with her co-teacher(s). She stated, "It's a team. And I think that there needs to be some evaluation at that level . . . That will facilitate growth." In the absence of that, however, she echoed the other's sentiments: "Usually if you're hearing about it, it's probably not working out."

Role-Related Responses

I used a role-ordered matrix (Table 13), to break down responses by GETs, SETs, and administrators. In glancing down the first column related to policies of pairing, most teachers, regardless of their position, believed administrators should listen to teacher requests and input about who co-teaches and with whom they co-teach. They also believed administrators should look for teachers who match in personality and style. Two teachers at Independence, Mr. Brian and Ms. Sprout, indicated their administrators are listening to them with regard to who is paired and in trying to keep teams together more than one year. No teacher at Palladia indicated they felt listened to. In looking at the administrator responses, the reason for this becomes clear. At Independence, the administrator believed strongly in letting the teachers have "ownership" of their co-teaching situation. At Palladia, the administrators were divided, with Dr. McCarthy believing teachers should not have the option to refuse to co-teach and Ms. Dickinson believing administrators should more carefully consider teachers' input.

In the second column, the general educators were divided on the usefulness of common planning time. Some felt it was an absolute necessity to allow them to plan together. Others felt it was a good idea but hard to make use of due to the extensive competing duties the SETs had,

with IEP meetings and case management work. In those cases, the teams either did not plan or met outside of school hours to do their planning. The SETs agreed that it was hard to use common planning due to other responsibilities. Both groups of teachers felt strongly that administrators should simplify SETs' schedules in various ways, from limiting the number of preps and co-teachers they had to providing additional time to handle case management duties beyond the regular planning time. All three administrators acknowledged the importance of giving teachers common planning time, although both Palladia administrators made disparaging comments about their teachers, saying they never used the time they gave them anyway.

The third column related to the composition of the students in the co-taught classes. The general educators were slightly divided on this, although many of them mentioned that the co-taught classes were more difficult to teach because of the numbers of students with behavioral and academic problems, either SWD or otherwise. Some of the GETs noted that they actually preferred for their co-taught classes to be over-loaded with struggling students because this made the group more homogenous and easier to plan for. The SETs agreed that there were too many problematic students in the co-taught classes, but they had a different perspective on it. Rather than focusing on homogeneity, many of them mentioned the need for a more diverse student body so the SWD had positive peer models to follow. On this issue, the administrators seemed to be on the same page with their teachers, focusing on creating a balance.

Table 13

Role-Ordered Matrix Summarizing Interview Responses

Role	Participant Name Subject */ **	Pairing	Scheduling – Teacher	Scheduling – Students	Training	Evaluation
General Education Teachers	**Tess Durbeyfield** English 10 (P) 16/ 10	"matching mindfully"; Pair good teachers; Content expertise; Personality	NA	Too many boys	Not much offered	Positive "Keep it up"
	Nate Dominico English 10 (P) 3/ 3	Keep pairs together; Views/ management styles should align; Reality is pairs are formed from convenience	NA	Lots of behavior problems & kids who need attention	None offered	Feedback only in crisis "Keep on doing that"
	Bailey Hughes Algebra I (I) 5/ 2	Personalities should match; People should choose to co-teach & choose co-teacher; Ability to compromise	Hard without common planning	NA	Provided by other co-teachers; Role-playing; Learn by doing	Sometimes get feedback
	Sue Hills AFDA (P) 29/ 19	Should keep teams together, but they don't; Should ask for teacher requests but don't; Co-teachers should be flexible	Common planning time is important, but SET doesn't have time because of other duties	NA	Not enough showing; Repetitive; Not realistic	Judged on brief, sporadic observations; Feedback only when it's not going well
	Claire Fraser World History 2 (I) 13/ 4	Should have similar personalities; Should keep pairs together	Much harder w/o common planning; Hard b/c of SET's other duties	Better to have more homogenous classes	Provided by other co-teachers; Unsure how to make models work	Generally positive feedback
	Daniel Smith US History (P) 11/ 11	Teacher input is not considered	Have common planning; just hang out and plan whenever	NA	Hands-off; Not realistic	Only get feedback if it's not working out; Should not compare test scores across settings

Role	Participant Name Subject */ **	Pairing	Scheduling – Teacher	Scheduling – Students	Training	Evaluation
	Owen Gregory US History (P) 14/ 13	Admin does not provide rationales; Should keep successful teams together – need consistency; Content knowledge is important	NA	NA	Repetitive; Nothing new	Couldn't tell who was GET and SET; Send other co-teachers to them for advice
	Reese Roberts Earth Science (P) 9/ 5	Should be similar in classroom management & organization and in personality/ style; Teachers should choose to co-teach & have input in co-teacher; Should keep teams together	SETs should be kept to minimal different contents; Common planning time is huge – unrealistic to expect teachers to meet outside of school day	Students need to be able and willing to do the work	Given, but not emphasized; Can be too much talking; Mentorship training was really helpful – how to work with people; Not always realistic	Don't recall feedback specific to co-teaching
	Dawn Beach Earth Science (P) 23/ 20	Most important things are personality and classroom management; Should listen to teacher input; Content knowledge is important	Should limit the number of different co-teachers for GETs & the number of content areas for SETs	Too many low-achieving students; Easier when groups are more homogenous	Most helpful was working with skilled SET	Would like feedback on co-teaching, but it doesn't happen; Should provide clearer expectations
	Mr. Brian Earth Science (I) 11/ 8	Should be continuity with teams – getting better	NA	Too many SWD	Seen the models but hard to relate to other content	NA
Special Education Teachers	**Parsnip Barnstable** English 10 (P) 11/ 5	Personalities/ philosophies should match; Pair good teachers; Content knowledge is important	Common planning time hard to use b/c of other sped duties; Planning happens outside of the school day; Should try to limit content areas and mobility for SETs	Overloaded with students with behavior problems (not SWD)	Meeting at beginning of year to discuss responsibilities; Not realistic; Experience working with good teachers is helpful; Personality test; Show, don't tell	If teachers are happy, admin leaves them alone; Generic, positive feedback

Role	Participant Name Subject */ **	Pairing	Scheduling – Teacher	Scheduling – Students	Training	Evaluation
Special Education Teachers	**Gaptooth Fish** English 10 (P) 10/ 10	Should keep pairs together but they don't	Should limit number of co-teachers & contents; Should offer time to plan, etc. – too much other stuff to do	Lots of really needy students	NA	Admin wants it to be seamless, but that's unrealistic
	Minerva Sprout Algebra I (I) 9/ 8	Admin asks me	NA	Should make sure there are positive role models in there	Offered inservices (provided by me)	Admin is supportive; Checks in, provides support & encouragement
	Jessica Fletcher AFDA (I) 14/ 11	Should ask for teacher requests	Really need common planning but don't get it; Should limit co-teachers and number of preps	Too many SWD – accelerated learners get bored	Provided by me; Really teams just need time to talk to each other; It's always about the models but never enough about how to actually use them	Specific feedback on teaching and roles in classroom; Admin wants station and parallel, but don't have resources
	Betty Smith World History 2 (I) 9/ 8	Should consider personalities and willingness to accept different styles	Common planning is important, but it's hard to use because of other duties	NA	Repetitive; It's usually on models, but we don't fit one	NA
	Jake Kelly US History (P) 19/ 15	Need to keep teams together	NA	Filled with kids who aren't motivated – are on "failure track"	Learned from experience; Repetitive; Should be follow-up but isn't	Pushing us to use more models; No feedback specific to co-teaching
	Erwin Helm US History (P) 14/ 14	Should ask for teacher input; Should choose flexible, accepting people	NA	NA	NA	Feedback on instruction, not co-teaching; They leave us alone
	Michael Jordan Earth Science (P) 9/ 9	Content knowledge is important; Personalities and styles	NA	NA	Experience working with other teachers has been valuable	Admin likes use of models – positive feedback on that

Role	Participant Name Subject */ **	Pairing	Scheduling – Teacher	Scheduling – Students	Training	Evaluation
	Taylor Jones Earth Science (P) 2/ 2	NA	NA	NA	Been more this year – not very helpful	Met with us as a team; No feedback on co-teaching specifically
	Helen Lair Earth Science (I) 2/ 2	Find teachers who are good for the students	Shared planning and shared location are important	Too many SWD	Good examples provided by another team; experience student teaching	NA
Administrators	**Carter Morrie** Assistant Principal (I)	They want volunteers – want teachers to take "ownership"; Look for teachers who are not "set in their ways"	Teachers want shared planning time – try to get it for them	Guidance putting a lot of struggling students in co-taught – working on it	Conferences w/ Co-Teaching Initiative; Push to get SETs content certified; Focus on relationships	Set expectations; GET = content & SET = individual needs; Are kids' needs getting met? How well do they work together? OTRs & FBs
	Sarah McCarthy Assistant Principal (P)	Expectation is that everyone will co-teach (whether they want to or not)	Fought to get teachers common planning time (but they don't use it)	Purposefully set rosters – limited SWD & removed students w/ behavior & academic problems	Gave them information about roles and expectations that they would both be responsible	Models, OTRs, formative assessment, responsiveness
	Julia Dickinsen Lead Special Education Teacher (P)	Should be purposeful, but it's not; Should listen to teachers' wishes, but they don't	Try to get them shared planning time (but they don't use it)	SWD need positive peer models	Haven't given much – going to do one on models; Not enough time; Hard to train specialization b/c has to be individualized	Specially designed instruction; Should be seamless

NA=no answer or not addressed in response
** = years of experience teaching*
*** = years of experience co-teaching*
I = Independence High School
P = Palladia High School

Regarding training opportunities, differences were based more on school than position. Teachers at Independence seemed somewhat more positive about the training they received than those at Palladia. They mentioned examples and role-plays provided by one of the co-teaching teams in the school (Ms. Sprout was a member of that team), but three Independence teachers commented that they did not see how to actually implement the models in their classrooms despite the training. Teachers of both types at Palladia were generally negative about the training they received, either saying they did not receive any or that what they did receive was repetitive and unrealistic. They received examples of "ideal" classes, which they did not feel represented the reality they faced in their classroom and with all of the other duties they were responsible to manage. The administrators thought very differently about training. Ms. Morrie had recently become very focused on helping teams work on their relationships with each other, Dr. McCarthy felt it was all about clear expectations, and Ms. Dickinsen was planning another training session on the models which sounded very similar to trainings they had provided in the past.

Finally, participants were asked about evaluation. Teachers across fields expressed that they usually received positive feedback, but it was rarely specific to their co-teaching. They felt like administrators expected them to use varied models and have the instruction be "seamless," a word the participants used to indicate that the general and special educator should be basically indistinguishable during instruction. Administrators across schools mentioned OTRs and responsiveness as important factors and said they wanted to see both teachers fully and equally involved in planning and implementing instruction.

Discussion

The potential moderating influences of teacher- and school-level factors seem to function slightly differently across the two schools, although there are some consistencies. Administrators and teachers at Independence seemed to be more on the same page in their views about co-teaching and how it should work than those at Palladia. Administrators had put forth clear expectations and were seen as being more involved and supportive. Teachers at Palladia generally saw their administrators as uninvolved at best and actively undermining their efforts at worst. Whether or not this seemed to have an impact on their instruction is evaluated and discussed in Chapter VI.

Experts in co-teaching highly recommend that co-teachers should volunteer to co-teach and should have a large degree of input into selecting their partner (Rice & Zigmond, 2000; Scruggs et al., 2007). This was happening at Independence, but not at Palladia. The administrators at Palladia were even conflicted among themselves about whether this recommendation is truly important. Given the fact that instruction looked the same across settings in both schools raises legitimate questions about whether it makes a difference in instruction whether teachers have this input, particularly about with whom they co-teach. Most of the teams in the study had enjoyed working together in the past and felt they had a good relationship with their partner this year. The first recommendation, that teachers should be allowed to volunteer for co-teaching is not relevant for this study because all teachers in this sample either chose to co-teach or were not opposed to co-teaching. It would be interesting to find out whether instruction in these classes would have looked different if teachers were resistant to it.

A common theme across teachers was that they did not have time to plan together, whether or not they had common planning time built into their schedules. This was largely attributed by both types of teachers to the extra duties placed on SETs such as managing a caseload of SWD or holding IEP meetings. However, most teachers and administrators felt having common planning time in their schedules was important, and experts in the field agree. Based on themes across responses, I hypothesize that the usefulness of common planning time is closely linked to teaching loads. The use and impact of common planning time is discussed further in Chapter VI, but based on teacher comments about the difficulty of adjusting to working in multiple settings and situations, it is likely that the more complex the teachers' schedules are in terms of number of preps and number of co-teachers, the less useful common planning time becomes.

Regarding training for co-teaching, the teachers in this sample almost unanimously agreed that it was not very helpful. Some said it was repetitive or unrelated to the realities of their classrooms. A few said they appreciated the concepts of using different models of instruction, but they did not know how to implement those models in their own classes. Administrators varied in what they saw as important for co-teachers to know. Ms. Morrie at Independence focused on making sure the teams communicated well and enjoyed working together. Although, when the teachers at Independence discussed their training, they almost exclusively talked about training that had been provided by Ms. Sprout and another teacher about using the co-teaching models, indicating that Ms. Morrie's work on communication had perhaps not been internalized by the teachers yet. Dr. McCarthy and Ms. Dickinsen at Palladia were in the process of planning a training for their teachers focused on the co-teaching models.

Interestingly, despite the training focus, models only came up briefly in the administrators' assessment of what was important when they observed classrooms. They spoke much more often about specialization of instruction and responsiveness to student needs. These particular topics were never mentioned by either administrators or teachers when discussing training opportunities, however. This implies a disconnect between what administrators see as important for successful co-teaching and what they emphasize in professional development opportunities and communicate to teachers.

It is possible this disconnect is a sign of confusion about what co-teaching should be, which would partially explain why teachers felt their co-teaching skill or implementation was never discussed in evaluations. Although administrators said they conducted observations or "walk-throughs" of co-taught classes, teachers at both schools said they had never received feedback specific to their co-teaching. The couple who did say they received feedback could not provide answers when asked what the content of the feedback was, saying things like, "it was generally positive." At Palladia, teachers assumed they were not receiving feedback because they were doing fine. Ms. Dickinsen's definition of the role of a SET, which she stated was to provide individualized special education for the SWD but also exhibit roles that are identical to actions of the GETs is strong evidence that administrators and teachers have received conflicting messages about the purpose of co-teaching and the roles of the teachers in co-taught settings. If these roles and purposes are not well-defined, evaluation becomes understandably problematic.

Reflection on Conceptual Framework

In my conceptual framework (Figure 2), I theorized that school-level supports for co-teaching acted as moderators affecting the degree to which teachers implemented specialized instruction. That section of the framework is presented in Figure 10. Based on interviews with

participants, some of these hypothesized factors may be more influential than others. Concerns were raised by teachers about not having input in the selection of their partners, but when asked about their relationships with the partner in the sample, all were very positive. Therefore, there may be problems with some pairs in the two schools (in fact, Dr. McCarthy at Palladia definitively said there were), but they did not surface in this project, likely because struggling teams did not volunteer to participate. Issues surrounding time did, however. GETs and SETs at both schools complained that the SETs did not have time to plan because they had too many non-instructional duties, making it difficult for them to fully implement co-teaching. Scheduling of students into co-taught classes was raised by some of the teachers, but at Palladia, administrators had taken pains to ensure the classes were not overloaded with struggling students. Additionally, in my field notes, I commented on behavior problems more frequently in the general education than co-taught classes. Therefore, this factor may be more related to teacher perception than reality.

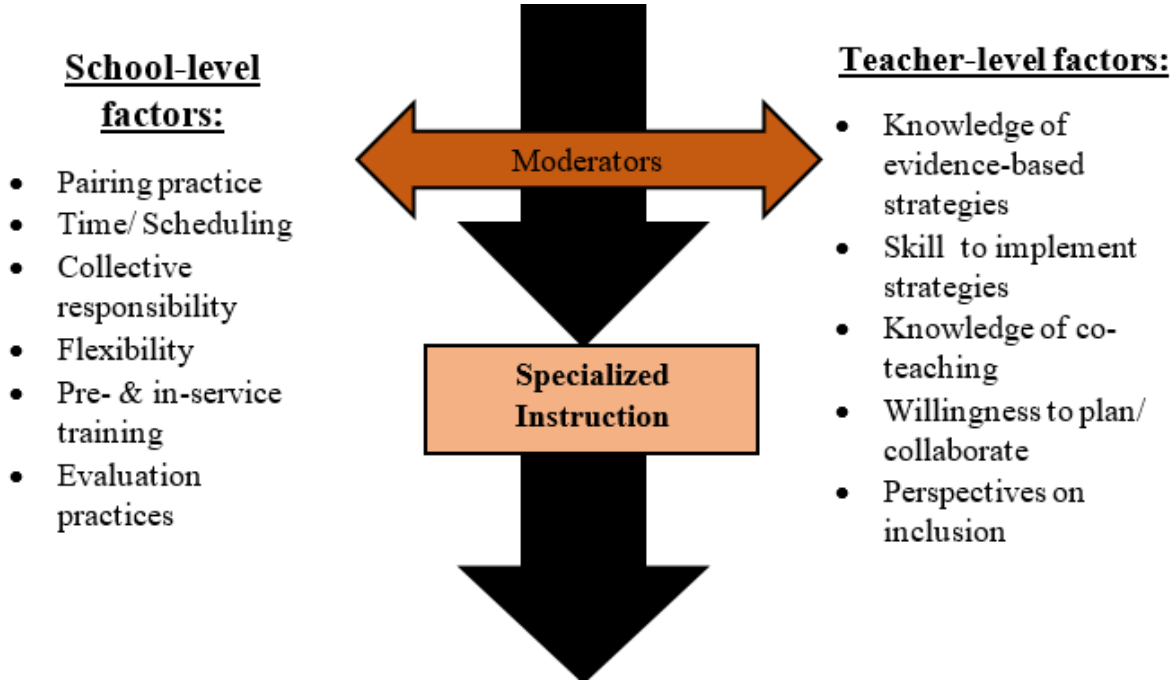

Figure 10. Moderators section of conceptual framework

Training and evaluation were problematic at both schools in that training provided to the co-teachers did not seem connected to the ways in which administrators were evaluating teachers. In addition, teachers reported the trainings were not useful for them in their practice because they were idealized and did not take their individual situations or needs into account. They also said they did not receive feedback from administrators on the implementation of co-teaching or specialized instruction, despite all administrators describing specialized instruction or responsiveness as being important to them. Collective responsibility, teacher-level factors, and whether or not these potentially moderating factors are actually impacting instruction, as is hypothesized in the conceptual framework for this study, are discussed in Chapter VI.

