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The Relationship Between Systems-Change Coaching and Levels of Implementation and Fidelity of Problem-Solving/Response to Intervention (PS/RtI)

Amanda March
University of South Florida, amarch@usf.edu

The Relationship Between Systems-Change Coaching and Levels of Implementation and Fidelity of Problem-Solving/Response to Intervention (PS/RtI)

by

Amanda Lynn March

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University of South Florida

Major Professor: George M. Batsche, Ed.D.
Michael J. Curtis, Ph.D.
Donald K. Kincaid, Ed.D.
Constance V. Hines, Ph.D.

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Dedication

I dedicate this dissertation to my parents, Gary and Jane March, for their unwavering support during my academic journey and enduring belief in my ability to achieve my dreams. To my mother, whose determination made my education a family priority. And to my father, whose imparted wisdom allowed me to keep everything in perspective.

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Abstract

This study examined the extent to which coaching facilitates the successful implementation of the Problem-Solving/Response to Intervention (PS/RtI) model in schools, as well as the extent to which coaching enhances the fidelity of implementation of PS/RtI practices in those schools. Data from 34 schools in seven districts participating in three years of a statewide initiative to implement PS/RtI practices with assistance of a PS/RtI coach were used to evaluate the relationship between coaching activities and levels of implementation and integrity outcomes. Data on various coaching-related factors (i.e., perceived coaching quality, coach continuity, frequency and duration of training and technical assistance), educator beliefs and perceived skills, and PS/RtI implementation and fidelity levels were collected and examined utilizing a series of multilevel modeling (MLM) procedures. Results of the analysis suggest that a number of coaching variables were related to growth in specific measures of PS/RtI implementation and fidelity over time. Specifically, shorter, more frequent training sessions were related to higher levels of staff consensus and fidelity of problem analysis implementation over time after controlling for the quality of the coaching delivered. Growth in PS/RtI implementation over time was predicted positively by the continuity (the degree to which coaching was delivered by the same individual over the three years of the study) of the coaching received. Educators' perceptions of their own PS/RtI skill levels related to manipulation of data and use of technology in schools predicted increases in fidelity of problem identification implementation over time after controlling for quality of coaching. Fidelity of program evaluation/RtI implementation was predicted by the quality of coaching received across time. The relationship between coaching and infrastructure development, as well as the relationship between coaching and fidelity of intervention development and implementation, were unclear. Potential explanations for the findings from this exploratory study and implications for future research are discussed.

Chapter I

Introduction

Success in school for all students is fundamental to the ability of the United States to remain competitive in the twenty-first century global marketplace. The nation's schools are under increasing pressure to continually meet the newest iterations of government policy and public demand to educate all students in an effective public education system. The No Child Left Behind Act of 2001 (NCLB, 2002) is one such piece of legislation, requiring that all students, regardless of race, socioeconomic status, disability (i.e., high-incidence disabilities), and English-language ability, achieve pre-determined levels of proficiency on statewide standards-based assessments. NCLB mandates the use of evidence-based curricular and pedagogical practices as well as data-based decision-making processes, thereby holding schools accountable for the educational outcomes of all students.

The Individuals with Disabilities Education Improvement Act (IDEIA, 2004) also mandates the utilization of data-based decision-making and research-based approaches to ensure that students with disabilities achieve state-approved proficiency benchmarks. IDEIA requires that schools consider students eligible for special education and related services under the category of Specific Learning Disabilities (SLD) when those students do not respond to evidence-based interventions delivered with fidelity over a reasonable period of time and meet the characteristics of that disability category. IDEIA requires that schools must demonstrate students' lack of response to interventions *in general education settings* through frequently administered assessments linked directly to predetermined statewide standards. Further, IDEIA requires schools demonstrate that students considered for special education services were provided effective instruction in reading and mathematics within the general education setting and that language was not a factor in the student performance prior to eligibility determination for any disability category. More recently, the United States Department of Education released its blueprint (Blueprint for Reform, 2010) for revising the Elementary and Secondary Education Act (ESEA), which is the original legislative name for No Child Left Behind (NCLB). According to the Blueprint's recommendations, schools should evaluate student progress toward performance targets based not only on whole-school and subgroup achievement analysis, but also on graduation rates to guide educational efforts. The Blueprint recommends that schools meeting performance benchmarks be rewarded, while those that do not should be mandated to implement increasingly rigorous and intensive evidence-based strategies until students meet or exceed benchmarks. In addition, the Blueprint proposes meeting the needs of students with disabilities throughout ESEA as well as through IDEIA. Thus, the Blueprint encourages states to develop and adopt effective service delivery systems to ensure *all* students meet such rigorous educational standards.

In sum, contemporary national legislative mandates and policy recommendations require the use of evidence-based practices and data-based decision-making processes to improve student outcomes and focus on strengthening the impact of core curriculum for all students. Schools, districts, and states across the nation must respond by developing and coordinating policies, practices, resources, and service delivery systems to effectively meet the requirements of the above mandates. Many educators remain unclear as to how to improve their practices and implement research-based strategies that meet the above requirements of enhancing the performance of all students in schools (Begeny & Martens, 2006; Marston et al., 2003; Spectrum K12 School Solutions, 2010). Researchers and practitioners alike have called for school-wide instruction, intervention frameworks and assessment practices to assist in monitoring student progress to inform decisions about current and future instructional need (Fletcher, Lyon, Fuchs, & Barns, 2007; Jimmerson, Burns, & VanDerHeyden, 2007). Problem-Solving/Response to Intervention (PS/RtI), a model designed to assist educators in organizing and aligning resources to enhance data-based decision-making and improve the outcomes of the educational services provided in their schools, has received national attention in educational policy arenas (Barnes & Harlacher, 2008; Batsche, Elliott, Graden, et al., 2005; Spectrum K12 School Solutions, 2010).

Problem-Solving/Response to Intervention (PS/RtI) Model

The Problem-Solving/Response to Intervention (PS/RtI) model emphasizes continuous assessment of student academic and behavioral skills to guide the development and implementation of evidence-based practices in the general education setting and to determine the extent to which all students respond to instruction through continuous monitoring of progress. Specifically, PS/RtI is defined as “the practice of providing high-quality instruction and interventions matched to student need, monitoring progress frequently to make decisions about changes in instruction or goals and applying child response data to important educational decisions” (Batsche, Elliott, Graden, et al., 2005, p. 3). PS/RtI is consistent with IDEIA (2004), NCLB (2002), and the Blueprint for Educational Reform (2010) requiring the use of scientifically-based curricula and pedagogy, data-based decision-making, and continuous monitoring of student progress toward predetermined outcomes. The following components are required for the effective implementation of the PS/RtI service delivery model: (1) a multi-tiered model of service delivery, (2) a problem-solving method, and (3) an integrated data collection and analysis system to inform decision-making (Batsche, Elliott, Graden et al., 2005).

