

**CO-TEACHING: USING THE CO-ACT TO IDENTIFY QUALITY CO-TEACH
PRACTICES AND PREDICT ACADEMIC OUTCOMES FOR STUDENTS
WITH DISABILITIES**

A Dissertation

by

KIRSTEN O'NEIL - OMELAN

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

December 2010

Major Subject: Educational Psychology

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December 2010

Educational Psychology

ABSTRACT

Co-teaching: Using the CO-ACT to Identify Quality Co-teach Practices and Predict
Academic Outcomes for Students with Disabilities.

(December 2010)

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This research was designed to examine patterns related to quality of Co-teach implementation, as evidenced by Co-teacher responses to the Colorado Assessment of Co-teaching (CO-ACT), and the usefulness of the CO-ACT in serving second purpose of predicting student academic outcomes. Participants consisted of 48 teachers (24 Co-teach partnerships) and 162 students with disabilities in grades 6-8 who were enrolled in a Co-teach class of the study's partnerships during the 2007-08 school year. The CO-ACT examines quality of Co-teach partnerships through measurement of various factors linked to Co-teaching best practices, and provides a scoring system identifying partnerships as exemplary and non-exemplary. Student academic outcome data consisted of district-designed local assessments and statewide assessment measures. Student academic outcome data was collected and analyzed for students with disabilities in identified Co-teach partnerships.

Four areas were examined in relation to the CO-ACT and its ability to predict student academic outcomes: a) whether the CO-ACT was able to predict student academic outcomes; b) the importance of the individual factors; c) the impact of the degree of Co-teacher agreement of practices; and d) analysis of these areas by subject area (math, reading, science and social studies). These four qualities were the basis for the four research questions for the study. Specifically, the aim of the study was to identify correlations among the qualities of each Co-teach partnership, and to determine whether there was a relationship between the quality of the partnership and student academic performance. Study findings indicated that in the area of math and science some CO-ACT factors were statistically significant in predicting student academic outcomes. However, when taking all study analysis into consideration, overall the results indicated that the CO-ACT did not provide statistically or practically significant predictions of student academic outcomes. Although the CO-ACT was designed to measure the presence of behaviors within a Co-teach setting that are reflected within the Co-teach literature as best practices, the exemplary or non-exemplary practices of Co-teachers did not appear to correlate with student academic outcomes. Implications of findings and recommendations for further research are discussed.

DEDICATION

This dissertation is dedicated to those who taught me that endurance, persistence and dedication will be rewarded: Mom, Dad, Jason, John and Abby.

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CHAPTER I

INTRODUCTION

Background

The Co-teaching instructional delivery model is not a recently conceptualized and implemented one. The National Study of Inclusive Education (1995) noted that Co-teaching was the most popular staffing model for supporting and implementing inclusion. In response to recent trends and legislation, the proliferation of the Co-teach model has continued. The 1997 Reauthorization of the Individuals with Disabilities Education Act (IDEA) emphasized that the preferred placement for students with disabilities is in the general education classroom. In addition, IDEA 1997 mandated that students with disabilities have access to the general education curriculum, be held to the same high achievement standards as students without disabilities, and participate fully in statewide accountability efforts; and that any special education services provided outside of a general education setting be justified within students' Individualized Education Programs (IEPs). The reauthorization of IDEA in 2004 and the No Child Left Behind (NCLB) Act of 2001 continued to support the principles within previous legislation.

Despite the wide implementation of Co-teaching, the research base is still extremely limited at the secondary level (Magiera & Zigmond, 2005). Magiera and Zigmond (2005) conducted a search of the literature dating from 1986 to 2003 on

This dissertation follows the style of *Exceptional Children*.

“Co-teaching, collaborative teaching, inclusion, special education and student learning or student outcomes” (p. 79). Their literature review “yielded only 13 articles on Co-teaching research that related to student achievement. . .seven of the studies showed significant positive student academic gains for students with disabilities in Co-taught classes” (p. 79).

Scruggs, Mastropieri, and McDuffie (2007) reported a meta-synthesis of qualitative research. They noted five reviews of Co-teaching in the Co-teach literature published from 1999 to 2004, which encompassed quantitative and qualitative studies of Co-teaching from 1987 to 2004 (Scruggs et al., 2007). Based on their review of the literature, Scruggs et al. (2007) stated that “previous reviews and other relevant literature have generally concluded that efficacy research is limited.” However, the available efficacy data, while limited, are generally positive (Scruggs et al., 2007).

Problem Statement

Implementation of Co-teaching as an instructional delivery model to support students with disabilities in general education settings is based on the belief that effective instructional practices within Co-teach classrooms will result in gains in academic outcomes for students with disabilities. Despite the fact that there is a long history of the practice of Co-teaching (Davis-Wiley & Cozart, 1998; Friend & Reising, 1993; Trump & Baynham, 1961), the quantitative research comparing practice to student academic outcomes, especially at the secondary level, remains limited (Magiera & Zigmond, 2005, p. 79). This study examined patterns related to quality of Co-teach

implementation, as evidenced by Co-teacher responses to the Colorado Assessment of Co-teaching (CO-ACT), and student academic outcomes.

Data Collection Methodology

The five middle schools in this study were selected using a convenience sample, and by applying the criteria of current implementation of a Co-teaching model to support students with disabilities in general education settings. Data for the study was collected through onsite teacher completion of the CO-ACT instrument and from student academic data provided by the Local Education Agency (LEA). The researcher traveled to each middle school campus and met individually with each Co-teacher during questionnaire completion. The methodology for selecting the Co-teachers (n = 48) is described in Chapter III. Student participants (n = 162) were determined by enrollment in identified Co-teach classes. All students with disabilities who had spring assessment scores and were enrolled in participating Co-teach classes were included in the study.

Purpose of the Study

Co-teaching is a common instructional model utilized to support students with disabilities as they access the general education curriculum. Research findings have been mixed in terms of Co-teaching's effectiveness in positively impacting academic achievement for students with disabilities. The purpose of this study was to identify any correlations among the qualities of Co-teach partnerships in grades 6-8 as measured by the (CO-ACT), and to determine whether there was a relationship between the quality of the partnership and student academic outcomes as measured by student assessment data. The quality of Co-teach partnerships was identified through the use of the CO-ACT

instrument (Adams, Cessna, & Friend, 1993). The CO-ACT examines quality of Co-teach partnerships through measurement of various factors linked to Co-teaching best practices, and provides a scoring system identifying partnerships as exemplary and non-exemplary. Student academic outcome data consisted of district-designed local assessments and statewide assessment measures. Student academic outcome data was collected and analyzed for students with disabilities in identified Co-teach partnerships. It was hypothesized that middle school students with disabilities served within high-quality Co-teach classrooms would have more positive academic outcomes than those served within low-quality ones. This study was designed to explore whether the quality of the Co-teach delivery at the middle school level, in core academic content areas, correlated to the academic performance of students with disabilities.

Research Questions

The questions posed for this study were as follows.

Research Question One. Does the CO-ACT instrument, as designed, predict student academic outcomes for students with disabilities within Co-teach classrooms?

Research Question Two. Are there some CO-ACT factors that are more critical in distinguishing effective Co-teachers, as measured by student academic outcomes?

Research Question Three. Is it important for teachers to be in agreement in their CO-ACT responses in order to achieve positive student academic outcomes?

Research Question Four. Are the findings from the first two research questions different across the following subject areas: Math, Reading, Science, and Social Studies?

Results

Analysis of the CO-ACT instrument and student assessment outcomes were conducted to discover any patterns or themes that existed for students with disabilities within Co-teach classes. Five middle schools serving students in grades 6-8, 162 students with disabilities and 48 Co-teachers (24 Co-teach partnerships) participated in the study.

Overall, it does not appear that the CO-ACT provided statistically or practically significant predictions of student academic outcomes. Despite the fact that the CO-ACT was designed to measure the presence of behaviors within a Co-teach setting that are reflected within the Co-teach literature as best practices, the exemplary or non-exemplary practices of Co-teachers did not appear to correlate with student academic outcomes in this study.

Organization of Dissertation

This study is divided into five chapters. This chapter briefly describes background information, presents the problem statement and the study's purpose, and lists the research questions. Chapter II reviews the literature that establishes the rationale for the study's purpose and research questions, and links the study to an area of need within the body of literature. The methodology and procedures followed for conducting the research are discussed in Chapter III. The research findings are reviewed in Chapter IV. Chapter V contains the researcher's conclusions, limitations of the study, and recommendations for further research. Finally, the Appendices contain supplementary materials.

CHAPTER II

REVIEW OF SELECTED LITERATURE

Historical Foundations of Practice

The history of Co-teaching as a method of delivery services to students with disabilities can be found in the general education practice of team-teaching (Friend & Reising, 1993). The technique of team teaching began in the 1950s (Davis-Wiley & Cozart, 1998) when, according to Trump and Baynham (1961), it was proposed by the National Association of Secondary School Principals Commission on Curriculum Planning and Development. The baby boom, a shortage of teachers, and the necessity of delivering more information to a growing student population within limited physical space all contributed to the Commission's recommendation (Davis-Wiley & Cozart, 1998). Faced with these challenges, schools across the nation investigated and implemented team-teaching (Trump & Baynham, 1961).

The practice continued into the 1960s, when variations of team-teaching evolved (Friend & Reising, 1993). These included the large group lecture followed by instruction to smaller class groups, and the joint planning of interdisciplinary units with delivery of instruction conducted individually (Friend & Reising, 1993). The overriding goal of the various models was to create student-centered environments (Easterby-Smith & Olive, 1984). Team-teaching continued through the 1970s in both elementary and secondary settings. However, team teaching encompassed various approaches and research of the practice was mostly descriptive, making it difficult to analyze its effectiveness (Friend & Reising, 1993). While general education implemented the practices of team teaching,

during the mid-1970s the Education for All Handicapped Children Act (1975) simultaneously mandated educational rights for students with disabilities and instigated a philosophical and practical shift in the way students with disabilities would be provided educational services within public schools.

During the 1980s and 1990s the Regular Education Initiative (REI) and the Individuals with Disabilities Education Act (IDEA), both afforded students with disabilities access to general education and services in the least restrictive environment, prompted a resurgence of the team-teaching concept; this manifested itself as the practice of Co-teaching. While the inclusion of students with disabilities was not the catalyst for the team-teaching movement, Co-teaching has gained momentum as an instructional delivery model. As in the past, Co-teaching has been utilized as an instructional model to meet the continued educational needs of students.

Definition of Co-teaching

There are two issues to consider when establishing a definition of Co-teaching. First, there is confusion in the terminology (Welch, 2000). Welch (2000) noted, “A variety of terms are often exchanged and used synonymously” (p. 366). The terms Co-teaching (Cook & Friend, 1995; Dieker, 2001; Nowacek, 1992), collaborative teaching (Gerber & Popp, 2000; Trent, 1998), cooperative teaching (Bauwens, Hourcade, & Friend, 1989; Salend, Johansen, Mumper, Chase, Pike & Dorney, 1997) and team teaching (Welch, Brownell, & Sheridan, 1999) all refer to a similar concept designed to provide services to students with disabilities within the general education environment (Muller, Friend & Hurley-Chamberlain, 2009). To further complicate matters, it is

unclear whether the prefix in Co-teaching refers to cooperative or collaborative (Reinhiller, 1996). According to Friend (2008b), the “co” in Co-teaching does not mean collaborative, but is a reference to the joint nature of the service delivery. According to Reinhiller (1996), the difference between the words is probably less important than understanding collaboration “as a concept or an umbrella term allow[ing] for variations on a theme” (p. 34).

The second issue, according to Welch (2000), “is that team teaching can take various forms, and it is often difficult to discern which form or forms are implemented” (p. 366). Currently, Co-teaching is used to describe an instructional model designed to address the needs of a unique population of students, and to provide support for both the general education teacher and for students with disabilities. Typically, Co-teaching involves the collaboration between a general education teacher and a special education teacher. According to Cook and Friend (1995), there are four definitional components to Co-teaching:

- Two or more professionals,
- Substantive instruction,
- Instruction to diverse populations, and
- Delivery of instruction in a single space.

Both teachers are responsible for planning lessons and activities, delivering content, and assessing student progress towards mastery of the concepts within a single classroom setting (Trump & Miller, 1973; Walther-Thomas, 1997; Zigmond & Magiera, 2001).

These definitions provide a general theoretical framework for the practice of Co-

teaching. When put into practice, however, more specific descriptions of the definitional components are necessary for successful understanding and implementation of the Co-teach model. In practice, Co-teaching is one model that facilitates the inclusion of students with disabilities (Cook & Friend, 1995). In order for Co-teaching to occur, all four of its definitional components must be present and implemented. The four definitional components of Co-teaching are described below.

In relation to the first component, that of involving two or more professionals, this pairing usually constitutes a certified general education teacher and a certified special education teacher (Cook & Friend, 1995; Kloo & Zigmond, 2008). However, depending on student needs and campus implementation, this may include a general education teacher and a paraprofessional.

Relative to the second component, the delivery of substantive instruction may look vastly different from one classroom context to another. When implemented, the intent is that both the educators are actively engaged in meaningful instruction. According to Cook and Friend (1995), educators delivering substantive instruction “do not supervise a study hall, support a single student, monitor students who are listening to a guest speaker, or assist in delivering instructional add-ons that are related only marginally to the curriculum of the general education classroom” (p. 4).

The third component, instruction to a diverse population of students, involves Co-teaching to a group of general education students and students whose individualized education programs (IEPs) can be met, with Co-teaching support, within the general education classroom (Cook & Friend, 1995; Kloo & Zigmond, 2008). While not

included in the theoretical definition of Co-teaching, in practice this diverse population of students has also come to include those in at-risk situations, those who are low-achieving, and/or those who are linguistically diverse learners (Boudah, Schumacher, & Deshler, 1997; Vaughn, Elbaum, Schumm, & Hughes, 1998).

Finally, the last component of the Co-teaching model is the delivery of instruction in a single space. The intent of this component is that students not be educated in separate environments. While there may be occasional separating of groups for instruction due to noise, movement, or physical space restrictions related to the activity, a consistent separation of instruction should not be considered a Co-teaching arrangement (Cook & Friend, 1995). For example, teachers who co-plan a unit, but deliver the instruction to separate groups in separate locations, would not be Co-teaching (Cook & Friend, 1995).

Models of Co-teaching

A definition of Co-teaching would be incomplete without an explanation of the six common models of Co-teaching described within the Co-teach research and literature. Each of the six models of Co-teaching has a distinct purpose and their own sets of strengths and weaknesses. According to Cook and Friend (2008), there are six models of Co-teaching. Each model and a brief description are found below:

1. One Teach, One Assist: One teacher leads and the other teacher drifts around the room and offers assistance and support to individuals or small groups.
2. Station Teaching: Students are divided into groups and work at classroom stations with each teacher.

3. Parallel Teaching: Teachers jointly plan instruction, but each may deliver it to half the class or small groups.
4. Alternative Teaching: One teacher works with a small group of students to pre-teach, re-teach, supplement, or enrich, while the other teacher instructs the large group.
5. Team Teaching: Both teachers share the planning and instruction of students in a coordinated fashion.
6. One Teach, One Observe: One teacher takes the instructional lead and the other teacher observes a student or multiple students. The observation has a specific purpose and data is systematically collected related to the purpose of the observation.

Behaviors Occurring Within a Collaborative Setting

When reviewing research of collaborative settings, several general behaviors are referenced as occurring within collaborative classes. These behaviors, and examples of instruments and processes used to collect information, are summarized below and are based upon researchers' statements regarding the design of the Co-teach models being analyzed within their studies.

Co-teacher Behaviors

Researchers cite expected behaviors as those that should occur in collaborative teaching settings. With these parameters established, researchers design their studies to discover whether expected behaviors are occurring. Expected and observed Co-teacher behaviors established within the literature are summarized below.

Expected Behaviors

The research and literature regarding collaborative teaching establishes a core set of the expected educator behaviors within a collaborative teaching setting. It is expected that several behaviors will be shared equally between the general and special education teachers within the collaborative setting. The following behaviors are considered the responsibility of both teachers within a collaborative teaching setting: delivering instruction to a group of students primarily in one space (Boudah et al., 1997; Fennick & Liddy, 2001; Friend & Cook, 1992; Key, 2000; Vaughn et al., 1998; Walsh, 1991); meeting to discuss student needs and to plan curriculum, accommodations, and assessment activities (Austin, 2001; Gibb et al., 1998; Nowacek, 1992; Salend et al., 1997; Welch, 2000); sharing responsibility for planning and engaging in delivery of substantive instruction in the same classroom for the same group of students (Cook & Friend, 1995; Rice & Zigmond, 1999); having joint responsibility to teach all students by simultaneously employing their complementary expertise (Gerber & Popp, 1999); and co-planning, working in the same space, and delivering instruction to heterogeneous groups of students with and without disabilities (Gerber & Popp, 2000; Murawski & Swanson, 2001; Walsh & Snyder, 1993).

Observed Behaviors

Research indicates variability between expected instructional behaviors and those observed or practiced within collaborative settings. Observations of behaviors range from collaborative practices that mirror accepted ones within the literature to those that are not at all reflective of collaborative practices. It is important to remember that

each collaborative setting is unique within the context of each individual, teacher partnership, class, grade level, content, school, district, and geographic area.

Several studies report observing behaviors, within collaborative teaching settings, that are accepted within the literature as effective practices. For example, Co-teachers have been observed providing multiple levels of support to students, demonstrating a shared ownership of the class, and maintaining monthly achievement reports to track student progress (Messersmith & Piantek, 1988). In addition, effective instructional planning practices have been observed between Co-teachers, including a focus on an increase in collaborative planning meetings (Messersmith & Piantek, 1988; Meyers, Gelzheiser, & Yelich, 1991) and joint instructional planning that emphasizes student needs (Meyers et al., 1991). Finally, effective instructional practices have been observed and reported within the collaborative teaching literature. Specifically, collaborative teachers experiment with new methodologies (Salend et al., 1997) and utilize a variety of instructional arrangements (Dieker, 2001). These teachers also demonstrate effective instructional behaviors. According to Rice & Zigmond (1999), collaborative teachers were observed engaging in specific instructional roles. In one example, the general education teacher taught the lesson and the special education teacher circulated, encouraging those having difficulty, redirecting behavior, explaining requirements, interpreting text, and re-teaching main ideas to individuals or small groups (Rice & Zigmond, 1999).

Predictably, there are also observed behaviors in collaborative settings that demonstrate less effective practices. Collaborative teachers do not appear to be

collaborating as much as would be expected, given the nature of the inclusive model (Fennick & Liddy, 2001).

Researchers have observed a high amount of time spent on non-instructional teaching behaviors, little increase in intervening on learning, and low student engagement rates (Boudah et al., 1997). Special education teachers are rarely given equal status in the partnership (Rice & Zigmond, 1999). Weiss and Lloyd (2002) observed the special educator taking the role of an aide or support staff (Welch, 2000) at various times during the partnership, thereby underutilizing his or her expertise within the collaborative setting. There are typically few changes in instructional roles based on instructional tasks (Boudah et al., 1997; Weiss & Lloyd, 2002). The general education teacher is observed “doing more” than the special education teacher (Austin, 2001), and teacher roles vary from day to day despite the expectation of an equal split in responsibilities (Trent, 1998). Collaborative teachers were observed to disagree regarding instructional flexibility and discipline policies (Welch, 2000), to lack common planning time (Weiss & Lloyd, 2002), and to experience minimal consistency in their collaborative teaching training (Weiss & Lloyd, 2002). Finally, instructional delivery models specific to collaborative teaching, such as station teaching, were utilized almost half the time to reduce the student/teacher ratio, but not to provide special or remedial instruction (Welch, 2000).

Behaviors Necessary for Effective Collaborative Teaching

In order for a collaborative teaching model to be effective, certain practices must be in place. In fact, most of the Co-teach literature focuses on the logistics (Kloo &

Zigmond, 2008) and practices necessary for successful Co-teaching. These practices involve a complex integration of skills from members of the school community. Administrators, teachers, students, and parents all contribute in supporting an effective collaborative environment. Research cites several characteristics of effective Co-teaching programs, which include the following practices: positive staff attitudes; logistical support from the district and campus administrations, and training in and prior exposure to Co-teaching methodology, professional partnership development, and instructional practices. These characteristics are necessary for building effective Co-teaching programs (Bauwens et al., 1989; Friend & Cook, 2003; Gately & Gately, 2001; Vaughn, Schumm, & Arguelles, 1997; Walther-Thomas, Korinek, McLaughlin, & Williams, 2000).

Staff attitude and administrative support. Effective Co-teaching requires both positive staff attitudes and logistical support from district and campus administrations (Gerber & Popp, 2000; Gibb et al., 1998; Rice & Zigmond, 1999; Salend et al., 1997). Administrative behaviors that support the development of positive staff attitudes within effective Co-teaching include establishing a vision for the Co-teaching program (Gerber & Popp, 2000); developing a school-wide commitment to inclusion and collegial support (Rice & Zigmond, 1999); setting high expectations for behavior and academic performance (Dieker, 2001); and creating a positive climate (Dieker, 2001). In addition, administrative support should help to overcome the barriers of negative attitudes toward inclusion, and the resistance of general education teachers to accept support from special education teachers in the education of “their students” (Rice & Zigmond, 1999).

Logistical support from district and campus administrations would include ensuring that Co-teachers have access to recommended practices, preparation, and school-based supports (Austin, 2001), scheduling considerations for students (Nowacek, 1992; Weiss & Lloyd, 2002), and programming requirements, such as provision of planning time for the collaborative teachers (Dieker, 2001; Fennick & Liddy, 2001; Gerber & Popp, 2000; Gibb et al., 1998; Nowacek, 1992; Welch, 2000).

Training and prior exposure to Co-teaching methodology. Effective Co-teaching programs require providing staff with training (Fennick & Liddy, 2001; Gerber & Popp, 2000; Gibb et al., 1998) and a need for prior experience with Co-teaching within teacher preparation programs that include additional coursework that address team teaching strategies and special needs (Key, 2000). Staff training also should focus on self-regulated student learning and the transition from a content orientation to students becoming strategic learners, multiple instructional models, goal compatibility, and learning communities (Trent, 1998).

Professional partnership development. The quality of Co-teaching depends on the ability of Co-teachers to become a good learning team (Messersmith & Piantek, 1988) and the presence of personal and professional compatibility and voluntary participation in the Co-teaching process (Rice & Zigmond, 1999). Professional relationships are very person-specific and impact the success of the model (Nowacek, 1992); favorable outcomes may not occur if forming the partnerships is left to chance (Trent, 1998). Finally, effective development of the professional partnership requires

that the roles and responsibilities of the collaborative teachers be clearly defined (Gibb et al., 1998).