CHAPTER VI: RELATIONSHIP OF TEACHER-, CLASSROOM-, AND SCHOOL-LEVEL FACTORS AND INSTRUCTION

As discussed in Chapter IV, there were no clear patterns in instructional practices across settings. Therefore, these patterns cannot be explored in terms of school-, teacher-, and classroom-level factors as the research questions proposed. In this chapter, I present results related to these factors in two ways. First, I present regressions that were intended to explore the relationship between hypothesized influential factors and the weighted fidelity values of the teams. However, these regressions ended up being less informative than I hypothesized due to intense variation across teams which were disguised when the teams' data were averaged together. Regressions results are presented and discussed with an eye toward hypothesis generation, but the bulk of this chapter will be spent analyzing selected cases of teams that highlight specific situations in the implementation of co-teaching and some of the problems inherent in answering questions about instruction in co-teaching.

Teacher Factors

The teacher-level factors I theorized as potentially important in terms of the level to which co-teachers specialized their instruction in co-taught classrooms were years of experience (teaching and co-teaching) and sense of self-efficacy.

Regression on Weighted Fidelity

First, I checked assumptions associated with linear regressions. The first and second assumptions are that the dependent and at least one independent variable are continuous. These assumptions are met in the design of the models. The additional assumptions are tested with each model, as described below. For all models, the unit of analysis is each observed class period. To examine the impact of teacher-level factors on the fidelity with which teachers implemented practices across settings, I tested two models which were presented in Chapter III:

$$\text{Model 1: } F = \beta_0 + \beta_1 Co + \beta_2 ExpC + \varepsilon$$

$$\text{Model 2: } F = \beta_0 + \beta_1 Co + \beta_2 ExpC + \beta_4 Eff + \varepsilon$$

The mean self-efficacy score was 6.9 (SD = .57), with the highest possible score being 9. Results of the regressions are presented in Table 14.

Table 14

Regression Models for Teacher-Level Factors Effect on Fidelity of Implementation

Predictor Variables	Model 1 (*n*=46)	Model 2 (*n*=44)
Co-taught	.017 (.064)	-.001 (.072)
Experience co-teaching	.001 (.006)	-.001 (.007)
Self-efficacy	-	.002 (.006)
Constant	.499** (.076)	.373 (.442)
F (df)	.05 (2, 43)	.04 (3, 40)
r^2	.002	.003
Adjusted r^2	-.044	-.072

Note 1: For variables, the value shown is the coefficient, with standard deviation in parenthesis
Note 2: The n values are different for the models because one teacher did not complete the survey, so his observations are not included in the calculations for Model 2.
** = $p < .01$

As is clear from the numbers in Table 14, years of experience and self-efficacy had little to no relationship with the weighted fidelity, either positively or negatively. Neither of the models was a good fit for the data, so I did not analyze AIC and BIC values as I planned. I examined studentized residuals to identify outliers and tested for influential observations for both models to determine whether a severely abnormal outlier could have impacted the findings. Both Models had two outliers. DFFITS did not identify any potentially influential observations. According to Cook's d, both Models had two influential observations. In both cases, two observations from team S-2 was identified as influential. Due to the small influence of self-efficacy, I opted to run the regression for Model 1 again, without the influential observations. Results of that regression are presented next to the original Model 1 in Table 15. The two observations that were removed were the first observation for team E-1 and the second observation for team S-2 – both were the general education settings. Both the AIC and BIC values indicate the partial model is a better fit, which makes sense. However, practically speaking, I do not consider the difference between the two versions of Model 1 to be significant. The coefficients and F-values are very similar, and no new statistical significance is gained by removing the two influential observations. In the interest of keeping the sample balanced with the same number of co-taught and general education observations, I prefer the full Model 1.

Without those observations, Model 1 is somewhat more informative, although it still does not account for a large percentage of the variation in fidelity. Results of this partial model indicate that co-taught classes have slightly lower fidelities than do general education, which is opposite of what I would hypothesize. Experience co-teaching has a very small positive relationship to fidelity – for each year of experience, fidelity increases about 1 percentage point.

Table 15

Comparison of Full and Partial Versions of Model 1

Predictor Variables	Full Model 1 (*n*=46)	Partial Model 1 (*n*=42)
Co-taught	.017 (.064)	-.029 (.059)
Experience co-teaching	.001 (.006)	.011 (.006)
Constant	.499** (.076)	.462** (.075)
F (df)	.05 (2, 43)	1.65 (2, 39)
r^2	.002	.078
Adjusted r^2	-.044	.031

** = p < .05*
*** = p < .01*

Classroom Factors

Potential classroom factors that may affect the degree to which teachers were able to implement specialized instruction were class size and the percentage of students with disabilities in the class. Teachers also discussed the number of other students in the class who were known to have behavioral or academic problems, but I did not collect data that would indicate the number of these students. I discuss below whether there were differences in teachers' interview responses as to this potential factor across the two groups.

Regression on Weighted Fidelity

I tested one model to determine the effect of these variables on fidelity of implementation:

$$\text{Model 3: } F = \beta_0 + \beta_1 Co + \beta_2 St + \beta_3 SWD + \beta_4 Co * SWD + \varepsilon$$

Results of this regression are shown in Table 16.

Table 16

Relationship of Student Composition on Fidelity of Implementation

Predictor Variables	Model 3 (*n*=46)
Co-taught	-.012 (.232)
Number of students	-.012 (.012)
Percentage of SWD	-.008 (.011)
Co-taught x Percentage of SWD	.007 (.012)
Constant	.830** (.282)
F (df)	.39 (4,41)
r^2	.037
Adjusted r^2	-.057

** = $p < .01$

Model 3 again shows very little association with fidelity for any of the included predictor variables. Based on studentized residuals, there were two outliers, both of which were influential according to Cook's d. I re-ran Model 3 without those influential observations, but the results were almost identical.

Based on these results, the relationship here between co-taught classes and fidelity is again slightly negative. For each additional student in a class, the average weighted fidelity decreases by about 1.2 percentage points. For every percentage point increase in SWD in a general education course, the fidelity decreases by about 1 percentage point, but in co-taught classes, an increase of one percentage point in SWD was not associated with fidelity at all.

School Factors

Potential school factors that were tested were whether or not the teachers had shared common planning time built into their schedules and the sense of collective responsibility teachers felt regarding students with disabilities.

Regression on Weighted Fidelity

Model 4 tested the relationship of two predictor variables on fidelity, the presence of co-planning time in teachers' schedules and their sense of collective responsibility. The mean collective responsibility score across all teachers was 3.54 (SD = .42), with the highest possible score being 7. The Model tested was:

$$\text{Model 4: } F = \beta_0 + \beta_1 Co + \beta_2 Pl + \beta_3 CR + \varepsilon$$

Results are presented in Table 17.

Table 17

Relationship of School-Level Factors on Fidelity Scores

Predictor Variables	Model 4 Full (*n*=44)
Co-taught	.035 (.063)
Co-planning	-.033 (.081)
Collective responsibility	-.024* (.011)
Constant	1.13** (.260)
F (df)	1.89 (3, 40)
r^2	.124
Adjusted r^2	.058

** = p < .05*
*** = p < .01*

Studentized residuals for Model 4 identified the same two outliers as were identified with Model 3, and Cook's d identified them as influential. I re-ran the regression for Model 4 without this influential observation, and all of the values were relatively the same. This model shows that when co-planning and collective responsibility are controlled for, the co-taught classes have fidelities about 4 percentage points higher than the general education classes. This relationship is the opposite direction found in the previous three models. However, fidelities go down for teams with co-planning when collective responsibility is controlled for, and for every point increase in collective responsibility, fidelity decreases by about two percentage points. This final value is significant at the .05 level; however, these final two relationships are in the opposite direction of what would be hypothetically expected. Again, with such a small sample, I cannot make general statements about the relationships observed in these regression results, but the fact that so many of them are opposite of what I hypothesized makes them worthy of further analysis once a larger sample is obtained.

Case Analyses

For the in-depth case analyses, I focus on five teams: E-1, Ms. Durbeyfield and Ms. Barnstable; H-1, Ms. Fraser and Ms. Smith; S-1, Mr. Roberts and Mr. Jordan; H-3, Mr. Gregory and Mr. Helm; and M-2, Ms. Hills and Ms. Fletcher. Each of these teams represents a particular pattern of instruction across the two settings that is illustrative in attempting to define important features of co-teaching and distinguish levels of quality of implementation of co-teaching.

Team E-1: Dedicated and Different

First, I present an overview of the team and their history together, then I evaluate how they adjusted instruction for their co-taught class as opposed to the general education class using the graphs combined with quantitative numbers describing their instruction. Finally, I discuss

select information pulled from their interviews that may shed light on why their co-taught instruction looked the way it did.

Team background. Ms. Durbeyfield and Ms. Barnstable have taught together for three years. Each of them has taught high school for more than a decade and has co-taught for at least five years. Both of them have taught with multiple other teachers and feel their current relationship is one of the strongest co-teaching relationships they have had. They have mutual respect for each other and genuinely enjoy working together. Ms. Durbeyfield currently serves as the English department chair at Palladia High. She mentors new teachers and has supervised student teachers. Ms. Barnstable joined the faculty at Palladia five years ago after teaching for six years at an alternative school for students with disabilities who had been unsuccessful in public schools.

Instructional profiles. The first day I observed this team's classes, their instruction was somewhat similar. Figure 11 shows what their instruction looked like that day and presents key descriptive information. In both classes, the majority of the time was spent in independent practice, with students working on an activity in which they identified and revised sentences written in passive voice. In fact, the lesson plans for the two classes seemed to be exactly the same. The main difference was that in the co-taught class, students could decide whether to stay in the room with Ms. Durbeyfield to have her walk them through the notes section or to go out with Ms. Barnstable to another room to work independently. In the general education class, Ms. Durbeyfield led a guided practice session to introduce the concept, then students worked independently as she circulated. In the co-taught class, the two teachers led a brief teaching segment at the beginning that included some cognitive strategy instruction about using graphic organizers to plan writing, then students split according to their preference. The statistic on the

side of the graph shows because of this split, almost 60% of the class consisted of the parallel teaching model. Fidelity was lower in the co-taught class partially because the teachers did not monitor the students as closely. I hypothesize this was because according to my field notes from that day, students in the general education class exhibited more problem behaviors and were off-task more often, causing Ms. Durbeyfield to be more involved in keeping them on task.

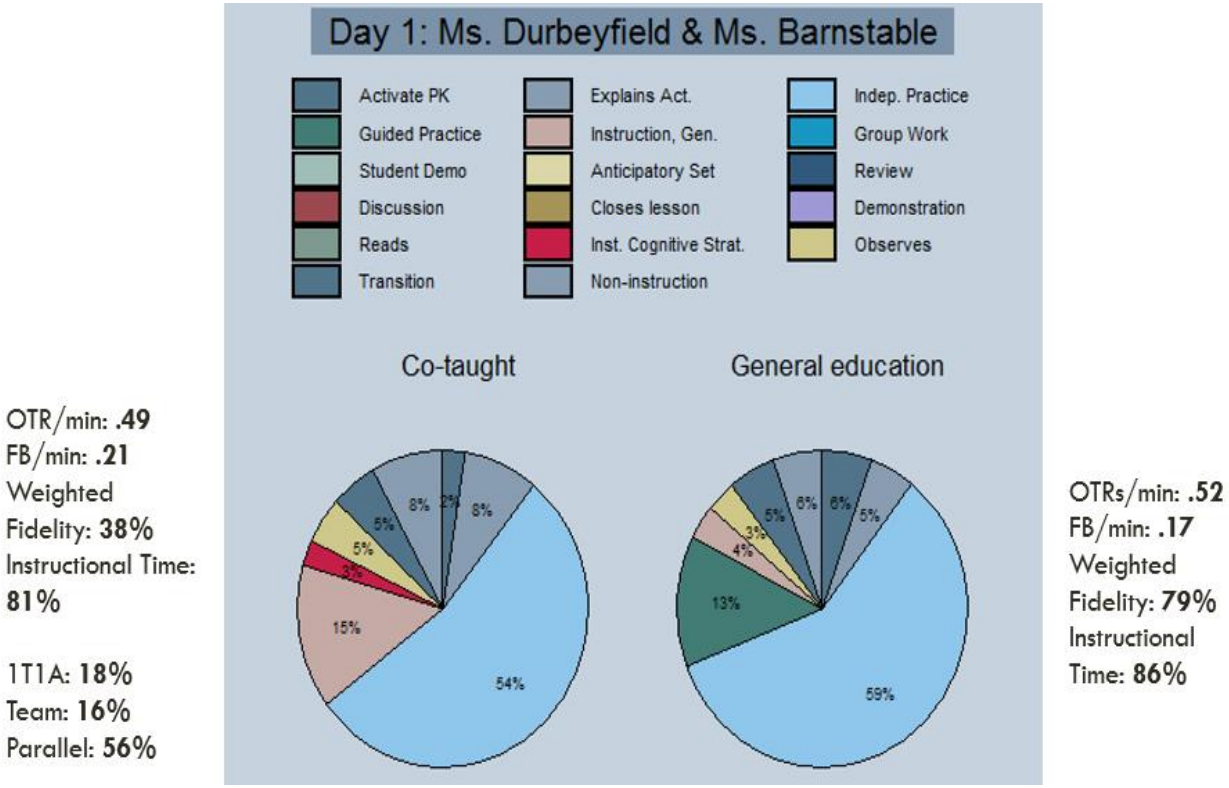

Figure 11. Instructional profile for Team E-1's first observation

On the second day of observation, the instruction was more clearly distinct. Figure 12 shows the instruction, rates of interactions, fidelity, and co-teaching models just as Figure 11 did. In addition, the figure on the bottom left indicates the percentage of the class for which Ms. Barnstable was the lead instructor. In the general education class this day, students independently worked through online modules Ms. Durbeyfield had created about paraphrasing, summarizing,

and quoting. Then they worked independently on essays they had been writing. She circulated periodically, working at her laptop when she was not actively engaged with students. In the co-taught class, Ms. Barnstable led an instructional lesson about the use of paraphrasing, summarizing, and quoting, discussing when each was most useful, which was coded as cognitive strategy instruction. Then she led a guided practice session in which the students practiced the skills and received feedback on their responses. The final part of the class was spent with students working independently on their essays with both teachers periodically circulating or working at their laptops.

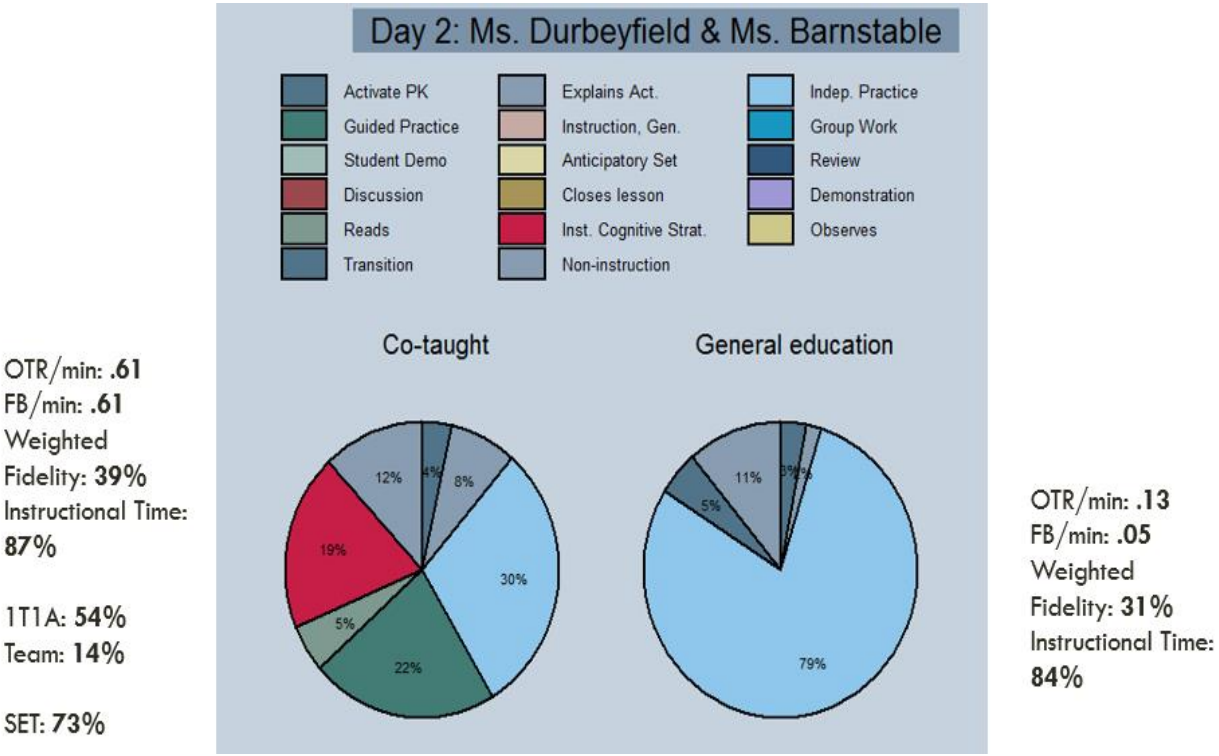

Figure 12. Instructional profile for Team E-1's second observation

On the third and final day of observation, there was another distinct difference between the instruction in the two classes. Figure 13 illustrates this difference. The goal for both classes on this day was the same – students were supposed to work on final revisions to the paper they

had been working on during the second observation. In the co-taught class, Ms. Barnstable led a review of the parts of an essay and how to tie them together. She used a PowerPoint and sample essay to illustrate this. Then students worked independently on their essays as the teachers circulated. In the general education class, Ms. Durbeyfield led an activity in which the students read and scored a sample essay Ms. Durbeyfield had written using the rubric she would use to grade their essays when they finished. They spent the rest of the time revising their own essays. Key points to note about the classes these days is that OTRs and FB statements were still quite low, although this does not take one-on-one interactions into account during the independent practice time. However, even though Ms. Durbeyfield ostensibly used guided practice, she actually did not call for very many responses, nor did she give direct feedback very often. In addition, in the co-taught class, half of the class was spent in no co-teaching model, meaning that one or both of the teachers was not actively engaged with students during that time.