Multi-tiered model of service delivery. PS/RtI promotes the use of a multi-tier model of service delivery to assist schools in restructuring and deploying their limited resources more effectively (Batsche, Elliott, Graden et al., 2005). Interventions are matched to student need for both the individual and groups of students to increase the efficiency with which educators provide services. Intervention services provided to students usually are categorized into *tiers*, or levels that intensify (i.e., increasing time, narrowing focus) the interventions. Although the number of tiers in such systems have ranged from 1 to 7 (Berkeley, Bender, Gregg Peaster, & Saunders, 2009), a three-tiered model is cited as most common in the literature (e.g., Adelman & Taylor, 1998; Burdette, 2007; Vaughn, 2003; Walker & Shinn, 2010). A recent national survey further supported the popularity of a three-tiered approach, indicating that 78% of district administrators reported either currently implementing or exploring adoption of a three-tiered PS/RtI model (Spectrum K-12 School Solutions, 2010). A summary of Batsche, Elliott, and Graden et al.'s (2005) three-tier model follows and will be used in the present study (see Figure 1).

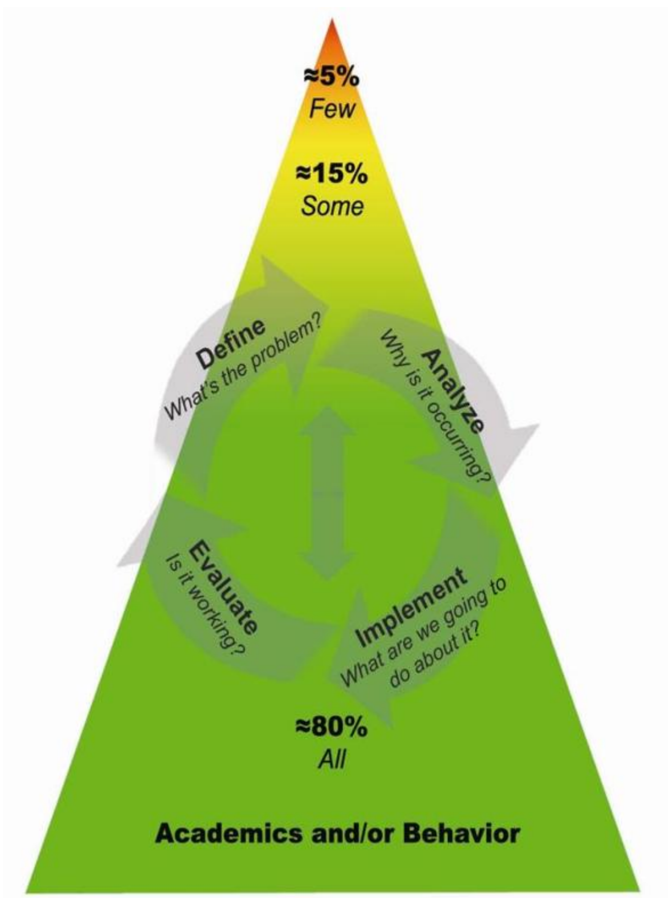

Figure 1. Illustration of the Three-Tiered Model of Service Delivery

Tier I instruction (i.e., universal or core intervention) involves providing scientific, research-based instruction to *all* students, while administering screening assessments 3-4 times per year to evaluate the overall impact of Tier I instruction and identify students not responding positively to the general education curriculum. A number of investigations have examined the impact of Tier I instructional practices, with demonstrated improvements in academic, behavioral, and socio-emotional outcomes of students (e.g., Colvin & Fernandez, 2002; Coyne, Kame'enui, Simmons, & Harn, 2004; Crawford & Snider, 2000; Foorman, Francis, & Fletcher, 1998; Fulk, 2003; Kellam, Rebok, Mayer, Ialongo, & Kalodner, 1994).

Tier II intervention (i.e., supplemental intervention) is provided to *some* students in addition to Tier I instruction, and is offered to those who display poor response to the core curriculum. Educators provide additional time and/or skill focus to the curriculum for groups of students in need of Tier II intervention targeting the content area of concern (e.g., reading). Progress monitoring data are collected on students receiving Tier II services more frequently (e.g., monthly), and problem-solving methods are utilized to facilitate data-based decision-making regarding the effectiveness of such interventions. Evidence-based interventions consistent with Tier II procedures have demonstrated improvement in academic and behavioral outcomes of students (e.g., Fairbanks, Sugai, Guardino, & Lathrop, 2007; Lane, O'Shaughnessy, Lambros, Gresham, & Beebe-Frankenberger, 2001; Lane et al, 2002; Lehr, Sinclair, & Christenson, 2004; Vaughn, 2003).

Tier III interventions usually involve more intensive, targeted, and individualized interventions for students who continue to demonstrate poor response to Tier I and Tier II instruction and intervention. Although the majority of students should respond positively to Tier I and Tier II instruction/intervention, approximately 5% will require intensive services and supports developed by a team of multidisciplinary educational professionals. Students requiring Tier III services are progress monitored more frequently (e.g., weekly, if appropriate) to assist educators in developing and evaluating appropriate intervention plans. Services provided to students requiring Tier III support may or may not involve those delivered through special education programming. However, when the resources (e.g., personnel, time, materials, finances) required for Tier III supports can no longer adequately be provided through general education, special education eligibility for those students should be considered (Fuchs, 2002; Gresham, 2001; Vaughn & Fuchs, 2003). Although research examining the impact of implementing interventions characteristic of Tier III supports has demonstrated improved academic and behavioral outcomes for children (e.g., Moor, Anderson, & Kumar, 2005; Stecker, Fuchs, & Fuchs, 2005), research evaluating the impact of Tier III services on skills of students who have been serviced through each phase of the multi-tier framework is sparse. However, emerging research suggests that when responsive, tiered models are implemented effectively, there is a reduction in the number of students who are referred and qualify for special education services (Fuchs, Mock, Morgan, & Young, 2003; O’Conner, 2007; O’Conner, Fulmer, Harty, & Bell, 2005).