Measuring Co-teacher Perceptions and Behavior

Researchers have utilized various methods to collect data from Co-teachers on perceptions of their practice and their implementation of the Co-teaching components. Bergen (1997) designed a survey to determine “whether teacher attitudes toward the included special education student learners affect attitudes toward Co-teaching” (p. 3). Austin (2001) examined the perceptions of Co-teachers using the Perceptions of Co-teaching Survey (PCTS) and a Semi-Structured Interview: Perceptions of Co-teaching Script. Dieker (2001) collected information investigating how secondary Co-teaching teams are structured and what practices they implement. Dieker (2001) collected data using direct classroom observations, teacher recording of planning time, student interviews, and teacher interviews. Gately and Gately (2001) developed the Co-teaching Rating Scale (CtRS) designed to provide teachers and administrators a tool to develop appropriate objectives and directions for practice. The CtRS enables Co-teachers to analyze their classroom practices and engage in reflection regarding their developmental stages of behavior (i.e., beginning, compromising, and collaborative stages). Villa, Thousand, and Nevin (2004) designed the Are We Really Co-teachers Scale, with the focus on actions and behaviors in the classroom. The Co-teacher Relationship Scale (Noonan, McCormick, & Heck, 2003) focuses on the attitudes, beliefs, and personal characteristics of Co-teacher partnerships. With the exception of Dieker’s (2001) direct classroom observations of Co-teacher classroom behaviors, the above surveys and

interviews combine questions regarding teacher perceptions of the practice, beliefs, attitudes, and questions regarding their implementation of specific practices.

The Colorado Assessment of Co-teaching (CO-ACT)

The Colorado Assessment of Co-teaching (CO-ACT) is a questionnaire designed to assist Co-teachers in understanding critical components of Co-teaching; the instrument has been found to differentiate exemplary teams from other Co-teaching teams (Adams et al., 1993). The CO-ACT (Appendix) contains five factors for which teachers rate multiple statements, and was designed and field-tested as part of a collaborative project between the CO-ACT researchers and the Colorado Department of Education (Adams, 1993). The project was funded by a grant through the U.S. Department of Education Office of Special Education and Rehabilitative Services (OSERS). The CO-ACT utilizes a Likert format designed to differentiate between exemplary and non-exemplary Co-teach partnerships (Adams, 1993). Partners rate their practice based upon five factors. The first three are Factor I, Personal Prerequisites (15 items); Factor II, Professional Relationship (9 items); and Factor III, Classroom Dynamics (14 items) (Adams et al., 1993). Factors IV (2 items) and V (2 items) are not used in the CO-ACT scoring as they were not found to discriminate between exemplary and non-exemplary Co-teach teams (Adams, 1993). However, these items are included in the CO-ACT and teachers are asked to respond to them, as respondents rated the statements highly important during the instrument's reliability analysis (Adams, 1993). Co-teachers rate each item on its importance within a Co-teach environment and its

presence within their current Co-teach partnership. A copy of the CO-ACT is included in the Appendix.

Upon completion of the Likert ratings, partnership responses are scored and totals are found for Factors I, II, and III for the ratings of importance and presence. The CO-ACT contains two scales, Importance and Presence; each scale is added up to create a total score. The two scales are never added to one another. The CO-ACT instrument is also structured with 10 subscales, one per factor per scale. However, the four subscales contained within Factors IV and V are not used in the CO-ACT scoring (Adams, 1993).

Descriptions of CO-ACT factors. Factor I: Personal Prerequisites are “the skills and characteristics that each teacher brings to the Co-teaching situation” (Adams, 1993). Examples of statements Co-teachers respond to within Factor I include: (a) Co-teachers have a distinct but essential purpose in the Co-taught class, (b) Co-teachers are competent problem-solvers, and (c) Co-teachers are confident of their skills as individual teachers (p. 2).

Factor II: Professional Relationship Issues “describe the collaborative interaction of Co-teachers themselves” (Adams, 1993). Examples of statements Co-teachers respond to within Factor II include: (a) Co-teachers are equally responsible for what happens in the classroom, (b) Co-teachers make important decisions together, and (c) one Co-teacher can pick up where the other leaves off (p. 4).

Factor III: Classroom Dynamics are “the beliefs and actions that give added benefit to the Co-taught classroom” (Adams, 1993). Examples of statements Co-teachers respond to within Factor III include: (a) Co-teachers believe students’ needs determine

classroom practice, (b) Co-teachers believe Co-teaching is worth the effort, and (c) Co-teachers share a philosophy about learning and teaching (p. 6).

Factors IV and V are pragmatic issues associated with Co-teaching, or the “temporal conditions that facilitate Co-teaching” (Adams, 1993). Examples of statements Co-teachers respond to within Factors IV and V include: (a) Co-teachers regularly set aside a time to communicate, (b) Co-teachers trust each other, and (c) Co-teachers respect each other’s professionalism (p. 8).

Instrument development and psychometrics. The CO-ACT was developed utilizing a four-phase field research qualitative paradigm (Adams, 1993). The project research team designed the first phase to focus on developing a framework for examining the elements of a Co-teaching relationship by reviewing research and by creating a teacher focus group. The teacher focus group consisted of 12 exemplary Co-teaching teams as identified by school administration. Focus group participants engaged in a partially open-ended dialogue for an average of two hours per group. The sessions were audio taped. Next, “the audiotapes of the discussions were transcribed; attributes of the Co-teaching relationship were summarized, carded, grouped and categorized (Adams, 1993, p. 3). During the focus group sessions, participants responded to several questions about the attributes of Co-teaching relationships that were developed through the review of research. The responses and information gathered through the focus groups resulted in identification of key properties of successful Co-teaching, and the preliminary draft of the instrument. The next stage of instrument revision employed an “Item Writing” team consisting of a group of professionals participating in exemplary

Co-teaching teams (n = 23). The “Item Writing” team “worked to transform concepts into declarative statements to be used in the questionnaire. . . statements were then incorporated into an evolving instrument” (Adams, 1993, p. 3).

During the second phase of development the instrument continued to be reviewed and revised by the project research team. The research team continued to facilitate the focus and item writing groups to further refine the instrument’s wording and clarity. The resulting instrument contained “five properties, fifteen categories and 115 items. . . utilizing a 4-choice Likert-scale” (Adams, 1993, p. 3). The research team followed “qualitative representational validity procedures” and mailed a draft of the instrument to editors and researchers for suggestions and comments (Adams, 1993, p. 3). Drafts of the instrument were also sent to 20 randomly selected Co-teachers who participated in the item-writing and focus groups. They were asked to “provide feedback about clarity and completeness of the instrument in representing their thoughts/impressions of the Co-teaching process (Adams, 1993, p. 3). The feedback from these groups guided the research team to revise the format of the instrument to “include the development of a dual response mode, an increase in the number of Likert choices, [and] a decrease in the number of items and random presentation of items” (Adams, 1993, p. 3).

The third phase of the project used “known-group” validation methods to “determine whether the developing instrument actually discriminated between average and exemplary Co-teaching teams” (Adams, 1993, p. 3). Adams (1993) defined “known-group” validation as “a method whereby in the preparation of the instrument for

distribution, demographic and open-ended questions were added and a numerical code was developed for identifying status and preserving anonymity, [and] the instrument was mailed to special and regular education Co-teaching professionals in various districts, throughout the State, half of whom were identified as outstanding or exemplary Co-teaching teams, half identified as average or non-exemplary teams.” Adams (1993) reported that 60 exemplary and 60 non-exemplary teams agreed by phone to participate by responding to the questionnaire. The instrument was mailed to each of the teams. Of these teams, 46 exemplary teams and 30 non-exemplary teams responded. Eight special educators and two general educators completed without response from their counterparts (Adams, 1993).

During the fourth phase, items were analyzed using statistical methodology (Adams, 1993). The project research team conducted “instrument reliability, factor analysis to identify subscales and MANOVAs to determine the grouping of items within subscales” (Adams, 1993, p. 4). Adams (1993, p. 4) reported that “statistical validity for determination of items which discriminated between exemplary and non-exemplary teams was set at .10 alpha. Forty items on the instrument were found to discriminate to a significant degree.” Of the 40 items found to discriminate to a significant degree, a factor analysis of those items found that “items clustered into three main factors/properties. . .these three factors correspond to three of the five factors represented on the instrument” (Adams, 1993, p. 4). The project research team conducted further analysis to examine correlations between and among data (Adams, 1993). Adams (1993) conducted further analysis, that included “rank mean ratings,

regression analysis of demographic variables (i.e., gender, level, etc.), correlations between items, Chi square (exemplary versus non-exemplary responses, general education versus special education responses), as well as ANOVAs and MANOVAs (exemplary versus non-exemplary across all dimensions)” (p. 4).

Effectiveness of Co-teaching

The research on Co-teaching is not conclusive regarding the effectiveness of this practice for students with disabilities (Magiera & Zigmond, 2005). The inconclusive nature of the literature stems from the wide variations in program development and implementation. It is difficult to make a definitive statement regarding effectiveness. The majority of studies that address effectiveness utilize anecdotal data from teachers, students, parents, and administrators (Friend & Reising, 1993). Measures of effectiveness based on objective student outcomes are in the minority. In addition, the “research base is extremely limited especially at the secondary level” (Magiera & Zigmond, 2005, p. 79). Magiera and Zigmond (2005) report a search of the literature from 1986 to 2003 “yielded only 13 articles on Co-teaching research that related to student achievement” (p. 79). In their metasynthesis of qualitative research, Scruggs, Mastropieri, and McDuffie (2007) reported that efficacy research of Co-teaching is limited. Research indicates that various barriers and influences impact the effectiveness of Co-teaching, such as difficulty in controlling variables from one collaborative setting to another (Gerber & Popp, 1999), thus allowing for minimal generalization (Murawski & Swanson, 2001). Replication of studies is almost impossible (Murawski & Swanson, 2001), and comparative studies are difficult to conduct. However, each study conducted

contributes to the literature on the instructional model of Co-teaching and is necessary in guiding future research on the effectiveness of Co-teaching.

Perceptions of Effectiveness from Program Stakeholders

There are several qualitative studies, summarized below, that document the perceptions of various stakeholders on the effectiveness of Co-teaching. These studies report the perceptions of effectiveness from students with and without disabilities, parents of students with and without disabilities, teachers, and administrators.

Understanding these perceptions adds to the general body of understanding regarding the effectiveness of Co-teaching.

Perceptions of students with disabilities. In studies reporting the perceptions of students with disabilities in a Co-teach classroom, themes of instructional, behavioral, and affective perceptions emerged. Students with disabilities perceived the following instructional practices to be associated with Co-teaching: assignment of more homework and schoolwork in a Co-taught model (Walsh, 1991), time to finish class work was not reduced (Walsh, 1991), more teacher help (Gerber & Popp, 1999), and positive effects on organizational skills and use of learning strategies (Gerber & Popp, 1999).

Behavioral perceptions of students with disabilities included: getting into less trouble in Co-teach class compared to special education class (Walsh, 1991), getting into more trouble in Co-teach class with two teachers watching (Gerber & Popp, 1999), and worsening classroom behavior by students with emotional disturbance (Gerber & Popp, 1999).

The majority of affective perceptions of students with disabilities revealed positive perceptions of the effectiveness of a Co-teach model. Students in Co-teach classes report that they enjoyed going to school more, were happier, felt better about themselves in a Co-taught class, and liked school better in a Co-teach service delivery model compared to the traditional special education model (Walsh, 1991). Students with disabilities were not afraid to ask questions within a Co-teach class (Walsh, 1991) and they felt enabled to get better grades (Gerber & Popp, 1999). There were, however, some students with disabilities who indicated confusion with a Co-teach class, due to having two teachers (Gerber & Popp, 1999).

Perceptions of students without disabilities. In general, the perceptions of students without disabilities within Co-teach classes mirrored the perceptions of effectiveness of students with disabilities. Again, themes of instructional, behavioral, and affective perceptions emerged. Students without disabilities noted the general instructional advantages of having two teachers and positive effects on their grades (Gerber & Popp, 1999). Students without disabilities did not think behavior was better in a Co-teach setting and believed there were greater odds of getting caught when misbehaving (Gerber & Popp, 1999). Finally, students without disabilities noted a positive impact on self-esteem and a lack of consistency between the approaches of the two teachers (Gerber & Popp, 1999).

Perceptions of parents of students with disabilities. Perceptions of effectiveness of Co-teaching by parents of students with disabilities focused on the following themes: instructional, behavioral, affective, and coordination of services.

Parent instructional perceptions indicated a belief that, in some instances, students received more homework and schoolwork in a Co-taught model (Walsh, 1991); however, in other instances parents believed students received less homework, and were able to complete work in class (Gibb & Young, 1997). Parents did not feel that Co-teach classes provided less time to finish class work (Walsh, 1991). Additionally, parents of students with disabilities reported perceptions that students received more instruction, student participation was increased (Gerber & Popp, 1999; Gibb & Young, 1997), students received more time from teachers, and students benefited from a study skills class combined with the teaming “Co-teach” model (Gibb & Young, 1997). Parent perceptions of behavior indicated students did not get into more trouble in the Co-teach class as compared to the special education class (Walsh, 1991).

Parents of students with disabilities reported affective perceptions that students enjoyed going to school more, were happier, and liked school better in Co-teach service delivery models compared to a special education class model (Gibb & Young, 1997; Walsh, 1991). Special education students felt better about themselves in a Co-teach class (Walsh, 1991), and the model supported positive self-esteem (Gerber & Popp, 1999; Gibb & Young, 1997). Students with disabilities tried harder and learned more in Co-teach classes, were not afraid to ask questions (Walsh, 1991), did not feel different in a Co-teach class (Gerber & Popp, 1999), and had the opportunity to have expanded social relationships (Gibb & Young, 1997). Finally, parents of students with disabilities participating in Co-teach support models perceived that the teachers and overall approach of the school emphasized empowering students (Gibb & Young, 1997).

Parent perceptions regarding impact on coordination of services included beliefs that Co-teach models provided more coordinated services (Gibb & Young, 1997). However, Co-teach models would not be effective services if students needed other options such as resource (Gerber & Popp, 1999). Parents were unsure about the long-term effectiveness for students with disabilities unless the Co-teach program continued to the next grade level (Gerber & Popp, 1999; Gibb & Young, 1997). Finally, parent involvement was not perceived as the determining factor in success; rather, it was the changes in students' achievement and attitudes within a Co-teach setting (Gibb & Young, 1997).

Perceptions of parents of students without disabilities. Gerber and Popp (1999) reported several perceptions from parents of students without disabilities participating in a Co-teach setting. Parents perceived that the program was not well communicated and the classes had a slower pace with lower standards (Gerber & Popp, 1999). Additionally, parents communicated the belief that there were too many students with disabilities in one class, and that “it’s not fair to put a good student in a collaborative class to fix behavior” (Gerber & Popp, 1999, p. 293). One positive perception communicated was that the Co-teach model allowed for the understanding of diversity (Gerber & Popp, 1999).

Perceptions of teachers. Co-teach literature provides considerable insight into the perceptions of Co-teachers regarding the impact of the Co-teach model on student performance and teacher practices. There are extensive anecdotal Co-teacher reports that teaming “Co-teaching” is beneficial for students and teachers (Austin, 2001; Fennick &

Liddy, 2001; Gibb et al., 1998; Key, 2000; Nowacek, 1992; Rice & Zigmond, 1999; Welch, 2000). While there is a general perception of effectiveness on the part of Co-teachers, clarity and perceptions regarding roles within the classroom are mentioned as areas that may impact effectiveness. For example, Gibb et al. (1998) reported that special educators perceived they were effective; however, they were unclear about their role within teaming Co-teach classrooms. Additionally, special education teachers considered themselves more helpful, or effective in working with students, than general education teachers considered them to be (Fennick & Liddy, 2001).

Impact on Student Performance

The impact on student performance addresses several areas, such as academics, behavior, social skills, and self-concept. With the exception of self-concept, perceptions within these areas contain both positive and negative impacts on student performance.

Impact on academics. In general, perceptions indicated an overall positive impact on performance of students with disabilities. Specifically, students with disabilities in Co-teach settings appeared to be more successful academically (Gibb et al., 1998; Messersmith & Piantek, 1988) and to learn more (Walsh, 1991). Co-teaching provided an additional level of services for students with disabilities (Nowacek, 1992). Finally, the focus on instructional modifications and organizational skills in Co-teach classes led to improved performance of students with disabilities (Trent, 1998). However, Walsh (1991) also reported perceptions that Co-teach classes provided less time for students to complete class work and that some students with disabilities received less attention than they would have in a special education class (Walsh, 1991).

Boudah et al. (1997) found that although actual performance of students with disabilities was poor in the study, teachers expressed satisfaction with student understanding and performance.

Impact on behavior. There is little information about the impact that the Co-teach delivery model has on the behavior of students with disabilities and students without disabilities. For example, some studies report that students with disabilities are more successful behaviorally in Co-teach settings (Gibb et al., 1998; Messersmith & Piantek, 1988; Walsh, 1991). However, Austin (2001) found that some students without disabilities copied undesirable behaviors of students with disabilities.

Impact on social skills. Students with disabilities frequently demonstrate difficulties in developing appropriate social skills. For example, Kavale (1996) found in a meta-analysis of 152 studies that about 75% of students with learning disabilities displayed discrepancies in social skills. Within Co-teach settings it appears that students with disabilities were more successful socially (Gibb et al., 1998; Messersmith & Piantek, 1988; Walsh, 1991). Students learned to cooperate and work together on teams (Austin, 2001; Messersmith & Piantek, 1988; Walsh, 1991). However, when students with disabilities who were not capable of achieving the same academic outcomes as their peers without disabilities were included in Co-teach settings for the purpose of socialization, this was found to contribute to their sense of alienation (Austin, 2001). Finally, positive social outcomes did not yield higher effect sizes for students with disabilities in Co-teach vs. control conditions (Murawski & Swanson, 2001).

Impact on self-concept. Vaughn et al. (1998) report the global self-concept of students with learning disabilities, in inclusive settings, is “likely to be similar to that of other achievement groups” (p. 434). However, in their study, students in Co-teach settings did not make gains on peer ratings of acceptance and overall friendship quality compared to a consultation/collaboration setting (Vaughn et al., 1998). Other studies have indicated improved self-confidence of students with disabilities (Gibb et al., 1998; Key, 2000; Messersmith & Piantek, 1988). Additionally, two studies found that students with disabilities felt better about themselves in Co-taught classes and were not afraid to ask questions (Nowacek, 1992; Walsh, 1991). Co-teach practices also indicated positive impacts on self-concept, because students with disabilities were not isolated (Gibb et al., 1998; Messersmith & Piantek, 1988) and were not treated differently by peers without disabilities (Gibb et al., 1998). Finally, there was a decrease in learned helplessness (Messersmith & Piantek, 1988), and indications were that students with disabilities tried harder (Walsh, 1991) within Co-teach classes.

Impact on Teacher Practices

The impact on teacher practices addresses areas such as professionalism, greater understanding of students with disabilities, curriculum, and expansion of instructional delivery strategies. Teachers reported that Co-teaching positively impacted their attitudes about the demands of teaching (Gibb et al., 1998; Nowacek, 1992), and teaching was more enjoyable and stimulating (Salend et al., 1997). Co-teaching adds a professional quality to the classroom (Gibb et al., 1998), and provides positive role models for professionalism (Key, 2000; Salend et al., 1997). Scruggs et al. (2007) found

in their metasynthesis of qualitative Co-teach studies that teachers “generally reported that they had benefited professionally from Co-teaching experiences” (p. 401). General education teachers experienced an increase in understanding of students with disabilities (Gibb et al., 1998; Nowacek, 1992). Curriculum impacts included findings that special education students received better curriculum presentation (Walsh, 1991), that Co-teaching provided a link to other teachers and subjects (Gibb et al., 1998), and that Co-teaching prevented isolation (Salend et al., 1997).

Instructional delivery is impacted in Co-teach settings. Co-teaching allows for improved lesson planning, the incorporation of varied teaching strategies (Nowacek, 1992; Walsh, 1991), and improved instructional delivery skills (Meyers et al., 1991). Co-teachers benefit from exposure to different teaching styles (Messersmith & Piantek, 1988; Nowacek, 1992; Walsh, 1991). Classroom activities can continue while individual students receive needed support (Adams & Cessna, 1993). Dieker (2001) found that over 50% of the lessons observed during her study on effective middle and high school Co-teach teams involved active learning, and “very rarely were lessons taught in the lecture or paper/pencil type of instruction traditionally found at the secondary level” (p. 5). Some Co-teach classrooms also incorporate creative methods in evaluating student performance (Dieker, 2001). However, in some instances, the use of team teaching or Co-teaching is simply used to reduce the student/teacher ratio and not to provide remedial or specialized instruction (Welch, 2000). In fact, Scruggs et al. (2007) found in their metasynthesis of 32 qualitative Co-teach studies that “the predominant Co-teaching model reported in these investigations is ‘one teach, one assist,’ with the special

education teacher often playing a subordinate role determined in part, by content knowledge, teacher ‘turf,’ and the greater number of general education students in the Co-taught classroom” (p. 411).

Administrator Perceptions

There appears to be limited information related to administrator perceptions of Co-teaching. In a review of 22 articles specifically examining the effectiveness of Co-teaching, only one mentioned administrators in the study sample. Walsh (1991) administered a survey to obtain information regarding the relative benefits of a Co-teach model compared to a traditional special education pull-out model. Teachers, parents, students, and administrators were provided surveys; however, administrator responses were not included in analysis due to small sample size ($n = 3$).

Quantitative Measures of Effectiveness Based on Outcomes for Students with Disabilities

As indicated previously, the literature on effectiveness of Co-teaching primarily utilizes anecdotal data from teachers, students, parents, and administrators (Friend & Reising, 1993). Therefore, quantitative measures of effectiveness based on student outcomes are not the norm. The effectiveness of Co-teaching based upon student outcomes ranges from some increase in performance of students with disabilities, to decreases in performance, to no differences in performance. Variability in performance also occurs within studies, depending on the outcomes measured. Boudah et al. (1997) found some strategic skills increase for students with mild disabilities; however, they also found that test and quiz scores decreased slightly for students with mild disabilities.

Low student engagement rates for students with mild disabilities and low-achieving students were found in Co-teach settings (Boudah et al., 1997). Magiera and Zigmond (2005) conducted a study comparing the instructional differences for middle school students with disabilities in Co-teach classes, compared to solo-taught classes. Their results “found limited instructional benefits for students with disabilities in Co-taught classes” (Magiera & Zigmond, 2005, p. 83). In fact, they found that the students with disabilities in Co-taught classes actually received less attention than when they were in general education classes taught by one general education teacher (Magiera & Zigmond, 2005). Walsh and Snyder (1993) found increases in student academic performance. Students with disabilities in Co-teach classes achieved significantly higher passing rates as a group and within subject areas than similar students with disabilities in general education settings (Walsh & Snyder, 1993). Additionally, Welch (2000) found gains for students with disabilities in student scores as measured by curriculum-based assessments, gains in reading fluency, and gains in reading recognition for students with disabilities. While all students appeared to make academic gains, some gains in the study were not statistically significant (Welch, 2000).