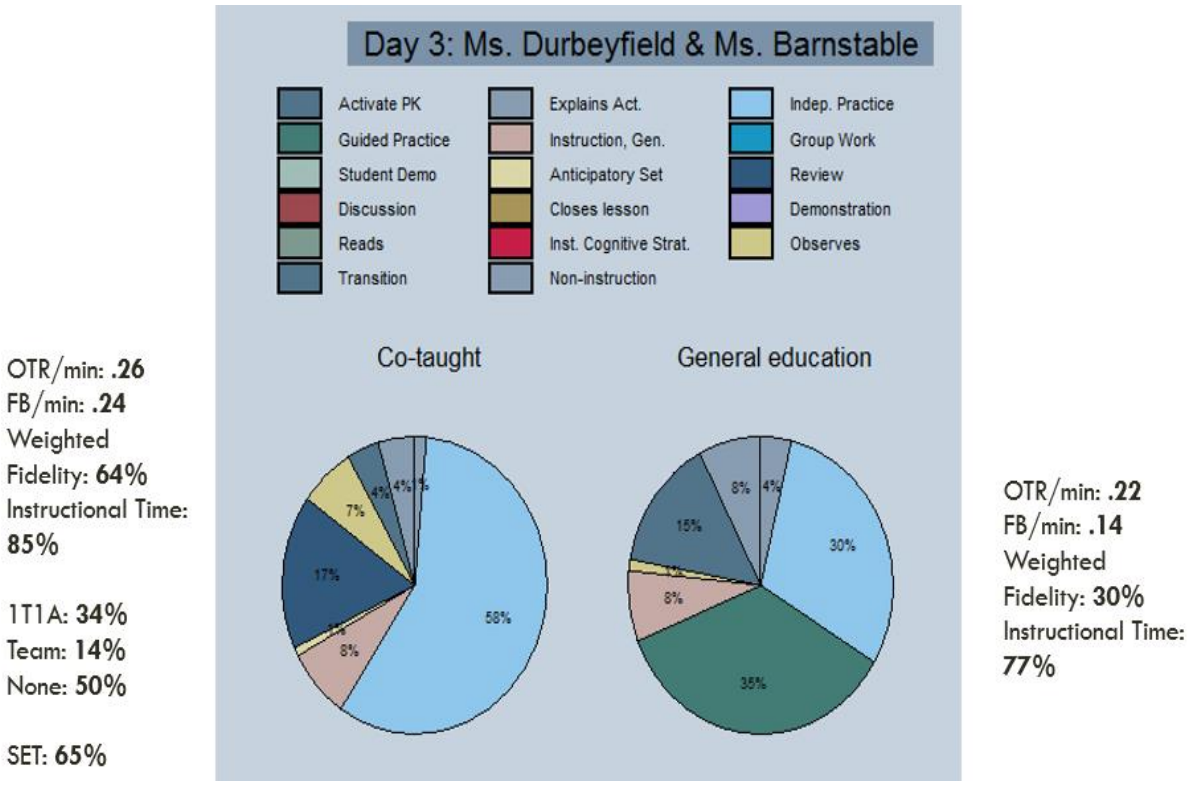

Figure 13. Instructional profile for Team E-1's third observation

Interviews. Ms. Durbeyfield and Ms. Barnstable share a planning block during the school day, but they do not use it to do their main planning. Instead, they stay after school once every week or two and plan the upcoming classes together. When asked if her planning or teaching was different in her solo- than her co-taught class, Ms. Durbeyfield said,

> Because I teach the same type of class without [her], I would say they're very similar. So it's not necessarily that my collabs follow the solo, it's almost probably that my solos follow the collab. … The two of us [figure] out what we want to cover next, and then what I do by myself I just kind of model and modify off of what she and I have already figured out.

This indicates planning for some teams may work backwards from how it is often theorized to, with the SET modifying the GET's normal plans. Rather, some GETs may be modifying the instruction they plan for the co-taught class.

Regarding planning, these teachers have a shared planning block built into their schedules, theoretically giving them 98 minutes every other day when they could meet to plan during the school day. However, they only use this block for occasional check-ins – to see if they have enough copies or to make sure they are on the same page. For their main planning sessions, they meet regularly after school. Ms. Barnstable says this is because it is just too hard to find enough protected time during the school day when they can just focus on planning – there are too many other things going on. They recorded one of their after-school planning sessions, and in it they planned their lessons from scratch, starting with an overview of the upcoming unit – major assignments, learning goals, etc. – and moving into the specifics of daily instruction. The two of them were decidedly equal partners in contributing ideas for instruction and assessment, and they brainstormed and worked off each other throughout the process.

Both teachers saw their roles as being complementary. They characterized Ms. Durbeyfield's role as being to plan instruction and content for the majority of the students and Ms. Barnstable to focus her attention on the students who were struggling – the ones who otherwise would fall through the cracks. Ms. Barnstable said having both teachers in there allows them to "wind up serving the whole spectrum of students a lot better." Ms. Durbeyfield said, "I'm maybe more of a pushover with the kids, and [Parsnip] is a little more willing to say, 'No, this is not acceptable. You can do better.'" However, Ms. Barnstable also acknowledged it is sometimes hard to find room for both of them: "I'd say a drawback is that we're not always … both used to our best 100% of the time. …Sometimes I think it's inefficient." This was certainly

the case the third time I observed them when one or both of them was not actively engaged in instruction for half of the class. For Ms. Durbeyfield, the greatest benefit of co-teaching was that it allowed them to move at a faster pace:

> I would say we cover more in the collabs, just because I think we can pick up the pace… It's classroom management; it's not constantly waiting for the kids. She can move to the talkative corner versus me always waiting for the talkative corner to realize they're being waited on.

I did not notice the co-taught class moving faster than the solo-taught class in my observations, but maybe it is a cumulative effect over the course of a unit rather than a noticeable difference from day to day. Team E-1's experience of the co-taught class moving faster, however, was the opposite of what most teachers' express. Many teachers remarked that they felt they had to slow the pace in their co-taught classes due to having more struggling students in those classes. It could have something to do with Ms. Barnstable's attitude – both teachers mentioned that she consistently maintains tremendously high expectations for the students in class; this might translate into more urgency and focus during instruction. I also did note in my field notes that the behavior in their co-taught class was noticeably better than in the general education class – Ms. Durbeyfield often had to pause and work to get students to pay attention, which happened very infrequently in the co-taught class.

Implementation of specialized instruction. Team E-1 did significantly change their instruction in their co-taught classes, which sets them apart from most of the other teams. However, these changes were not consistently suggestive of more specialization. The second observation day represents instruction in the co-taught class that more closely matches evidence-based practices for SWD than the instruction in the general education class that day. Ms.

Barnstable provided direct instruction and guided practice in place of the independent activity Ms. Durbeyfield provided for her general education class. However, mitigating this, the fidelity was quite low for both classes – based on fidelity marker analysis, the teachers did not monitor students' understanding, nor did they engage in think-alouds or provide clear directions. On the third day of observation, instruction in the general education class actually was more in line with evidence-based practice than the co-taught one. Ms. Durbeyfield provided guided practice for her students, whereas Ms. Barnstable presented more teacher-directed instruction. At this point in the unit, students were finishing their essays, so the initial instruction had been delivered previously, making this a review. SWD need to be more directly engaged in reviews in order to help them retain and apply the information. The fidelity on that day was lower in the general education class (30% compared to 64%), however, making this a mix of both better and worse instruction for SWD.

Team H-1: A Model of Consistency

Team background. This was Ms. Fraser and Ms. Smith's second time teaching together. Both have been teaching at Independence for about 10 years, but this was only Ms. Fraser's fourth term co-teaching. They enjoy working together and see themselves as a highly successful team. Ms. Smith had previously co-taught with Ms. Morrie, who was now the administrator who oversaw co-teaching at the school and cited her time working with Ms. Smith as highly influential in her thinking about co-teaching.

Instructional profiles. I observed Team H-1 twice, and instruction looked very similar across the classes both times, as can be seen in Figures 14 and 15 below. Instruction was also consistent across observations. Both classes began with a short quiz on material they had covered the previous class. Ms. Smith took a small group of students out during the quiz time,

presumably to provide accommodations. Then Ms. Fraser led an instructional segment that consisted of a PowerPoint from which the students took notes while Ms. Fraser talked through them. She was a strong storyteller and clearly enthusiastic about her subject, but these were definitively lectures; there was very little interaction. Following the lecture, there would be a group activity, which Ms. Smith led in the co-taught classes, but the activities were exactly the same in both classes. The first day, students completed a word sort in which they matched the causes of World War I and World War II. The second day, students wrote a letter as if they were a Russian citizen explaining the causes of the Russian Revolution. Both of these activities were tightly connected with the instruction they had received during the lecture. The primary co-teaching model they used was one-teach-one-assist, and although their instructional time was slightly above the average for the teams in the sample, their rates of interactions were much lower than the average.

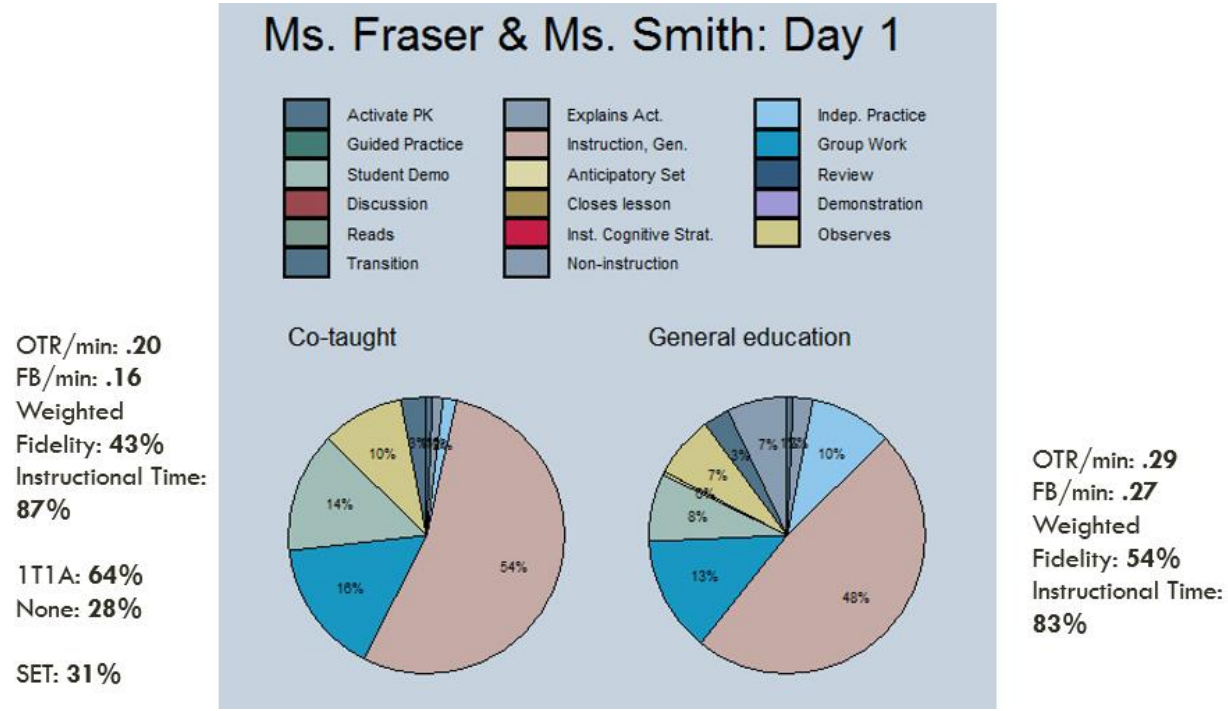

Figure 14. Instructional profile for Team H-1's first observation

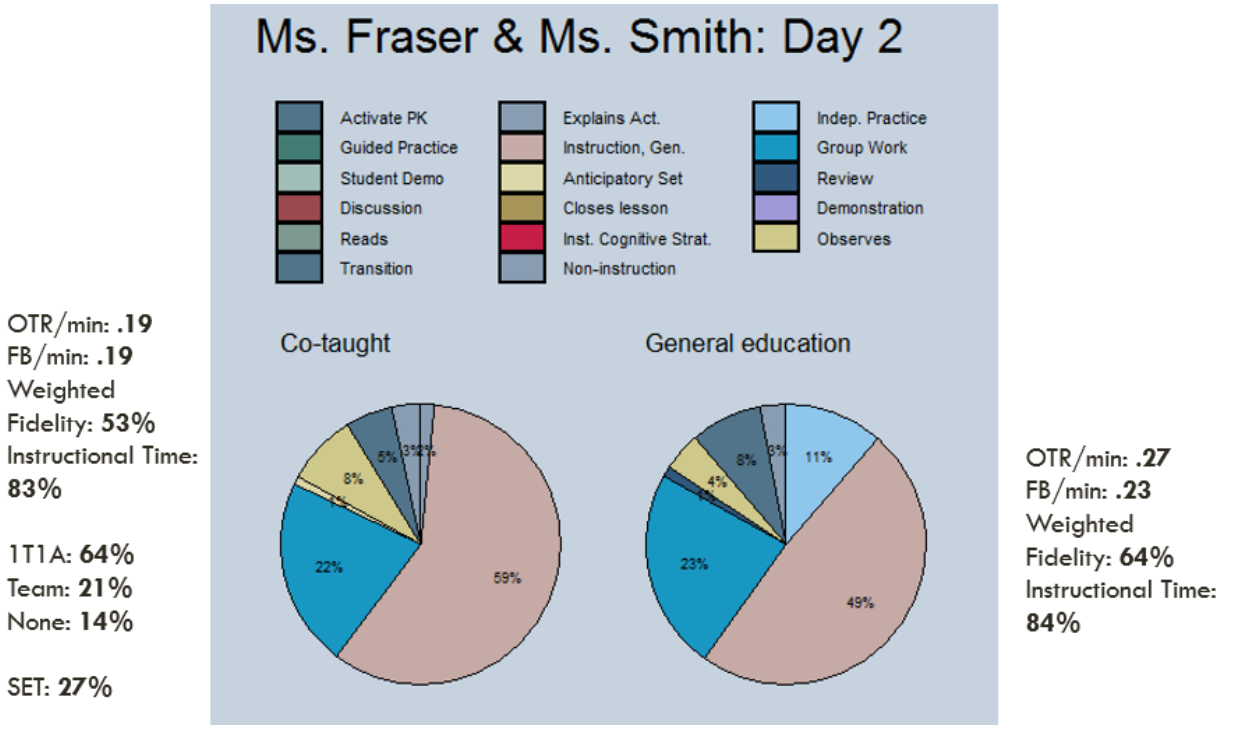

Figure 15. Instructional profiles for Team H-1's second observation

Interviews. Both teachers described Ms. Fraser's role as being the lead instructor in charge of content delivery and Ms. Smith's role as being the main parent contact and provider of accommodations. They also stated that Ms. Smith brought creative ideas and activities to the classes. Both the word sort and the letter-writing activity were developed by Ms. Smith. She also made up acronyms to help students remember key information. Ms. Fraser and Ms. Smith did not share a planning block. Instead, they met occasionally to plan during lunch. I sat in on one of these planning sessions, and it lasted just over four minutes, in which they discussed a student who was struggling and decided which word sort to use the next day (it had been created the last time they taught together).

Ms. Fraser saw the biggest benefit of co-teaching as having another adult to observe and brainstorm with when trying to evaluate students. She said, "[Co-teaching]'s definitely really good in terms of the observation department, figuring out and deciding . . . what could be an issue and what is just pure laziness." She said it can be difficult to really figure out what is going on with a student without that second pair of eyes. Ms. Smith feels she is an essential part of her co-taught classes but does not feel the traditional models fully describe her relationship with her co-teachers:

> I support [my co-teachers] in areas – not support them in the sense of I'm a secretary. … I interject. I have good relations with all the students. . . . I do have a lot of rapport. Every morning you'll find half the students in my room at 7, reviewing …. We don't fit into a full model. You know how they have all the models? I don't fit into a clean one. I don't know where I fit, I just support everything. That's more of my role. And supporting makes it sound like the assistant, but…

Ms. Smith says when starting a new co-teaching relationship, she sits back for a while and observes the teacher's style, gauging his or her strengths and weaknesses to decide how she can best fit into the class. She prides herself on her creative activities and says she helps break teachers out of their molds and think about teaching differently. She says she cannot contribute much to the actual instruction because of the nature of the content – that when Ms. Sprout and her co-teacher present training on the models, it makes sense for math, but not for history: "You can teach the same math problem a little easier. I feel that I can't stand up simultaneously and talk about the constitution." Therefore, she sees her main contributions as being in holding review sessions and contacting parents.

Implementation of specialized instruction. Team H-1 did not implement any form of specialized instruction – there was essentially no difference between the general education and co-taught classrooms on any evaluated metric. Ms. Smith had provided the word sort and writing activities, which was beneficial, but they were employed in the two settings identically, and they were not intended to address specific needs of students in the co-taught class. Ms. Smith acknowledged that her biggest contributions happened outside of class time.

Team H-3: Consistently Strong

Team background. Team H-3 presents an example of a situation in which the instruction across settings is not very different, but the instruction provided in both settings is strong. Owen Gregory and Erwin Helm had the longest history working together. They could not remember the exact number of years they have co-taught, but they both agree they have been together for more than a decade. Mr. Gregory is currently the history department chair at Palladia. Both men had non-traditional paths to the classroom. Mr. Gregory worked as a motorcycle mechanic for a number of years after college, living all over the country, before he decided to become a high school history teacher. He wore his distinctiveness proudly, sporting numerous tattoos and decorating his classroom with license plates and images of Jack Skellington from the movie *Nightmare Before Christmas*. Erwin Helm worked as a counselor at a wilderness alternative school for a number of years before joining the faculty at Palladia. He initially did not have a teaching license, so he worked as an instructional assistant for a semester until he received his provisional license and has been a special education teacher since then. He has a quieter personality than Mr. Gregory, but they share a subtle, somewhat sarcastic sense of humor.

Instructional profile. Mr. Gregory had the highest rate of OTRs and FB statements of any teacher in the sample, averaging about one per minute of each. His average weighted fidelity

across settings was 79% -- 77% in general education, and 81% in co-taught. However, his method of co-teaching with his partner Erwin Helm was traditional – they used one-teach-one-assist most of the time, and Mr. Gregory was the lead instructor about three-quarters of the time. Instruction in the two settings was almost identical, as shown in Figures 16, 17, and 18. They spent the majority of the time in instruction or review. Theirs was a flipped class – students would take notes at home, then the teachers would review the information in class using questioning and discussion. One day, they incorporated group work. They were the only history team that did not rely on PowerPoint lecture for their instruction; they incorporated images and music. Mr. Gregory wrote and produced his own history rap songs, and he used them extensively as a teaching tool.