Problem-solving method. The problem-solving process (i.e., data-based decision-making) occurs at teach tier of service delivery, and typically involves four steps: problem identification, problem analysis, plan development and implementation, and program evaluation/response to intervention (Batsche et al., 2005; Bergan & Kratochwill, 1990). Teams of professionals use the four steps of problem-solving when addressing problems for an individual student, groups of students, or all students. Research on the impact of this problem-solving process by school-based teams indicates improvement in student outcomes (e.g., academic skills, on-task behavior; Burns & Symington, 2002). Problem-solving processes have also been linked to systemic outcomes such as a decrease in special education referrals and placements (Burns & Symington, 2002) and reduction of disproportional representation of minority students in special education (Gravois & Rosenfield, 2006). See Figure 2 for a diagram of the problem-solving process.

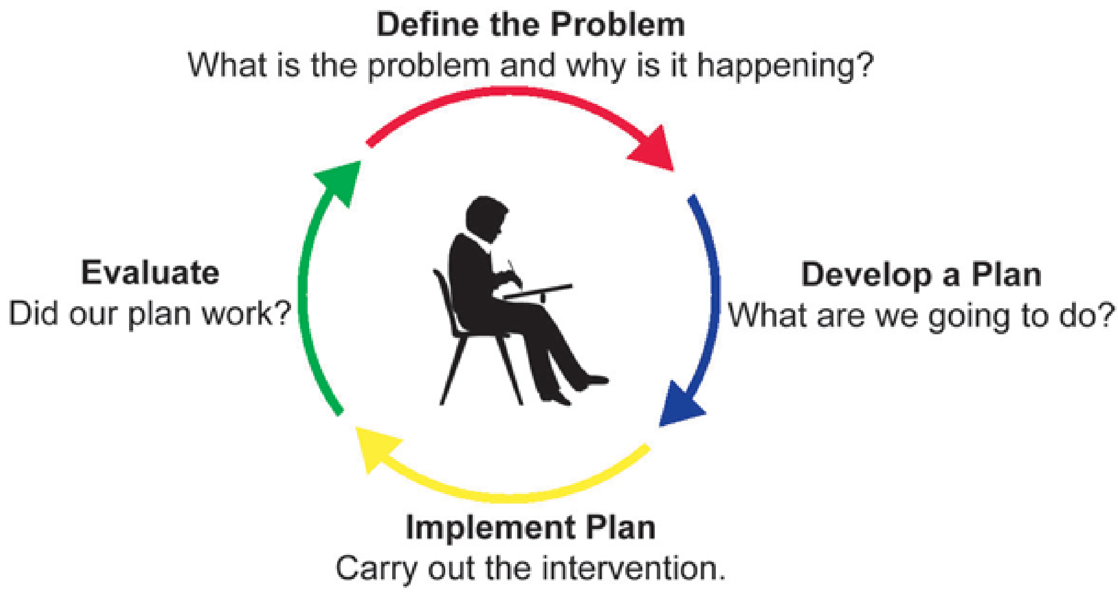

Figure 2. Illustration of the Problem-Solving Method

Integrated data system. An integrated data assessment and progress monitoring system is essential to inform decisions about students' response to intervention at each tier of service delivery. The most common foundation of such data systems includes curriculum-based assessment procedures such as curriculum-based measurement (CBM; Deno, 1985; Shinn, 1989) and curriculum-based evaluation (CBE; Howell & Nolet, 1999). The use of such curriculum-based assessment procedures as evidence-based practice in PS/RtI models has gained widespread support (Shinn, 2010).

In sum, the PS/RtI process serves several functions when implemented systematically within a school system. First, the PS/RtI model provides a decision-making framework to assist educators in determining how to efficiently and effectively allocate their limited resources to students. Additionally, the problem-solving process can be used for early identification, analysis, and intervention of academic, behavioral, and socio-emotional problems for individual and groups of students. PS/RtI also guides educators in determining the frequency and intensity of services needed for all students to be successful, allowing for less severe student difficulties to be addressed in the general education environment while more severe student problems are given the additional resources necessary to meet acceptable benchmarks. Thus, PS/RtI meets the mandates of both NCLB (2002) and IDEIA (2004) by promoting the use of evidence-based practices via data-based decision-making, evaluation of student response to intervention, and research-based curricular and pedagogical processes. Finally, the PS/RtI model can be used to identify students in need of special education support when the services required for their success reach beyond the capacity of general education.

Professional Development for Educational Reform

Research has shown that educational reform efforts are not self-implementing, nor do they easily integrate within the day-to-day instructional practices of school staff (Fullan, 2010; Hall & Hord, 2006). Fullan (2010) suggests that such educational reform efforts often fail because policymakers, legislators, and administrators do not adequately attend to schools as systems within larger social contexts (e.g., neighborhoods, districts, states, legal mandates). New educational initiatives often are selected quickly and implemented within schools without a thorough analysis of fit with the current problems or how schools as systems must be redesigned in a coordinated, systemic manner. As a result, schools often take on numerous competing and conflicting initiatives, delivering services in an unfocused manner and diluting potential impact on student outcomes (Hatch, 2001). Therefore, when one initiative does not demonstrate results quickly, another initiative often is attempted without examining why the previous reform activities failed to produce the desired results.

Hatch (2001) suggests that a primary reason school reform efforts fail is because schools are not given assistance to develop the necessary systems-based capacity to reconstruct many aspects of their operations, or develop the knowledge, commitment, and skills needed for successful implementation over time. Fullen (2010) indicates that the key to effective school reform requires the development of *collective capacity*, or the emotional commitment and technical expertise of all stakeholders at all levels of the organizational continuum (i.e., individual, classroom, school, district, state) in collaboration toward one ultimate goal. In order for new practices to saturate and take hold within an educational organization to build such collective capacity, teachers and school staff require high quality professional development directly tied to the unique context of the school to guide implementation efforts (Elmore, 2002; Richards, Pavri, Golez, Changes, & Murphy, 2007). Professional development is a broad term to describe the means by which professional educators acquire or enhance the knowledge, skills, attitudes, and beliefs necessary to meet the expectations of their profession (NSDC, 2001; Kratochwill et al., 2007). As with other school improvement initiatives, PS/RtI requires extensive professional development at many levels (e.g., teachers, administrators, support service personnel, district leaders) (Bastche et al, 2005; Brown-Chidsey & Steege, 2005; Glover & DiPerna; 2007; Knoteck, 2005; Kratochwill, Volpiansky, Clements, & Ball, 2007). Specifically, successful PS/RtI implementation in schools requires a major conceptual and practical shift from traditional educator behaviors.