In a meta-analysis examining the impact of Co-teaching on student academic outcomes, Murawski & Swanson (2001) found a mean effect size of 0.40, indicating that Co-teaching is a moderately effective procedure for influencing student outcomes. Although a large effect size was found in a Co-teach study within a kindergarten setting, suggesting the practice may be appropriate for this grade level (Murawski & Swanson, 2001), researchers found limited data indicating Co-teaching can have a positive impact

on student academic achievement (Murawski & Swanson, 2001). Finally, in one study, students in language arts Co-teach setting earned significantly lower course grades compared to similar students in a general education setting (Walsh & Snyder, 1993). In a study of Co-teaching in middle school classrooms under routine conditions (i.e., limited teacher training and limited or no co-planning time for teachers), Majiera and Zigmond (2005) stated that “limited instructional benefits were found for students with disabilities in Co-taught classes” (p. 83).

There are also findings from Walsh & Snyder (1993) indicating that Co-teach settings might not positively or negatively impact outcomes for students with disabilities. For example, no significant differences in academic outcomes were found for students with disabilities in a Co-teach setting compared to students with disabilities in a general education setting without a Co-teacher (Walsh & Snyder, 1993). Also, when looking at the impact on discipline outcomes, discipline referrals were not significantly different; with the exception of fewer referrals in Co-teach social studies than in the comparison group (Walsh & Snyder, 1993).

Barrier and Influences on Effective Co-teaching Practices

Barriers and influences on the effectiveness of Co-teaching practices appear clustered around the following broad categories: pre-implementation preparation, administrative support, financial support, student scheduling, planning, student skill gaps, and the teacher collaborative relationships. While the barriers and influences are summarized across studies, it is important to remember the overlapping nature of these

influences. In other words, the effective implementation of any of these collaborative practices may impact the fidelity of one or more of the other practices.

The lack of preparation for Co-teaching, prior training (Gibb et al., 1998), and quality of pre-implementation planning all impact the effectiveness of the Co-teach model (Walsh, 1991; Welch, 2000). The administration's support (Salend et al., 1997; Trent, 1998) and financial constraints were noted as having impacts on the effectiveness of Co-teach implementation (Trent, 1998). Student and staff scheduling (Weiss & Lloyd, 2002) are important factors in Co-teach programs. Specifically, including high numbers of low-achieving students, in addition to students with disabilities, has been found to reduce the effectiveness of Co-teach settings (Vaughn et al., 1998; Walsh, 1991). The opportunity for regular teacher planning (Trent, 1998; Walsh, 1991; Weiss & Lloyd, 2002; Welch, 2000) influences the effectiveness of Co-teach practices. Finally, the skill gaps of students within Co-teach settings influence the effectiveness of Co-teaching (Walsh, 1991; Weiss & Lloyd, 2002).

The importance of the collaborative relationship between Co-teachers is frequently cited as a barrier to effective implementation of Co-teach models. The compatibility of Co-teach partners can impact the success of the model (Nowacek, 1992). Gibb et al. (1998) reported that a lack of effective communication, a varying degree of personal commitment, and the perception of the special education teacher as an aide can block successful implementation.

Limitations of Research

The limitations of Co-teaching research are similar to the limitations of research conducted in authentic settings. Research studies that attempt to measure the effectiveness of instructional programs, whether in general education or in special education, is limited by the impacts of human variability from one context to another. In addition, the research tends to focus narrowly on the elementary level. There is minimal research on middle school or junior high Co-teaching, yet at this level, Co-teaching is utilized and literature on teaming and clustering of teachers and subjects is prevalent (Murawski & Swanson, 2001). Research on the effectiveness of Co-teaching is difficult to conduct due to the following factors: emphasis on qualitative measures, study design, participant sample size, and teacher variables.

Co-teach research has a heavy emphasis on qualitative measures that incorporate teacher self-report interviews, particularly interviews with teachers where Co-teaching is already considered successful, thus allowing potential bias (Austin, 2001; Dieker, 2001; Gibb et al., 1998; Murawski & Swanson, 2001; Rice & Zigmond, 1999; Salend et al., 1997; Trent, 1998). Research design on Co-teaching reports student outcomes qualitatively, using terms such as “improved” and “better,” rather than measuring outcomes quantitatively (Murawski & Swanson, 2001), resulting in limited measurable results for the body of research (Gibb et al., 1998; Welch, 2000).

Study designs require a clear definition of the subject area being researched. Unfortunately, in the Co-teaching design of research, there are different definitions of Co-teaching (Gerber & Popp, 1999; Meyers et al., 1991; Murawski & Swanson, 2001;

Nowacek, 1992; Rice & Zigmond, 1999). Study designs do not provide enough detailed descriptions regarding intervention types (Walsh & Snyder, 1993; Welch, 2000), severity of disability (Walsh & Snyder, 1993), or age (Meyers et al., 1991). Classroom composition might not be reported (i.e., descriptions of the special education population being served) (Adams & Cessna, 1993; Murawski & Swanson, 2001), nor ethnicity and/or socio-economic status, which would allow analysis of effects for these variables (Murawski & Swanson, 2001). Much of the current research available on collaborative instruction does not report measures used in studies (Murawski & Swanson, 2001), making it difficult to be confident in the results or judge the measures' effectiveness. Research on the effectiveness of Co-teaching is challenged by the random assignment of teaching partners, issues associated with matched samples (Welch, 2000; Zigmond & Magiera, 2001), and non-random assignment of classes (Boudah et al., 1997). Finally, study design is impacted by the variation in numbers of special education students within collaborative classes (Vaughn et al., 1998).

Studies attempting to measure the effectiveness of Co-teaching are also limited by study sample sizes. Studies often have small numbers of teachers (Adams & Cessna, 1993; Austin, 2001; Boudah et al., 1997; Dieker, 2001; Gibb et al., 1998; Meyers et al., 1991; Salend et al., 1997). Frequently, there are small populations of students with disabilities, which also makes generalization difficult (Adams & Cessna, 1993; Austin, 2001; Boudah et al., 1997; Dieker, 2001; Salend et al., 1997; Welch, 2000).

There are teacher variables that are difficult to control while conducting research on the effectiveness of Co-teaching. For example, it is challenging for researchers to

control for teachers' personalities, which appears to be a major variable in success or failure of collaborative teams (Boudah et al., 1997; Murawski & Swanson, 2001). Co-teacher attitudes significantly impact the success of collaboration (Rice & Zigmond, 1999), and research data on the actions of the special education teacher during Co-teaching have been limited (Magiera & Zigmond, 2005; Murawski & Swanson, 2001; Welch, 2000). It is possible that students of a teacher working alone in an inclusive classroom could have similar or different results (Boudah et al., 1997; Welch, 2000) compared with students in a Co-teach setting. It appears to be difficult to control for variations in teacher training for Co-teaching (Adams & Cessna, 1993), in addition to the common observation of differences between teacher roles and responsibilities (Welch, 2000; Zigmond & Magiera, 2001). Finally, there is difficulty controlling for variations due to voluntary or forced participation in collaborative programs (Gibb & Young, 1997; Meyers et al., 1991; Rice & Zigmond, 1999).

Future Directions of Research

With the continued emphasis of the Individuals with Disabilities Education Act (IDEA) and Elementary and Secondary Education Act (ESEA) on universal access to the general education curriculum and education in the least restrictive environment for students with disabilities, implementation of models such as Co-teaching makes sense. However, in the current educational climate of accountability for all students in public education, it is federally mandated that educators utilize "evidence based practices" and "scientifically-based research" in the development and implementation of academic, behavioral, functional, and social curriculum. Given this legislative context, the wide

variation in current research findings, the proliferation of Co-teaching, and the necessity to provide all students with educational programs that promote academic and behavioral success, warrant continued research regarding Co-teaching practices.

Future research should focus particularly on the efficacy of this model in obtaining gains for students with disabilities in the following areas: academic (Boudah et al., 1997; Nowacek, 1992; Rice & Zigmond, 1999; Salend et al., 1997; Trent, 1998; Walsh, 1991), behavioral, and social (Austin, 2001; Nowacek, 1992; Rice & Zigmond, 1999; Salend et al., 1997; Trent, 1998; Walsh, 1991; Welch, 2000). It is necessary to replicate the currently limited studies on student outcomes (Welch, 2000). There is also a need to explore validation of the Co-teach model for use at the secondary level (Boudah et al., 1997).

As Co-teaching does not operate in a vacuum, it is also necessary to pursue research that provides insights into how this model impacts all stakeholders (i.e., special and general education teachers, students with and without disabilities, parents of both student groups, administrators, and other members of the school community) and what roles and responsibilities (Gibb et al., 1998) each has in collaborative environments. The effects on students without disabilities (i.e., general education, low performing, at-risk) should be explored further (Austin, 2001; Rice & Zigmond, 1999). Perceptions of stakeholders participating in the Co-teach model should continue to be evaluated (Austin, 2001; Gerber & Popp, 1999; Gibb & Young, 1997; Salend et al., 1997).

The literature mentions various characteristics that make Co-teaching successful. Some areas for future research regarding successful characteristics of Co-teaching

include support from administration (Gibb et al., 1998; Trent, 1998), Co-teach program requirements such as planning (Gibb et al., 1998; Welch, 2000), and the amount and type of training for Co-teaching (Boudah et al., 1997; Fennick & Liddy, 2001; Gibb et al., 1998). Successful Co-teaching can also be impacted by teacher expectations (Vaughn et al., 1998), philosophies, and compatibility of personalities (Dieker, 2001), and these should be examined. Finally, obstacles to implementation of successful Co-teach programs and solutions to overcome challenges are valid areas for future research (Salend et al., 1997).

There are some future research topics that recommend attempting to quantify certain aspects of the Co-teach model. Teacher instructional actions within Co-teach classes should be explored and quantified (Boudah et al., 1997; Trent, 1998). The uses of special education strategies (Gerber & Popp, 2000; Weiss & Lloyd, 2002) within Co-teach settings should be analyzed. A clarification of various models of Co-teaching (Rice & Zigmond, 1999; Welch, 2000), and the development of instruments and procedures to document and compare student progress across different settings in a more reliable way (Trent, 1998), would continue to support the quantification of Co-teaching characteristics.

There are several variables that could be manipulated and/or analyzed in a different manner that would further the body of Co-teaching research. Researchers should examine their study designs and consider the following recommendations. Consideration should be given to the efficacy of Co-teaching for different ability groups of students with disabilities (i.e. moderate, severe, and more disruptive behaviors)

(Murawski & Swanson, 2001; Rice & Zigmond, 1999), and to research outcomes related to gender, age, grade, and subject matter (Murawski & Swanson, 2001). Study designs should examine the impact that the number of students with disabilities has on the academic outcomes of all students in a Co-teach class (Vaughn et al., 1998; Welch, 2000), and the impact of instructional variability among collaborative settings (Wiess & Lloyd, 2002). Finally, experimental designs utilizing comparison groups to measure outcomes (Murawski & Swanson, 2001; Welch, 2000) and the comparison of Co-teaching to other service delivery options (Dieker, 2001; Murawski & Swanson, 2001) are recommended areas for future research on the effectiveness of the instructional practice of Co-teaching.

CHAPTER III

METHOD

Context

This research was designed to explore the usefulness of a short questionnaire instrument in predicting academic outcomes for middle school students with disabilities, grades 6-8, served within Co-teach settings. Specifically, the study was designed to identify Co-teach partnerships as exemplary or non-exemplary, based on Co-teachers' responses to the Colorado Assessment of Co-teaching (CO-ACT), and to analyze student academic outcomes for each partnership. Student academic outcome data were collected. Student assessment data consisted of curriculum based assessments, district adopted assessments created by Region 4 Education Service Center (ESC) or the administration of the Texas Assessment of Knowledge and Skills (TAKS) for the 2007-08 school year. The timeline and design will be discussed in this chapter. The intent of the analysis was to discover any patterns or themes that existed between exemplary and non-exemplary Co-teach partnerships and student academic outcomes.

The research was designed to examine possible correlations between results of the CO-ACT and academic outcomes for students with disabilities in grades 6-8. All students with disabilities in identified Co-teach classes at participating middle school campuses, who took end of year district and state assessments, were eligible to participate in the study. All Co-teachers in selected Co-teach classes were eligible to participate in the study. The research decision to focus on Co-teach partnerships, and students in grades 6-8, was based on a review of the literature on the effectiveness of

Co-teaching and student academic outcomes. Selection criteria for campuses, Co-teach classes, and students will be discussed in this chapter.

In order to answer the research questions, data was gathered on teacher responses to the CO-ACT and student academic performance. All Co-teachers eligible to participate were contacted to complete the CO-ACT instrument. Co-teachers provided their own demographic data during their completion of the CO-ACT. The district of the selected middle school campuses provided student academic outcome data and demographics.

Setting

The public school district involved in this study served over 32,000 prekindergarten through 12th-grade students in a diverse and growing area in southeast Texas. The district's ethnic distribution was 38.45% African American, 35.9% Hispanic, 20.6 % white, 4.8 % Asian and Pacific Islander, and 0.2 % Native American (TEA, 2008a). Within this district there were a total of 22 elementary schools serving students in Pre-school Programs for Children with Disabilities (PPCD) through grade 5, six middle schools with grades 6 through 8, three comprehensive high schools with grades 9 through 12, and one high school career academy. The six middle schools were educational settings designed to serve the needs of students enrolled in grades 6, 7, and 8. There were approximately 3,391 students with disabilities receiving special education supports and services within the district during the 2007-08 school year.

Participants

The selection of the district and middle school campuses was a convenience sample. The district was selected based on its proximity to the researcher and the commitment of the district to provide necessary student academic data. The criteria and selection process for the campuses, Co-teachers, and students are described in this chapter. The final teacher and student samples for this research were from five public middle schools from one district in southeast Texas.

Middle School Campus Selection

All middle school campuses in the district were eligible for participation. There were a total of six middle school campuses in the district during the 2007-08 school year. One selection criterion was established and applied to all six middle schools: the middle school campuses included in the study had to be currently implementing a Co-teach model (described below) to support students with disabilities within the general education setting. The Special Services Department Chair was asked whether his or her campus was implementing the Co-teach model to serve students with disabilities within general education settings. The definition of Co-teaching guiding this study was discussed with each Department Chair to ensure the model implemented on his or her campus met the study definition of Co-teaching. Five of the six middle school campuses met the definition of Co-teaching as outlined in this proposal. The middle school excluded from the study reported implementing an instructional support model rather than a Co-teaching model.

Co-teacher Sample

Teachers in this study were middle school general and special education teachers who provided Co-teach services to students with disabilities. A partnership consisted of one general and one special education teacher who were Co-teaching the same group of students with disabilities. This sample unit was selected using systematic sampling to ensure that sample partnerships were mutually exclusive. In order to identify the sample of Co-teach partners, the following Co-teach partnership selection criteria were applied to the list of all middle school Co-teach partnerships for the 2007-08 school year:

- Co-teaching in one of the following core subject areas: Math, Reading, Science, or Social Studies.
- Working with the same partner multiple periods during the school day.
- Having taught more than one year with the same partner.

The five identified campuses were asked to provide a copy of their Special Services master schedule containing the teaching assignments for each Co-teach class on their campus. The campus master schedule was checked to verify that the teachers, grade levels, and content areas for all classes were identified as Co-teach ones. The Special Services Department Chair at each campus reviewed the campus master schedule for accuracy. A total of 43 partnerships were thus identified as Co-teach classes.

Once the Co-teach partnerships were identified for each of the five campuses, the systematic selection procedure (see above criteria) was applied to the original list of Co-teachers, resulting in 26 partnerships (52 individual teachers) in the sample. The original list of all middle school Co-teachers contained multiple partnerships with some Co-

teachers listed multiple times with different partners. To avoid Co-teachers having to respond to multiple CO-ACT questionnaires for multiple Co-teach settings, random selection was used in these instances to identify as many Co-teach partnerships as possible that did not result in Co-teachers listed in more than one partnership. This special procedure was used to address the practical fact that in districts it is not unusual for general and special educators to Co-teach with multiple partners for multiple periods of the day across multiple subjects and grade levels.

Student Sample

Students in this study were middle school students identified as having a disability and who received Co-teach services. There were approximately 801 students with disabilities served by the six middle school campuses in the district. The research student sample included 162 students with disabilities served within Co-teach settings by the five identified middle school campuses. The ethnic distribution of the 162 students within the research sample was as follows: 40% (n = 65) African American; 30% (n = 48) Hispanic; 28% (n = 46) white; and 2% (n = 3) Native American, Asian, or Pacific Islander. The student sample was 35% (n = 57) female and 65% (n = 105) male. Table 3.1 summarizes the distribution of disability categories across all the middle schools in the district compared to the five middle schools included in the study.

Table 3.1

Distribution of Disability Categories for Students as Percentages and Counts

| Disability Category | <u>All Middle Schools</u> | | <u>Study Middle Schools</u> | |
|--------------------------|---------------------------|-----|-----------------------------|-----|
| | Percent | N | Percent | N |
| Learning Disability | 49% | 390 | 58% | 94 |
| Emotional Disturbance | 18% | 146 | 19% | 31 |
| Other Health Impairment | 13% | 107 | 15% | 25 |
| Speech Impairment | 7% | 53 | 2% | 4 |
| Mental Retardation | 5% | 44 | 1% | 1 |
| Autism | 5% | 44 | 3% | 5 |
| Auditory Impairment | 1% | 7 | 1% | 1 |
| Orthopedic Impairment | 1% | 7 | 1% | 1 |
| Traumatic Brain Injury | .01% | 1 | 0% | 0 |
| Visually Impaired | .02% | 2 | 0% | 0 |
| Total Student Enrollment | 100% | 801 | 100% | 162 |

Note. All district middle schools (n = 6) and study middle schools (n = 5).

Academic outcomes data for students in the identified Co-teach classes were compiled and analyzed. The following descriptive data for each student with a disability was gathered: grade, gender, ethnicity, and qualifying disability. The student sample was

determined by the Co-teach partnership sample, and participation in either a state or district assessment during the spring of 2008. As shown in Table 3.2, 301 students with disabilities enrolled in the selected Co-teach partnership classes. Of those 301 students, several were included multiple times, as some students received instruction in more than one Co-teach class included in the Co-teach partner sample. Also included in the original 301 were students who either withdrew, or participated in a state assessment for which scores were not reported. For example, several students participated in the TAKS-M assessment and for the spring of 2008, the TAKS-M assessment was a field test in which the state did not report scores for students. These students were not included in the final sample. Therefore, the unique number of students within the sample was 162. Table 3.2 shows total enrollment data for students with disabilities at each campus, served within a Co-teach class, and at each grade level.

Table 3.2

Total Middle School Co-teach Enrollment by Campus and Grade

| Campus (C) | Grade 6 | Grade 7 | Grade 8 | Campus Total |
|------------|---------|---------|---------|--------------|
| C1 | 0 | 14 | 15 | 29 |
| C2 | 54 | 6 | 42 | 102 |
| C3 | 6 | 4 | 10 | 20 |
| C4 | 75 | 38 | 15 | 128 |
| C5 | 17 | 5 | 0 | 22 |
| Total | 152 | 67 | 82 | 301 |

Table 3.3 summarizes enrollment data for students with disabilities at each campus, served within a Co-teach class, at each grade level for the study student sample.

Table 3.4 summarizes the number of students within the study by subject area.

Table 3.3

Final Student Sample Enrollment by Grade Level

| Campus (C) | Grade 6 | Grade 7 | Grade 8 | Campus Total |
|--------------|-----------|-----------|-----------|--------------|
| C1 | 0 | 13 | 15 | 28 |
| C2 | 25 | 4 | 18 | 47 |
| C3 | 6 | 3 | 9 | 18 |
| C4 | 23 | 20 | 9 | 52 |
| C5 | 12 | 5 | 0 | 17 |
| Total | 66 | 45 | 51 | 162 |

Table 3.4

Final Student Sample Number of Students by Subject Area (n = 162)

| Number of Students | |
|--------------------|----|
| Math | 41 |
| Reading | 42 |
| Science | 43 |
| Social Studies | 36 |

Instrumentation

Two sets of data were collected to answer the research questions. The data collection systems for Co-teachers and students were gathered using the Colorado Assessment of Co-teaching questionnaire, Texas statewide assessment results, and LEA developed Curriculum Based Assessments (CBAs).

Teacher Data Collection System

Colorado Assessment of Co-teaching (CO-ACT)

Student Data Collection System

- a. Spring 2008 administration of the Texas Assessment of Knowledge and Skills (TAKS)
- b. Spring 2008 administration of the Texas Assessment of Knowledge and Skills–Accommodated (TAKS–Accommodated)

- c. Spring 2008 administration of the Texas Assessment of Knowledge and Skills–Modified (TAKS–M)
- d. Spring 2008 administration of district developed Curriculum Based Assessments (CBAs)
- e. Spring 2008 administration of Region 4 Education Service Center (ESC) assessments aligned with format and content of TAKS

Colorado Assessment of Co-teaching (CO-ACT)

The Colorado Assessment of Co-teaching (CO-ACT) is a questionnaire designed to assist Co-teachers in understanding critical components of Co-teaching; the instrument has been found to differentiate exemplary teams from other Co-teaching teams (Adams et al., 1993). The CO-ACT contains five factors for which teachers rate multiple statements. Partners rate their practice based upon five factors: (I) Personal Prerequisites (15 items), (II) Professional Relationship (9 items), and (III) Classroom Dynamics (14 items) (Adams et al., 1993). Factors IV (2 items) and V (2 items) are not used in the scoring of the CO-ACT as they were not found to discriminate between exemplary and non-exemplary Co-teach teams (Adams, 1993). The CO-ACT was used to collect data about the agreement between Co-teaching pairs regarding the degree to which each factor described their current Co-teaching situation and the factor's importance in Co-teaching. Each teacher responded individually to each factor and rated each factor on both importance and description.

For the purposes of this study, Co-teach partnerships/dyads were determined as exemplary or non-exemplary by averaging each Co-teacher's total CO-ACT score to

obtain an overall dyad score. The dyad score was then compared to the scoring system established by the CO-ACT researchers. The decision to take an average of the scores was decided by the researcher as the CO-ACT provided no scoring guidance regarding determining the total quality of the partnership. The scoring system was based upon creating individual determinations of exemplary or non-exemplary ratings. This decision was made because the design of this study sought to compare the quality of partnerships as a whole to academic outcomes, versus comparing the individual teacher scores to student outcomes. In addition, the scoring system did not address the issue of discrepancy in scores between Co-teach partners; nor allow for any consideration regarding the degree of discrepancy. For example, according to the scoring system, a total exemplary score was ≥ 169.08 ; therefore, once a dyad's scores were averaged, no matter how close they were to this cut-off, if they did not meet the 169.08, they would not have been considered an exemplary partnership within this study.