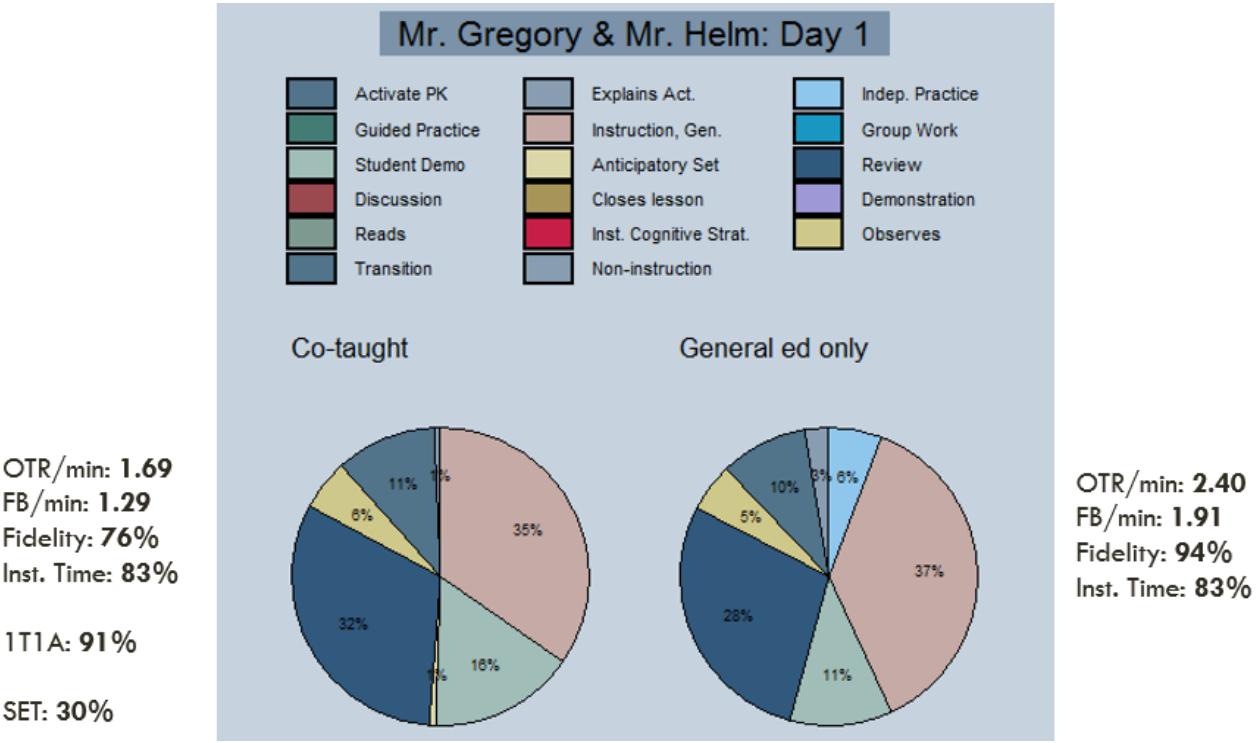

Figure 16. Instructional profiles for Team H-3's first observation

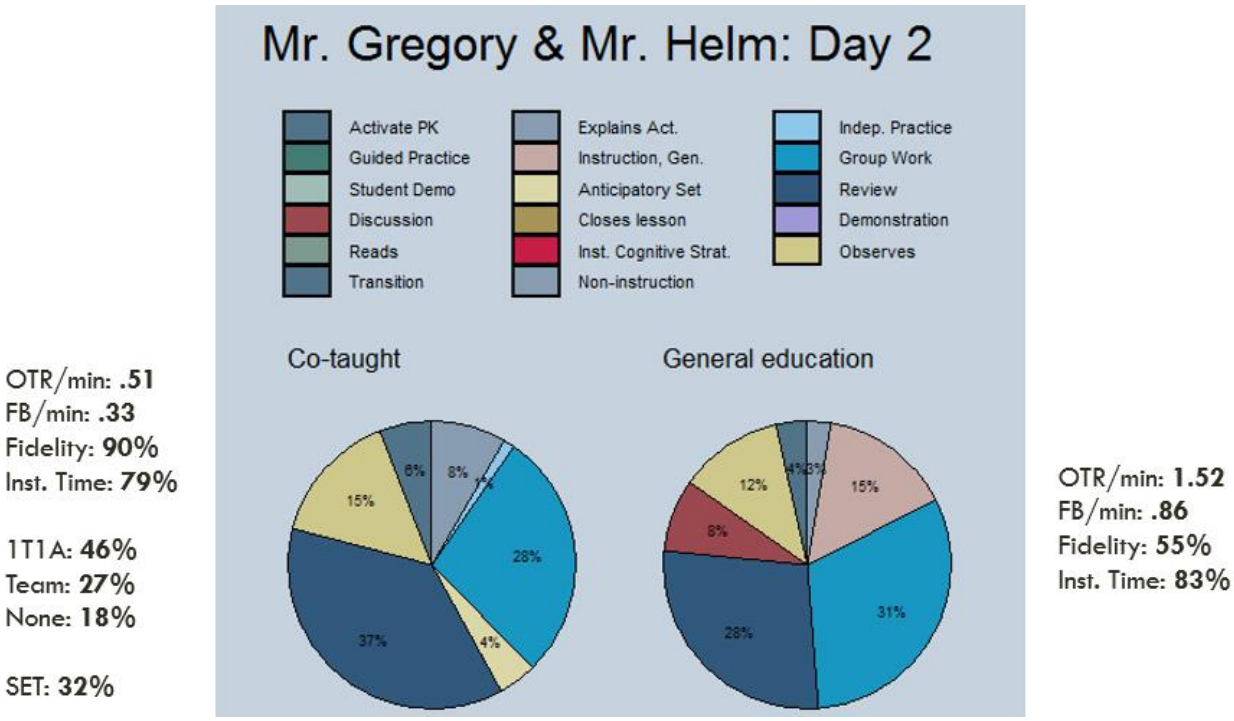

Figure 17. Instructional profiles for Team H-3's second observation

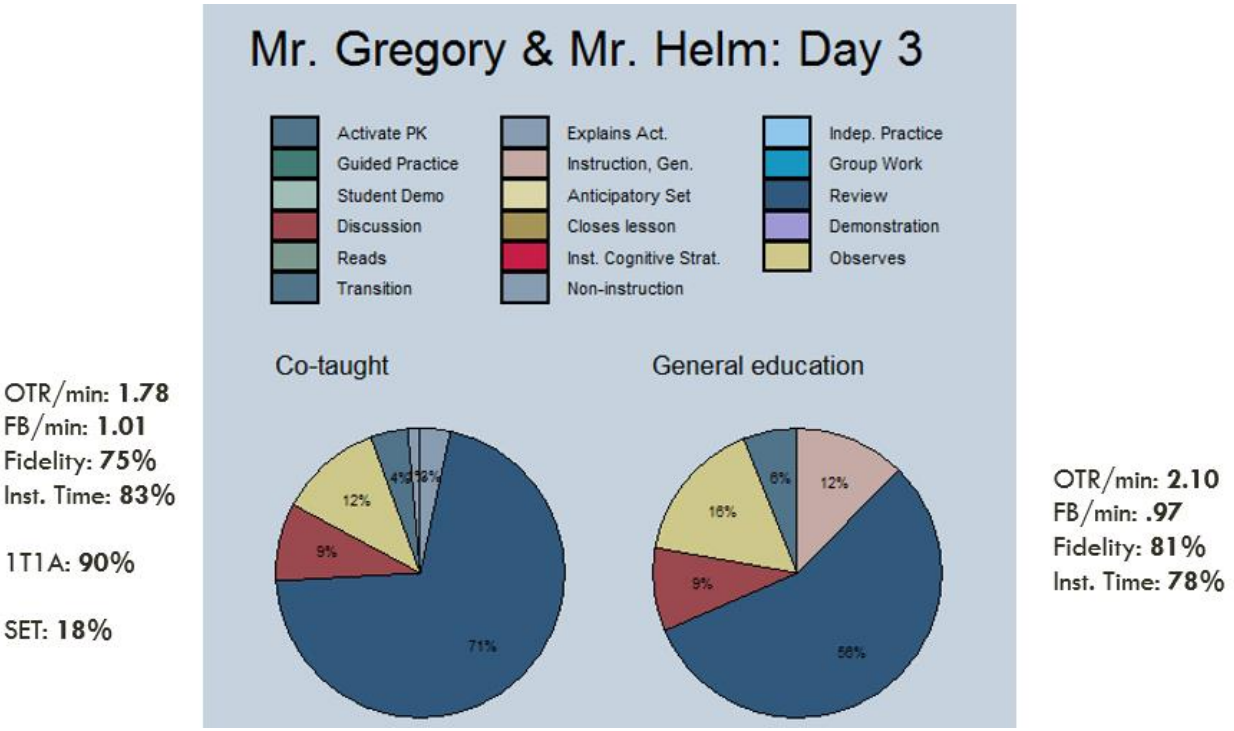

Figure 18. Instructional profiles for Team H-3's third observation

Mr. Helm mainly served as a support for individual students, circulating and prompting them to get back on task or reminding them about what they were supposed to be doing. He would sit down in empty desks and help students organize their materials and occasionally add to the discussion. Sometimes, he and Mr. Gregory would switch places as the lead instructor; when Mr. Gregory was not in the lead, he typically stood in the back listening and adding comments periodically. Rates of OTRs and FB statements were higher in the general education setting, which may have been an effort to compensate for the lack of the one-on-one interactions students in the co-taught class received from Mr. Helm. Fidelity rates hovered around 80%, except in the general education class on the second day. According to analysis of the implementation markers (IMs), when Mr. Gregory led a discussion that day, he did not exhibit uptake of student responses or ensure he was including a range of students across the room.

Interviews. In their interviews, both teachers acknowledged that they no longer plan much together, and they both expressed regret about that. They said early in their teaching relationship they did, however. They would meet after school and on weekends, usually at one of their houses, to talk about and plan their lessons. This was especially true the year they decided to switch to a flipped format because they had to redo all of their lessons and activities to accommodate it. They share a common planning block, but Mr. Helm has duty during half of the block, and often on other days he is pulled to handle issues related to his caseload, so they typically use that block just to quickly check in with each other (though Mr. Helm says they do this almost every day). Given his history at the alternative school, he is skilled at working with students who have emotional and behavioral challenges, so according to Mr. Gregory, Mr. Helm's caseload is often more intense and difficult to manage than other SETs'. Mr. Helm says he feels co-teaching can at times be inefficient because with respect to Mr. Gregory,

> he's such a good teacher that really, I don't need to be there. . . . I feel like he hits every student . . . with every sort of learning strategy, so . . . a lot of times I feel like I could just sit back and let him do everything.

Mr. Helm sees his main contribution as helping with classroom management and keeping the students organized with their materials.

Based on my field notes, the main difference I noticed between the classes was student behavior. In the general education class, the students were rowdier – more talkative and off-task. Mr. Gregory had to stop frequently to wait for them to listen. I did not notice that happening very often at all in the co-taught class. Whether that was due to coincidence of student composition or due to the presence of a second adult is unclear.

Implementation of specialized instruction. There was little evidence in this team that they were specializing their instruction. However, Mr. Gregory is a strong teacher in his own right, so it could be argued that the SWD in the co-taught class were getting stronger instruction than in some of the classes that might be attempting to specialize more. That said, there are areas of instruction in that class that could be improved to more closely meet evidence-based recommendations for inclusive instruction. For example, the classes have little overall structure – there was a lot of talk and repetition of information, but the class as a whole did not have clear structures, and the teachers did not provide specific cues to signal changes in activities. Mr. Helm could have added these things to the class to strengthen it even further. Administration has indicated they see his team as exceptionally strong. When an accreditation team visited the school a couple of years ago and wanted to observe a co-taught class, they were sent to this team's room. Mr. Gregory said the feedback they got afterwards was that the accreditation team could not tell which of them was the GET and which was the SET; he reportedly told them,

"'Good, that's the way it should be.' And that's what [administration] was saying, too. They were like, 'That's the ideal co-op team.'"

Team S-1: Questionable Changes

Team background. This was Team S-1's first year teaching together; it was also Mr. Roberts' first year at Palladia. Mr. Jordan had taught at Palladia for nine years and also served as a football coach there. He has taught in a number of content and subject areas, but recently has been mostly co-teaching in science classes. Mr. Roberts enjoys co-teaching with Mr. Jordan, saying his co-teaching experiences in the past had been decidedly negative, with his co-teachers either not coming to class regularly or refusing to plan with him.

Instructional profiles. Mr. Roberts in team S-1 was a strong teacher as evidenced by his instruction in his general education classes. His solo weighted fidelity score was 61%, slightly higher than the overall average. His OTRs and FB statements are lower than the average, at 0.43, likely due to his extensive use of group work. An examination of his IMs shows that his whole-group instruction on new content had extremely high fidelity – his language was clear and consistent, he included modeling and think-aloud, and he repeated essential information. He actively monitored his students when they worked on group and individual activities.

On the first day I observed this team (see Figure 19), Mr. Roberts told me his co-taught class was a little bit behind his solo-taught, so the differences here are somewhat artificial. In the general education class, he started with a review of some notes they had taken the class before, then he added to them, writing on the board and reminding them about how to identify important points to write down. Afterwards, the students moved to sit with their lab partners and work on finishing a textbook activity they had previously started. As they worked, Mr. Roberts circulated, answering questions and helping them work through problems. In the co-taught class, the

students had not yet started the notes. The two teachers split the class into a parallel teaching format, with each teacher taking half the class. The groups were formed by where students were sitting. The teachers each taught a different topic, then they switched groups and taught again. For the purposes of coding, I followed the group of students who went with Mr. Jordan first, then I followed them to Mr. Roberts. Mr. Jordan led the class in taking notes on the same topic Mr. Roberts had been doing in his solo-taught class. He had a piece of paper with the notes on it; he copied the notes onto the board, and the students copied from the board onto their papers.

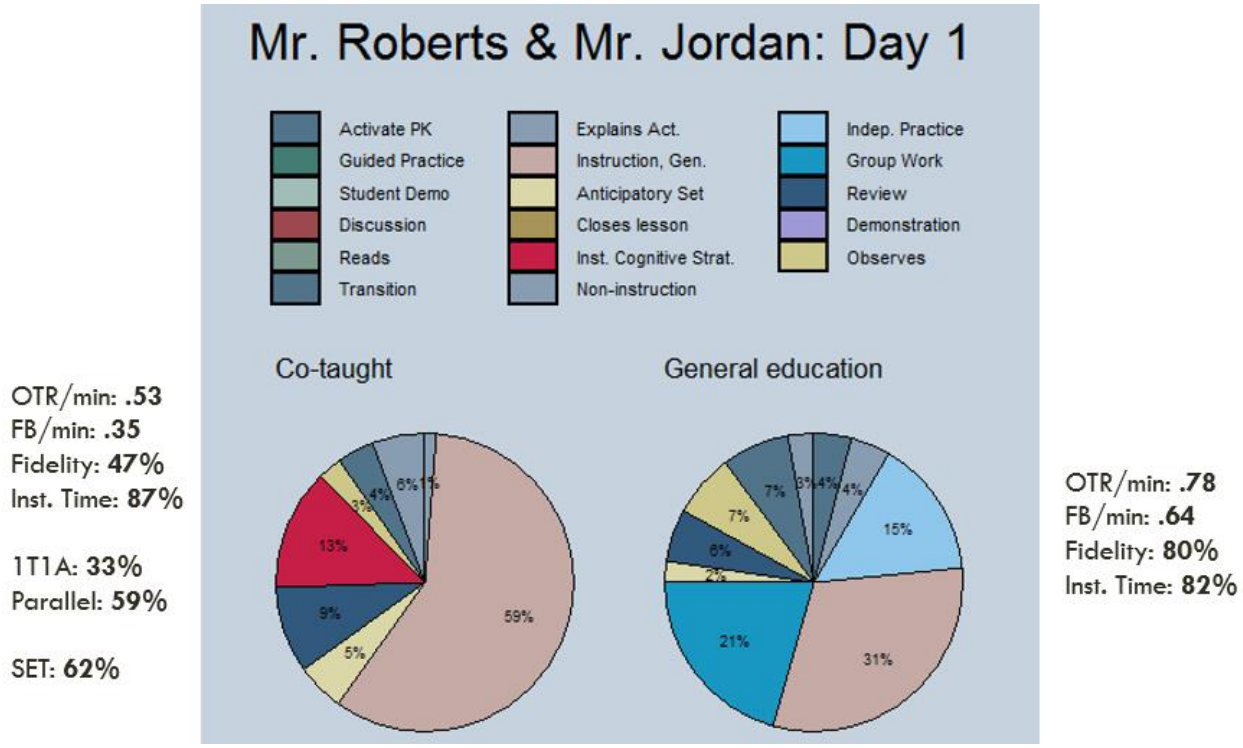

Figure 19. Instructional profiles for Team S-1's first observation

In my field notes from that day, I noted significant differences in teaching style. In Mr. Jordan's group, there was little to no interaction between him and the students. On the other hand, Mr. Roberts' group was highly interactive and conversational in style. He asked students to skim paragraphs and point out things they noticed or thought were important. They contributed

ideas, and Mr. Roberts explicitly showed them how to organize those ideas into outline-formatted notes. He paraphrased their ideas into short phrases they were to write in their outlines and pointed out text features they could use, such as "I notice that's a bold word. So I probably want to write down that definition so I have the technical definition." Mr. Jordan's notes were much more wordy and less explicitly organized, and he did not reference the text or talk about how his notes were formatted or created.