Professional development content in PS/RtI. Professional development as it relates to PS/RtI has emerged only recently in the professional literature. Researchers and policymakers are beginning to outline recommendations for training. According to Batsche et al. (2005), professional development efforts in PS/RtI must address three general components: beliefs/attitudes, knowledge, and skills. Kratochwill, Volpiansky, Clements, and Ball (2007) suggest that successful implementation of PS/RtI requires professional development that is, “multifaceted and involves knowledge of evidence-based interventions, multitiered intervention models, screening, assessment, and progress monitoring, administering interventions with a high degree of integrity, support and coordinated efforts across all levels of staff and leadership within the school, and sustaining systems of prevention grounded in an RtI framework” (p. 624). Brown-Chidsey and Steege (2005) make recommendations specifically focused on training educators to use RtI methods, emphasizing three essential components: multiple content-specific sessions for RtI training, assessment of participant learning outcomes, and measurement of participant implementation integrity. In sum, a variety of variables exist when considering the content of professional development for PS/RtI.

Professional development coaching in PS/RtI. Regardless of the professional development content and training schedule developed, research is clear that educators require ongoing support when learning to implement skills required of a new system-wide initiative. Neufeld and Roper (2003a), while citing Darling-Hammond and McLaughlin, list the following characteristics of effective professional development: it must be participant-driven and based on inquiry; it must be collaborative and focused on professional communities of practice; it must be sustained, ongoing, and intensively focused; it must be supported by modeling, coaching, and collaborative problem-solving; it must be both connected to and developed from work with students; it must be informed by the acts of teaching, assessment, observation, and reflection; and it must be connected to other aspects of school change and reform. Such elements of successful professional development align with the National Staff Development Council (NSDC)'s Standards for Staff Development (2001). These 12 standards for effective professional development in schools are supported by decades of research on practices that improve student learning (e.g., Abdal-Haqq, 1996; Corcoran, 1995; Guskey, 2000; Joyce & Showers, 1988; Pardini, 2000; Sykes, 1999).

Conceptualizing the means through which educational leaders can integrate recommended elements into comprehensive professional development plans has led to a great interest in coaching as a vehicle to facilitate implementation of professional development content (Neufeld & Roper, 2003a; Poglinco et al., 2003; Russo, 2004). Schools, districts, and states have embraced coaching as a practical means to support the implementation of reform efforts such as PS/RtI over the recent years (Batsche et al., 2007; Neufeld & Roper, 2003a; Sugai & Horner, 2006). Although the enthusiasm for coaching in professional development activities cannot be denied (Duessen et al., 2007; Poglinco et al., 2003), the descriptive, observational, explanatory, and empirical research on coaching, its impact on educator practices, and effects on student outcomes is meager at best (Cornett & Knight, 2009; Killion & Harrison, 2006; Poglinco et al., 2003). In fact, researchers have not yet been able to develop a comprehensive, agreed-upon definition of *coach* or *coaching* that satisfies the needs of all professional groups or coaching models currently in place in the nation's school systems (Rush & Shelden, 2005b).

The more commonly cited definitions of coaching emerge from the fields of teacher leadership, professional development, educator collaboration, and educational reform. Joyce and Showers (1981), generally noted as the first to empirically explore the concept, define coaching as, "a collegial approach to the analysis of teaching for the purpose of integrating mastered skills and strategies into: a) a curriculum; b) a set of instructional goals; c) time span; d) a personal teaching style" (p. 170). The functions of the coaching process, according to Joyce and Showers (1983), include providing companionship and technical feedback, analyzing application, and adapting to the students. Poglico et al. (2003) define coaching as, "a form of inquiry-based learning characterized by a collaboration between individual, or groups of, teachers and more accomplished peers [and] involves professional, ongoing classroom modeling, supportive critiques of practices, and specific observations" (p. 1). Rush and Sheldon (2005a) suggest a more generalized definition when stating that, "coaching is an adult learning strategy where a coach promotes a learner's ability to reflect on his or her actions as a means to determine the effectiveness of an action or practice and develop a plan for refinement and use of the action in immediate and future situations" (p. 1). Taken together, coaching in the broadest sense can be described as a number of related strategies for improving performance (Brown, Stroh, Fouts, & Baker, 2005). Regardless of specific authors or citations, a core element among all definitions and descriptions of coaching in the education literature is the concept of collaboration among professionals to enhance the skills and behaviors of educators toward improving the educational performance of students.

Rationale for the Study

Many schools, districts, and states are in the process of implementing and expanding the PS/RtI model (Barnes & Harlacher, 2008; Batsche, Elliot, Graden, et al., 2005). Approximately 60% of district administrators nationwide reported some level of PS/RtI implementation in 2010, reflecting a steady rise in implementation from 54% in 2009, 32% in 2008, and 24% in 2007 (Spectrum K12 School Solutions, 2010). Because of its popularity within the teacher support literature, many PS/RtI initiatives are utilizing coaching as a means of ongoing professional development to enhance PS/RtI implementation and sustainability in schools (Batsche et al., 2007; Neufeld & Roper, 2003a; Sugai & Horner, 2006). However, a paucity of empirical evidence currently exists to suggest that coaching actually enhances the knowledge, skills, and abilities required of educational staff to effectively implement PS/RtI practices. Further, no known study to date has evaluated the impact of coaching on the implementation and integrity of PS/RtI practices in schools. Without sound empirical support for coaching practices in PS/RtI, a bevy of schools and districts may be utilizing costly and inefficient coaching structures in a futile attempt to enhance student outcomes via an ineffective professional development method.