The CO-ACT was selected for this study because it allowed collection of data both on perception (i.e., importance) and implementation (i.e., description/presence). This allowed for exploration of various correlations between variables. In addition, information regarding the process of instrument development and psychometrics was available directly from reports provided by the instrument developers, as described in Chapter II.

Student Achievement Data

Student achievement data from district assessments and from standardized criterion-referenced data from state assessments were analyzed for each student with a

disability served within the Co-teach sample. District assessment data consisted of Curriculum Based Assessments (CBAs). The district set timelines for the local assessments.

State assessment data for the 2007-08 school year consisted of one of the following assessments for each content area tested by grade level, as determined by the requirements set forth by the Texas Education Agency (TEA). Statewide assessments included the Texas Assessment of Knowledge and Skills (TAKS), the Texas Assessment of Knowledge and Skills–Accommodated (TAKS–Accommodated), the Texas Assessment of Knowledge and Skills–Modified (TAKS–M), and the Texas Assessment of Knowledge and Skills–Alternate (TAKS–Alt). The TAKS, TAKS–Accommodated, and TAKS–M all assess students at their enrolled grade level, based on the Texas Essential Knowledge and Skills (TEKS), which is the state curriculum. The 2008 TAKS-M Social Studies assessment was a field test. Therefore, students within the study Co-teach partnerships who took TAKS-M for their Social Studies assessment were not included in the student sample as there was no score available for their assessment. The TAKS–Alt is designed for students with the most significant cognitive disabilities and assesses student access to the general education curriculum through prerequisite skills linked to the enrolled grade level TEKS. No participants in the sample participated in TAKS–Alt assessments. These assessments were the current state designed and approved assessments for students with disabilities. Statewide assessments met federal and state accountability criteria for students with disabilities.

For the TAKS and the TAKS–Accommodated, the state reports student performance results using raw scores and scaled scores for each content area and each grade level. There are three rankings that describe a student’s performance on state assessments: Commended Performance, Met Standard, and Did Not Meet Standard. The TAKS and TAKS–Accommodated assessments have the same mastery standard for each content area and grade level. That is, a student taking the 6th grade TAKS Reading and one taking the 6th grade TAKS–Accommodated Reading would be evaluated based on the same standard-setting criteria. In this example, for a student to meet the standard on either assessment, he or she must achieve a minimum raw score of 27/42 correct, which is a scaled score of 2100. The only exception to the met standard scaled score of 2100 is the 8th grade Science TAKS and TAKS–Accommodated; these have a met standard scaled score of 2041. The TAKS–M is designed for students who need extensive modifications of and/or accommodations to classroom instruction and assignments in order to demonstrate progress in the TEKS. The TAKS–M tests students at their enrolled grade level; however, there are different standard-setting cut scores for the TAKS–M. Following the same 6th grade Reading example, in order for a student to have met standard on the TAKS–M, he or she must obtain a minimum raw score of 17/31. The state continues to use a scaled score with the TAKS–M so student performance can be compared with the state’s passing standards.

Co-teacher Data Collection Procedures

The CO-ACT questionnaire was used to identify exemplary and non-exemplary Co-teach partnerships. In order to allow partners a minimum of one school year of Co-

teaching with each other prior to responding, teachers completed the CO-ACT questionnaire at the end of the 2007-08 school year, during May.

Each of the 52 Co-teachers received an introductory e-mail providing a description and the purpose of the study, an approximate time commitment, and a request for questionnaire participation. The e-mail stated that participants would be contacted within a few days to set up a face-to-face meeting at a convenient time to complete the questionnaire. Teachers were informed that their participation was voluntary and that they could decline if they did not want to participate. Also, they would receive an incentive for their participation, a \$20 gift card to an area mall, once the questionnaire was completed. One of the 52 teachers declined, citing lack of time to commit to the process. Despite follow-up attempts, the teacher continued to decline participation, resulting in an automatic removal of her Co-teach partner from the questionnaire contact list. The remaining 50 teachers were contacted and face-to-face meetings were scheduled. Teachers completed the CO-ACT questionnaire at their campus at a time of their choosing. During the face-to-face meeting, each teacher was provided a study information sheet, allowed an opportunity to ask questions regarding the study, signed a voluntary consent form, completed the CO-ACT, and received a monetary incentive for completion of the CO-ACT. During scheduling of the face-to-face meetings, one Co-teacher failed to respond to repeated contact attempts via e-mail and telephone. The Special Services Department Chair was contacted and it was discovered that this teacher had been on medical leave for approximately three months. The partner of the teacher on medical leave completed a CO-ACT; however, those

responses were not included in the final study results, as a questionnaire from her Co-teacher on medical leave was not available, even after repeated contact attempts.

Therefore, the final number of Co-teach partnerships who completed the CO-ACT questionnaire was 24, consisting of 48 Co-teachers. As the original partnership sample size was 26 (52 teachers), and 24 (48 teachers) partnership teams completed CO-ACT questionnaires, the participation rate was 92%.

Co-teacher Demographic Data

During the completion of the CO-ACT, Co-teachers provided responses to various descriptive information areas. While this information was not utilized to answer any of the study research questions, it was viewed as valuable information and could be used in future studies related to this data set. Co-teachers provided the following information: gender, age, ethnicity, type of certification, highest level of education, certification route, years of teaching, years of Co-teach experience, and type of Co-teach training. The Co-teacher sample was 83% female ($n = 40$) and 17% male ($n = 8$). Descriptive information provided by Co-teachers is summarized in Tables 3.5–3.9.

Table 3.5

Co-teacher Age

| Age | N | % |
|------------|----|------|
| 20-30 yrs. | 20 | 42% |
| 31-40 yrs. | 9 | 19% |
| 41-50 yrs. | 11 | 23% |
| 51-61 yrs. | 8 | 16% |
| Total | 48 | 100% |

Table 3.6

Co-teacher Ethnicity

| Ethnicity | N | % |
|------------------|----|------|
| Caucasian | 31 | 65% |
| African American | 14 | 29% |
| Asian | 2 | 4% |
| Biracial | 1 | 2% |
| Total | 48 | 100% |

Table 3.7

Co-teacher Certification, Level of Education, and Certification Route

| Characteristic | Certification | | Level of Education | | Certification Route | |
|-------------------|---------------|------|--------------------|------|---------------------|------|
| | N | % | N | % | N | % |
| General Education | 24 | 50% | | | | |
| Special Education | 24 | 50% | | | | |
| Bachelors | | | 37 | 77% | | |
| Masters | | | 11 | 23% | | |
| Traditional | | | | | 23 | 48% |
| Alternative | | | | | 25 | 52% |
| Totals | 48 | 100% | 48 | 100% | 48 | 100% |

Note. Blank cells indicate data not appropriate for the cell.

Table 3.8

Co-teacher Years of Experience

| Experience | Teaching | | Co-teaching | |
|------------|----------|------|-------------|------|
| | N | % | N | % |
| 0-5 yrs. | 26 | 54% | 45 | 94% |
| 6-10 yrs. | 12 | 25% | – | – |
| 11-15 yrs. | 2 | 4.2% | 2 | 4% |
| 16-20 yrs. | 2 | 4.2% | 1 | 2% |
| 21-25 yrs. | 3 | 6.3% | – | – |
| 26-30 yrs. | 3 | 6.3% | – | – |
| Totals | 48 | 100% | 48 | 100% |

Note. Blank cells indicate that no participant reported years of Co-teaching experience for that range of experience.

The majority of Co-teachers in this study had not been Co-teaching with their partner beyond the current school year. Seventy-three percent ($n = 35$) of Co-teachers reported they had only been Co-teaching with their partner for the current school year. Seventeen percent ($n = 8$) reported Co-teaching with their partner for two years, and only 10% ($n = 5$) reported Co-teaching with their partner for three years. There were no Co-teachers who reported Co-teaching with their partner for more than three years.

Table 3.9

Training Received Regarding Co-teaching

| Type of Training | N | % |
|-----------------------------------|----|-----|
| Undergraduate | 4 | 8% |
| Graduate | 2 | 4% |
| Student Teaching/Internship | 2 | 4% |
| District Workshop | 34 | 71% |
| Campus Workshop | 39 | 81% |
| Regional ESC Workshop | 9 | 19% |
| On-The-Job | 2 | 4% |
| Alternative Certification Program | 3 | 6% |

Note. Counts and percentages do not equal N = 48, or 100%, due to some participants having Co-teach training in more than one area.

Reducing Respondent Bias

The reliability of the CO-ACT data is, in part, dependent upon the truthfulness of the participant responses. Therefore, several measures were taken to establish trustworthiness and the credibility of the responses to the CO-ACT instrument. In naturalistic inquiry, trustworthiness and credibility are the techniques that give truth value through internal validity (Erlandson, Harris, Skipper, & Allen, 1993). Erlandson et al. (1993) state that distortions of bias “may be caused by respondents wanting to please the investigator, presenting their own personal inclinations, wanting to deceive or confuse the researcher, or not wanting to respond at all. . . [or] flagrantly introduced by a

respondent who has a hidden agenda” (p. 134). The following strategies were implemented in an attempt to reduce respondent bias:

- The researcher met with each partner individually.
- Co-teach partners did not complete the questionnaire in each other’s presence.
- Prior to providing the questionnaire a study information sheet was reviewed, and it included assurances that responses would be confidential.
- No personal identification information was asked of the teachers or recorded on the questionnaire.
- The researcher did not reveal to participants that the instrument would differentiate between exemplary and non-exemplary partnerships, to avoid the possibility that participants would feel compelled to respond so as to be rated “exemplary.”
- The researcher did not reveal that Co-teach “status” (exemplary/non-exemplary) would be compared to student academic outcomes.
- The researcher reiterated to each participant that only the researcher would have access to individual questionnaire data, and any public reports would be presented in an aggregate form.
- Participants were informed that their individual responses would not in any way impact the researcher’s program completion or status.

Student Achievement Data Collection Procedures

Upon request by the researcher, a data set of student achievement results was provided by the participating district, which contained student academic achievement data for the 2007-08 school year. The researcher provided the district a list of the middle school Co-teachers who completed the CO-ACT questionnaire. The district was able to determine the students with disabilities who were enrolled in each of the participating Co-teach classes. For the study sample, the October 2007 Public Education Information Management System (PEIMS) snapshot date was used to determine student enrollment in Co-teach classes. Therefore, any student with a disability enrolled in an eligible Co-teach class as of the October PEIMS snapshot date was included in the data set provided by the district. Data for each student included an identifier code that allowed for the student's identity to remain confidential, but also provided a way for the researcher to confirm student data across multiple achievement datasets provided. Student achievement data included the following information: grade, gender, ethnicity, economically disadvantaged status, course subject, campus, state assessment, and local assessments. The student achievement data was used in comparison with the Co-teach partnerships to determine whether any potential relationships existed between the quality of Co-teach implementation and student academic outcomes.

Design

This study utilized correlation measures to analyze quantitative data using parametric methods, to study the relationship between Co-teach partnership ratings on the CO-ACT and academic outcomes for students with disabilities. A primary assumption of this study was that the CO-ACT was able to accurately identify, as measured by their score on the questionnaire, partnerships who were exemplary or non-exemplary based upon their implementation of Co-teach best practices. The study was conducted between September 2007 and May 2008. Student academic data were collected for assessments taken during the spring of 2008. Teacher CO-ACT questionnaire data was collected in the spring of 2008. Table 3.10 outlines the timeline of the study.

Table 3.10

Timeline for Study

| | |
|----------------------------|---|
| October 2007 to April 2008 | Students participated in Co-teach delivery model |
| April 2008 | Students in grades 6-8 complete required state/local assessments |
| May 2008 | CO-ACT questionnaire data collected from eligible Co-teach partnerships |
| Fall 2008 | Final student academic data collected from district |

The student assessments administered in April 2008 are summarized in Table 3.11. The researcher obtained CO-ACT responses from Co-teachers during May 2008.

Table 3.11

2007-08 Student Assessment Summary

| Grade | Date Administered | Assessment | Subject Area |
|-------|-------------------|------------------|----------------|
| 6-8 | April 2008 | State Assessment | Math |
| 6-8 | April 2008 | State Assessment | Reading |
| 6-7 | May 2008 | CBA | Science |
| 8 | April 2008 | State Assessment | Science |
| 6-7 | May 2008 | CBA | Social Studies |
| 8 | April | State Assessment | Social Studies |

Note. State Assessments include TAKS, TAKS-Accommodated, and TAKS-M.

Data Analysis

Data collected via the CO-ACT and student assessment instruments were examined to determine whether the quality of Co-teach implementation impacted student academic performance. In addition to Factors I, II, and III in the CO-ACT questionnaire describing presence and importance, demographic information was obtained from each Co-teacher completing the CO-ACT. The following teacher covariates were included in the questionnaire: gender, ethnicity, level of education,

teacher certification route (i.e., traditional or alternative certification), areas of certification, age, years of teaching experience, years of Co-teaching experience, years of experience with current Co-teacher, and types of Co-teaching training received. In addition to student academic data, the following student covariates were obtained: gender, ethnicity, disability, economically disadvantaged status, and grade level. Covariates were collected to provide descriptive information regarding the teacher and student samples. However, covariates were not included in the analysis to answer the study research questions. Covariates were not included in the analysis, based on the determination that they did not add any additional value in answering the research questions. Factors IV and V of the CO-ACT were not included in the statistical analysis as they were not included in its scoring, as described in the instrumentation section in Chapter II. Finally, the scale rating importance on the CO-ACT was not included in the study, as there was minimal variability in teacher responses. The vast majority of teachers responded that all factors were important in Co-teaching, and it was determined that this information did not add additional value in determining the answers to the research questions.

Answering the Research Questions

All research questions were answered through use of parametric statistics. See Figures 3.1-3.4 for path models showing the visual representations of the relationship of variables. Correlation methods were utilized to measure potential relationships between research question variables. The software used for data analysis was Microsoft Office Excel 2007 and SPSS 16.0. The researcher used Excel to store, organize, sort, and

process calculations such as sum, mean, standard deviation, and z-scores. SPSS is a computer program for statistical and data analysis. A dataset created in Microsoft Excel was imported into SPSS for statistical analysis of the research questions. Analyses related to each research question are presented below.

Research Question One: Does the CO-ACT, as designed, predict student academic outcomes for students with disabilities within Co-teach classrooms?

Data analysis of this question utilized correlation methods to explore whether a relationship existed between the two variables. This question was answered using bivariate correlation of two data sources. Data sources included student post-test scores, and the partnership rating as exemplary or non-exemplary. Partnership rating was determined by calculating the average of the “presence” partnership scores compared to the CO-ACT average total score of exemplary Co-teaching teams. This analysis is represented in Figure 3.1.

Research Question Two: Are there some CO-ACT factors that are more critical in distinguishing effective Co-teachers as measured by student academic outcomes?

Data analysis of this question utilized correlation methods to compare one variable with each of three other variables, and explore whether there was a relationship between them. Bivariate correlations between student post-test scores, and each of the three CO-ACT factors (personal prerequisites, professional relationship, and classroom dynamics), were examined through separate analyses. This analysis is represented in Figure 3.2.

Research Question Three: Is it important for teachers to be in agreement in their CO-ACT responses in order to achieve positive student academic outcomes?

Data analysis of this question utilized correlation methods to explore whether a relationship existed between the two variables. This question was answered using two data sources: bivariate correlation between student post-test scores, and the degree of agreement between Co-teach partnership scores on the “presence” indicator on the CO-ACT. This analysis is represented in Figure 3.3.

Research Question Four: Are the findings from the first two research questions different across the following subject areas: Math, Reading, Science, and Social Studies?

Data analysis of this question utilized correlation methods to explore whether a relationship existed between the results of the first two research questions across the four core subject areas. Separate analyses were conducted to explore these relationships. The variable comparisons explored in Questions One and Two were disaggregated into the four subject areas to determine whether any patterns emerged. This analysis is represented in Figure 3.4.

Figure 3.1. Research Question One Path Model

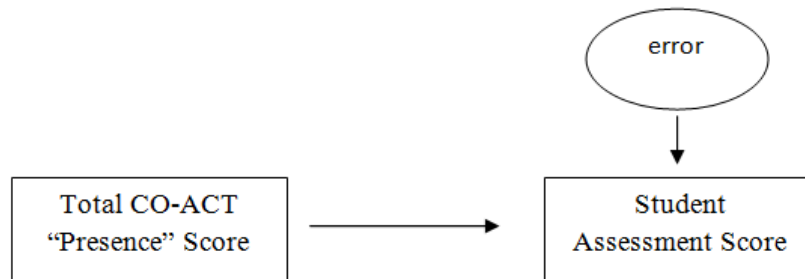


Figure 3.2. Research Question Two Path Model

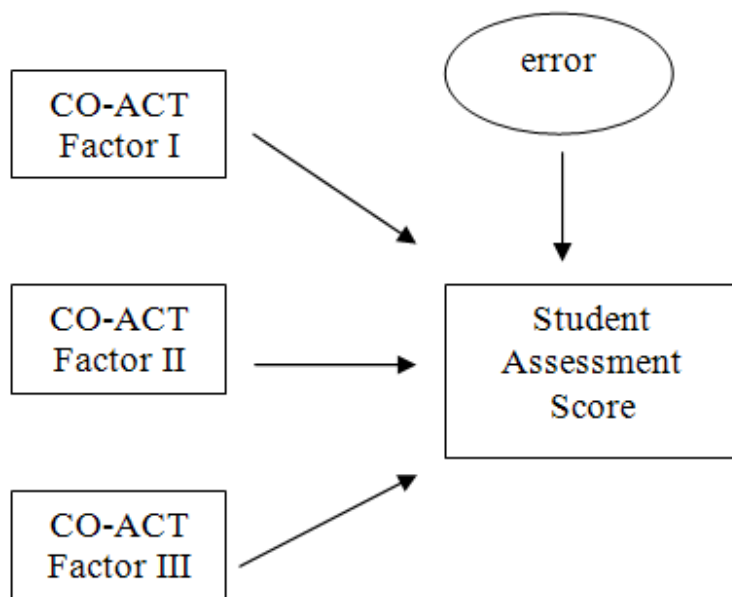


Figure 3.3. Research Question Three Path Model

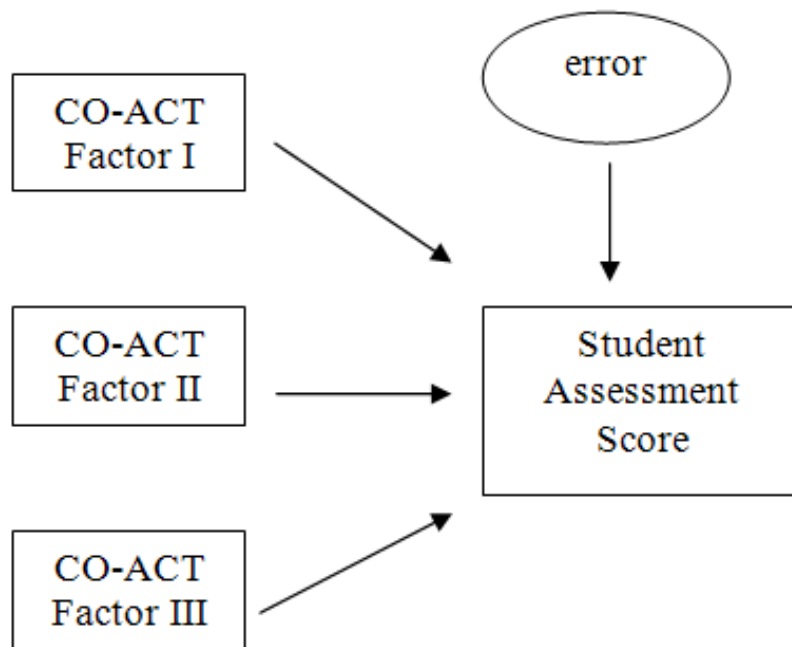
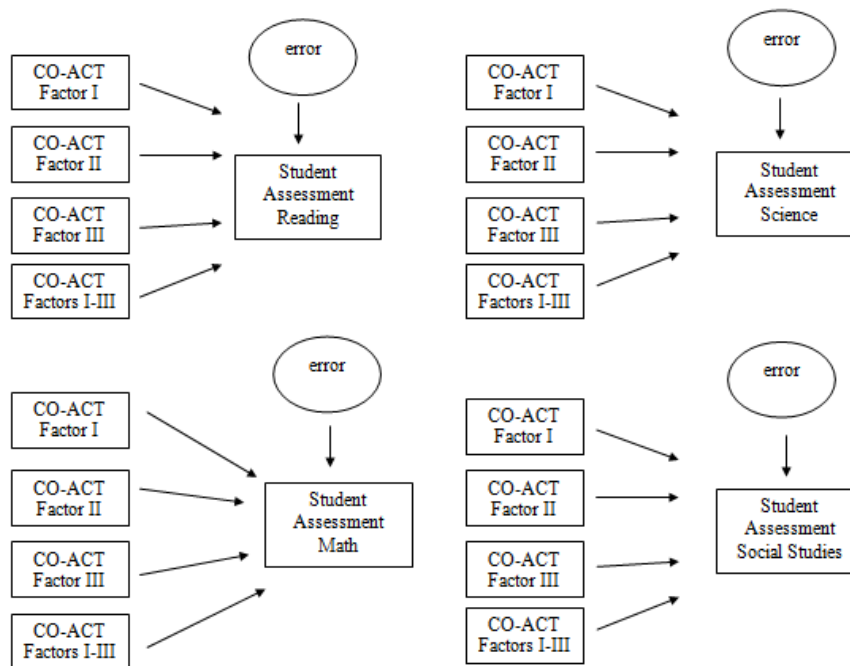


Figure 3.4. Research Question Four Path Model



Study Limitations

The limitations of this study were similar to the limitations of other research conducted in authentic settings, including: a random assignment of students was not possible; the Co-teach settings could not be observed to determine the integrity of the partnership (Welch, 2000). Conducting research that attempts to measure the academic outcomes of a group, related to the quality of the instructional programming, is limited by the human variability from one context to another. Study results may not be used to infer beyond the scope of this research. This study was not able to control the following student and teacher factors.

Student factors. Students included in the sample were not randomly assigned to their Co-teach classrooms. Campus scheduling procedures determined which particular Co-teach class a student was assigned to. On some campuses, assignment to a Co-teach class was impacted by teacher availability, teacher quality, and teacher credentials. The number of students with disabilities assigned to each class also differed across campuses. For example, some Co-teach classrooms may have had three students with disabilities, while others may have had seven.