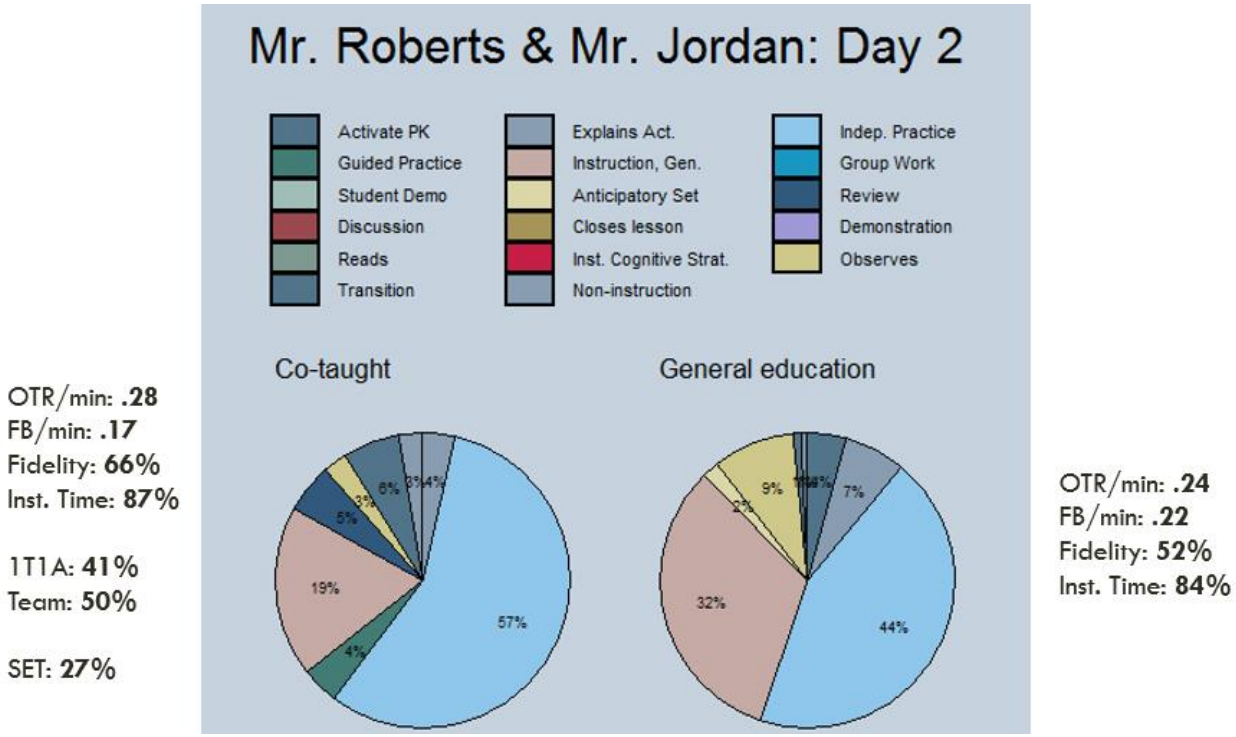

Figure 20. Instructional profile for Team S-1's second observation

Figure 20 shows this team's instruction on the second day I observed them. This time the instruction was more similar across the two settings. A large chunk of time was spent in both classes with the students completing a worksheet on topographic maps. The main difference here was the way the teachers implemented the initial instruction on using the maps. Mr. Roberts again used the textbook as a major source of information, pointing out examples of maps and

their features in the textbook. Mr. Jordan projected a topographic map and pointed out the features that way. Both teachers had the students take notes on the parts of a map, but the definitions Mr. Jordan gave were more confusing, as evidenced by students' inability to apply the definitions in identifying parts on the map. Both teachers circulated equally, helping individual students during the independent activity.

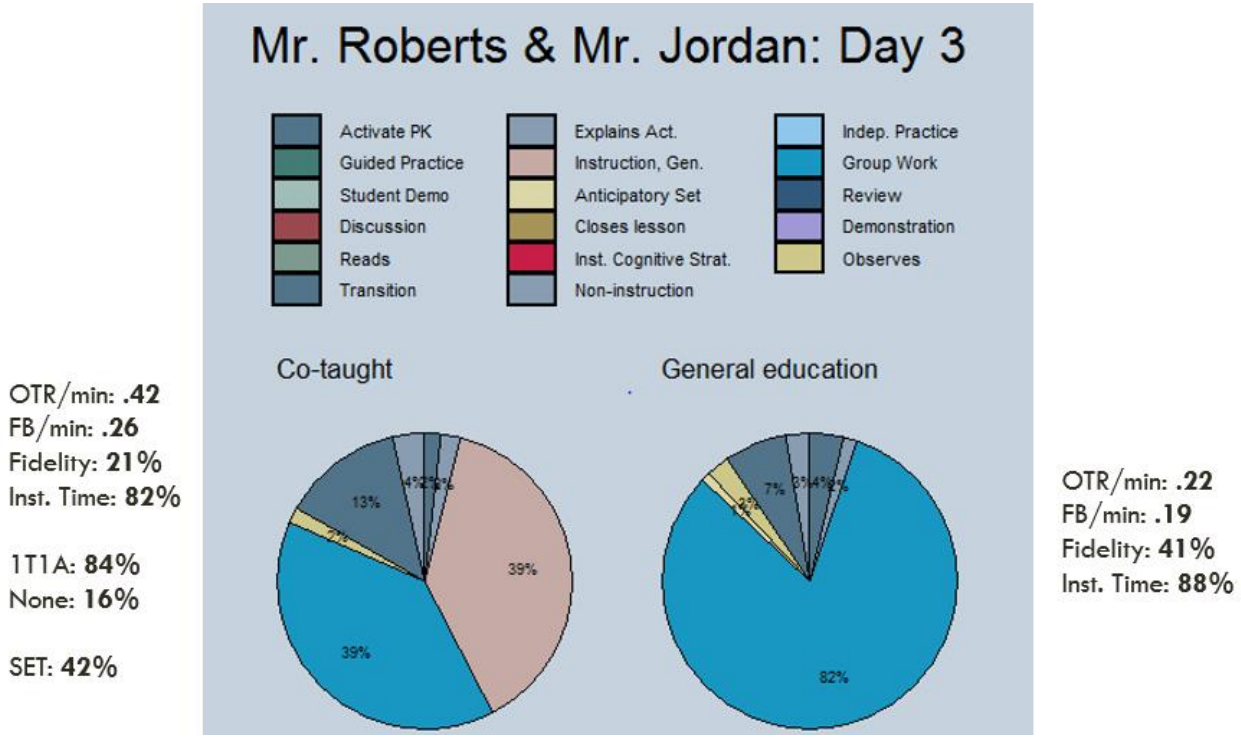

Figure 21. Instructional profile of Team S-1's third observation

The third observation (see Figure 21) was again quite different across the settings. In the general education class, Mr. Roberts started with a review of the characteristics of minerals. He asked a lot of questions and gave feedback on their responses. The students spent the vast majority of the class, however, working on a group activity in which they were folding paper to make different crystalline shapes. Mr. Roberts' interactions with students this day were more social than instructional, and he spent a lot of time sitting with a student who did not have a

partner, helping him make his paper shapes. I asked Mr. Roberts what the purpose of this activity was, and he said it helps them to understand the shapes better when they can see them in 3-D. Fidelity this day was low, largely because the activity was distinctly below students' instructional level, meaning that opportunities for monitoring learning were not present. In the co-taught class, which seemed to be a little behind again, they spent the first part of the class instructing students on the properties of crystals.

Mr. Jordan led this part of the class, and he opted to use a foldable to structure the notes on the properties of crystals, which is why instructional time in this class was a little lower than the other – some time had to be spent cutting and folding the paper for the foldables. Fidelity percentage was quite low for this class because Mr. Jordan did not structure the notes well – he did not reference the flaps of the foldable while he went through the notes, leading to great confusion among the students about where to write things. Mr. Roberts wrote the notes on the board as Mr. Jordan read them aloud from his own copy, and Mr. Roberts interjected frequently to give examples and clarifications. By the end of the notes, Mr. Jordan had given up on the foldable and told the students to write the last two characteristics anywhere. Then, Mr. Jordan had created an activity in which students were supposed to come to the board and circle things that are not minerals. There was a lot of confusion about this at first, but the teachers morphed it into a discussion about ice and coal, during which the students seemed more engaged. The end of the class was spent with the students beginning the paper-folding activity.

Interviews. In the interviews, both teachers felt very favorably about their co-teaching partnership. They reported not arguing over things and having similar personalities and approaches to classroom management. Mr. Roberts enjoyed the flexibility that was possible with two teachers, specifically mentioning using parallel teaching and other models. This team was

the only team that regularly used their common planning block to engage in extended planning together. They recorded one of their planning sessions, and it seemed as though they followed a system for planning – they talked about what topics they wanted to cover, then brainstormed about what activities they would implement, and finally, they discussed what each of them would be responsible for during those activities. Mr. Roberts took the lead in the conversation, serving as the main source of the plans, with Mr. Jordan expanding and offering supplemental ideas.

Mr. Roberts described his professional relationship with Mr. Jordan as something of a work in progress. He mentioned the videos that he had seen in training of teachers using the models, and he expressed admiration for the classes in which it was not clear who was the GET and who was the SET, but he said right now,

> we're learning each other and understanding that it's not going to look like that video, probably not at all this year. I mean, maybe by the next year, we'll be getting close, but it's not going to look like that. . . . It's a time thing. It's not just, jump in there – instantly, you all are good co-teachers together.

He was optimistic that, given enough time together, he and Mr. Jordan could meet that ideal of seamless teaching, but even still, he was happy with their current relationship. He acknowledged that they sometimes have different teaching styles, but he approached it philosophically, saying he was trying to reduce his urge to "jump in and take over." He said, "The kids are getting the information. And who knows, the way he presented it might work better for some kids. . . . If it's not wrong, fine."

Implementation of specialized instruction. For this team, the more specialized instruction was actually provided in the general education classes. Mr. Roberts provided OTRs and FB statements, worked in examples that clearly connected to students' lives, and

incorporated study skills instruction into his lessons. In my field notes, I observed that he was engaging and highly focused. In the co-taught classes, however, Mr. Jordan was often responsible for delivering large portions of the instruction, and he was simply not as skilled of an educator. He rarely interacted with students, and his activities were poorly executed. Despite the fact that this team was one of the few that incorporated different co-teaching models, they did not provide necessarily improved instruction in their co-taught class.

Team M-2: Trading Responsibilities

Team background. Team M-2 was the most experienced team in this sample. Sue Hills had been teaching for 29 years, and Jessica Fletcher for 14. This was their first year teaching together, however. Ms. Hills had been an SET for the first half of her career, eventually switching to general education to get away from the paperwork requirements associated with special education. A few years ago she applied for and was awarded a National Board Certification. Ms. Fletcher is solely certified in special education, but she is knowledgeable about mathematics and has been teaching math her entire career. Administration has asked her to attempt to add a secondary mathematics endorsement, but she has refused, saying she fears she will be asked to teach large self-contained classes on her own if she did.

Instructional profiles. I observed Team M-2 twice. Instruction across settings was quite different, but it was also led by different teachers. Figure 22 presents information about their classes the first day I observed them. The lessons look fairly similar, with most of the class being taken up with whole-class, teacher-led instruction. In fact, the activity and notes were identical in the two classes. The main difference was that in the co-taught class, they finished the notes in time for the students to engage in an independent practice activity associated with the notes, whereas in the general education class, the notes took almost the entire time. In looking at the

information in Figure 22, a large difference is that in the co-taught class, Ms. Fletcher was the lead instructor the entire time, with Ms. Hills playing a support role. During the instruction, Ms. Hills stood in the back most of the time, occasionally checking on students and in one instance, carrying out instructions provided by Ms. Fletcher about dealing with an outburst from a student. During the independent activity, both teachers actively circulated, asking students questions about their thinking and providing feedback on their responses. In both classes, teachers asked a lot of questions and provided rates of feedback that were much higher than the sample's average. An examination of the IMs shows that neither teacher provided non-examples of the concept, nor did they use modeling or think-alouds during the instruction, instead walking students through the process using questioning. Fidelity in the general education setting was lower because in that class, Ms. Hills did not repeat essential information or make authentic connections to students' lives, whereas Ms. Fletcher did in the co-taught class.

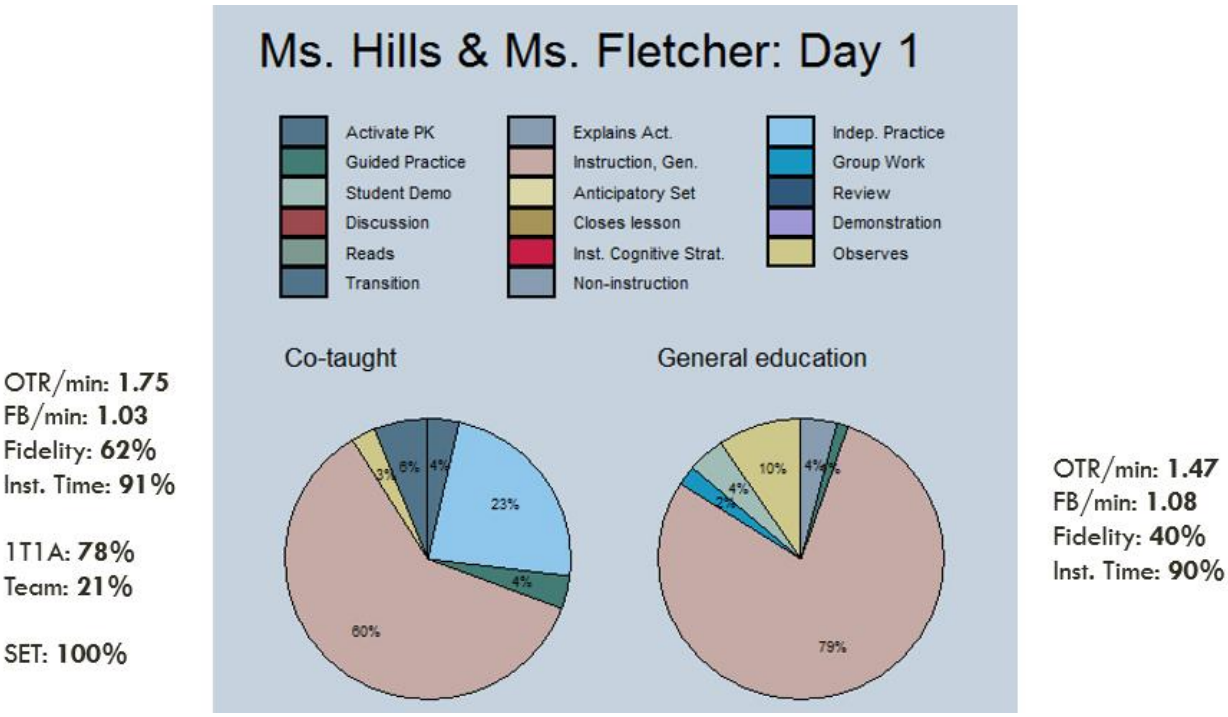

Figure 22. Instructional Profile for Team M-2's first observation

The second day I observed Team M-2 (Figure 23), I saw slightly more difference in instruction, although the pattern of Ms. Fletcher leading the entire co-taught class was the same. The topic they covered was the same in both classes again as well. They used the same notes sheet, but Ms. Hills moved through it much more slowly, only getting through about half of it in the class. She also did not go in the order on the sheet. At one point, she determined through questioning that the students were not understanding, so she asked them to get into groups and go to the white boards posted up around the room. She then called out problems and asked them to solve them. This activity did not score high on fidelity – there was no individual responsibility for students, most of whom relied on one person in the group to do the work for them. Ms. Hills circulated, having conversations with individual groups rather than engaging the entire class, meaning that the students were unengaged the majority of the time during the group activity. Ms. Fletcher, on the other hand, moved through the notes at a brisk pace, getting through the whole sheet with time to spare. She asked a lot of questions, but it was unclear to me as an observer whether most students were responding or not. She interpreted their responses as evidence of understanding, however, and moved quickly to allow them time at the end of class to work through some sample problems related to the notes. Again, both teachers circulated actively, offering feedback on students' reasoning and responses.

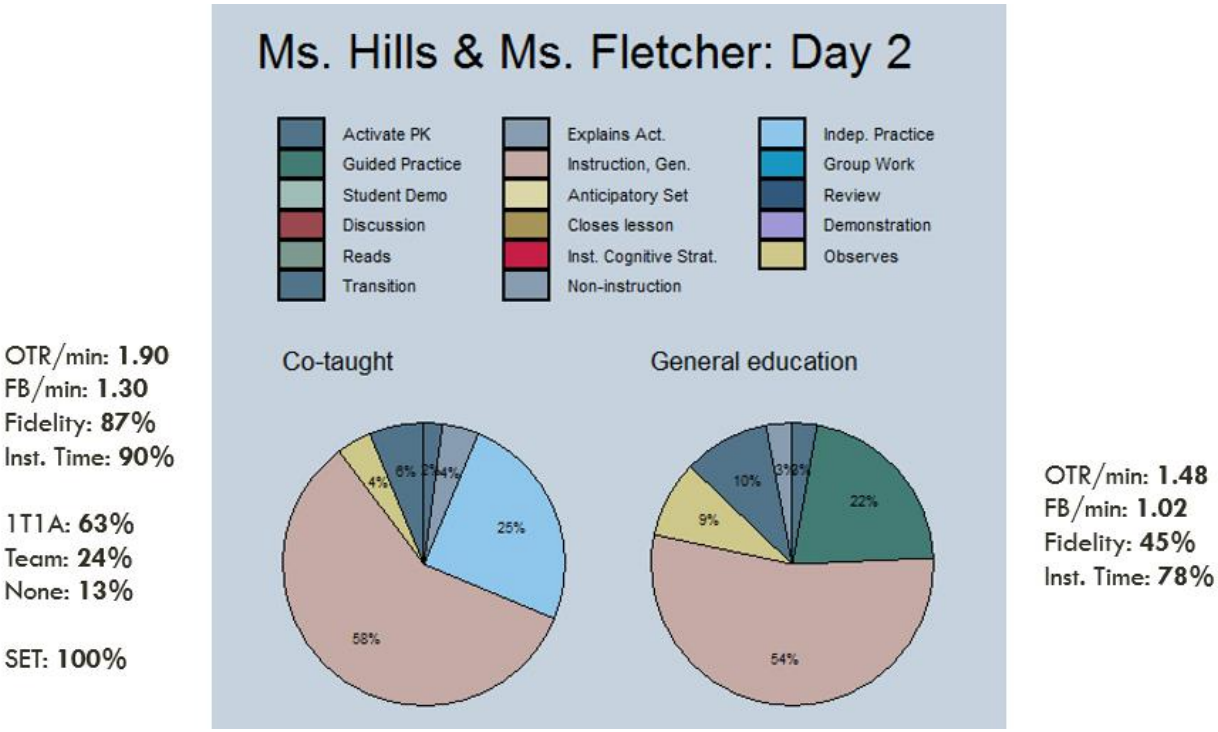

Figure 23. Instructional profile for Team M-2's second observation

Interviews. Ms. Hills and Ms. Fletcher did not share a common planning block. Administrators told me they did, but the block listed as a planning block for them was actually assigned to Ms. Hills to supervise an online class. Because of this, they did not regularly plan with each other. Ms. Fletcher had four preps along with other duties, so they said they did not have time. Instead, they planned electronically through Google Docs and email. Ms. Hills said she and Ms. Fletcher's other co-teachers try to plan as a group and share materials "to try to keep her sane." In discussing the roles they play in the classroom, Ms. Hills said, "I'm flexible, I can do whatever." With some, she is more of the lead instructor, and with others she is a support. About Ms. Fletcher, she said, "she wants to come in and lead a lot, because that's who she is, and she has that energy, and that works with that group." However, felt very comfortable taking the lead on days when Ms. Fletcher was out for any reason. Ms. Fletcher, for her part, saw her role

as being basically identical to the GET's, just being a little more focused on individual students and IEPs. Then, she acknowledged that taking on both roles meant she had "a lot more load."