Purpose of Study

The purpose of the study discussed below was to examine the extent to which coaching facilitates the successful implementation of the PS/RtI model in schools, as well as the extent to which coaching enhances the fidelity of PS/RtI practices in those schools. In the context of this investigation, a PS/RtI coach is defined as a site-based professional with responsibility for facilitating the implementation and fidelity of PS/RtI at the school level. Data from schools participating in three years of a statewide initiative to implement PS/RtI practices with assistance from a PS/RtI coach were used to evaluate the relationship between coaching and levels of implementation and integrity outcomes. Specifically, the frequency and type of coaching activity (e.g., training, technical assistance), perceived quality of coaching delivered, as well as the continuity of a given coach in schools were investigated in relation to the level of PS/RtI implementation as well as implementation fidelity over time. As relatively little is known about coaching within PS/RtI, this study sought to identify factors that influence implementation and determine whether the high and low levels of implementation and implementation fidelity by schools vary as a function of coaching factors. The following research questions were addressed in the current study:

Research Questions

1) What is the relationship between coaching and level of PS/RtI implementation in schools over time?
    a. What is the relationship between coaching and level of PS/RtI consensus development in schools over time?
    b. What is the relationship between coaching and level of PS/RtI infrastructure development in schools over time?
    c. What is the relationship between coaching and level of PS/RtI implementation development in schools over time?
2) What is the relationship between coaching and level of fidelity of PS/RtI implementation in schools over time?
    a. What is the relationship between coaching and level of fidelity of problem identification implementation in schools over time?
    b. What is the relationship between coaching and level of fidelity of problem analysis implementation in schools over time?
    c. What is the relationship between coaching and level of fidelity of intervention development and implementation in schools over time?
    d. What is the relationship between coaching and level of fidelity of program evaluation/response to intervention implementation in schools over time?

Definition of Terms

Problem-Solving/Response to Intervention (PS/RtI) Implementation. Within the context of this study, this occurs when systems change principles are accurately applied to PS/RtI practices within the school setting. The systems change model employed in this study involves three stages: Consensus, Infrastructure, and Implementation (Batsche, Curtis, Dorman, Castillo, & Porter, 2007; Kurns & Tilly, 2008). Therefore, PS/RtI implementation occurs when educators employing this systems change model seek to develop consensus among key stakeholders responsible for using PS/RtI practices, build the necessary infrastructure and support mechanisms to sustain such practices, and then promote the successful implementation of problem-solving across a three-tiered service delivery framework.

Problem-Solving/Response to Intervention (PS/RtI) Implementation Fidelity. Within the context of this study, this occurs when educators accurately employ the four step problem-solving process to make educational decisions within a PS/RtI model. The four stages of the problem-solving process include: problem identification, problem analysis, intervention development and implementation, and program evaluation/response to intervention (Bergan & Kratochwill, 1990). Educators use the four stages of problem solving when addressing problems for students or groups of students to systematically (1) identify the expected skill(s) the student(s) is/are expected to perform (i.e., replacement behavior), (2) determine what factors are inhibiting performance of the targeted skill(s), (3) develop and implement a plan to remove barriers to learning, and (4) evaluate student response to intervention (RtI; Batsche et al., 2005).

Chapter II

Literature Review

This chapter begins with a discussion of federal legislation that provides the context for PS/RtI and the need for systemic reform in schools. Next, a review of best-practices in educator professional development processes is provided. A discussion of coaching for school-based systemic reform is presented next, followed by a comprehensive overview of theoretical and empirical support for various models and outcomes of school-based coaching. This chapter closes with an overview of methods used to evaluate the impact of coaching.

National Context for Educational Reform

The No Child Left Behind Act of 2001 (NCLB, 2002), in combination with the Individuals With Disabilities Education Improvement Act of 2004 (IDEIA, 2004), have created significant pressure in the nation's schools to improve the quality of instruction delivered to K-12 students, including students with disabilities. Both federal mandates require the use of evidence-based curricular and pedagogical practices as well as data-based decision-making processes within the core curriculum, thereby holding schools accountable for the educational outcomes for all students. Schools, districts, and states across the nation must respond by developing and coordinating policies, practices, resources, and service delivery systems to effectively meet the requirements of these mandates. Advocates for reform have called for school-wide instructional frameworks and assessment practices to produce meaningful student data to inform decisions about current and future instructional need (Fletcher, Lyon, Fuchs, & Barns, 2007; Jimmerson, Burns, & VanDerHeyden, 2007). Problem-Solving/Response to Intervention (PS/RtI) is one model designed to assist educators in organizing and aligning resources to enhance data-based decision-making and improve student outcomes that has received a great deal of attention across the United States (Barnes & Harlacher, 2008; Batsche, Elliott, Graden, et al., 2005; Spectrum K12 School Solutions, 2010).

Problem-Solving/Response to Intervention

The Problem-Solving/Response to Intervention (PS/RtI) model emphasizes many of the critical tenets required by NCLB and IDEIA, including continuous assessment of student academic and behavioral skills to guide the development and implementation of evidence-based practices in the general education setting and to determine the extent to which all students respond to instruction. PS/RtI is defined as “the practice of providing high-quality instruction and interventions matched to student need, monitoring progress frequently to make decisions about changes in instruction or goals and applying child response data to important educational decisions” (Batsche, Elliott, Graden, et al., 2005, p. 3). PS/RtI includes a multi-tier model of service delivery, a problem-solving method, and a data collection and assessment system to inform decision-making at each tier. Problem-solving is the scientific method used to make educational decisions, and includes a multi-step process to develop, implement, and evaluate instruction and/or interventions (Bergan & Kratochwill, 1990). Individual and teams of educators utilize the problem-solving process for various levels of student data analysis, such as a single student, groups of students, a classroom, or an entire school or district. The problem-solving process includes the following steps: (1) problem identification (i.e., the discrepancy between current student performance and desired performance), (2) problem analysis (i.e., develop hypotheses surrounding factors that are contributing to the problem, (3) intervention development and implementation, and (4) evaluation (i.e., evaluation of students' response to intervention) (Batsche et al., 2005).

The PS/RtI model provides educators with a structured multi-tier framework for efficiently allocating resources and effectively developing instructional practices matched to student need. Interventions are matched to need for both individual and groups of students to increase the efficiency with which services are provided. Intervention services are categorized into *tiers*, or levels that reflect increasing intensity (i.e., increasing time, narrowing focus) of interventions. Although several models currently exist in practice (Berkeley, Bender, Gregg Peaster, & Saunders, 2009), a three-tiered model is cited most commonly in the literature (e.g., Adelman & Taylor, 1998; Burdette, 2007; Vaughn, 2003; Walker & Shinn, 2010) and serves as the framework for the Florida PS/RtI Project (Batsche, Curtis, Dorman, Castillo, & Porter, 2007).