This study was not able to control for the appropriateness of student placement within a Co-teach setting. The Individual Education Plan (IEP) team makes the decisions regarding student educational services and supports. Differences among students with disabilities (i.e., type and severity of disability) assigned to a Co-teach class was outside the control of the researcher.

Teacher behavior and training. Variations in extent of teaching and Co-teaching experience, certification preparation, Co-teach training, and expertise within the classroom may have limited this study. According to teacher responses on the CO-ACT questionnaire, all of these areas contained a wide range of variability. A summary of teacher responses was mentioned previously.

The CO-ACT questionnaire statements represent the best practices of Co-teaching. Teacher differences in knowledge of best practices of the Co-teach model may have impacted responses to CO-ACT. For example, one statement on the CO-ACT is, “Co-teachers make a unique contribution based on, but not limited by, their professional expertise” (Adams, 1993). A teacher may respond to this statement with “highly

describes” to rate his or her Co-teach partnership, when in fact this statement is not the reality of the situation. This may be due to a discrepancy between the teacher’s definition of “unique contribution” and its meaning within the context of Co-teaching best practices.

Differentiation of the Study

This research differed from previous studies in that it focused on middle school Co-teach classrooms instead of elementary ones. The research also attempted to explore the impact of Co-teach quality on student academic outcomes, as opposed to looking at qualitative measures to analyze the impact of Co-teach quality on student performance.

CHAPTER IV

RESULTS

The purpose of this study was to explore the usefulness of the Colorado Assessment of Co-teaching (CO-ACT) instrument in predicting academic outcomes for middle school students, grades 6-8, with disabilities served within Co-teach settings. The study was designed for two purposes: to identify Co-teach partnerships as exemplary or non-exemplary, based on Co-teachers' responses to the CO-ACT; and to analyze student academic outcomes to discover any patterns or themes for students with disabilities within Co-teach classes. The study involved the selection of five middle schools implementing Co-teaching during the 2007-08 school year. All students in the study participated in a Co-teach class for a minimum of seven months, and completed a high-stakes state-standards based assessment test or a district developed assessment during the spring of 2008. Students took one of the following state assessments: Texas Assessment of Knowledge and Skills (TAKS), Texas Assessment of Knowledge and Skills – Accommodated (TAKS-Accommodated), or Texas Assessment of Knowledge and Skills – Modified (TAKS-M). For students in a grade and subject area for which a statewide assessment was not offered, their academic data came from a district-developed Curriculum Based Assessment (CBA), or a district adopted assessment created by Region 4 ESC. To answer the research questions, Co-teach partners were asked to complete the CO-ACT at the end of the 2007-08 school year. Their ratings were averaged to develop a partnership score after each Co-teacher's questionnaire was

scored using the CO-ACT scoring system. Student statewide assessment data was obtained for the April 2008 administration of the assessments.

Research Question One: Does the CO-ACT, as designed, predict student academic outcomes for students with disabilities within Co-teach classrooms?

Research Question Two: Are there some CO-ACT factors that are more critical in distinguishing effective Co-teachers as measured by student academic outcomes?

Research Question Three: Is it important for teachers to be in agreement in their CO-ACT responses in order to achieve positive student academic outcomes?

Research Question Four: Are the findings from the first two research questions different across the following subject areas: Math, Reading, Science, and Social Studies?

This chapter is organized to provide summary information of the study and answers to the research questions.

Participants and Setting

There were six public middle school campuses within the school district. Five of the six middle school campuses were included in the study. The sixth middle school was excluded as it was not implementing a Co-teach model on its campus at the time of the study. Each of the participating five campuses served students in grades 6-8. A total of 24 partnerships (48 individual teachers) and 162 students with disabilities were eligible for inclusion in the final study sample.

Descriptive Information on Data Sources

Two sources of data were used to answer the research questions in this study: Co-teacher response data from the CO-ACT survey, and student end-of-year assessment

data that included scores on a statewide assessment or on a district-developed or district adopted assessment. All data was collected during the spring of 2008, in order to provide Co-teachers a reasonable amount of time to develop a partnership and implement the Co-teach model. This timeline also allowed students a reasonable amount of time to be exposed to instruction within a Co-teach class and to receive as much curriculum instruction prior to participating in an academic assessment.

Descriptive Information for the CO-ACT

Numerous descriptive statistics were collected from the Co-teachers during their completion of the CO-ACT (see Chapter III, Tables 3.4-3.8, for all descriptive data collected). For the purposes of answering the research questions, however, the only CO-ACT descriptive variables utilized were the scores for the teacher responses for the individual Factors I, II, and III, and the Factor total score for the scale that measured whether the factor was present within their current Co-teach partnership.

According to the scoring system for the CO-ACT, Co-teacher scores can be compared to the average total score on the instrument to determine how close to an exemplary rating the individual Co-teachers scored themselves. Co-teachers can compare their scores by each factor and with a total score for all factors combined. The CO-ACT has two scales, one measuring the importance and one measuring the presence of behaviors within a Co-teach setting. This study focused on the scale that measured the presence of behaviors within the Co-teach partnership. Co-teachers were considered to meet the exemplary range of Co-teach behaviors if they scored as follows: Factor I \geq 68.03; Factor II \geq 38.69; Factor III \geq 62.75; and Total on Factors I-III \geq 169.08.

Individual Co-teacher responses to the CO-ACT revealed that fewer than half of the participants responded that the practices reflected within the CO-ACT, either individually or as a total, were present at an exemplary level within their current Co-teach partnership. Seven of the 24 Co-teach partnerships rated the presence of Co-teach practices at an exemplary level. This was calculated by taking the total of each partner's scores on Factors I-III, adding both partners' totals, and dividing by 2. Table 4.1 provides additional descriptive statistics for teacher responses to the Factors on the CO-ACT.

Discrepancy scores were utilized to answer Research Question Three.

Discrepancy scores were calculated by subtracting each Co-teacher's total score for each factor from his or her partner's total score for each factor. The same process was applied to calculate the total discrepancy score for Factors I-III. Table 4.2 provides descriptive statistics for partnership discrepancy.

Table 4.1

Descriptive Statistics for Individual Teacher CO-ACT Factor Responses (n = 48)

| Measure | Factor I | Factor II | Factor III | Factors I-III |
|-------------------|----------|-----------|------------|---------------|
| Minimum | 24 | 9 | 48 | 48 |
| Mean | 62.63 | 34.69 | 55.92 | 153.23 |
| Median | 65.5 | 36.0 | 57.0 | 159.0 |
| Mode | 68, 70 | 37 | 55 | 145 |
| CO-ACT Range | 15-75 | 9-45 | 14-70 | 38-190 |
| Maximum | 75 | 45 | 69 | 188 |
| <i>SD</i> | 10.80 | 7.83 | 10.43 | 27.43 |
| Exemplary Score | ≥ 68.03 | ≥ 38.69 | ≥ 62.75 | ≥ 169.08 |
| for CO-ACT | | | | |
| Participants | 17 | 15 | 13 | 14 |
| Scoring Exemplary | | | | |

Note. CO-ACT exemplary scores are for the “presence” scale and are the scores according to the scoring instructions on the CO-ACT. The “n” values refer to the number of respondents who scored greater than or equal to the exemplary range for that CO-ACT Factor.

Table 4.2

Descriptive Statistics for CO-ACT Partnership Discrepancy Scores (n = 48)

| Measure | Factor I | Factor II | Factor III | Factors I-III |
|--------------------|----------|-----------|------------|---------------|
| Minimum | 1 | 1 | 1 | 2 |
| Mean | 10.83 | 8.29 | 10.92 | 27.63 |
| Median | 6.5 | 8.5 | 9.0 | 20.0 |
| Mode | 5 | 1 | 1 | 2, 12, 58 |
| Discrepancy Range | 0-60 | 0-36 | 0-56 | 0-152 |
| Maximum | 31 | 25 | 41 | 97 |
| Standard Deviation | 9.14 | 6.39 | 9.58 | 24.68 |

Reliability of partnership scores across items, and partnership discrepancy scores, were calculated prior to data analysis to answer Question Three. Cronbach's (1951) alpha was calculated to determine the internal consistency of the CO-ACT scores for each partnership. When evaluating the internal consistency of an instrument, Huck (2008), states that reliability is defined as "consistency across the parts of the measuring instrument, with the 'parts' being individual questions or subsets of questions. To the extent that these parts 'hang together' and measure the same thing, the full instrument is said to possess high internal consistency reliability" (p. 79). Cronbach's alpha was selected to measure the internal consistency reliability of the partnership scores, due to its ability to evaluate instruments that contain Likert-type responses (Huck, 2008). The

closer the coefficient is to +1.00, the better internal consistency an instrument is considered to have (Huck, 2008).

After reliability coefficients were obtained for partnership scores, difference score reliability was calculated (Kaplan & Saccuzzo, 2005). Typically, difference scores are unreliable, with the exception of certain conditions: if the reliability of each scale is highly reliable, which is the case for the CO-ACT partnership scores; and when the original scores are poorly correlated, which also occurred in this study (Kaplan & Saccuzzo, 2005) confidence in the reliability of difference scores increases. These results support the finding that most of this study's teachers are not in agreement that the practices within the CO-ACT are actually present within their partnerships. Table 4.3 provides results of reliability calculations for partnership discrepancy scores. Difference score reliability calculated for the individual CO-ACT factors and the total for all CO-ACT factors ranged from .876 to .957. The reliability of the partnership difference scores was reasonable, indicating it was appropriate to proceed with analysis of Question Three, which is discussed later in this chapter.

Table 4.3

Reliability of Partnership Discrepancy Scores

| CO-ACT Factor | r_{DD} |
|---------------|----------|
| Factor I | .895 |
| Factor II | .876 |
| Factor III | .912 |
| Factors I-III | .957 |

Correlation between the CO-ACT factors was analyzed to determine the degree to which each CO-ACT factor was influenced by the other factors. The correlations between CO-ACT factors, shown in Table 4.4, appeared to be significant. Therefore, collinearity analysis was conducted to determine what impact the correlations might have on multiple regression results for using the CO-ACT factors, individually and as a whole, to predict student academic outcomes.

Table 4.4

CO-ACT Factor Correlation Matrix

| CO-ACT | Factor I | Factor II | Factor III |
|------------|----------|-----------|------------|
| Factor I | – | .733 | .735 |
| Factor II | – | – | .655 |
| Factor III | – | – | – |

Due to the significant correlation values between CO-ACT factors, collinearity analysis was conducted. Collinearity refers to “the extent to which the predictor variables have nonzero correlations with each other” (Thompson, 2006, p. 234). In other words, collinearity occurs when two or more independent variables are highly correlated. Exploring the potential collinearity was necessary to determine whether the independent variables (CO-ACT factors) were so highly correlated that it would become difficult to distinguish their individual influences on the dependent variable (student academic outcomes). The collinearity analysis reported tolerance and the Variance Inflation Factor (VIF). While obtaining either of these statistics would reveal collinearity issues, both are reported in Table 4.5. According to Hocking (2003), when examining the potential of collinearity between variables, “a common rule of thumb is to use $VIF_j > 10$ as an indication of collinearity” (p. 168); therefore, VIF calculations were obtained. All VIF calculations for each of the CO-ACT factors revealed VIF results of less than 3. This indicates that while the CO-ACT factors are correlated with each other, there did not appear to be a large concern regarding collinearity. Table 4.5 details the results of the collinearity analysis.

Table 4.5

CO-ACT Factor Collinearity Analysis

| CO-ACT | B | SE B | β | p | Tolerance | VIF |
|------------|-------|------|---------|------|-----------|-------|
| Factor I | -.006 | .022 | -.037 | .788 | .341 | 2.931 |
| Factor II | -.003 | .025 | -.015 | .902 | .439 | 2.277 |
| Factor III | .015 | .020 | .092 | .454 | .419 | 2.388 |

Descriptive Information for Statewide Assessments

Statewide assessments in the four core content areas (Reading, Math, Social Studies, and Science) were administered during the spring of 2008. Students within the study sample participated in the content-area assessment appropriate for their enrolled grade level. See Chapter III, Table 3.10 for descriptions of the assessments administered at each grade level by core content area. The TEA set the passing standard for all content-area assessments at the scale score of 2100, with the exception of the 8th grade Science TAKS, which had a passing standard scale score of 2041. For purposes of data analysis, all student academic scores were converted into z-scores using the sample mean and standard deviation. Tables 4.6-4.9 show the available means and standard deviations for the population and study sample for the reading, math, science, and social studies assessment scores. Mean scores on statewide assessment for students with disabilities was obtained through Statewide TAKS Summary Reports for 2007-08 (TEA, 2008b).

Table 4.6

Means and Standard Deviations for Reading Assessment Scores

| Grade | Special Education Students | | | | | | |
|-------|----------------------------|--------|-------|----|--------|--------|---------|
| | State | | State | | Sample | | z-score |
| | M | SD | M | SD | M | SD | |
| 6 | 2350 | 219.64 | 2126 | — | 1983 | 135.92 | -1.05 |
| 7 | 2261 | 186.60 | 2063 | — | 2035 | 114.69 | -0.24 |
| 8 | 2055 | 199.80 | 1996 | — | 2066 | 83.93 | 0.83 |

Note. State standard deviations for special education students were not available from TEA reports.

Table 4.7

Means and Standard Deviations for Math Assessment Scores

| Grade | Special Education Students | | | | | | |
|-------|----------------------------|--------|-------|----|--------|--------|---------|
| | State | | State | | Sample | | z-score |
| | M | SD | M | SD | M | SD | |
| 6 | 2289 | 251.56 | 2041 | — | 1983 | 261.77 | -0.22 |
| 7 | 2219 | 183.67 | 2039 | — | 2042 | 107.66 | 0.03 |
| 8 | 2231 | 203.04 | 2026 | — | 1966 | 93.32 | -0.64 |

Note. State standard deviations for special education students were not available from TEA reports.

Table 4.8

Means and Standard Deviations for Science Assessment Scores

| Grade | Sample | |
|-------|--------|------|
| | M | SD |
| 6 | 14.8 | 4.48 |
| 7 | 21.0 | 5.39 |

Note. Grade 8 scores are not included, as within the study there were no students in an 8th grade Co-teach science class. State mean and standard deviations were not included as science is not a tested subject in grades 6 and 7. Science assessments were locally developed and therefore are reported in raw scores.

Table 4.9

Means and Standard Deviations for Social Studies Assessment Scores

| Grade | Special Education Students | | | | | | |
|-------|----------------------------|--------|-------|----|--------|--------|---------|
| | State | | State | | Sample | | z-score |
| | M | SD | M | SD | M | SD | |
| 6 | | | | | 14.4 | 4.88 | |
| 7 | | | | | 8.7 | 2.08 | |
| 8 | 2328 | 183.31 | 2169 | _ | 2120 | 153.95 | -0.32 |

Note. State mean and standard deviations were not included for grades 6 and 7 as science is not a tested subject in those grades. Grade 8 state standard deviations for special education students were not available from TEA reports. Means and standard deviations for grades 6 and 7 were based upon raw scores from locally developed assessments; means for grade 8 were based upon state scaled scores.

Descriptive Information for District Developed Assessments

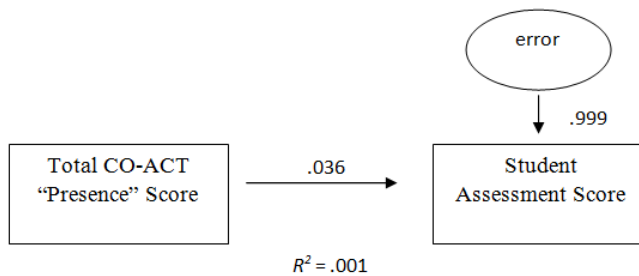
District assessment data consisted of Curriculum-based Assessments (CBAs). No information regarding the psychometrics of the district assessments was provided to the researcher. Concerning the assessments, the district provided student raw scores attained on the district assessments, and assurance that locally developed assessments were aligned to the Texas Essential Knowledge and Skills (TEKS); statement that assessments were designed to be in TAKS format; and assurance that students were provided the assessment accommodations as outlined in their Individualized Education Plans (IEPs). District assessments were used in analysis for 6th and 7th grade science and social studies, as these content areas are not assessed through a state assessment at these grade levels.

Research Question One

Does the CO-ACT instrument, as designed, predict student academic outcomes for students with disabilities within Co-teach classrooms?

The correlation ($r = .036$, $p = .647$) indicated there was not a statistically significant relationship between scores on the CO-ACT instrument and student assessment scores. The Co-teachers' partnership scores on the CO-ACT were not statistically significant predictors of student assessment scores. The path model for this research question is presented in Figure 4.1 below.

Figure 4.1. Findings for Research Question One Path Model



Research Question Two

Are there some CO-ACT factors that are more critical in distinguishing effective Co-teachers as measured by student academic outcomes?

Multiple regression analysis was used to answer Question Two. The averages of each CO-ACT factor were the three predictor variables, and student assessment scores was the outcome variable. This analysis yielded an effect size of ($R^2 = .004$), and .987 as the standard error of the estimate indicating that these variables do not predict student academic outcomes. The path model for this research question is presented below in Figure 4.2.

Figure 4.2. Findings for Research Question Two Path Model

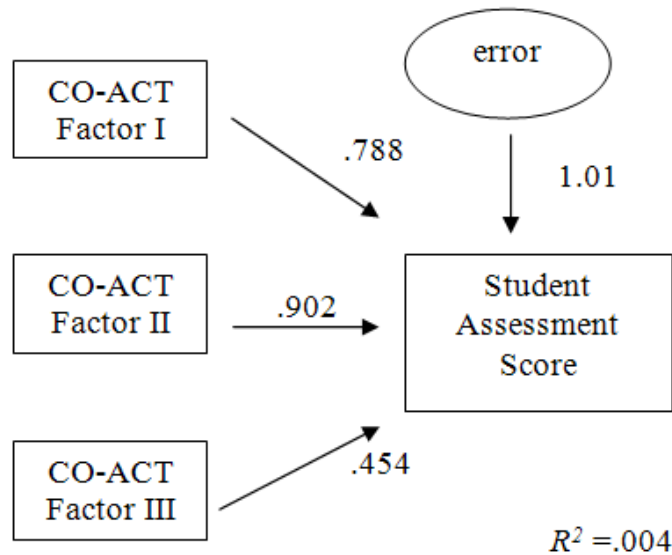


Table 4.10 shows the summary of regression analysis for the individual CO-ACT factor prediction of student assessment scores. The p-values obtained for each factor are high, indicating that when analyzed individually, no single CO-ACT factor is a significant predictor of student assessment scores. The Beta coefficients, which are the measure of the relative strength of the predictor variables (Huck, 2008, p. 422), also support the findings revealed by the p-values. The negative Beta coefficients for Factors I and II indicate that as the factors increase, the strength of their prediction of student academic outcomes actually decreases.

Table 4.10

*Summary of Regression Analysis for Individual Factor Prediction of Student Assessment**Scores*

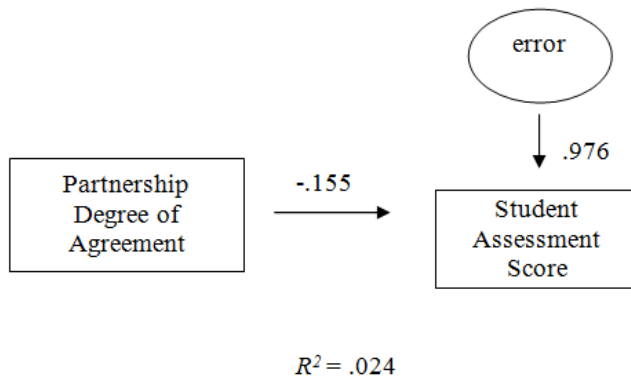
| CO-ACT | B | SE B | β | p |
|------------|-------|------|---------|------|
| Factor I | -.006 | .022 | -.037 | .788 |
| Factor II | -.003 | .025 | -.015 | .902 |
| Factor III | .015 | .020 | .092 | .454 |

Research Question Three

Is it important for teachers to be in agreement in their CO-ACT responses in order to achieve positive student academic outcomes?

Pearson's r was used to determine any correlation between Co-teacher agreement regarding presence of behaviors within their Co-teach partnership and student assessment score. The correlation ($r = -.155$, $p = .049$) indicated a statistically significant relationship between the two variables. As teachers became closer in agreement regarding the presence of practices within their partnership, then in general, the prediction of student assessment scores was higher. The effect size for this analysis was $R^2 = .024$, indicating that when we take CO-ACT agreement into consideration, our predictions of student assessment outcomes would improve on average by 2.4%. The path model for research Question Three is presented below in Figure 4.3.

Figure 4.3. Findings for Research Question Three Path Model



Research Question Four

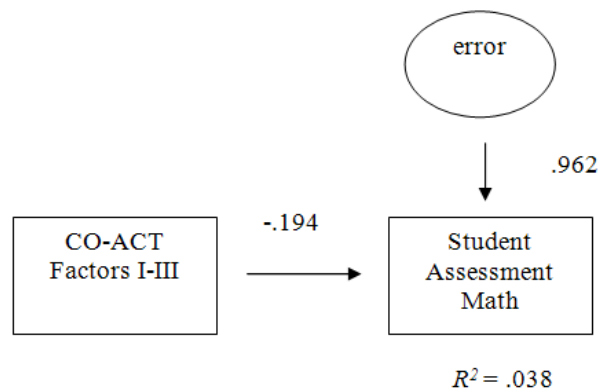
Are the findings from the first two research questions different across the following subject areas: Math, Reading, Science, and Social Studies?

Total CO-ACT Dyad Scores Analyzed by Subject Area and Prediction of Student Assessment Scores

Analysis of the first part of Question Four requires reference to Question One. Research Question One analyzed whether the CO-ACT instrument as designed would predict student academic outcomes. The predictor variable was the average dyad score for each of the Co-teach partnerships, and the outcome variable was the student assessment score. For Question Four, the researcher further disaggregated the student assessment score data. Using the same predictor variable of average dyad scores, Pearson's r correlations were calculated individually by subject area instead of as an aggregate of all subject areas, with student assessment scores as the outcome variable.

Total CO-ACT Co-teach partnership dyad scores and prediction of math assessment scores. A Pearson's r correlation between the total Co-teach partnership dyad scores and math assessment scores was calculated. The correlation ($r = -.194$, $p = .223$) did not yield statistically significant results. The total Co-teach partnership dyad scores were not significant predictors of math assessment scores ($R^2 = .038$). This is represented below in Figure 4.4.