Both teachers felt generally unsupported by their administration, complaining about the lack of common planning time and the rarity of working with the same teacher more than one year in a row. Ms. Hills said without common planning, they were limited in what they could do:

> If you don't have common planning, you don't have enough time to process. We're doing good just to get the materials in, and we've taught long enough that we can use the 'teacher code' for what we're going to do on the fly. But . . . we haven't sat down with goals at any point. All the stuff that I would love to be able to do, which I go to inservices and they tell me I should do. Gosh, I would love to be able to do that. But, no.

Despite this lack of support, Ms. Hills felt very positively about co-teaching, saying it allowed her to focus either on behavior or on instruction instead of having to handle both at once. Ms. Fletcher also liked having a support in the room, and she appreciated being able to see other teachers' styles of instruction.

Implementation of specialized instruction. This is one team that unequivocally had more specialized instruction in their co-taught class than in the self-contained. They had more OTRs and FB statements and provided more time for students to practice and receive immediate feedback on their performance. Fidelity percentages were consistently higher in the co-taught classes, indicating more frequent monitoring, scaffolding, and repetition of important information. However, this specialization was occurring basically without the benefit of co-teaching because the SET was completely in charge of providing the instruction. I did note in my field notes that, as with other teams discussed above, student behavior was noticeably better in

the co-taught class than in the general education. Students were more engaged with Ms. Fletcher, and she had to stop much less often to regain students' attention.

Discussion

Regarding the regression models, none of the contextual factors I hypothesized as important in implementation quality turned out to be statistically significant. The theory behind these hypotheses is based solidly in the research, so I conjecture the reason the regressions did not show significance is related to either the particular sample in this study or perhaps that the size of the sample was not large enough to exhibit the patterns statistically. A larger sample would allow me to further investigate this hypothesis; if these factors are, in fact, not important, that would have major implications for the ways in which co-teaching is implemented in schools. Another interesting result was that in the regression models, the coefficient for co-teaching was often negative, which is opposite of what I expected. This is a finding I plan to examine further once I have more data from a larger sample to see if it holds.

Another potential reason for the lack of significance in the regression is that the weighted fidelity may be a faulty metric. It has never been used before as an outcome and is solely based at this point on theory. Therefore, its construct validity has not been fully evaluated. If it does not truly measure the construct of specialization of instruction for SWD, the hypothesis driving those regression models is questionable. The fact that fidelity values were so low overall indicates that either teachers are not doing what I think they should be or that the metric itself does not accurately measure specialization. I suggest it is the former, based on evidence from the findings. For example, team H-3, Mr. Gregory and Mr. Helm scored high on fidelity and they also had one of the highest rates of OTRs, which is one measure of quality teaching. In addition, based on

reactions from my field notes, as I watched them I felt they were qualitatively very good – their instruction was interesting, relevant, and multi-modal.

Additionally, as discussed above, Mr. Robert's general education class had higher fidelity than his co-taught. Although I have not specifically examined that team's videos to compare when he was teaching to when his partner Mr. Jordan was teaching, my field notes and impressions were that Mr. Roberts was a stronger teacher than Mr. Jordan. He made his instruction relevant to students' lives, maintained high levels of student engagement and involvement, and he explicitly taught his students study skills, such as how to create outlined notes from reading passages. Mr. Jordan did not do any of those things – his instruction typically consisted of reading from his own notes and copying those notes onto the board for students to copy into their notebooks. There was very little interaction between him and the students. Therefore, the value of the weighted fidelity was related to my qualitative (and admittedly subjective) judgment of teaching quality. I will explore this in future studies as explained in Chapter VII.

Analysis of the individual cases presents a number of challenges in measuring and defining specialized instruction in co-taught classes. Teams like M-2 and H-3 provided strong instruction in their co-taught classes, but it was delivered primarily by one teacher, with the other serving almost entirely in a support role. Does this supportive role provide enough benefit to justify the expenditure of resources in having that person in the class? For H-3, the main benefits seemed to be that certain students got more one-on-one attention and improved student behavior. M-2 also saw improved student behavior in the co-taught class, but it is impossible to know whether that was in any way a result of the second teacher being there.

Team H-1 represented a few teams in this sample in that their instruction was almost identical across settings, and the GET was the primary instructional lead in the co-taught settings. These classes exhibited the patterns seen in other observation research on co-teachers (Cook et al., 2011). Instruction was not specialized at all, either by practices nor fidelity of implementation, and the team members did not plan together to try to make that happen.

Teams E-1 and S-1 present more complicated pictures because these teams did plan together (they were the only ones in the sample to do so), and they altered instruction based on their planning. However, the level of specialization did not necessarily increase as a result. With Team S-1 in fact, instruction became less specialized and accessible for SWD in every way as a result of the special educator being more involved. E-1's results were more mixed. Their fidelity values were not always high, but they incorporated more direct instruction and even a little cognitive strategy instruction into their co-taught classes, indicating that they were thinking about increasing accessibility.

These findings related to differences in instruction and the factors associated with those differences paint a complicated picture of what good co-teaching looks like and how schools can support it. As evidenced by the case analyses in the previous section, specialization of instruction seems to be related to both choice of instructional practices as well as the quality of implementation of those practices, making it difficult to quantify. No matter how it is eventually measured, however, the findings from this project demonstrate that, at least in this sample of teachers, specialized instruction is not happening overall. There were glimpses of it in some lessons with some teams, but as a whole, instruction was very similar across settings, and the differences were not always in the direction of being more specialized or accessible to SWD. This was true regardless of teacher factors, classroom factors, and school factors, despite their

hypothesized importance in the literature and the conceptual framework behind this study. Implications of this, if they hold true with a larger sample, would be profound; I discuss them and relationships to my conceptual framework in Chapter VII.

CHAPTER VII: IMPLICATIONS AND FUTURE RESEARCH

The purpose of co-teaching, as explained by Marilyn Friend and others, is to provide access to the general education curriculum while at the same time providing individualized, specialized instruction for SWD. In my conceptual framework, I hypothesized that moderating factors related to schools and teachers might interfere with the level and quality of specialized instruction co-teachers provide. The central purpose of this project was to determine whether the co-taught classes in this sample met that purpose and to find a way to define and describe what instruction in co-taught classes looked like using those criteria as well as the contextual factors that seemed to influence the ways in which co-teachers implement instruction. I found that overall, co-taught classes are not providing the kind of individualized, specialized instruction promoted by co-teaching advocates. This work is in its early phases, but there are implications for research and practice currently, there are also clear directions for future lines of research.

Implications

A central takeaway from this work is that in large measure, specialized instruction is not occurring. In this sample, this was true regardless of the supportive features the schools had put in place surrounding co-teaching. Most of the teachers in the sample had common planning time with their co-teacher, for example, and many had co-taught together for several years. However,

these factors did not seem to influence at all the level of specialization or quality of instruction provided in the co-taught settings.

In addition, the field of special education needs to produce a better definition of co-teaching and the roles of co-teachers. In research, without this definition, there is no clear measure of the successful implementation of co-teaching, making it impossible to measure whether specific features of co-teaching have any impact on student outcomes. The implementation markers (IMs) used in this project provide one direction toward a definition of implementation, resulting in a more detailed picture of instruction as well as a measure of how well the instruction is designed to be accessible for SWD. However, types of instructional practices should be considered in the definition as well in some way, making the definition as yet incomplete and in need of further refinement (see below).

Practically, without a clear definition, teachers and administrators have little guidance on supporting or implementing co-teaching. This has led to confusion in the field about what the roles of the teachers should be, which is evidenced by Ms. Dickinsen's interview response about specialized instruction. She described specialized instruction initially as being instruction focused on the individual needs of SWD; for example, instructing a student who has ADHD how to use self-monitoring techniques to increase her on-task behavior. However, when asked what the SET should be doing during a co-taught class, she replied that the two teachers should be indistinguishable in their roles – that specialization happens at the class level in the form of universal design. Ms. Dickinsen is not alone in this contradictory assessment (Beninghof, 2016); however, this lack of clarity results in administrators being unsure how to train and evaluate co-teachers and teachers being unsure of exactly how to plan or implement co-teaching in the classrooms.

This confusion on the teachers' part is evidenced by the lack of specialized instruction, even in teams that planned regularly together. I did find that teachers who planned regularly changed the instruction in their co-taught classes significantly; however, I did not see any teams in which the co-taught classes were consistently higher-quality instruction, with the exception of team M-2, which was led exclusively by the SET. This leads to three implications. First, it is likely that something in those teachers' attitudes toward teaching and/or co-teaching or their level of commitment more generally that makes them different from their peers in some way, explaining why they made co-planning a priority when other teams did not, regardless of the presence of shared planning time in the schedules. Second, most teams that did not plan indicated they did not do so because there was no time, even with shared planning, because the SETs were so overloaded with work. Given the number of teachers of both types who said this, it should be considered seriously. It is highly likely that providing common planning without additional supports, such as a reduced teaching load or caseload responsibility is not particularly helpful for co-teachers. Third, the fact that despite careful planning, the quality of specialization was still mixed indicates a lack of understanding of what co-teaching should be or a lack of skill in implementing it. Once the definition of co-teaching is made clearer, perhaps a method of assessing teacher knowledge could be created to determine whether this is truly a knowledge gap, and training could be developed to address the lack of understanding.

Future Research Directions

This research is intended to be a starting point for future studies which will build on and expand these findings. There are five main directions I see data from this project influencing future work: a) refinement of the CT Scan, b) refinement of the description of fidelity of implementation for co-teaching, c) the role of administration in supporting co-teaching, d)

experimentally studying the impact of co-teaching on student academic outcomes, and e) training for co-teachers.

Refinement of the CT Scan

The CT Scan is still being piloted and validated as an observational tool for use in co-taught classrooms, for which the data collected from this study can be used in later validation studies. The process of coding these videos can be used for development of a specific protocol to use when observing co-taught classes in which both teachers are actively providing instruction. Outputs generated by the CT Scan (i.e., distribution of time graphs and sequencing chart) can be used in later social validity studies, determining the perceived usefulness of these outputs for administrators and teachers.

In addition, the low reliability calculations for weighted fidelity and the lower-incidence instructional practices discussed in Chapter IV point to the difficulty in securing reliability on such a complicated instrument. The categorical and instructional menus are complex and nuanced. Therefore, standardized procedures should be developed for training new observers and for establishing minimum levels of reliability on valued constructs. The methods of calculating reliability for this project were not ideal for this sort of data, particularly with regard to the percentage agreements. This problem of training observers to reliability is one that will require significant attention in the coming months and years.

Definition of Co-Teaching

As described above, the definition of quality co-teaching needs further refinement. I present my reflections on this definition and consequent changes to my conceptual framework in Figure 24 below, which I explain more fully in a later section of this chapter. The definition, I believe, should center around the construct of specialized instruction. Based on my review of the

relevant literature and my analyses of these observational data, I would broadly define specialized instruction in this context to mean use of practices associated with explicit instruction implemented in accordance with the research base as evidenced by adherence to the IMs used in this study. However, I believe there is another component not addressed by the data in this study, which is instruction targeted toward individual student needs. Because I was not privy to individual conversations teachers had with their students, I was unable to determine the extent to which SETs were working with students on individual goals. The conversations I did happen to overhear were not in this vein, but that is not evidence of a complete lack of this type of instruction. Therefore, a key goal in future research will be to determine a method by which I can capture the extent to which SETs are planning for and implementing accommodations or learning plans based on individual needs for individual students. This will likely require having teachers wear microphones during teaching to capture these interactions and also perhaps asking teachers before or after class to detail the individual goals they are working on with students. The true measure of fidelity for co-teaching should include instructional techniques and implementation of instruction for the class as a whole and also for single students with disabilities.

Role of Administrators

Another issue I would like to further explore is the role of administration in supporting co-teachers. In this study, administrator attitudes and supports seemed on the surface to have little to do with implementation of co-teaching. It seemed as though administration at Independence was overall more supportive and positive about co-teaching, but none of the teams at Independence demonstrated specialized instruction in any form in their co-taught classes. It is unclear then, in what ways administrators can change the ways in which their teachers approach

and implement co-teaching. It is possible that with a larger sample size contributions of school-level factors would have shown a significant relationship with implementation of quality practices, but in this sample, this was not the case. If there is actually no relationship, it would require a reworking of my conceptual framework for co-teaching and a rethinking of the way we approach administrator support of co-teaching.

Effectiveness of Co-Teaching

The primary question in any educational research on methods or services provided to students is whether or not those methods or services have positive impacts on student achievement. This study provides a starting point for a line of research investigating this question related to co-teaching. Future analysis of the data on instruction collected through this project and from future projects that contribute to a much larger sample can identify features of co-taught classrooms and instructional practices that result in more specialized instruction. This more specialized instruction should, in theory, result in better outcomes for SWD, and efficient use of teacher resources should result in better outcomes for all students in the class.

As Friend et al. (2010) suggested, the key is to identify features of co-taught classrooms that can be used to delineate between co-taught classrooms, allowing us to compare them. Moving forward, I will use the data collected in this project to operationalize these features and create specific descriptions of them that can be used to distinguish between co-taught classes and thus create separate groups of co-taught classrooms that can be empirically compared to each other. Researchers can use these groups to conduct descriptive empirical work, comparing outcomes for students in certain types of co-taught classes to those in other types of classes and re-evaluating the role that administrators play in creating a supportive school environment for co-teachers. Beyond this, however, the hypothesized salient features can be experimentally

manipulated in single-case or group design studies, allowing for more robust causal claims about the ways in which these features impact student achievement.

Co-Teacher Training

One intriguing finding that came from the interviews with the teachers was the references to training teachers had received that they found helpful for co-teaching. All of these trainings were provided outside of the school system and related to personal discovery and building skills in navigating interpersonal relationships. Particularly given that teachers did not find the existing training very practical or useful, and that the training being offered was not in line with what administrators viewed as important for co-teaching, it is essential to explore different options for training co-teachers. Creating a more clear definition of co-teaching as described above will provide direction, but exploring the areas of interpersonal relationships and teamwork is also promising. Even if a definition and criteria for implementation are developed, if teachers cannot work together as professionals, they are unlikely to be successful co-teachers.

One of the main goals of this project was to highlight features of them that could be used to differentiate one from another for the purposes of experimental comparison. However, there were such small instances of evidence-based instruction or specialization that these features were impossible to infer. This speaks to a larger problem facing this field than simply problematic research design – a widely-used and expensive service delivery model is currently not able to be studied due to lack of positive comparison cases. Therefore, the question must turn to whether this delivery model is flawed from its conception or simply in implementation – whether it is worth trying to strengthen it or whether it should be abandoned all together.

Administrators and teachers in this study and in others express extremely positive attitudes about co-teaching. They feel it is useful and beneficial for students of all kinds.

Theoretically, co-teaching has value – it is hard to imagine that having two trained, experienced teachers working together for students would not be a benefit. It is possible that researchers have simply not been able to quantify this benefit as yet; it is also possible that the complications of implementation of co-teaching inhibit its potential benefits. As a researcher moving forward, I do not feel it is time to abandon co-teaching; the overwhelming positive response to it from the people who engage it in every day indicate that it is worth continued study. However, this future research should be based in a more clear definition and framework of expectations and should be systematic in attempting to identify what aspects of the model are effective in increasing student learning and which are not.

Revisions to the Conceptual Framework

Based on the findings and analyses above, I present a revised conceptual framework in Figure 24, which I believe better reflects the realities and conceptualization of co-teaching. I removed the top portion which presented the rationale and requirements of inclusive settings so the focus now is on co-teaching alone. The top section remains the same because the purposes of co-teaching remain to provide access to the general education curriculum while also providing SWD the individualized instruction they require. I added a step between the implementation of co-teaching and specialized instruction which is regular planning. In this study, the only teams that adjusted their instruction for their co-taught class were the ones that met to plan on a regular basis for an extended period of time. This suggests that without that regular planning, it would be exceptionally difficult, if not impossible, for teachers to implement truly specialized instruction. The moderating factors are still present but somewhat modified. I placed them such that they moderate the relationship between co-teaching implementation and regular planning because I see this relationship as much stronger. There are some factors that could influence the strength of

instruction implemented even with the best planning, but based on the findings from this study, I observed problems of training and time, for example, interfering with whether or not the teams planned and with how they planned when they did.

Additionally, in the boxes listing the potential moderators, I emphasized the ones that seemed to be most prominent in this study. For school-level factors, these were time, training, and evaluation. Time was an issue because teachers felt they did not have time to plan together; training was implicated in teachers' lack of knowledge of how to implement models in their classes and in the fact that the training content did not match what the administrators expressed was truly important to them. Evaluation was a factor in light of its absence – teachers did not know what administrators expected because they were given no feedback on their co-teaching performance. The teacher-level factors that seemed most important were knowledge, skill, and commitment. At this point, those factors are hypothetical rather than tested. The teacher-level factors that were tested in this study were years of experience and self-efficacy, which did not appear to be important. They remain in the model because they may prove to be important in later studies with larger samples, but they are de-emphasized to reflect their lack of impact in this study. Based on the fact that even the two teams that planned regularly did not implement specialized instruction, it is my hypothesis that teachers' knowledge and skill related to planning implementation of evidence-based practices are likely to be important factors. I also hypothesize that teachers' commitment to co-teaching is important because one team that planned regularly did so despite the fact that the teachers did not have enough time to do so during the school day – they met after school – whereas other teams with this same problem did not.

The final change in this revised framework is the way in which I present specialized instruction. Based on my analyses of the observational data, I believe there are four features that

should be considered in determining whether a co-teaching team is implementing specialized instruction. The first of these is whether they use explicit instructional practices, including modeling, think-alouds, guided practice, and well-supported independent practice. The second is cognitive strategy instruction, which for the purposes of this study was grouped with explicit instruction. I split it out in the model because of its strong research base (see Chapter II) and because of its almost complete absence throughout the over 60 hours of classroom instruction I observed, which led me to believe it is an area that deserves more attention in co-teaching research and implementation. Third, specialized instruction requires high levels of OTRs and specific FB statements. Research is still needed to determine optimum levels of these at the secondary level, but these are fundamental strategies to monitor students' understanding and to promote student learning (e.g., Archer & Hughes, 2011; Hattie & Yates, 2014). Finally, the fourth component of specialized instruction is fidelity of implementation of the instructional practices. This includes use of visual aids and other scaffolding techniques, using clear and consistent language, providing multiple examples and non-examples, and frequent monitoring of students' understanding in order to adjust instruction as needed (e.g., Archer & Hughes, 2011).