Tier I instruction (i.e., universal or core intervention) involves providing scientific, research-based instruction to *all* students. NCLB (2002) and IDEIA

(2004) require districts to select core curricula and pedagogy that are empirically validated to improve student performance relative to state proficiency standards. Educators administer screening assessments 3-4 times per year to evaluate the overall impact of Tier I instruction and to identify students who are not responding positively to the general education curriculum. Efforts to address Tier I instructional practices have demonstrated improvements in academic, behavioral, and socio-emotional outcomes of students (e.g., Colvin & Fernandez, 2002; Coyne, Kame'enui, Simmons, & Harn, 2004; Crawford & Snider, 2000; Foorman, Francis, & Fletcher, 1998; Fulk, 2003; Kellam, Rebok, Mayer, Ialongo, & Kalodner, 1994).

Tier II intervention (i.e., supplemental intervention) is provided to *some* students in addition to Tier I instruction, offering additional support to those who display poor response to the core curriculum. Tier II intervention includes additional time and/or skill focus beyond the general curriculum for groups of students, targeting the content area of concern (e. g., reading, math, science). Progress monitoring data are collected on students receiving Tier II services more frequently (e.g., monthly) than would be the case relative to Tier I. The problem-solving method is utilized to facilitate data-based decision-making regarding the effectiveness of Tier II interventions. Evidence-based Tier II procedures have demonstrated improvement in academic and behavioral outcomes of students (e.g., Fairbanks, Sugai, Guardino, & Lathrop, 2007; Lane, O'Shaughnessy, Lambros, Gresham, & Beebe-Frankenberger, 2001; Lane et al., 2002; Lehr, Sinclair, & Christenson, 2004; Vaughn, 2003).

Tier III interventions usually involve more intensive, targeted, and individualized interventions for students who continue to demonstrate poor response to Tier I and Tier II practices. Students requiring Tier III services are progress monitored more frequently (e.g., weekly, if appropriate) than in Tiers I and II to assist educators in developing and evaluating evidence-based intervention plans. Services provided to students requiring Tier III support may or may not require special education programming. However, when the resources (e.g., personnel, time, materials, finances) required for Tier III supports can no longer adequately be provided through general education, special education eligibility should be considered if that student also demonstrates the characteristics of a disability (Fuchs, 2002; Gresham, 2001; Vaughn & Fuchs, 2003). Emerging research suggests that when responsive, tiered models are implemented effectively, there is a reduction in the number of students who are referred and qualify for special education services (Fuchs, Mock, Morgan, & Young, 2003; O'Conner, 2007; O'Conner, Fulmer, Harty, & Bell, 2005). Further, research examining the impact of implementing Tier III-type supports has demonstrated improved academic and behavioral outcomes for students (e.g., Moor, Anderson, & Kumar, 2005; Stecker, Fuchs, & Fuchs, 2005).

The use of an integrated data collection and assessment system to inform decision-making at each tier is the third component of a PS/RtI model (Batsche et al., 2005). Ongoing data collection related to student academic and behavioral performance is necessary for educators to determine which students are not responding to instruction/intervention. Within PS/RtI, such data systems typically include curriculum-based assessment procedures such as curriculum-based measurement (CBM; Deno, 1985; Shinn, 1989) and curriculum-based evaluation (CBE; Howell & Nolet, 1999).

In summary, the PS/RtI model provides several useful processes when implemented systematically within a school system: (1) a decision-making framework to assist educators in determining how to efficiently and effectively allocate their limited resources to students; (2) a problem-solving process used for early identification, analysis, and intervention of academic, behavioral, and socio-emotional problems for individual and groups of students; and (3) and a data system to guide educators in determining the frequency and intensity of services needed for all students to be successful, allowing for less severe student difficulties to be addressed in the general education environment while more severe student problems are given the additional resources necessary to meet established benchmarks.

Trends in Educational Innovations

Educational reform efforts have saturated schools in the United States for decades and have become a common fixture in the culture of the American educational system (Fullen, 2010; Hall & Hord, 2006). For reasons such as foreign competition, need to accommodate an increasingly diverse student population, and political demand for increasing educator accountability, school reform initiatives are continually being adopted and implemented within the nation’s educational system (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009; OSEP, 2004). According to Fullen (2010), meaningful large-scale school reform efforts often fail because policymakers, educators, and administrators do not consider systems functioning and change principles when planning for and implementing innovations within the school context. Too often, reform efforts are initiated without investing the necessary time and resources required to meaningfully plan, coordinate, and execute the initiative while considering the specifics of the individual school culture, climate, and context. The result has been a variety of disjointed and often competing initiatives, targeting the same problems but requiring conflicting actions from school personnel and students. When one initiative does not result in expected outcomes, another one is attempted without examination of the reasons why the previous effort did not produce desired results. In other words, many school innovations fail because the implementers lack a systems perspective (Curtis & Stollar, 2002).

A Systems Approach to Innovation

According to Curtis and Stollar (2002), a systems perspective is the "ability to understand how the various component parts of a system, the system itself, and the surrounding systems or environment influence one another" (p. 225). A system is "the orderly combination of two or more individuals whose interaction is intended to produce a desired outcome" (Curtis, Castillo, & Cohen, 2008, p. 888). Further, a school is considered a system "because it consists of component parts (e.g., students, teachers, school psychologists, cafeteria workers, parents, principal) that are organized and interact for the purpose of producing a definable outcome (e.g., academic achievement by all students)" (Curtis, Castillo, &

Cohen, 2008, p. 888). The school is embedded within a larger school district system, which is also embedded within larger regional and state level educational systems. Schools are also composed of a variety of subsystems such as students, teachers, specialists, classrooms, grade levels, and problem-solving teams that must be considered when implementing an innovation (Curtis, Castillo, & Cohen, 2008).