Figure 4.4. CO-ACT Factors I-III and Math Path Model

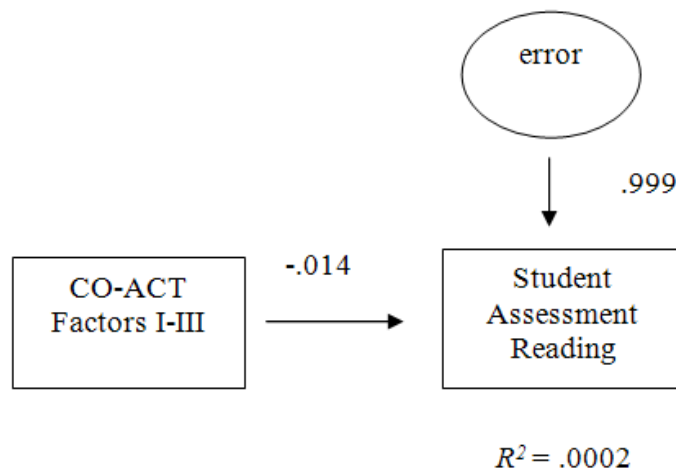


Total CO-ACT Co-teach partnership dyad and prediction of reading assessment scores. Pearson's r correlation between the total Co-teach partnership dyad scores and reading assessment scores was calculated. The correlation ($r = -.014$, $p = .930$) did not yield statistically significant results ($R^2 = .0002$). The total Co-teach

partnership dyad scores were not significant predictors of reading assessment scores.

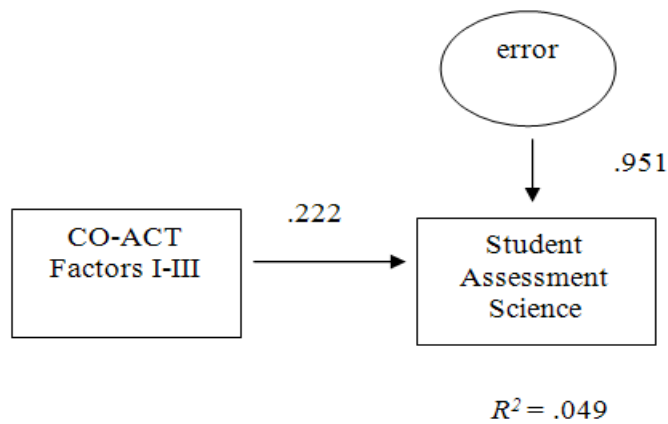
Figure 4.5 below depicts this analysis.

Figure 4.5. CO-ACT Factors I-III and Reading Path Model



Total CO-ACT Co-teach partnership dyad scores and prediction of science assessment scores. Pearson's r correlation between the total Co-teach partnership dyad scores and science assessment scores was calculated. The correlation ($r = .222$, $p = .152$) did not yield statistically significant results ($R^2 = .049$). The total Co-teach partnership dyad scores were not significant predictors of science assessment scores. This is represented in Figure 4.6 below.

Figure 4.6. CO-ACT Factors I-III and Science Path Model



Total CO-ACT Co-teach partnership dyad scores and prediction of social studies assessment scores. Pearson's r correlation between the total Co-teach partnership dyad scores and social studies assessment scores was calculated. The correlation ($r = .239$, $p = .160$) did not yield statistically significant results. The total Co-teach partnership dyad scores were not significant predictors of social studies assessment scores ($R^2 = .057$). Figure 4.7 depicts this analysis.

Figure 4.7. CO-ACT Factors I-III and Social Studies Path Model

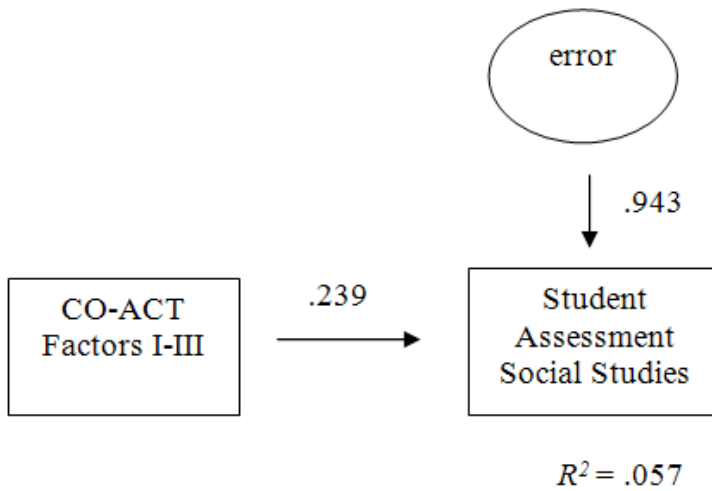


Table 4.11 provides a summary of the correlations between the total CO-ACT partnership scores for each subject area analysis. As explained above, the total CO-ACT partnership scores did not yield results that would indicate they would serve as statistically significant predictors of student assessment scores in any of the four subject areas.

Table 4.11

Summary of Correlations Between Total CO-ACT Partnership Scores by Subject Area

| Subject | N | r | p |
|----------------|----|-------|------|
| Math | 41 | -.194 | .223 |
| Reading | 42 | -.014 | .930 |
| Science | 43 | .222 | .152 |
| Social Studies | 36 | .239 | .160 |

Note. The value of “N” is the number of assessment scores analyzed per subject area.

Individual CO-ACT Factors Prediction of Assessment Scores, Analyzed by Subject Area

Analysis of the second part of Question Four requires reference to Question Two. Research Question Two analyzed whether there were some CO-ACT factors that were more critical in distinguishing effective Co-teachers, as measured by student assessment scores. For Question Four, the researcher further disaggregated the student assessment score data and, using three predictor variables, the individual factor dyad scores. Bivariate regression analysis was applied, with the student assessment scores as the outcome variable, and individual subject areas were analyzed instead of an aggregate of all subject areas.

Individual CO-ACT factors prediction of math assessment scores. For math assessment scores, the effect size was .194, when adjusted for sample size ($R^2 = .129$, $p = .223$) with a standard error of the estimate of .952, indicating that, as a group, the three

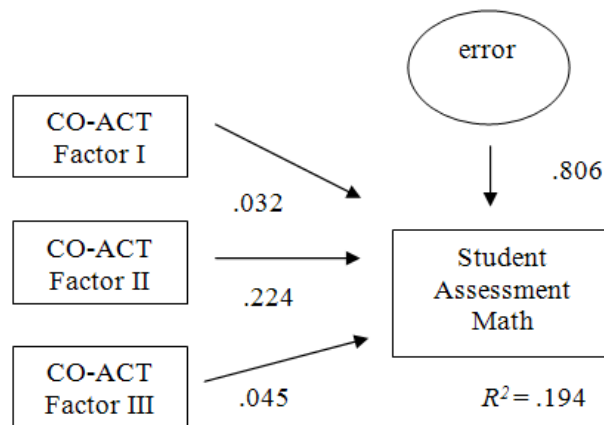
factors improve prediction of students' assessment outcomes for math. More specifically, Factors I and III were statistically significant while Factor II was not. A review of the Beta coefficients provides information regarding the relative strength of the Factor I and III predictors while holding the other predictors constant. The Beta coefficients were as follows: Factor I ($\beta = .606$), Factor II ($\beta = -.327$), and Factor III ($\beta = -.510$). As the Co-teacher averages for Factor I increased by one standard deviation (i.e., Co-teachers became closer in their agreement on Factor I), student assessment scores in math increased .606 standard deviations. However, Factor III results revealed a contradictory relationship. For Factor III, the Beta coefficient was ($\beta = -.510$), indicating that as Co-teacher averages for Factor III increased by one standard deviation, student math assessment scores decreased by -.510. A summary of the regression analysis for the individual factor prediction of math assessment scores is found below in Table 4.12. Figure 4.8 shows the path model for the individual factor prediction of math assessment scores.

Table 4.12

*Summary of Regression Analysis for Individual Factor Prediction of Math Student**Assessment Scores (n = 41)*

| CO-ACT | B | SE B | β | p |
|------------|-------|------|---------|------|
| Factor I | .116 | .052 | .606 | .032 |
| Factor II | -.062 | .050 | -.327 | .224 |
| Factor III | -.127 | .061 | -.510 | .045 |

Figure 4.8. Individual CO-ACT Factors and Math Path Model



Individual CO-ACT factors prediction of reading assessment scores. For reading assessment scores, the effect size was .086, when adjusted for sample size ($R^2 = .014$, $p = .323$) and a standard error of the estimate of .968, indicating that, as a group, the three factors did not improve prediction of students' assessment outcomes for

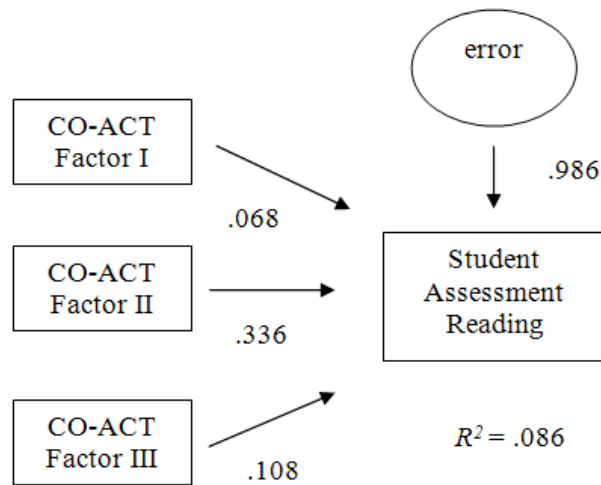
reading. Individually, there was not a relationship between any of the three factors with assessment outcomes for reading. Table 4.13 provides the summary of regression analysis for individual factor prediction of reading assessment scores and Figure 4.9 shows the path model for this analysis.

Table 4.13

Summary of Regression Analysis for Individual Factor Prediction of Reading Student Assessment Scores (n = 42)

| CO-ACT | B | SE B | β | p |
|------------|-------|------|---------|------|
| Factor I | -.086 | .046 | -.766 | .068 |
| Factor II | .032 | .033 | .201 | .336 |
| Factor III | .085 | .052 | .610 | .108 |

Figure 4.9. Individual CO-ACT Factors and Reading Path Model



Individual CO-ACT factors prediction of science assessment scores. For science assessment scores, the effect size was .304, when adjusted for sample size ($R^2 = .250$, $p = .003$) and a standard error of the estimate of .856, indicating that, as a group, the three factors improve prediction of students' assessment outcomes in science. As a total, it would improve prediction by a total of 30.4%. More specifically, Factors II and III were statistically significant while Factor I was not. A review of the Beta coefficients provides information regarding the relative strength of the Factor predictors while holding other predictors constant. The Beta coefficients were as follows: Factor I ($\beta = .200$), Factor II ($\beta = 1.071$), and Factor III ($\beta = -1.004$). As the Co-teacher averages for Factor II increased by one standard deviation (i.e., Co-teachers became closer in their agreement on Factor II), student assessment scores in science increased 1.071 standard deviations. However, as in the analysis of math scores, Factor III results revealed a

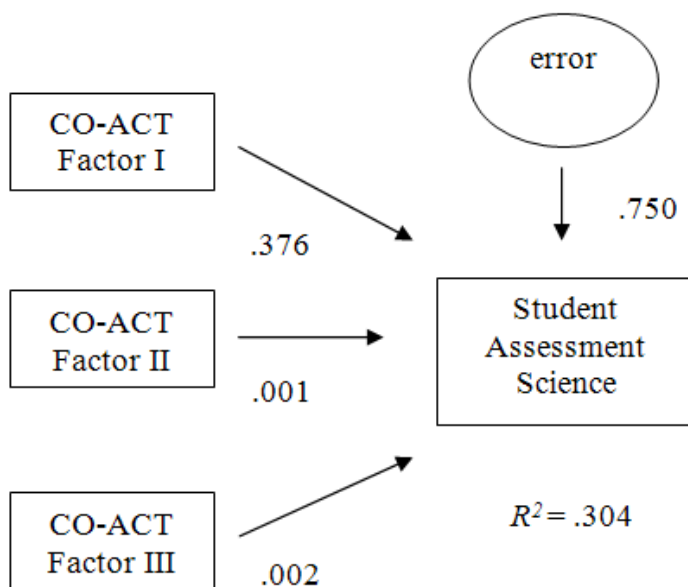
contradictory relationship. For Factor III, the Beta coefficient was ($\beta = -1.004$), indicating that as Co-teacher averages for Factor III increased by one standard deviation, student math assessment scores decreased by -1.004 standard deviations. Table 4.14 provides the summary of regression analysis for individual factor prediction of science assessment scores and Figure 4.10 shows the path model for this analysis.

Table 4.14

Summary of Regression Analysis for Individual Factor Prediction of Science Student Assessment Scores (n = 43)

| CO-ACT | B | SE B | β | p |
|------------|-------|------|---------|------|
| Factor I | .047 | .052 | .200 | .376 |
| Factor II | .454 | .128 | 1.071 | .001 |
| Factor III | -.231 | .071 | -1.004 | .002 |

Figure 4.10. Individual CO-ACT Factors and Science Path Model



Individual CO-ACT factors prediction of social studies assessment scores.

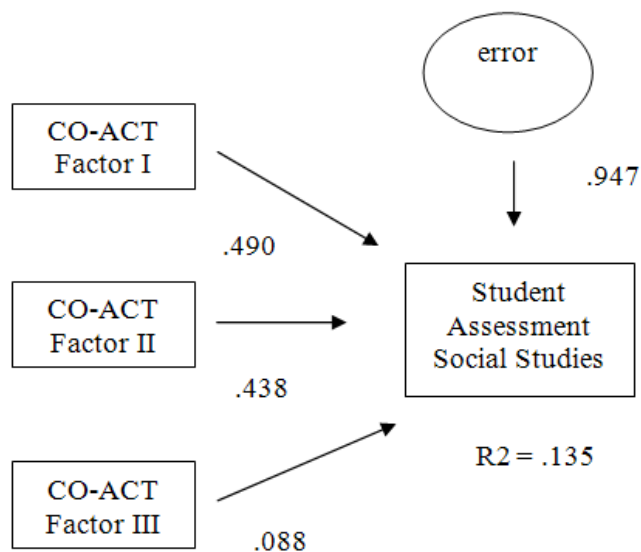
For social studies assessment scores, the effect size was .135, when adjusted for sample size ($R^2 = .053$, $p = .195$), and a standard error of the estimate of .945, indicating that, as a group, the three factors did improve prediction of students' assessment outcomes by a slight amount of 5.3% for social studies. Individually, there was not a relationship between any of the three factors with assessment outcomes for social studies. Table 4.15 provides the summary of regression analysis for individual factor prediction of social studies assessment scores and Figure 4.11 shows the path model for this analysis.

Table 4.15

*Summary of Regression Analysis for Individual Factor Prediction of Social Studies**Student Assessment Scores (n = 36)*

| CO-ACT | B | SE B | β | p |
|------------|-------|------|---------|------|
| Factor I | -.058 | .083 | -.220 | .490 |
| Factor II | -.133 | .169 | -.428 | .438 |
| Factor III | .110 | .063 | .871 | .088 |

Figure 4.11. Individual CO-ACT Factors and Social Studies Path Model



Summary of Results

Analysis of the CO-ACT instrument and student assessment outcomes were conducted to discover any patterns or themes that existed for students with disabilities within Co-teach classes. Five middle schools serving students in grades 6-8, 162 students with disabilities, and 48 Co-teachers (24 Co-teach partnerships) participated in the study. Overall, it does not appear that the CO-ACT provided statistically or practically significant predictions of student academic outcomes. Despite the fact that the CO-ACT was designed to measure the presence of behaviors within a Co-teach setting that the Co-teach literature cites as best practices, the exemplary or non-exemplary practices of Co-teachers did not appear to correlate with student academic outcomes in this study.

As the results of the four research questions indicated, only 3 of the 11 analyses yielded statistically significant results that would indicate that teacher practices were positively impacting student assessment scores. The result that was statistically significant ($r = -.155$, $p = .049$) was the correlation between teacher agreement of the presence of best practices behaviors within their Co-teach classrooms. When analyzed as a whole, as teacher agreement increased, student assessment outcomes also increased. The analysis to explore whether some CO-ACT factors were more critical in distinguishing effective Co-teachers showed some subject areas had positive impact on predicting student assessment scores, when those subject areas were broken out. When math and science scores were analyzed with each individual factor, Factor I for math ($\beta = .606$) and Factor II for science ($\beta = 1.071$) revealed a pattern of increase in teacher

agreement in these factor areas that was associated with an increase in student academic outcomes.

With the exception of two contradictory relationships that presented statistically significant results, the remaining analyses did not present a statistically significant pattern of relationships. Specifically, unexpected results in Factor III for math ($\beta = -.510$) and Factor III for science ($\beta = -1.004$) indicated that as Co-teacher averages increased (i.e., their level of agreement of practices increased), student assessment scores showed a decrease. This appears to differ from the findings of Question Three, in which the total overall CO-ACT score of agreement in behaviors appeared to indicate that as agreement increased, student assessment scores also increased. The implications of these themes will be discussed further in Chapter V.

CHAPTER V

DISCUSSION AND SUMMARY

Purpose

The purpose of this study was to examine patterns related to quality of Co-teach implementation, as evidenced by Co-teacher responses to the Colorado Assessment of Co-teaching (CO-ACT) and by student academic outcomes. The CO-ACT examines quality of Co-teach partnerships through measurement of various factors linked to Co-teaching best practices, and provides a scoring system identifying partnerships as exemplary and non-exemplary. Student outcomes were measured through state and locally developed assessments that were aligned to the state adopted curriculum and administered during the spring of 2008. This study included five middle schools serving students grades 6-8 during 2007-08. Participants included middle school Co-teachers (n = 48) and students with disabilities (n = 162) served within the selected Co-teach classes. This study was designed to explore whether the quality of the Co-teach delivery at the middle school level, in core academic content areas, correlated to the academic performance of students with disabilities. Specifically, the purpose of this study was to answer the following research questions:

Research Question One. Does the CO-ACT instrument, as designed, predict student academic outcomes for students with disabilities within Co-teach classrooms?

Research Question Two. Are there some CO-ACT factors that are more critical in distinguishing effective Co-teachers, as measured by student academic outcomes?

Research Question Three. Is it important for teachers to be in agreement in their CO-ACT responses in order to achieve positive student academic outcomes?

Research Question Four. Are the findings from the first two research questions different across the following subject areas: Math, Reading, Science, and Social Studies?

The provisions of the No Child Left Behind Act (NCLB, 2001) very clearly emphasize implementing instructional practices based on scientific research for all students. In addition, the Individuals with Disabilities Education Improvement Act (IDEA, 2004) also places emphasis on using scientifically based instruction for students with disabilities. These mandates form the legal foundation for using evidence-based instruction. According to Wendling and Mather (2009), using evidence-based instruction ensures that “the program, methodology, and/or practice have records of success” (p. 3). Co-teaching is one instructional practice used to support students with disabilities within general education settings.

As reviewed in Chapters I and II, the literature is extensive regarding the components necessary for successful Co-teaching and stakeholder perceptions regarding effectiveness of the model. There is data to indicate that Co-teaching is evidence-based, but the emphasis is still on studies that measure the effectiveness of the practice based on stakeholder perceptions instead of student academic outcomes (Friend, Cook, Hurley-Chamberlain & Shamberger, 2010). Most of the studies used to support the effectiveness of Co-teaching use anecdotal data (Friend & Reising, 1993), and the research on it regarding its effectiveness for students with disabilities is inconclusive (Magiera & Zigmond, 2005). Therefore, this study focused on exploring the impact of the quality of

Co-teaching on predicting academic outcomes for students with disabilities. Using the Colorado Assessment of Co-teaching (CO-ACT) to determine quality of teacher implementation of Co-teach practices and student assessment scores, this study was designed to expand the Co-teach literature base and continue to inform the field as it analyzes the evidence base for Co-teaching.

Method

This study was conducted during the 2007-08 school year with Co-teachers and students enrolled in middle school Co-teach classes in grades 6-8. A convenience sample of the participating middle schools provided 162 students and 48 Co-teachers for this study. Selection and descriptive data of the middle schools and participants are provided in Chapter III. The study included all students with a disability who were eligible for special education services, enrolled in one of the identified Co-teach classes, and participated in either a state or local end-of-year assessment. Descriptive information on Co-teachers was obtained through completion of the CO-ACT. Descriptive and assessment score information for students was provided by the middle schools' local education agency. Comparative information for assessments (i.e., means and standard deviations) for the state and participating middle schools was collected from the Texas Education Agency (TEA) public assessment reports. Details regarding the method of the study can be found in Chapter III.

Research Results

Descriptive statistics were collected from Co-teachers and students and research questions were answered using parametric statistics. The CO-ACT was designed to

measure the presence of behaviors within a Co-teach setting that are reflected within the Co-teach literature as best practices; however, the exemplary or non-exemplary practices of participating Co-teachers did not appear to correlate with student academic outcomes in this study.

As with this study, other researchers have explored utilizing Co-teacher assessments as part of the process of determining efficacy of Co-teaching (Hang & Rabren, 2009), and as a way to determine whether there are relationships between Co-teacher ratings of their behaviors within Co-teach settings (Cramer & Nevin, 2006). This study differed slightly in its purpose from previous studies in that it attempted to utilize a Co-teacher assessment to explore whether it would predict student academic outcomes. As with previous studies this study explored identifying Co-teacher behaviors and analyzing student outcomes such as standardized test scores (Hang & Rabren, 2009); however, this study attempted to add the additional dimension of the predictive capabilities of an instrument. In addition, this study analyzed the effects of teacher agreement of practices, similar to some of the research questions of Hang and Rabren (2009) and Cramer and Nevin (2006).

Of the 11 analyses conducted in this study, three revealed statistically significant results that would indicate teacher practices as assessed by the CO-ACT were positively correlated to student assessment scores. First, the correlation between teacher agreement about the presence of best practices behaviors within their Co-teach classrooms indicated that as teacher agreement increased, student assessment outcomes also increased. Second, when exploring whether some CO-ACT factors were more critical in

distinguishing effective Co-teachers, the analysis of math with Factor I and science with Factor II revealed that teacher agreement in these factor areas was associated with an increase in student academic outcomes. The third statistically significant finding produced unexpected results. In Factor III for math and science, analysis indicated that as Co-teacher averages increased (i.e., their level of agreement of practices increased for Factor III), student assessment scores showed a decrease. The implications of these themes will be discussed further in this chapter.

Research Question One

Does the CO-ACT instrument, as designed, predict student academic outcomes for students with disabilities within Co-teach classrooms?

Research Question One was designed to explore whether the CO-ACT questionnaire, specifically Factors I-III, would serve as a predictor for academic outcomes for students with disabilities within a Co-teach classroom. Total partnership scores on Factors I-III revealed partnerships scoring in both the exemplary and non-exemplary range of Co-teach practices. The correlation analysis did not indicate that the average of total partnership scores on the CO-ACT were predictors of student assessment scores.