The final two changes to the framework are small in size but large in concept. They specify the contexts in which teachers in co-taught classes should implement this specialized instruction. The genesis for this addition resulted from my consideration of part of Ms. Dickinsen's interview. She defined specialized instruction at first this way: "You identif[y] the skill set that the student [is] missing, and then you [figure] out how to remediate that, how to teach compensatory strategies. . . . You can't generalize it." Later in the conversation, however, she said in relation to the SET's role that it should look very similar to the GET's role in the classroom because "What's good for one is good for all." I asked if she meant specialization for

the whole class, and she responded that it was like universal design – if something was good for one student, it should be done for the whole class. After giving this much thought and analyzing my observation records, I believe these are two different types of specialized instruction. This project focused on the latter – practices that can and should be implemented in the whole class to make the material accessible for the substantial portion of the students who have disabilities. This type is presented on the new conceptual framework in the box on the upper left of the specialized instruction circle. This type of *generalized specialized instruction* should be delivered using the four features listed inside the circle using the vehicle of the co-teaching models (Table 1) as appropriate. The second type, *individualized specialized instruction,* is presented at the upper left of the specialized instruction circle on the framework. It should be delivered individually and based on the student's needs as identified in the IEP. For example, if a student exhibits frequent off-task behavior, the teachers could plan and implement an individualized self-monitoring procedure for that student and collect data on its effect on the student's behavior. These types of individual interventions should also be delivered using the features of specialized instruction as presented in the framework, but they would be done on an individual basis as opposed to for the entire class. Because this study only collected data on generalized specialized instruction, my conceptualization of this concept is theoretical, and, as described above, future studies will need to determine the relationship between these two types of specialization and the roles the two teachers should play in planning and implementing both of them.

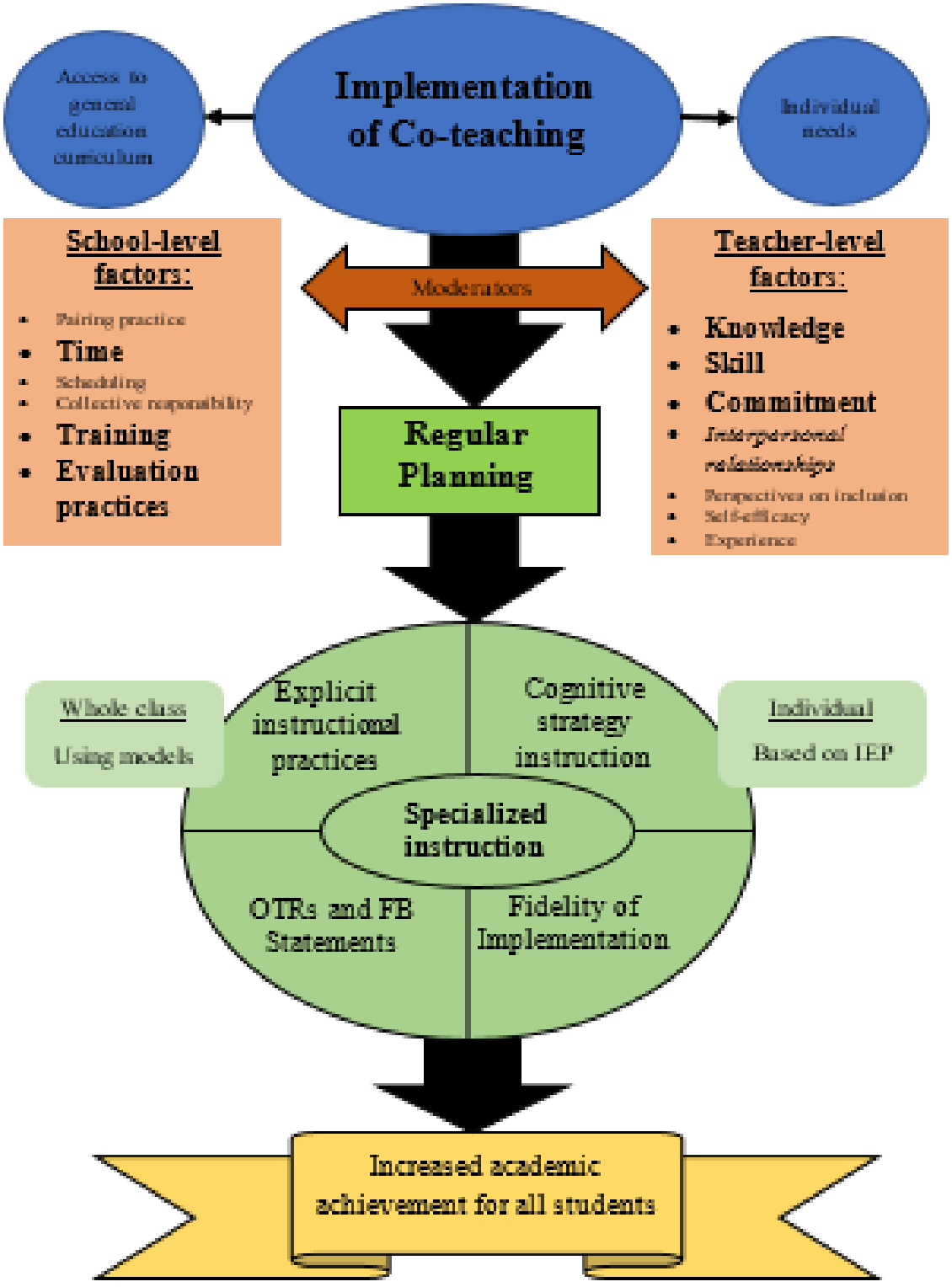

Figure 24. Revised conceptual framework

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Appendix A

Interview Questions: Administrators

1. What are your responsibilities with regard to instruction?
2. What is your background/ training with regard to special education?
3. How do you conceptualize the role of co-teaching in your school?

   Possible follow-up questions:

   a. What do you see as the responsibility of the general educator? Special educator?
   b. What kind of students do you think are best served in co-taught classrooms?
   c. What do you see as the strengths/ challenges related to co-teaching?
4. How do you (or your administration) structure the logistics of co-teaching?

   Possible follow-up questions:

   a. How do you choose which teachers will co-teach?
   b. How do you pair teachers?
   c. How do you allocate students to co-taught classes?
   d. How do you organize schedules for co-teachers?
   e. What types of professional development/ training/ or other support do you (or the school or district) provide for co-teachers?
      i. What is the protocol for when co-teachers have difficulties negotiating their relationship?
5. What do you look for when you observe in a co-taught classroom?
6. What questions do you have about co-teaching? What other information or training would you like about it (or related subjects)?

Appendix B

Teacher Questionnaire

Instructions: Please read and answer the questions below. To respond, click in the answer space and choose a response from the drop-down menu or type in your own response for open-ended questions. To select a check box, click on it.

Write a first and last name you would like to serve as your pseudonym: Click here to enter text.

Part 1. Demographics

1. What is your age?
2. What is your gender? Select a gender.
3. What is your race/ ethnicity? Select a race/ethnicity.
4. Including this year, how many years of teaching experience do you have? Click here to enter text.
5. What type of certification/ license do you hold? Full

   If you chose Other, enter your type of certification here: Click here to enter text.
6. In which subjects are you licensed to teach? **(Choose all that apply.)**

   ☐ Special Education
   ☐ English Language Arts
   ☐ Mathematics
   ☐ Science
   ☐ History
   ☐ Physical Education
   ☐ Art or Music
   ☐ Foreign Language
   ☐ Vocational programs
   ☐ Other: Click here to enter text.

7. Do you teach in a content area for which you are unlicensed or provisionally licensed? Choose an item.

8. Do you primarily work in general or special education? Choose an item.

9. **For special educators,** in what areas do you specialize or are licensed? **(Choose all that apply.)**
   ☐ Learning disabilities
   ☐ Emotional or behavioral disabilities
   ☐ Autism Spectrum Disorder
   ☐ Other Health Impaired
   ☐ Hearing or vision impairments
   ☐ Intellectual disabilities
   ☐ Speech or language disabilities
   ☐ Traumatic Brain Injury
   ☐ Other physical disabilities

10. **For special educators**, in what settings do you teach this term? **(Choose all that apply.)**

    ☐ Self-contained
    ☐ Resource
    ☐ Collaborative
    ☐ Other

11. **For special educators**, how many students are currently on your caseload?

Part 2. Co-Teaching

12. In how many content areas are you teaching this term?

13. Please list the content areas in which you teach:

14. With how many different teachers do you co-teach this year?

15. Approximately how many other co-teaching teams in your subject area are there in your school?

16. Including this year, how many years have you co-taught?

17. Including your current co-teacher(s), how many co-teachers have you worked with in total?

18. How much input did you have in the selection of your co-teacher? Select a response.

19. To the best of your knowledge, why were you two paired together?

    Select or enter a reason.

    If you chose Other, please enter the reason here: Click here to enter text.

20. Do you and your co-teacher have shared planning time in your schedule?

    Select a response.

21. Do you and your co-teacher plan regularly together? Select a response.

22. On average, how much time do you spend co-planning with your co-teacher per week?

    Select a response.

23. When do you usually meet to plan with your co-teacher? (Choose all that apply.)

    ☐ Not applicable – we do not meet to plan.
    ☐ During shared planning time
    ☐ Before school
    ☐ After school
    ☐ During lunch
    ☐ Evenings (outside of school)
    ☐ Weekends
    ☐ Other: Click here to enter text.

Part 3: Teacher Beliefs

This section is designed to assess the kinds of things that influence your school activities. Please indicate your opinion about each statement below. If your responses differ by class, respond considering your co-taught class(es) specifically.
(Note: Questions adapted from the Teachers' Sense of Efficacy Scale Short Form; Tschannen-Moran & Hoy, 2001)

Rate each question on a scale of 1-9 (1= Nothing/ not at all; 3 = Very little; 5 = Some influence/ ability; 7 = Quite a bit; 9 = A great deal)

1. How much can you do to control disruptive behavior in the classroom?

2. How much can you do to motivate students who show low interest in school work?

3. How much can you do to get students to believe they can do well in school work?

4. How much can you do to help your students value learning?

5. To what extent can you craft good questions for your students?

6. How much can you do to get children to follow classroom rules?

7. How much can you do to calm a student who is disruptive or noisy?

8. How well can you establish a classroom management system with each group of students?

9. How much can you use a variety of assessment strategies?

10. To what extent can you provide an alternative explanation or example when students are confused?

11. How much can you assist families in helping their children do well in school?

12. How well can you implement alternative strategies in your classroom?

Part 4: Collective Responsibility

For each statement in this section, estimate the number of teachers in your school who fit the description, based on your experience and observations.
Rate each question on a scale of 1-5 (1 = None; 2 = A few; 3 = About half; 4 = Most; 5 = All).

1. About how many teachers in your school feel responsible for improving overall teaching quality in the school?

2. About how many teachers in your school adjust their materials or instruction to be accessible to all students?

3. About how many teachers in your school take responsibility for helping students develop strong study habits?

4. About how many teachers in your school take responsibility for helping students develop self-control and/or social skills?

5. About how many teachers in your school set high expectations for academic work from students with disabilities?

6. About how many teachers in your school take responsibility for ensuring that all students learn, including students with disabilities?

7. About how many teachers in your school are willing to accept students with disabilities into their classrooms?

Appendix C

Definitions of Instructional Practices and their Implementation Markers (IMs)

Construct			Definition
Activates prior knowledge	**Definition**		Reference to content previously learned; Questions about previously-learned material that are designed to relate previous material to new instruction
	What it is NOT		Instruction of new or previously-learned material Asking questions to lead students to new understandings Activity whose sole purpose is to review – this code is for quicker activation with the goal of tying previous knowledge to new information.
	IMs	**Cues**	Provides a statement of what the teacher is doing
		Relevance	The prior knowledge is clearly related to the new topic, and this connection is made explicit by the teacher
		Monitors underst.	Teacher asks questions or uses another method to monitor whether students have the requisite background knowledge
		Adjustment	If the students do not have the required background knowledge, teacher adjusts to address this, by reteaching or reviewing before moving on
	What it may sound/look like		"Last week we talked about . . ." "Can someone remind us how to add two-digit numbers?"
Anticipatory set	**Definition**		Preview/ explanation of what this lesson or segment will consist of
	What it is NOT		Reteaching information; preview of what tomorrow's lesson will be
	IMs	**Provides cue**	Explicit signal (e.g., "Here is what we're going to do today.")
		Clarity/consistency	Language is clear, organized, and consistent
		Rationale	Teacher states the reason why this topic is being covered or why this activity is relevant (beyond the SOL – must include at least a brief explanation)
		Goal	Learning goal/ target is included – what should students know/ be able to do by the end of the lesson
	What it may sound/look like		"Today, we are going to talk about the steps involved with long division." "This lesson will cover the factors that lead to the Civil War. First, we will review a little bit, then we will take some notes on key terms, then we will do a group activity."

Closes lesson	**Definition**		Stating, reviewing material learned that day as a closing to the lesson. May include a preview of what will happen tomorrow. Includes assessment of student learning.
	What it is NOT		Full re-teaching of a concept
	IMs	**Monitors underst.**	Teacher monitors whether students reached the learning target/goal for the lesson.
		Feedback	Provides feedback that includes reference to accuracy
	What it may sound/look like		"Today we learned how to multiply a 3-digit by a 2-digit number. What do we do when we have zero on the bottom?" "Today we discussed the difference between similes and metaphors. Can someone give me an example of a simile?"
Demon-stration	**Definition**		Performing or showing a demonstration to illustrate a concept or idea
	What it is NOT		Explanation and modeling of steps/ task/ process
	IMs	**Organization**	Materials are readily available; set-up time is minimal
		Logical sequence	Steps or parts of the demonstration are presented in a logical order
		Clarity/consistency	Language during demonstration is clear and consistent
		Student engagement	Opportunities for student engagement, either through hands-on experience or by asking clarification questions
		Monitors underst.	Teacher asks questions or uses other methods to assess students' understanding of the demonstration and its connection to the learning target
	What it may sound/look like		"Watch how . . . This shows . . ."
Discussion	**Definition**		Teacher and students engage in a conversation to clarify or extend learning. Discussion may be used to introduce a topic, teach or clarify understanding, or review a concept.
	What it is NOT		Scattered questions in the context of an academic lecture; for this construct, the discussion itself is the primary method for constructing understanding. Deeper-level questioning and an ongoing conversational element are essential components of this construct. If all questions are rote or choral, it is not a discussion. ** In math, this often takes the shape of discourse related to mathematical topics.

	IMs	**Authentic**	Questions/ scenarios are authentic to students' experience/ interest and/or authentic to realistic situations. They do not feel overly contrived.
		Planned Qs	Questions are well-planned; there is a clear focus and direction to the discussion related to the learning goal
		Range of students	Teacher calls on students all over the room
		Student talk & evidence	Encourages students to provide evidence or rationale for their responses; asks follow-up questions
		Uptake	Picks up student remarks and works them into the discussion
	What it may sound/look like		"What does this make you think about?" "Bill, what do you think about what Fatima just said?" "Why did you choose that method to solve the problem? Can anyone think of a different way to approach it?"

Explains instructional activity	**Definition**		Giving directions for an activity students will engage in
	What it is NOT		Providing instructions for general classroom procedures, such as handing in papers, reviewing behavioral expectations, modeling a process
	IMs	**Clarity/consistency**	Directions are clearly presented with language consistent with instruction
		Chunked	Instructions are chunked into manageable pieces (no more than 2-3 steps presented at a time). If more than 2-3 steps are presented, students are given an easy-to-access visual reference to guide them through the activity.
		Clear target	Teacher gives students a clear academic learning target. This does NOT include a number of problems to complete or "finish the sheet." The target or goal must be academic, must reference skill/knowledge.
		Conceptual and/or Purpose	The task includes aspect intended to deepen students' conceptual understanding of the topic. If it is a procedural task only, a purpose for completing it is explicitly explained.
		Monitors underst.	Teacher assess students' understanding of what they are expected to do
		Prompts strategy use [generalization]	Teacher prompts students to use a previously-taught strategy to help them complete the task, if appropriate. If no strategy is appropriate, check this box.

	What it may sound/look like		"When you get with your group, first decide who will take on each role. Then send someone up to the front to collect your group's materials . . ." "As you are working through this assignment, remember your RAP strategy to help you summarize the reading." "This assignment is going to help you build your fluency with solving one-step equations so that when we go on to the next topic, you can use more of your brain to focus on learning the new material instead of focusing on solving."
Facilitates student demo/ presentation	**Definition**		Teacher asks student(s) to present or demonstrate their knowledge about something.
	What it is NOT		Teacher calling on students to answer questions
	IMs	**Feedback**	Provides feedback on accuracy or completeness. Must be specific feedback, not generic.
		Questioning	Asks questions about decisions students made or about the content of their presentation – encourages them to provide evidence/ rationales.
		Transitions	Transitions into and out of and between demonstrations is well-organized and quick.
	What it may sound/look like		"Rasheed, could you and Jimmy come to the front and show the class the way you were demonstrating the Earth's rotation around the sun? I really liked the way you captured it." [After a group presents] "That was excellent. Sherman, can you explain to me exactly what part of the process you represented when you rolled your pencil across the floor?"
Facilitates group work	**Definition**		Teacher actively monitors as students work together on a project or converse together (e.g., turn-and-talk). NOTE: Only code this if the teacher is interacting in some way with students. Active monitoring (circulating, listening to conversations) is facilitation
	What it is NOT		Standing behind a podium or just scanning the room – code that as "Observing/ Assessing > Proctoring."
	IMs	**Clear directions**	Instructions about what students are to do is clear; if they are complex, visual supports are provided
		Participation + Responsibility	Teachers encourage participation by all students (usually by giving explicit directions for members of the group); each student has a task to complete to show responsibility for his/her own learning

		Instructional Level	There is evidence that students are challenged but not overwhelmed (or lack of evidence that the assignment is too easy or too hard)
		Monitors underst	Teacher monitors the activity and provides specific feedback to groups. Could also be in the form of scaffolding/ prompting to push farther.
		Debriefs	When groups come back together in the whole group, teacher provides feedback or leads discussion on the learning
	What it may sound/look like		Teacher circulating between groups interacting with students

Facilitates independent practice or fluency-building activity	**Definition**		Students work independently to solve problems or complete an independent activity. Activity is student-driven/ student-directed (i.e., students work without direct prompting or questioning). Activity is intended as practice, not merely assessment. NOTE: For this code, the teacher should be actively monitoring students' progress.
	What it is NOT		Students work on problems while teacher sits at desk on laptop (this should be coded as Not Teaching); students work while teacher stands at front of room, scanning it (should be coded as Observe/Assess > Proctoring). Assessments do not fit in this category (e.g., daily quizzes, exit tickets)
	IMs	**Clear directions**	Instructions about what students are to do is clear; if they are complex, visual supports are provided
		Goal/ rationale	Teacher provides an academic goal or rationale for the assignment. There is a clear reason given about why students are being asked to do it (i.e., evidence that the assignment is more than busy-work)
		Instructional level	There is evidence that students are challenged but not overwhelmed (or lack of evidence that the assignment is too easy or too hard)
		Feedback	As teacher actively monitors, he/she provides feedback, either by telling students their responses are correct or by prompting/ questioning them to go farther or rethink.
		Adjusts/ Differentiates/ Scaffolds	If students are struggling or finishing too early, teacher adjusts the goal and/ or assignment (such as by providing an extension activity or modified assignment). NOTES: This can be either for the class as a whole or for individual students. The adjustment should be clearly relevant and

			purposeful (i.e., not just something to fill the time). If the assignment is on students' level (i.e., the 3rd fidelity marker is checked), and there is no evidence that the assignment needs to be adjusted, check this marker as well.
	What it may look/sound like		Teacher circulating, stopping to speak quietly with individual students.
Guided practice	**Definition**		Students rehearse new concepts or tasks with prompting and feedback from the teacher. A key element of this construct is that the teacher frequently assesses student understanding and provides immediate feedback to the students. In Explicit Instruction, this is the "We do" segment. WRITE THE TOPIC BEING TAUGHT IN THE NOTES FIELD.
	What it is NOT		Discussion or modeling with no student participation; independent practice
	IMs	**Organized**	The examples/ tasks are logically sequenced to guide students' understanding.
		Consistent	The examples/ tasks in this stage directly mirror what the teacher modeled/ taught.
		Frequent Monitoring	Teacher <u>frequently</u> asks questions or cues responses to monitor understanding. Should be multiple OTRs per minute.
		Feedback	Teacher provides feedback regarding accuracy so students know if they are on the right track. This feedback should also include some adjustment of explanations or tasks based on what the teacher learns from the monitoring.
		High Success Rate	Teacher requires students to demonstrate a high level of mastery before moving on or providing independent practice
	What it may sound/look like		"Can someone tell/ show us the first step?" "Try the first problem, and then we'll go over it together." "Yes, that is correct because . . ." "No, that's not quite it. When you . . ."