Program Evaluation of Systems Reform Efforts

The facilitation of a systems-level reform effort such as the implementation of a PS/RtI model requires ongoing evaluation at all levels of the organization (Curtis, Castillo, & Cohen, 2008). A comprehensive program evaluation model often is utilized to guide the collection of data to evaluate the impact of such school reform efforts. According to Wholey, Hatry, and Newcomer (2004), program evaluation is “the systematic assessment of program results and, to the extent feasible, systematic assessment of the extent to which the program caused those results” (p. xxxiii). One example of a program evaluation model that emphases large-scale systems reform efforts is that developed by The Florida Problem-Solving/Response to Intervention (FL PS/RtI) Project (Castillo, Batsche, & Curtis, 2010). The Project staff adopted a three-stage change model to assist schools in the facilitation of systemic implementation of PS/RtI practices: (1) *Consensus Development*, (2) *Infrastructure Building*, and (3) *Implementation* (Batsche, Curtis, Dorman, Castillo, & Porter, 2007; Kurns & Tilly, 2008). Educators employing this change model seek to develop consensus among key stakeholders responsible for utilizing PS/RtI (i.e., principals, teachers, instructional support personnel, student service personnel), build the necessary infrastructure and support mechanisms to sustain PS/RtI practices (i.e., comprehensive data collection and analysis system, problem-solving processes), and then promote the successful implementation of problem solving across the three tiers of service delivery. The Project developed a variety of instruments and data collection strategies to summatively and formatively assess the components of consensus building, infrastructure development, and degree of PS/RtI implementation over time.

The Florida PS/RtI Project employed a logic model to guide their efforts in generating and analyzing their systems reform efforts over time. A logic model can be described as “a useful advanced organizer for designing evaluation and performance measurement, focusing on the important elements of the program and identifying what evaluation questions should be asked and why and what measures of performance are key” (McLaughlin & Jordan, 2004, p. 7). The FL PS/RtI logical model outlines how the implementation of PS/RtI will unfold under certain environmental conditions, and includes the following elements: inputs, processes, short-term outcomes, and long-term outcomes. The FL PS/RtI Project logic model is an example of a useful tool for conceptualizing, planning, and communicating the implementation of a large-scale systemic reform effort within a specific application context. See Appendix O for a copy of the FL PS/RtI Project’s logic model.

Critical Elements of Systems Reform Efforts

In order to effectively embark on the type of systems change required when initiating and evaluating large-scale school reform efforts such as Problem-Solving/Response to Intervention (PS/RtI), what must first be addressed is often the underlying beliefs and values of individuals residing within the system, as well as their professional skill sets, that serve as the basis for current practices (Brown et al., 2005; Hall & Hord, 2006). According to Brown et al (2005):

> An important element of many school improvement strategies is “capacity building” that includes the development of human and social capital within the organization necessary for successful school and district reform. While this capacity building also focuses on very specific technical skills, such as the collection, understanding, and use of data, it is often primarily concerned with adult perspectives and beliefs about all aspects of the educational experience, including an understanding about the need for change, the process of change, beliefs about student capabilities, and effective teaching practices. (p.1).

The above excerpt describes the myriad of factors that impact the extent to which adequate capacity is built within a school or district in order to facilitate PS/RtI implementation efforts. Researchers and policymakers are beginning to outline recommendations for educator training for PS/RtI implementation that include the above aspects as necessary for building capacity. According to Batsche et al. (2005), staff training efforts in PS/RtI must address three essential components: beliefs/attitudes, knowledge, and skills. However, research on the extent to which educator beliefs, efficacy, knowledge, and skills relate to levels of PS/RtI implementation is limited. Further, the information on how changes in educator beliefs relate to skill development within the context of professional development for PS/RtI implementation is also scarce. A brief review of available research on the relationships between educators' beliefs, efficacy, skills, and reform implementation follows.

Relationships between educators' beliefs, perception of skills, and reform implementation. Bol et al. (1998) examined Memphis City Schools (MCS) teachers' perceptions of support provided when implementing the New American Schools (NAS) restructuring models, and how these perceptions affected instructional changes and student outcomes. The following types of support were provided to MCS teachers: external professional development; time for on-site teacher collaboration; and resources such as materials, equipment, time, and funding. Questionnaires were administered to 980 teachers in 34 MCS schools during the spring of 1997. In addition, a sample of 7 to 10 randomly selected teachers comprised focus groups in each of the 34 schools. Data collected from the questionnaires and from the focus groups after two years of implementation revealed that teacher perceptions of external professional development and resource adequacy were significantly related to pedagogical change and enhanced student outcomes. Further, teachers reported time for collaboration was one of the most critical aspects of the school reform initiatives. Teachers also reported that implementation efforts were often hindered due to a lack of skills necessary to implement the models, as well as a failure to receive sufficient professional development focused on those skills. Although this study included only data from an inductive analysis of teacher perceptions with limited statistical analysis utilized, Bol et al.'s (1998) findings highlight the importance of teachers' perceptions of having the necessary skills and professional development support to adequately implement a school reform effort.

Smith et al. (1998) also examined the school reform efforts implemented in MCS schools after the second year of NAS restructuring model implementation. Data were collected via interviews with school principals, focus groups with teachers, teacher questionnaires, and classroom observations. With regard to schools that were considered quick to implement their selected restructuring reform model, the following factors were identified as key elements: strong principal leadership, degree of compatibility of the selected design and the schools' philosophy and goals, teacher buy-in to the design, strong teaching staff, and shared perception by teachers and administrators that implementation was positively impacting student learning outcomes. Although Smith et al.'s (1998) findings were limited to simple descriptive statistics and generalizations reported from the interviews, they provide contextual evidence for additional educator and school variables considered crucial for successful reform implementation.

Nunn, Jantz, and Butikofer (2009) investigated the concurrent validity between two scales measuring teacher efficacy beliefs and perception of response to intervention (RtI) outcomes. The Teacher Efficacy Belief and Behavior Scale (TEBBS; Nunn, 1998) and the Indicators of RtI Effectiveness

Scale (IRES; Nunn, 1999) were used in this study. Data were collected from 429 k-12 educators (i.e., teachers, administrators, support staff) receiving ongoing training in RtI implementation practices. Participants completed the two scales on the fifth and final day of a year-long RtI training curriculum. Pearson-Product Moment correlations for subscales of the TEBBS and IRES indicated significant relationships between teachers' belief in efficacy along all dimensions of the TEBBS in parallel with each dimension of the IRES. Findings revealed that increases in teacher efficacy were associated with perceptions of improved outcomes of interventions, satisfaction with results, collaborative team process, and data-based decisions. This study provides foundational evidence for further investigation of relationships between capacity-related variables, such as beliefs and perceived skills, and RtI implementation outcomes.