There are two factors which may have impacted findings that should be considered with the results obtained for Question One. First, the researcher determined exemplary and non-exemplary partnerships by averaging the total CO-ACT individual scores for each partner to obtain an average dyad score. This process was used by the researcher as there was no process identified with the CO-ACT to inform how to

determine an exemplary or non-exemplary partnership. The CO-ACT only provides scoring to identify how each individual perceives his or her presence of best practices.

In addition, these findings may have been influenced by the ability of the CO-ACT to accurately identify the best practices on which the instrument is based. While the CO-ACT developers obtained reliability with the instrument and demonstrated that it effectively discriminated between exemplary and non-exemplary partnerships, this was done using a “known group” process (Adams, 1993). In other words, the researchers had practitioners, such as administrators, identify exemplary and non-exemplary teams and then utilized the identified teams to determine reliability and validity. The researcher was not able to locate any studies that indicated the CO-ACT had gone through any additional research to confirm that it is in fact useful in identifying best practices within a wide range of Co-teach teams. For example, increased confidence in the CO-ACT’s ability to accurately identify partnerships as exemplary or non-exemplary would increase if the CO-ACT was administered to a variety of partnerships of unknown quality and then responses were paired with fidelity observations that contained high inter-rater reliability by those trained in Co-teaching best practices.

As stated previously, the CO-ACT was originally designed to identify the extent to which Co-teachers implemented Co-teaching best practices. The intent of the questionnaire was not to serve as a predictor of student academic outcomes. Perhaps it was faulty to assume that this questionnaire, in addition to identifying best practices, could also predict student academic outcomes. However, an instrument with that ability does have practical value, and researchers might consider creating a new instrument with

the purpose of predicting student academic outcomes using the CO-ACT as a baseline for determining the quality of Co-teach partnerships.

Continued exploration of the CO-ACT instrument, would prove valuable to the field. Tools to identify non-exemplary practices, which correlate to student academic outcomes, especially early in implementation, could provide an opportunity for professional development and a change in teacher practices. As an example, administrators could use such a tool for guidance in identifying partnerships that need assistance. Administrators are frequently cited as “individuals who have the power to put into place the conditions that are necessary for Co-teaching to have a positive impact on student learning” (Friend, 2008a, p. 16). Limited administrator knowledge of Co-teaching practices will prevent Co-teaching from progressing (Friend, 2008a). If an administrator lacks knowledge of best practices, how can he or she assist in identifying areas that need improvement in order to provide targeted support? It is likely in many cases now that the quality of practices is not identified, and that students remain in settings where fidelity of implementation of Co-teaching practices does not occur and thus receive less than full instructional benefits.

Research Question Two

Are there some CO-ACT factors that are more critical in distinguishing effective Co-teachers, as measured by student academic outcomes?

Multiple regression analysis was used to answer Research Question Two. The partnership averages of each CO-ACT factor were the three predictor variables, and student assessment scores were the outcome variables. The analysis indicated that no

single CO-ACT factor was more critical in predicting student academic outcomes. In fact, results revealed that as Co-teach partner scores increased (i.e., responses indicating presence of exemplary practices were occurring) the strength of the prediction of Factors I and II for student academic outcomes actually decreased.

Factor I of the CO-ACT measures the personal prerequisites necessary within a Co-teach partnership. Factor I questions address the skills and characteristics each teacher brings to the partnership. These skills include “teaching style, knowledge specific to your discipline or subject, and your contribution to the classroom” (Adams, Cessna, & Friend, 1993, p. 11). Factor II addresses the professional relationship behaviors between Co-teach partners. These behaviors describe the “collaborative interaction of the Co-teachers, the ability to work toward a shared goal and the extent to which key decisions are shared, and accountability for those decisions” (Adams, Cessna, & Friend, 1993, p. 11).

The results for Question Two complement those for Question One. As with Question One, these results may be impacted by the fact that the original design of the CO-ACT was only meant to identify exemplary and non-exemplary Co-teach practices between Co-teach partners; the CO-ACT is a paper-pencil self-report measure; and the study design relied upon the assumption that the CO-ACT accurately identified Co-teach practices. Perhaps this influenced the unusual finding with Factors I and II. There does not appear to be a clear reason why, as Co-teach partner averages increased (i.e., as they identified implementation of higher levels of exemplary practices within their partnership), the strength of prediction of academic outcomes decreased. It appears that

no matter how the data is analyzed, the CO-ACT is consistently poor in predicting student academic outcomes.

However, as mentioned previously, an instrument that could serve a dual purpose would be beneficial to the field. In addition, if further study was conducted to explore the predictive strength of the individual factors, perhaps researchers could identify one factor that is more predictive of academic outcomes. The practical significance of pursuing this research would be to improve efficiency and effectiveness of partnership training. If researchers are able to determine certain factors that are stronger predictors of academic outcomes, then administrators and Co-teachers could prioritize skills within partnerships and provide targeted training and support in those areas as Co-teachers continue to build the overall strength of their partnership. As with other Co-teach research (Cramer & Nevin, 2006; Friend, et al., 2010) this study continues to support the need for targeted training and support. Time and resources are limited within school settings, and the more that specific skills can be identified for intervention and/or continual improvement, the more resources can be efficiently allocated.

Research Question Three

Is it important for teachers to be in agreement in their CO-ACT responses in order to achieve positive student academic outcomes?

A correlation analysis between Co-teacher agreement regarding presence of behaviors within their Co-teach partnership and student assessment scores indicated a statistically significant relationship between the two variables. As teachers became closer in agreement regarding the presence of practices within their partnership, then

generally student assessment scores were higher. Although the effect size indicates that an increase in Co-teacher agreement of practices would only improve prediction on average by 2.4%, this finding may have some practical significance. It would seem to indicate that this agreement between Co-teachers would play a role in predicting positive student academic outcomes. In other words, regardless of whether or not a partnership agreed (according to their CO-ACT responses) that they were implementing exemplary or non-exemplary practices, the CO-ACT prediction of positive student academic outcomes slightly improved. According to the average of their total CO-ACT responses on Factors I-III, of the 24 partnerships, 7 scored in the exemplary range and 17 scored in the non-exemplary range.

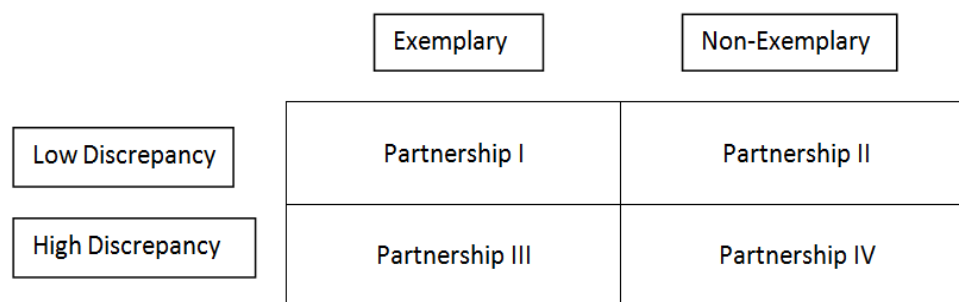
This finding supports the current literature that emphasizes the importance for Co-teachers to understand their roles and responsibilities within Co-teach partnerships (Dieker, 2001; Fennick & Liddy, 2001; Hang & Rabren, 2009). Hang and Rabren (2009) found that general and special education Co-teachers both believed, according to a self-report survey, that they were primarily responsible for managing student's behavior. This lack of understanding of roles and responsibilities likely impacts study findings, and as with this study, indicates that additional research regarding importance of teacher agreement regarding practices is warranted.

The results indicating that even as partners agreed they were implementing non-exemplary practices, prediction of positive student academic outcomes increased was unusual. It seems intuitive that if partners agreed they were implementing non-exemplary practices, that there would not be a correlation to positive student academic

outcomes. Some possible explanations for this finding might include the influence of other instructional factors which were not assessed. Perhaps students were engaged in other instructional interventions outside of the Co-teach classroom that impacted their progress within the Co-teach setting or perhaps the strength of the instructional delivery of one teacher was enough that the implementation of the Co-teach model was not a factor in student achievement.

Another possible influence might have been the decision to average scores to determine exemplary or non-exemplary partnerships and the inability of the researcher to take the degree of agreement into account during analysis. As described in Chapter III, the CO-ACT scoring system provided neither a process for determining the overall quality of the partnership nor guidance on whether discrepancies between partners were a consideration during scoring. Due to the decision to average scores, and the unknown impact of degree of discrepancy, further research would need to analyze four possible types of partnerships (See Figure 5.1). Within this study it would be possible to have partnerships that were exemplary with a low discrepancy between Co-teachers, partners who were exemplary with a high discrepancy and partnerships who were non-exemplary with a low discrepancy between Co-teachers and partners who were non-exemplary with a high discrepancy. The researcher was unable to determine to what extent these conditions occurred as, without further analysis regarding the CO-ACT instrument, it was not possible to determine the cut-off points that would determine the type of partnership. Further study would need to occur to determine whether these issues would influence the results obtained for Question Three.

Figure 5.1 Possible Types of Co-teach Partnerships



A critical factor in obtaining meaningful results for Research Question Three, and all the research questions, is a clear and consistent understanding of the practices described within the CO-ACT and what they look like during implementation. If Co-teachers are unclear and/or vary in their interpretation of the practices, this could result in great variability within the findings. For Question Three, this may have influenced results; since the question relied on analysis of discrepancy of practices, it would be imperative that Co-teachers be able to accurately identify and rate their practices. If two Co-teachers have different understandings of how these practices are implemented, this might impact their degree of agreement. In other words, if a Co-teacher does not understand the fundamental meaning of each of the practices, how could he or she appropriately rate their presence within the partnership? In addition, the degree to which Co-teachers were critical of their practices might cause variability. For example, perhaps the 17 partnerships that considered their implementation non-exemplary rated themselves more critically than those that rated themselves exemplary. Or perhaps the 7 partnerships that considered their implementation exemplary rated themselves less critically than those that rated themselves non-exemplary. If this situation occurred then

results would certainly be impacted, as it adds to variability of the predictor variables. Perhaps Co-teachers are fundamentally unable to accurately agree on what is occurring within their classrooms. A practical implication of this theme would be the importance of training and coaching of Co-teachers regarding implementation of best practices. Co-teachers need to see modeling of best practices, and then be observed and given feedback regarding their implementation of these practices. This finding continues to support the research base on Co-teaching that highlights the continuous need for professional development regarding Co-teaching (Cramer & Nevin, 2006; Friend et al., 2010).

Research Question Four

Are the findings from the first two research questions different across the following subject areas: Math, Reading, Science, and Social Studies?

Answering Research Question Four requires reference to Research Questions One and Two. In relation to Question One, analysis was conducted to determine whether the total partnership scores on the CO-ACT would predict student outcomes if analyzed by each core content area (Math, Reading, Science, and Social Studies). Taking into account that the assumption was made that this self-report instrument accurately identified best practices, results indicated that total partnership scores on the CO-ACT did not serve as useful predictors of student assessment scores when analyzed by subject area. This finding was consistent with the original analysis of Questions One. CO-ACT scores did not predict student assessment scores when those scores were correlated to

the CO-ACT as an aggregate of all content areas (Question One); nor was there a correlation when the assessment variable was subdivided into its four content areas.

This finding may have been due to the same limitations associated with Research Question One. In addition, the decision to average scores to determine partnership status as exemplary or non-exemplary and the possibility that the CO-ACT was not able to accurately discriminate between exemplary and non-exemplary Co-teach partnerships may have influenced these findings.

Answering Question Four also required exploring the results of Question Two by content area. The individual factor average dyad scores were used as the three predictor variables and regression analysis was applied using the student assessment scores as the outcome variable, and analyzed individually by subject area.

For math assessment scores, the three factors as a group did improve prediction of students' assessment outcomes by approximately 19.4%. When analyzed individually, Factors I and III were statistically significant while Factor II was not. For reading assessment scores, the three factors as a group did not improve prediction of students' assessment outcomes. Individually, there was not a relationship between any of the three factors with assessment outcomes for reading. For science assessment scores, the three factors as a group did improve prediction of students' assessment outcomes. As a total, it would improve prediction by a total of 30.4%. Individually, Factors II and III were statistically significant while Factor I was not. For social studies assessment scores, the three factors as a group did improve prediction of students' assessment outcomes by a

slight amount of 5.3%. There was not a statistically significant relationship between any of the individual factors with assessment outcomes for social studies.

It appears that there may be potential for further exploration with the CO-ACT and prediction of student academic outcomes when factors are analyzed individually by subject area. Specifically, the CO-ACT appears to provide the strongest prediction of student academic outcomes in math and science.

Math and Science

In order to further explore the possible reason for the strong prediction of Math and Science scores, the researcher looked at the number of exemplary and non-exemplary partnerships within the subjects. Perhaps most of the exemplary or non-exemplary partnerships were within these two subject areas and therefore influenced the predictive ability of the CO-ACT. Upon review, there were three exemplary and four non-exemplary math partnerships. There was one exemplary and three non-exemplary science partnerships. This made up a total of 11 partnerships within math and science out of the 24 total partnerships within the study. Table 5.1 shows the number of exemplary and non-exemplary partnerships per subject area. There did not appear to be an obvious pattern regarding the number of partnerships within these subject areas; therefore, follow up study may be appropriate as these findings may be due to other factors.

Other factors, consistent with current research, that may have influenced the findings for Math and Science might include the following: student and Co-teacher sample size (Adams & Cessna, 1993; Austin, 2001; Boudah et al., 1997; Dieker, 2001;

Gibb et al., 1998; Meyers et al., 1991; Salend et al., 1997), individual teacher quality, level of teacher preparation (Adams & Cessna, 1993), staff development opportunities in both Co-teaching and/or general best practices of instruction, quality of curriculum, and the influence of any other instructional interventions within these content areas that may have been delivered outside of these classrooms.

Table 5.1

Number of Exemplary and Non-Exemplary Partnerships by Subject Area

| | Exemplary (n = 7) | Non-Exemplary (n = 17) |
|----------------|----------------------|---------------------------|
| Math | 3 | 4 |
| Reading | 2 | 5 |
| Science | 1 | 3 |
| Social Studies | 1 | 5 |

There may also be a theme emerging with in math and science related to Factor III. Factor III addresses skills related to classroom dynamics. Adams, Cessna, & Friend (1993) describe classroom dynamics as “the beliefs and actions that give added benefit to the Co-taught classroom. These include your perceptions of how teaching and learning occur, your knowledge of the academic and social curriculum and the range of individualizing strategies you use” (p. 11). The items in Factor III address the following

Co-teacher practices: differentiating instructional strategies and assessments; making continual adjustments and believing they are necessary to meet individual needs; using a variety of motivational techniques; using a variety of response to diversity; having a shared philosophy about learning and teaching; using a curriculum that includes social-emotional skills; and believing that Co-teaching is worth the effort. There are two practices within Factor III that are specifically associated with the special education Co-teacher: “the special educator has skills to develop and adapt curricula to meet unique student needs,” and “the special educator has skills to suggest instructional strategies to meet unique student needs” (Adams, Cessna, & Friend, 1993, p. 6). None of the other factors mention specific curriculum and instructional strategy skills related to the special education Co-teacher. Factor I has two statements related to the curriculum knowledge and skills of the general education teacher, and it was a statistically significant predictor of student academic outcomes in math. It is worth noting that the two factors that obtained statistically significant results are the two that contain direct statements related to curriculum and instruction skills and strategies.

Perhaps the special educator’s ability to suggest strategies and adapt curricula to meet student needs is a component necessary within a Co-teach class, not only for successful academic outcomes for students, but also because this can add to the strength of prediction of student academic outcomes. This finding is particularly interesting as these skills associated with the special educator are consistent with the literature regarding the expertise that the special educator should bring to the partnership (Friend, 2008a). This assumption makes obvious intuitive sense, but within the context of this

research it may present a theme worth exploring should the CO-ACT be further studied as a means to better predict student academic outcomes.

Social Studies and Reading

The prediction of academic outcomes for social studies improved by approximately 5.3%, and there was not a statistically significant predication of academic outcomes within reading. These findings may have also been impacted by the same factors that were mentioned for math and science. In addition to the previous influencing factors, in an attempt to determine why a smaller effect size was found for social studies and no significant effect size for reading, the researcher reviewed the number of exemplary and non-exemplary partnerships within these two content areas and the number of students within the sample size for these subject areas. No significant pattern emerged within these two areas. The total number of partnerships within these two content areas was 13 compared to 11 partnerships within math and science and the total number of students within these two content areas was 78 compared to 84 students in math and science (see Table 3.4).

Research Summary

Overall it appears that the CO-ACT would not serve as an effective tool in predicting student academic outcomes within Co-teach classrooms. While there were some interesting themes that emerged (such as the prediction strength of the CO-ACT when analyzed by factor and subject area, as within Research Question Four in math and science), the CO-ACT would not be a useful tool for predicting student academic outcomes. The continued use of the CO-ACT as a tool for measuring implementation of

exemplary or non-exemplary practices would be valuable to the field. Measuring Co-teacher implementation of best practices is certainly necessary in ensuring that students within a Co-teach classroom receive effective instruction.

In addition, this study revealed an important consideration that must be taken into account should further research be done in designing an instrument that would predict student academic outcomes within Co-teach classrooms. Co-teachers must fundamentally understand the theoretical and practical meaning of the practices described within the CO-ACT. This concept is vital and consistently reiterated within the literature both from the standpoint that “misunderstandings can negatively affect program success” (Friend et al., 2010, p. 15), and from research findings that indicate continued confusion regarding practices occurring within the Co-teach classroom (Cramer & Nevin, 2006; Hang & Rabren, 2009). The confounding results obtained during analysis of Research Question Three justify this assertion. Revising the CO-ACT with research grounded in accurate responses from Co-teachers regarding their practice would mean that greater confidence could be placed in the CO-ACT results. In other words, if there is agreement on practices within the classroom, that agreement should be as accurate as possible. Training prior to having teachers complete the CO-ACT regarding the theoretical and practical meaning of their behaviors might increase confidence in CO-ACT results and inform the revision process. Perhaps systematic training and continual professional development regarding effective Co-teach practices would improve quality of Co-teaching and student academic outcomes. If quality practices were implemented and student progress measured to determine whether Co-

teaching is in fact a model that improves academic outcomes, then there might not be a need to create an instrument with predictive capabilities.

One of the study's most troubling findings was that of the 24 partnerships, 17 obtained average dyad scores within the range of non-exemplary practices (See Table 5.1). These 17 partnerships had 118 of the 162 student participants enrolled within their classrooms, and spanned all five of the participating campuses. Thus, of the students with disabilities enrolled in Co-teach classes, 73% obtained instruction within partnerships that identified themselves as not implementing exemplary practices. It would appear that a tool to allow administrators to identify quality of Co-teach practices and link those practices to student academic outcomes should be a priority. Another alarming aspect of this finding is that the vast majority of these partnerships had been together for a minimum of one school year and their students had been enrolled in these classes for a minimum of seven months. While the reasons these situations were allowed to continue for an entire school year are outside the scope of this study, the findings indicate more attention must be given to the practice of Co-teaching and to designing systems and tools that will quantitatively measure the quality of implementation and the effectiveness of this practice for students with disabilities. Finally, since the majority of partnerships within the study reported implementation of non-exemplary practices, this may further support the previously noted possibility that something other than the quality of Co-teaching is accounting for those instances in which student academic outcomes increased in the presence of non-exemplary practices. Since most of the partnerships were non-exemplary, something else such as influences of other

instructional interventions, strength of instructional practices despite Co-teaching model and/or individual characteristics of students is probably accounting for the achievement of the students.

Research Limitations

Some of the influencing factors that may have impacted study results and have influenced the general body of Co-teach research are the following: the influence of covariates; the small sample size (Adams & Cessna, 1993; Austin, 2001; Boudah et al., 1997; Dieker, 2001; Gibb et al., 1998; Meyers et al., 1991; Salend et al., 1997); the lack of partnership training (not only in Co-teaching practices, but also regarding the meaning of CO-ACT behaviors); the training of Co-teach partners (Adams & Cessna, 1993); the length of Co-teach partnerships; the use of only one academic outcome variable; the non-random assignment of students and pairing of partnerships (Welch, 2000; Zigmond & Magiera, 2001); the decision to average dyad scores to make determinations regarding exemplary versus non-exemplary partnerships; reliance on a paper/pencil self-report questionnaire (Austin, 2001; Dieker, 2001; Gibb et al., 1998; Murawski & Swanson, 2001; Rice & Zigmond, 1999; Salend et al., 1997; Trent, 1998); and the lack of an implementation check to inform the fidelity of participant responses. Any of these limitations may have influenced the results obtained in this study. These influencing factors will be further discussed in this section.

Influence of Covariates

As discussed in Chapter III, covariates were only collected to provide descriptive information regarding the teacher and student samples. The use of covariates can

“dramatically increase statistical power...by decreasing variation among clusters and within clusters” (Hedges & Rhoads, p. 12). In this study covariates were used neither for student achievement nor for Co-teach partners; therefore, it is possible that the exclusion of important covariates might have significantly and meaningfully changed the results obtained regarding the predictive ability of the CO-ACT.

Sample Size

A convenience sample was used to determine the teacher partnerships ($n = 24$) for this study. Once teacher partnerships were determined, all students with disabilities in these teachers' classes were eligible for the study. The final student sample was 162 participants. Table 4.11 in Chapter IV shows the number of participants per subject area. The average number of participants per subject area was 40.5. The average number of participants within each partnership was 6.75. The analyses that disaggregated by content area could have been impacted by the small sample sizes within the subject areas. Similarly, the small sample sizes per partnerships also could have impacted results. Small sample sizes can result in higher p-values (Whitley & Ball, 2002). According to Whitley and Ball (2002), “...the *P* value determines how likely it is that the observed effect in the sample is due to chance” (p. 335). In other words, it is the “probability of correctly identifying a difference between the two groups in the study sample when one genuinely exists in the populations from which the samples were drawn” (p. 335). This limitation is particularly applicable within this study, as the small sample sizes may result in the conclusion that there is no difference between the groups,

when in fact the sample size may simply be too small to correctly identify any differences (Whitley & Ball, 2002).

Partnership Training and Experience

The variations in extent of teaching and Co-teaching experience, type of certification preparation, Co-teach training, length of partnership, and expertise within the classroom may have limited this study. Tables 3.4 and 3.6–3.8 in Chapter III summarize Co-teachers' responses to these areas. The variations that these characteristics may have caused were not controllable by the researcher, and could have impacted study results.

Student Academic Outcome

This study utilized a single measure given once during the school year to examine academic outcomes. An academic outcome measure that is a one-time high-stakes assessment, such as the TAKS, TAKS-Accommodated, or TAKS-Modified, may not be the most effective measure of student performance. Students may or may not have met standards or exceeded them based on other factors associated with a one-time assessment that were unrelated to the quality of Co-teacher practices.