Instruction on a new topic – general	**Definition**		Teacher-led instruction using systematic delivery. Includes modeling/ think-alouds. May include brief questioning. May be straight lecture. In Explicit Instruction, this is the "I do" segment of the lesson. Use this code when a more specific one does not apply (e.g., Examples, Connection)
	What it is NOT		Student-led group work; independent seatwork; inquiry-based activities; guided practice
	IMs	**Clarity/consistency**	Language is clear and understandable; terms used are consistent throughout
		Connections	Teacher makes explicit, strong connections to previously learned material, things from students' lives, current events, or learning from other classes. DO NOT CHECK THIS IF THE CONNECTIONS ARE OBVIOUSLY NOT UNDERSTOOD BY THE STUDENTS.
		Repetition	Teacher repeats the essential information/ terms more than once, preferably with a cue such as "This is important."
		Examples and Non-examples	If applicable, teacher provides examples AND non-examples of the concept or term. The examples are clear and explicitly explained; the non-examples are chosen to help students distinguish between similar concepts or terms. IN MATHEMATICS, only check this box is the examples are presented in a logical sequence (e.g., simple to complex)
		Modeling	If applicable, teacher models the concept or process being taught by working through the steps. (If not applicable, check the box as completed.)
		Think Aloud	Teacher thinks aloud while modeling. This must include examples of thought processes/ concepts/ decision-making, not simple procedures.
		Visual Aids/ Scaffolding	Teacher uses appropriate visual aids that are clearly related to the learning target/ topic AND/OR provides one or more scaffolds to support student learning (e.g., graphic organizer, study guide) and/or support working memory.
		Monitors underst.	Teacher in some way monitors student understanding of the instruction AND adjusts as needed (asking questions without attending to the answers does not count)
	What it may look/sound like		Lecture; presentation

Instruction on a Cognitive Strategy	**Definition**		Teacher-led instruction on the use of a cognitive strategy meant to assist students in understanding and completing an academic task. It can be a learning, problem-solving, test-taking, writing, or reading strategy, for example. The key is that the strategy is one that can be applied to multiple situations.
	What it is NOT		Instruction on a content-specific topic
	IMs	**Clarity/ consistency**	Language is clear and understandable; terms used are consistent throughout
		Repetition	Teacher repeats the essential information/ terms more than once, preferably with a cue such as "This is important."
		Situations specified	Teacher explains exactly when the strategy should be used and contrasts with situations that would not be appropriate
		Modeling	Teacher models the strategy by working through the steps.
		Think Aloud	Teacher thinks aloud while modeling. This must include examples of thought processes/ concepts/ decision-making, not simple procedures.
		Visual Aids/ Scaffolding	Teacher uses appropriate visual aids that are clearly related to the learning target/ topic AND/OR provides one or more scaffolds to support student learning (e.g., graphic organizer, study guide)
	What it may look/ sound like		Examples of strategies: PIRATES, FISH, RAP
Reads from book/ reading passage (or facilitates group reading)	**Definition**		Teacher reads to the class from a book or reading passage. Students may or may not have their own copies to follow along. Or students read aloud while teacher reads along.
	What it is NOT		Students reading silently
	IMs	**Avoids "popcorn" reading**	Students volunteer for reading or are given advance notice or supports to read
		Checks for understanding	Teacher stops periodically to have brief discussions with questioning to check students' understanding of the reading
		Refers to text structures/ supports	During the reading, teacher points out text features such as headings, bolded words, or pictures and how they aid in understanding. [If it is a literary text, teacher should point out use of language or punctuation to add to the meaning.]
		Visual Aids/ Scaffolds	Teacher uses appropriate visual aids AND/OR provides scaffolds to support student learning (e.g., graphic organizer, study guide)

	What it may sound/look like		Teacher reading while students follow along Teacher reading a picture book, showing it to students
Reviews (or re-teaches) previously learned material	**Definition**		Leading an activity designed specifically to review information students have previously learned. Very little or no new information will be presented
	What it is NOT		Instruction of new material Activation of prior knowledge
	IMs	**Participation**	All students actively participate in the review in some way
		Monitors underst.	Teacher monitors whether students have the requisite background knowledge. Monitoring must be of all or most students (related to Participation)
		Feedback	Provides specific feedback that includes reference to accuracy
	What it may sound/look like		Test review Jeopardy game Hangman Charades Questioning activity

Appendix D

Field Notes Template

Teacher(s) (Peudonyms only): _____

Date: _____

Class: _____

Time: _____

Describe the physical space – desk arrangements, board and projector placement, items on the walls, etc. *(only need to do this once per classroom, unless changes are made between observations)*

Time Stamp *(every 5-10 min)*	Observations *(focus on interactions, content of questions and feedback, sensory details; use S1, S2 etc. to refer to students rather than names)*	Comments *(personal reactions or triggered memories)*

Post-observation summaries/ reflections/ clarifications (*completed within 24 hours of observation*):

Appendix E

Interview Questions: Teachers

1. Thinking generally (i.e., not related to a specific situation), how do you conceptualize your role in a co-taught classroom? What about the role of the (special/ general) educator?
2. What benefits and drawbacks do you perceive with the co-teaching model?

   Possible follow-up (if they don't say how they personally feel about co-teaching):

   a. Do you enjoy co-teaching? What do you enjoy (or not) about it?
3. What are the pros and cons of including of students with disabilities in general education classes (often called mainstreaming or inclusion)?
4. Do you feel co-teaching is an effective way to provide services to students with disabilities?

   a. If it is only effective for some, describe the "ideal" student for a co-taught class.

   b. How do you think it affects students without disabilities?
5. Describe your relationship with your co-teacher. How long have you worked together? How many classes to you teach together? How does it compare to relationships with other co-teachers? Have you had any disagreements or differences of opinion? How do you deal with them?

   What factors are most important to consider when pairing co-teachers together?
6. Is your method of planning or teaching different when you co-teach than when you teach on your own? Describe why or why not and how it differs.

   a. Do you plan with your co-teacher? Describe that process.

   b. How did you develop your planning routine?

7. What messages do you receive from administration about co-teaching? How do they seem to view it?

   Possible follow-ups:

   a. Do administrators observe your co-taught class?

   b. Do you receive any feedback about it?

8. What factors are most important for the effectiveness of co-teaching?

   a. What factors lead to productive co-teaching relationships?

   b. What supports does your school or district provide related to co-teaching? What do you see as being most helpful? What do you wish they would provide?

9. Do you feel you have enough training and knowledge to allow you to be a successful, effective co-teacher?

   a. If so, what was the most valuable experience for this?

   b. If not, what do you wish you had learned prior to co-teaching for the first time? (Or, what advice would you give a teacher who was entering co-teaching for the first time?)

10. Is there else about co-teaching, either your specific experiences or more globally that I haven't asked that you would like me to know?

Appendix F

Informed Consent Agreement – Administrator

Please read this consent agreement carefully before you decide to participate in the study.

Purpose of the research study: The goal of this research is to construct a detailed description of instruction in co-taught mathematics classes to identify the extent of specialization teachers provide and features of the classes that distinguish them from each other and from solo-taught classes of the same subject.

What you will do in the study: As the contact administrator for this study, you will help facilitate my communication with the teachers. You will also participate in one interview regarding policies and procedures related to co-teaching in your school. This interview will be audio taped to allow for transcription and analysis. During the interview, you can skip any question that makes you uncomfortable, and you can stop the interview at any time. Audio recordings will be saved on a restricted UVA server until the transcription has been confirmed to be accurate, and then the audio recordings will be destroyed.

Time required: The study will require about 1 hour of your time. The interview should take no more than 30-45 minutes, and facilitation of communication will require very minimal time.

Risks: There are no anticipated risks in this study.

Benefits: There are no direct benefits to you for participating in this research study. The study may help us better understand the processes of planning and delivering instruction in co-taught classes and will inform future experimental studies that will identify evidence-based practices of co-teaching.

Confidentiality: The information that you give in the study will be handled confidentially. Your information will be assigned a code number and a pseudonym. The list connecting your name to this code will be kept on a password-protected external hard drive that will remain separate from all other study data. When the study is completed and the data have been analyzed, this list will be destroyed. Your name will not be used in any report. The audio recording of the interview will be destroyed as soon as the transcription is verified to be accurate.

Voluntary participation: Your participation in the study is completely voluntary.

Right to withdraw from the study: You have the right to withdraw from the study at any time without penalty. If the interview has already been completed, the audio recording will be destroyed immediately should you decide to withdraw.

How to withdraw from the study: If you want to withdraw from the study, prior to or after the interview, email Wendy Rodgers, the principal investigator at the email address below. If you decide to withdraw from the study during the interview, simply ask the interviewer to stop the interview and inform him/her that you will be withdrawing from the study. There is no penalty for withdrawing.

IRB-SBS Office Use Only		
Protocol #	2016-0315	
Approved	from: 8/23/16	to: 8/22/20
SBS Staff		

Payment: You will receive no payment for participating in the study.

If you have questions about the study, contact:

Wendy Rodgers, M.Ed.
Curry School of Education, 405 Emmet St. S
University of Virginia, Charlottesville, VA 22903.
Telephone: (804) 814-8740
Email address: wjr3yr@virginia.edu

Michael Kennedy, Ph.D.
Curry School of Education, 405 Emmet St. S
University of Virginia, Charlottesville, VA 22903.
Telephone: (434) 924-0827
Email address: mjk3p@virginia.edu

If you have questions about your rights in the study, contact:

Tonya R. Moon, Ph.D.
Chair, Institutional Review Board for the Social and Behavioral Sciences
One Morton Dr Suite 500
University of Virginia, P.O. Box 800392
Charlottesville, VA 22908-0392
Telephone: (434) 924-5999
Email: irbsbshelp@virginia.edu
Website: www.virginia.edu/vpr/irb/sbs

Agreement:

I agree to participate in the research study described above.

Signature: _____ **Date:** _____

You will receive a copy of this form for your records.

Informed Consent Agreement - Teacher

Please read this consent agreement carefully before you decide to participate in the study.

Purpose of the research study: The goal of this research is to construct a detailed description of instruction in co-taught mathematics classes to identify the extent of specialization teachers provide and features of the classes that distinguish them from each other and from solo-taught classes of the same subject.

What you will do in the study: You will complete a 32-item questionnaire about your experience and general approach to instruction. Your co-taught class and the corresponding solo-taught class (if applicable) will be observed 3-4 times over the course of approximately 2 months. Most observations will be conducted live and video recorded. One or two may be only video recorded. If you plan instruction with your co-teacher, 1-2 of your planning sessions will be observed and audio recorded. You will also participate in one interview regarding your co-teaching practices. This interview will be audio taped to allow for transcription and analysis. During the interview, you can skip any question that makes you uncomfortable, and you can stop the interview at any time. During any of these activities, you can skip any question that makes you uncomfortable, and you may stop the activity at any time.

Time required: The study will require about 1-2 hours of your time outside of class. The interview should take no longer than one hour, and the questionnaire should take fewer than 30 minutes. The only other time required will be communication with the researcher to schedule observations and interviews.

Risks: There are no anticipated risks in this study.

Benefits: There are no direct benefits to you for participating in this research study. The study may help us better understand the processes of planning and delivering instruction in co-taught classes and will inform future experimental studies that will identify evidence-based practices of co-teaching.

Confidentiality: The information you give in the study will be handled confidentially. Your information will be assigned a code number and a pseudonym. The list connecting your name to this code will be kept on a password-protected external hard drive that will remain separate from all other study data. When the study is completed and the data have been analyzed, this list will be destroyed. Your name will not be used in any report. During data analysis, all recordings and study documents will be stored on a restricted UVA server. The audio recordings of the interview and planning sessions will be destroyed as soon as the transcriptions are verified as accurate. The video recordings of classroom instructions will be destroyed as soon as analysis of the data is complete.

Voluntary participation: Your participation in the study is completely voluntary.

IRB-SBS Office Use Only		
Protocol #	**2016-0315**	
Approved	from: **8/23/16**	to: **8/22/20**
SBS Staff		

Right to withdraw from the study: You have the right to withdraw from the study at any time without penalty. Any audio or video recordings that have already been collected will be destroyed immediately should you decide to withdraw.

How to withdraw from the study: If you want to withdraw from the study, email Wendy Rodgers, the principal investigator, at the email address below. If you decide to withdraw from the study during the interview or one of the observations, simply ask the interviewer/ observer to stop and inform him/her that you will be withdrawing from the study. There is no penalty for withdrawing.

Payment: You will receive no payment for participating in the study.

If you have questions about the study, contact:

Wendy Rodgers, M.Ed.
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If you have questions about your rights in the study, contact:

Tonya R. Moon, Ph.D.
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Charlottesville, VA 22908-0392
Telephone: (434) 924-5999
Email: irbsbshelp@virginia.edu
Website: www.virginia.edu/vpr/irb/sbs

Agreement:
I agree to participate in the research study described above.

Signature: _____ **Date:** _____

You will receive a copy of this form for your records.

IRB-SBS Office Use Only			
Protocol #	2016-0315		
Approved	from: 8/23/16	to: 8/22/20	
SBS Staff			

Appendix G

Qualitative Codes and Definitions

Code	Definition	Sample Quote
Differences between settings	Related to different teaching methods or styles between co-taught and non-co-taught classes	"Usually when we plan, I'll say, 'Here's kind of what I was thinking, you know how we want to do things.' And I would say 75% of the time we do very similar things in our collaborative to just my regular class. But we have had several lessons where we're doing completely different things." (Mr. Smith)
Scheduling – Teacher	Related to how co-teachers' schedules were constructed For teachers: Do they have common planning time? How many content areas do they work in? How many co-teachers do they have? For administrators: Are there efforts to provide common planning and limit planning demands in teachers' schedules?	"when you have 3 different collaborative partners, you go 'I don't even know where we're going to be.' Because you're using someone else's room that you don't know. So you know where do they have supplies?" (Ms. Fletcher)
Scheduling – Student	Related to how students were assigned to co-taught classes For teachers: How do they determine who will do well in co-taught settings? What is the typical make up of students in co-taught classes? For administrators: How do they determine which students (not those with disabilities) will be in co-taught classes?	"Some kids need to be with mixed abilities, and they learn from that. Other kids shut down. And they do better in a smaller group because they have to build feelings of being safe. And I think that the larger the group, the less safe they feel." (Ms. Fish)
Purpose/ Benefits of Co-teaching	Related to the purpose of co-teaching or benefits from it. For teachers: What benefits do they and their students get? Is it "worth" the investment? For administrators: What purpose does co-teaching serve in the school? Is it "worth" the investment?	"just that input when you're planning a lesson and getting a different viewpoint and different opinions, and I think what's really underrated with that situation is for the kids to see how two adults work together and work things out." (Mr. Brian)
Pairing	Related to the ways in which co-teachers are paired to work together. For teachers: Do they typically have input in the selection of their co-	"I still think we are, and this really bothers me, every year we sit down at time to do the master schedule, and I don't feel there's thoughtful

	teacher(s)? What are important factors in pairing? Do they work with the same partner for multiple years? <u>For administrators:</u> What is the process for pairing teachers? What do they consider?	consideration given to pairing people. I don't think we get their input." (Ms. Donnelly)
Training	Related to pre-service or in-service training about co-teaching <u>For teachers:</u> What training have they received, and was it useful? How have they learned to co-teach? <u>For administrators:</u> What training do they provide? On what and why?	"At the start of the school year, we have a meeting for all the collab teachers. And they go through different lesson plans and different co-teaching models. And the responsibilities. Like, we have to talk about what we think the responsibilities are of each teacher. And then, I think it's actually in two weeks, we've got a required meeting. We're going to watch a video about co-teaching models, and all the collab pairs are going to be there to watch the video." (Ms. Barnstable)
Evaluation	Related to administrator observation or evaluation of co-teachers/ co-teaching <u>For teachers:</u> How often they are observed as co-teachers and whether they receive feedback specific to co-teaching. <u>For administrators:</u> Whether and how they observe/ evaluate co-teachers? What are they looking for in co-teachers? What is "ideal" co-teaching?	"When they've come in for an evaluation, when they come in for a big formal evaluation, they've come during a collaborative block. Which is usually when I ask them because you can usually count on the behavior to be better because there's two people. They'll mention it, it's an aside. It's not the primary focus. I mean, I think if I didn't get along, I would hear something." (Ms. Hills)