Student and Teacher Assignments to Co-teach Classes

This study was limited by the inability to randomly assign teachers to Co-teacher partnerships and students to Co-teach classes. According to Welch (2000), the non-random nature of student assignments is similar to other research conducted in authentic settings. The non-random assignment of students also presents a limitation in that it is difficult to control the influence of factors that might occur by virtue of a student being

enrolled in multiple Co-teach classes for multiple subjects. While this study only counted each student once within a Co-teach subject area, the fact is that many were enrolled in multiple Co-teach classes. The academic benefits or barriers related to student learning within other Co-teach assignments add further variability within this study. Additionally, this study was not able to control for the appropriateness of student placement within a Co-teach setting. Differences among students with disabilities (i.e., type and severity of disability) assigned to a Co-teach class was outside the control of the researcher, as this is an individual determination made by each student's Individual Education Plan (IEP) committee and dependent upon scheduling practices at each campus.

Scoring Decision to Determine Quality of Partnership

The decision to average dyad scores to make determinations regarding exemplary versus non-exemplary partnerships may have added variability to the results of this study. Taking the average of the two Co-teacher scores on the CO-ACT may have influenced their rating as exemplary or non-exemplary. For example, if one partner rated the partnership particularly high and individually would be exemplary, and the other partner rated in the non-exemplary range, a higher average by the exemplary rating Co-teacher may have skewed the partnership into exemplary range when in fact this might not have been the most appropriate rating for that partnership. The same impact could have happened in the reverse (i.e. a very low non-exemplary score by one partner could have skewed the partnership to non-exemplary even if the other partner rated in the

exemplary range). Without guidance and/or development of a process to ensure accurate ratings, there is the possibility that this procedures impacted results.

Fidelity of Responses

As with other studies, the Co-teach settings was not observed to determine the integrity of the partnership delivery of the Co-teach model (Welch, 2000). The researcher was unable to confirm the accuracy and/or reasonableness of teacher responses with any other evidence. The CO-ACT questionnaire statements represent the best practices of Co-teaching. Teacher differences in knowledge of best practices of the Co-teach model may have impacted responses to CO-ACT, as well as teacher interpretation of how to implement those practices. In addition, the data derived from the CO-ACT is self-report data. While it yields quantitative measures that can be analyzed, the quality of that data is still reliant on teacher perception of their implementation of Co-teaching practices.

Use of Various Co-teach Models

As mentioned in Chapter II, there are five different models of Co-teaching, each with its own purpose, strengths, and weaknesses. The various models allow teachers to change instructional groupings based on student needs. Two strengths of several models (station teaching, parallel teaching, and alternative teaching) mentioned within the literature are that they allow increased instructional intensity and lower the teacher-to-student ratio (Cook & Friend, 1995). While the specific type of Co-teach model utilized by Co-teachers was not identified as part of this study and is not specifically addressed within the CO-ACT, teachers are asked to respond to the statement, “Co-teachers vary

student grouping arrangements to foster student learning” (Adams, Cessna, & Friend, 1993, p. 2). The implementation of a specific model may have had an impact on student achievement. The use of various models was beyond the control of the researcher, and may have added variability to student achievement scores.

Recommendations

As a result of this study, there are several recommendations that school districts and campuses should consider regarding Co-teaching and student academic outcomes. Administrators and Co-teachers must engage in high-quality meaningful professional development regarding the theoretical and practical behaviors and practices necessary to deliver quality Co-teaching. Training should be provided prior to Co-teaching and then continually, as long as Co-teaching is an adopted practice in a district and/or campus.

In addition to training, administrators and Co-teachers should engage in direct classroom observations that result in critical analysis of the implementation of Co-teach practices, based on the best practices identified within the literature. Teacher training and observations with constructive feedback will support the fidelity of Co-teaching implementation. Training and systematic observations are two strategies that might reduce the potential for Co-teachers to continue using non-exemplary practices throughout an entire school year, as likely occurred in this study, based on the responses from 17 of the study’s 24 Co-teach partnerships.

Districts and campuses must critically analyze what happens within Co-teach classes in terms of quality and student academic outcomes. It is necessary to closely monitor student progress over time. Districts and campuses should not assume that

students are or are not deriving benefits or making progress based only on anecdotal evidence. Teacher perception data should not be the sole basis for measuring quality of practices. Districts and campuses should obtain specific student quantitative data and critically analyze it in relation to teacher practices.

In terms of the CO-ACT, it would appear that it would continue to be useful as a mechanism for prompting dialogue between Co-teach partners regarding their perceptions of practices occurring within their classrooms. However, additional measures such as classroom observations should be used in tandem with the CO-ACT to ensure fidelity of the Co-teachers' self-report regarding their perceptions of implementation. In addition to measuring the overall quality of the partnership, focus should also be placed upon analysis of the discrepancy between Co-teacher agreement regarding practices within their classrooms.

Areas for Future Research

Several recommendations for future research that may be valuable to the field can be drawn from this study's conclusions. This study can serve as a baseline for the CO-ACT and its ability to predict student academic outcomes. Results may be built upon as the field continues to explore the relationship between quality of Co-teaching and student academic outcomes.

An important contribution of this study is that it used an instrument to predict student academic outcomes within middle school Co-teach classes. Research has suggested that Co-teaching has been adopted with little quantitative research to back it up (Scruggs, Mastropieri, & McDuffie, 2007). Future research should attempt to develop

and/or refine instruments that will inform practice by quantitatively identifying quality of Co-teach practices and associating those instruments with prediction of student academic outcomes. Research designed to compare CO-ACT scores with observations of teaching to determine whether Co-teachers can accurately identify best practices within their classrooms would provide insight into what they really understand about those practices and behaviors.

A reasonable amount of research has been conducted on Co-teaching and students with disabilities, due to the emphasis on outcome-based educational practices. However, it is necessary to develop tools that assist in identifying quality practices and predicting whether their implementation will produce positive academic outcomes. Future research should explore the development of these tools and/or revisions of current tools available to the field.

Several authors (Cook & Friend, 1995; Vaughn, Schumm, & Arguelles, 1997; Walther-Thomas et al., 2000) have asserted that the instruction provided to students in Co-taught classes allows for a wider range of grouping options and for increased intensity of instruction. However, considerable research is still needed that shows that these benefits actually equate to improved student academic outcomes. Friend & Hurley-Chamberlain (n.d.) agree with the need for further research regarding Co-teaching and academic outcomes for students. Specifically, Friend & Hurley-Chamberlain state that “the missing piece in Co-teaching concerns academic and other outcomes for students” (Lack of Evidence on Co-teaching’s Effectiveness, section, para. 2). Fundamentally, this

study highlights the continued need to explore an essential question regarding Co-teaching: does Co-teaching improve student academic outcomes?

One theme in this study was Co-teacher confusion and lack of agreement between regarding the presence of practices within their classrooms. Future research might explore a more standardized definition of the six Co-teaching models and the discrete teacher behaviors involved with Co-teaching. The research should attempt to operationalize these behaviors, which may allow teachers to better evaluate their practices and provide observers with clear criteria for providing feedback. Additional research analyzing the progress of students within the six Co-teach methodologies (one-teach and one-assist, station, parallel, alternative, one-teach and one observe, and team-teaching) (Hang & Rabren, 2009) would provide valuable evidence regarding the correlations between student achievement levels and quality of Co-teaching.

Research designs that combine analysis of the quality of Co-teaching and the collection and evaluation of data from a variety of assessments, including pre- and post-test designs, benchmark assessments, and IEP goals and objectives may provide valuable information regarding student achievement. This recommendation is supported by current work in the field (Cramer & Nevin, 2006; Hang & Rabren, 2009) as well as findings from this study.

Finally, the information in this study can serve as a baseline for the CO-ACT. Additional research on how to combine the individual scores, other than use of averages of the partners, to establish a total dyad score identifying exemplary or non-exemplary practices would be useful. The identification of individual perceptions regarding

partnership practices is helpful to prompt dialogue between partners regarding their Co-teach implementation (Cramer & Nevin, 2006); however, Co-teaching relies upon the complex interactions of both teachers. Therefore, developing a way to measure the combined partnership effect on student academic outcomes seems necessary.

While the design of this study contains several limitations, the study itself is expected to provide valuable information to the growing body of research on Co-teaching and practical implications for implementation of the Co-teach model for school practitioners. As mentioned in the literature review, there is limited research on the effectiveness of Co-teaching for students with disabilities enrolled in grades 6-8, and little research linking the model to specific quantitative academic outcomes. Therefore, this study adds additional insight related to the effectiveness of Co-teaching. Finally, the findings of this study will aid practitioners as they plan for and implement Co-teach models at the middle school level.

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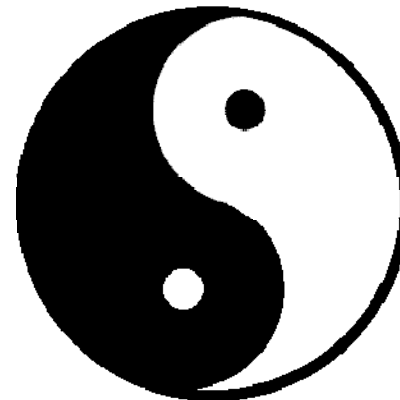
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APPENDIX

Colorado Assessment of Co-teaching (CO-ACT)



Developed by
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© September 1993

**Colorado
Assessment of
Co-teaching
(CO-ACT)**



Co-teaching occurs when two educators jointly deliver instruction to a group of students, primarily in one classroom. One form of Co-teaching happens when general and special educators teach in a classroom that includes some students who have identified disabilities.

This instrument is designed to help you understand the critical components of successful general-special education Co-teaching. The items included have been found to differentiate exemplary from other Co-teaching teams.¹

If you are a Co-teaching novice, responding to this questionnaire will help you prepare for your new role and responsibilities. If you are a veteran Co-teacher, you may use this to reflect on and refine your skills. Co-teaching partners will find it especially helpful to discuss their responses.

¹We wish to acknowledge the Co-teachers in Colorado who participated in the research that led to the development of this instrument.

Analyzing Your Co-teaching

FACTOR I

SD=Strongly Disagree

D=Disagree

N=Neutral

A=Agree

SA=Strongly Agree

1. Co-teachers are willing to share their knowledge and skills with each other.
2. Co-teachers monitor student progress on a regular basis.
3. Co-teachers monitor student progress in all areas of the curriculum.
4. The classroom teacher has skills to teach the curriculum effectively.
5. Co-teachers regularly assess what's working and what isn't.
6. Co-teachers are confident of their skills as individual teachers.

How much do you agree that that each factor describes your co-Co-teaching situation?

| | SD | D | N | A | SA |
|---|----|---|---|---|----|
| 1 | 1 | 2 | 3 | 4 | 5 |
| 2 | 1 | 2 | 3 | 4 | 5 |
| 3 | 1 | 2 | 3 | 4 | 5 |
| 4 | 1 | 2 | 3 | 4 | 5 |
| 5 | 1 | 2 | 3 | 4 | 5 |
| 6 | 1 | 2 | 3 | 4 | 5 |

How much do you agree each factor is important in Co-teaching?

| | SD | D | N | A | SA |
|---|----|---|---|---|----|
| 1 | 2 | 3 | 4 | 5 | |
| 2 | 1 | 2 | 3 | 4 | 5 |
| 3 | 1 | 2 | 3 | 4 | 5 |
| 4 | 1 | 2 | 3 | 4 | 5 |
| 5 | 1 | 2 | 3 | 4 | 5 |
| 6 | 1 | 2 | 3 | 4 | 5 |

FACTOR I

How much do you agree that that each factor describes your co-teaching situation?

How much do you agree each factor is important in Co-teaching?

7. Co-teachers are competent problem solvers.

| | SD | D | N | A | SA |
|----|----|---|---|---|----|
| 7 | 1 | 2 | 3 | 4 | 5 |
| 8 | 1 | 2 | 3 | 4 | 5 |
| 9 | 1 | 2 | 3 | 4 | 5 |
| 10 | 1 | 2 | 3 | 4 | 5 |
| 11 | 1 | 2 | 3 | 4 | 5 |
| 12 | 1 | 2 | 3 | 4 | 5 |

| | SD | D | N | A | SA |
|----|----|---|---|---|----|
| 7 | 1 | 2 | 3 | 4 | 5 |
| 8 | 1 | 2 | 3 | 4 | 5 |
| 9 | 1 | 2 | 3 | 4 | 5 |
| 10 | 1 | 2 | 3 | 4 | 5 |
| 11 | 1 | 2 | 3 | 4 | 5 |
| 12 | 1 | 2 | 3 | 4 | 5 |

8. One of the strengths of the classroom teacher is knowledge of the curriculum.

9. Co-teachers make a commitment to deliberately build and maintain their professional relationship.

10. Co-teachers each have a distinct but essential purpose in the Co-taught class.

11. Co-teachers make a unique contribution based on, but not limited by, their professional expertise.

12. Co-teachers vary student grouping arrangements to foster student learning.

FACTOR I

How much do you agree that that each factor describes your co-teaching situation?

How much do you agree each factor is important in Co-teaching?

13. Students in a Co-taught class receive help and structure to complete assessments.

| | SD | D | N | A | SA |
|----|----|---|---|---|----|
| 13 | 1 | 2 | 3 | 4 | 5 |
| 14 | 1 | 2 | 3 | 4 | 5 |
| 15 | 1 | 2 | 3 | 4 | 5 |

| | SD | D | N | A | SA |
|---|----|---|---|---|----|
| 1 | 2 | 3 | 4 | 5 | |
| 1 | 2 | 3 | 4 | 5 | |
| 1 | 2 | 3 | 4 | 5 | |

14. Co-teachers model effective communication.

15. Co-teachers model cooperation.

FACTOR II

16. Co-teachers are able to release some control to their Co-teacher.

17. Co-teachers are equally responsible for what happens in the classroom.

18. Co-teachers make important decisions together.

19. Co-teachers carry their part of the workload.

20. During a lesson, Co-teachers can sense the other's thoughts and direction.

How much do you agree that
that each factor describes your co-
teaching situation?

| | SD | D | N | A | SA |
|----|----|---|---|---|----|
| 16 | 1 | 2 | 3 | 4 | 5 |
| 17 | 1 | 2 | 3 | 4 | 5 |
| 18 | 1 | 2 | 3 | 4 | 5 |
| 19 | 1 | 2 | 3 | 4 | 5 |
| 20 | 1 | 2 | 3 | 4 | 5 |

How much do you agree
each factor is important in
Co-teaching?

| | SD | D | N | A | SA |
|---|----|---|---|---|----|
| 1 | 2 | 3 | 4 | 5 | |
| 1 | 2 | 3 | 4 | 5 | |
| 1 | 2 | 3 | 4 | 5 | |
| 1 | 2 | 3 | 4 | 5 | |
| 1 | 2 | 3 | 4 | 5 | |

FACTOR II

How much do you agree that that each factor describes your co-teaching situation?

How much do you agree each factor is important in Co-teaching?

21. Co-teachers share the gentle and the tough roles.

| | SD | D | N | A | SA |
|----|----|---|---|---|----|
| 21 | 1 | 2 | 3 | 4 | 5 |
| 22 | 1 | 2 | 3 | 4 | 5 |
| 23 | 1 | 2 | 3 | 4 | 5 |
| 24 | 1 | 2 | 3 | 4 | 5 |

| | SD | D | N | A | SA |
|---|----|---|---|---|----|
| 1 | 2 | 3 | 4 | 5 | |
| 1 | 2 | 3 | 4 | 5 | |
| 1 | 2 | 3 | 4 | 5 | |
| 1 | 2 | 3 | 4 | 5 | |

22. One Co-teacher can pick up where the other leaves off.

23. Co-teachers monitor on-task behavior during instruction.

24. Co-teachers are organized.

FACTOR III

25. Co-teachers switch instructional strategies when necessary.

26. Co-teachers make continual adjustments to ensure student success.

27. Co-teachers modify assessment tools and procedures as needed.

28. Co-teachers use a variety of techniques to motivate students.

29. In a Co-taught class, students may be working on the same goal, but they may demonstrate their accomplishment in different ways.

How much do you agree that that each factor describes your co-teaching situation?

| | SD | D | N | A | SA |
|----|----|---|---|---|----|
| 25 | 1 | 2 | 3 | 4 | 5 |
| 26 | 1 | 2 | 3 | 4 | 5 |
| 27 | 1 | 2 | 3 | 4 | 5 |
| 28 | 1 | 2 | 3 | 4 | 5 |
| 29 | 1 | 2 | 3 | 4 | 5 |

How much do you agree each factor is important in Co-teaching?

| | SD | D | N | A | SA |
|---|----|---|---|---|----|
| 1 | 2 | 3 | 4 | 5 | |
| 1 | 2 | 3 | 4 | 5 | |
| 1 | 2 | 3 | 4 | 5 | |
| 1 | 2 | 3 | 4 | 5 | |
| 1 | 2 | 3 | 4 | 5 | |

FACTOR III

How much do you agree that that each factor describes your co-teaching situation?

How much do you agree each factor is important in Co-teaching?

30. The curriculum in a Co-taught class includes social-emotional skills.

| | SD | D | N | A | SA |
|----|----|---|---|---|----|
| 30 | 1 | 2 | 3 | 4 | 5 |
| 31 | 1 | 2 | 3 | 4 | 5 |
| 32 | 1 | 2 | 3 | 4 | 5 |
| 33 | 1 | 2 | 3 | 4 | 5 |
| 34 | 1 | 2 | 3 | 4 | 5 |
| 35 | 1 | 2 | 3 | 4 | 5 |

| | SD | D | N | A | SA |
|---|----|---|---|---|----|
| 1 | 2 | 3 | 4 | 5 | |
| 1 | 2 | 3 | 4 | 5 | |
| 1 | 2 | 3 | 4 | 5 | |
| 1 | 2 | 3 | 4 | 5 | |
| 1 | 2 | 3 | 4 | 5 | |
| 1 | 2 | 3 | 4 | 5 | |

31. The special educator has skills to develop and adapt curricula to meet unique student needs.

32. Co-teachers know a variety of ways to respond to student diversity.

33. Co-teachers believe students' needs determine classroom practice.

34. Co-teachers believe it's important to balance academic needs of students.

35. Co-teachers believe Co-teaching is worth the effort.

FACTOR III

- 36. Co-teachers share a philosophy about learning and teaching.
- 37. Co-teachers believe their purpose is to facilitate learning as well as impart knowledge.
- 38. The special educator has skills to suggest instructional strategies to meet unique student needs.

How much do you agree that that each factor describes your co-teaching situation?

| | SD | D | N | A | SA |
|----|----|---|---|---|----|
| 36 | 1 | 2 | 3 | 4 | 5 |
| 37 | 1 | 2 | 3 | 4 | 5 |
| 38 | 1 | 2 | 3 | 4 | 5 |

How much do you agree each factor is important in Co-teaching?

| | SD | D | N | A | SA |
|---|----|---|---|---|----|
| 1 | 2 | 3 | 4 | 5 | |
| 1 | 2 | 3 | 4 | 5 | |
| 1 | 2 | 3 | 4 | 5 | |

FACTOR IV

39. Co-teachers regularly set aside a time to communicate.

40. Co-teachers have schedules that permit them to plan together.

FACTOR V

41. Co-teachers trust each other.

42. Co-teachers respect each other's professionalism.

How much do you agree that that each factor describes your co-teaching situation?

| | SD | D | N | A | SA |
|----|----|---|---|---|----|
| 39 | 1 | 2 | 3 | 4 | 5 |
| 40 | 1 | 2 | 3 | 4 | 5 |
| 41 | 1 | 2 | 3 | 4 | 5 |
| 42 | 1 | 2 | 3 | 4 | 5 |

How much do you agree each factor is important in Co-teaching?

| | SD | D | N | A | SA |
|---|----|---|---|---|----|
| 1 | 2 | 3 | 4 | 5 | |
| 1 | 2 | 3 | 4 | 5 | |
| 1 | 2 | 3 | 4 | 5 | |
| 1 | 2 | 3 | 4 | 5 | |

SCORING INSTRUCTIONS

To provide additional information about your responses, we suggest you analyze them in this way.

- First, add the scores you gave each item in each factor for all of the items
- Write the total for each factor in the appropriate blank

| | | | |
|------------|-------|------------|-------|
| Importance | | Presence | |
| Factor I | _____ | Factor I | _____ |
| Factor II | _____ | Factor II | _____ |
| Factor III | _____ | Factor III | _____ |
| Total | _____ | Total | _____ |

- Now, add down the columns to determine the instrument total.

UNDERSTANDING YOUR SCORES

This section contains a description of each of the factors and information on the average scores obtained by exemplary teams. It is intended to help you understand your responses.

Factor I: Personal Prerequisites. Personal prerequisites are the skills and characteristics that each teacher brings to a Co-teaching situation. They include your teaching style, knowledge specific to your discipline or subject, and your contribution to the classroom.

The average total score of exemplary Co-teaching teams on this factor is: **Importance: 66.16 Presence: 68.03**

UNDERSTANDING YOUR SCORES

Factor II: The Professional Relationship. The professional relationship describes the collaborative interaction of the Co-teachers. It includes the sense of parity between Co-teachers, the ability to work toward a shared goal and the extent to which key decisions are shared, and accountability for those decisions.

The average total score of exemplary Co-teaching teams on this factor is: **Importance: 37.28 Presence: 38.96**

Factor III: Classroom Dynamics. Classroom dynamics are the beliefs and actions that give added benefit to the Co-taught classroom. These include your perceptions of how teaching and learning occur, your knowledge of the academic and social curriculum, and the range of individualizing strategies you use.

The average total score of exemplary Co-teaching teams on this factor is: **Importance: 60.88 Presence: 62.75**

Total Score. One additional way of considering your responses on the instrument is to look at your total score. When you consider this score, it is important to keep in mind that Co-teaching has many variations. A high overall

score typically reflects Co-teaching that relies extensively on a collaborative relationship and might be referred to as collaborative Co-teaching. Teachers report that collaborative Co-teaching is very fulfilling for them and very beneficial for students; however, because of circumstances, it may not be the most preferred or feasible type for you. Other less intensive approaches to Co-teaching can also be effective.

The average total score of exemplary Co-teaching teams is:
Importance: 163.92 Presence: 169.08

UNDERSTANDING YOUR SCORES

Factor IV: Contextual Factors. Contextual factors include the temporal conditions that facilitate Co-teaching. Only two items were identified as critical by the teachers who validated this instrument. The items suggest the importance of allocating time for shared planning and communication. Because there are only two items in this factor, a score is not useful.

Factor V: Factor V items are slightly different than the others. This factor consists of items that form the foundation of Co-teaching. The two items in this category were rated as **highly important** by all the Co-teachers who participated in this Co-teaching study. While the “presence” scores did not discriminate highly effective teams for others, the two statements were rated so highly important by all that we included them in the instrument for your consideration.

William T. Randall
Commissioner of Education
State of Colorado

Colorado State Board of Education
1993

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