Professional Development

The literature described above highlights the importance of enhancing educators' beliefs and skills through training and support when implementing a large-scale school reform effort. Further, research consistently demonstrates that educational reform efforts are not self-implementing, nor do they easily integrate within the day-to-day instructional practices of school staff (Fullan, 2010; Hall & Hord, 2006). In order for new practices to saturate and take hold within an educational organization, teachers and school staff require high quality professional development to guide implementation efforts (Lieberman, 1995). Professional development is a broad term that describes various processes used to enhance skills needed to effectively meet one's occupational expectations, and is often used interchangeably with terms such as *continuing education* and *staff development* in the school setting (Kratochwill, Volpiansky, Clements, & Ball, 2007). The National Staff Development Council (NSDC), a professional association of educators, defines professional development as a "comprehensive, sustained, and intensive approach to improving teachers' and principals' effectiveness in raising student achievement" (Hirsh, 2009, p.12).

Ongoing professional development for school staff is not only recommended as "best practice," but is required in today's educational arenas where fast-paced changes in policy and practice necessitate continuous enhancement to an educator's repertoire of knowledge, skill, and pedagogy (Darling-Hammond & McLaughlin, 1995). The No Child Left Behind Act (NCLB, 2002) and the Individuals with Disabilities Education Improvement Act (IDEIA, 2004) have placed significant pressure on schools to ensure that teachers use proven educational practices that improve student learning outcomes. Specifically, NCLB emphasizes "significantly elevating the quality of instruction by providing staff in participating schools with substantial opportunities for professional development" (NCLB, 1001[10]). NCLB also requires that schools receiving funds under Title 1 "devote sufficient resources to effectively carry out high-quality and ongoing professional development for teachers, principals, and paraprofessionals and, if appropriate, pupil services personnel, parents, and other staff to enable all children in the school to meet the State's student academic achievement standards" (NCLB 1114 [1]). IDEIA further promotes the importance of skilled professionals in schools, stating that "high quality, comprehensive professional development programs are essential to ensure that the persons responsible for the education or transition of children with disabilities possess the skills and knowledge necessary to address the educational and related needs of those children" (IDEIA 1450 [6]). Because of these mandates, the "pressure to improve instruction in schools may be greater today than at any other time in the history of American education" (Knight, 2007, p. 1). Thus, educational leaders are at a heightened state of urgency to find effective professional development techniques to provide their staff members the tools needed to teach all students successfully.

Conventional wisdom and common sense suggest that it is impossible for educators to learn everything they will need to know regarding professional practice during their teacher preparation programs. Thus, the responsibility to provide meaningful professional development to teachers and other school staff has traditionally fallen upon schools, districts, and state agencies that employ these individuals (Russo, 2004). For years, professional development opportunities often have taken the form of "one-shot" workshops, where educators receive training from external trainers or consultants on topics that may or may not be relevant to instructional needs (Duessen, Coskie, Robinson, & Autio; 2007; Knight, 2009a; Russo, 2004). In such arrangements, teachers typically hear about new practices via lecture-based presentations during professional development days, and receive little opportunity for collaborative reflection, follow-up discussions, or guided practice and feedback while attempting to implement the new skills and practices in their classrooms (Darling-

Hammond & McLaughlin, 1995; Knight, 2009a). Research indicates, however, that this traditional model of professional development is not effective for cultivating professional learning among educators. Specifically, only approximately 10% of educators will attempt a new skill in classrooms when no follow-up is provided after a professional development workshop (Bush, 1984). Further, such "one-shot" workshops often evoke complex professional dynamics that decrease educators' interest in developing new skills, and inadvertently create negative attitudes towards professional learning in schools (Knight, 2000).

Because of the ineffectiveness of traditional models of professional development, researchers and practitioners alike increasingly demand significant reform in school-based professional development, promoting methods that incorporate what evidence demonstrates as effective adult learning techniques (Darling-Hammond & McLaughlin, 1995; Lieberman, 1995; Miller, 1995). Effective professional development, as demonstrated through research and professional consensus, is sustained over time, actively engaging for participants, standards-based, and relevant to the contexts in which educators practice (Garet, Porter, Desimone, Birman, & Yoon, 2001; U.S. Department of Education, 1999). Miller (1995) suggests that successful professional development is job-embedded and emphasizes educators' theoretical and conceptual understanding of their work.

In a seminal work by Darling-Hammond & McLaughlin (1995), the authors conclude that effective professional development collaboratively engages educators in inquiry-based activities targeted to their unique personal and professional needs. Neufeld and Roper (2003a), while citing Darling-Hammond and McLaughlin, list the following characteristics of effective professional development: it must be participant-driven and based on inquiry; it must be collaborative and focused on professional communities of practice; it must be sustained, ongoing, and intensively focused; it must be supported by modeling, coaching, and collaborative problem-solving; it must be both connected to and developed from work with students; it must be informed by the acts of teaching, assessment, observation, and reflection; and it must be connected to other aspects of school change and reform. Such elements of successful professional development align seamlessly with the National Staff Development Council's Standards for Staff Development (2001). The National Staff Development Council (NSDC) has developed 12 standards for effective professional development in schools that are supported by decades of research on practices that improve student learning (e.g., Abdal-Haqq, 1996; Corcoran, 1995; Guskey, 2000; Joyce & Showers, 1988; Pardini, 2000; Sykes, 1999).

Coaching

Conceptualizing means through which the above elements can be integrated into comprehensive professional development plans has lead to great interest in coaching as a vehicle to facilitate such efforts (Neufeld & Roper, 2003; Poglinco et al., 2003; Russo, 2004). According to Poglinco et al., (2003) "the concept of coaching fills a particular, and promising, niche in the range of strategies to improve the capacity of teachers to provide high-quality instruction to their students" (p.1). School-based coaching generally involves professionals with expertise in some area (i.e., content, instructional practices, whole-school reform initiatives) working closely with individual or small groups of educators to enhance instructional practices with the ultimate goal of positively impacting student achievement (Duessen et al., 2007; Russo, 2004). Russo (2004) suggests one of the most compelling rationales for school-based coaching:

> …many of the more conventional forms of professional development-such as conferences, lectures, and mass teacher-institute days – are unpopular with educators because they are often led by outside experts who tell teachers what to do, then are never heard from again. To be effective, scores of researchers say, professional development must be ongoing, deeply embedded into teachers' classroom work with children, specific to grade-level or academic content, and focused on research-based approaches. It must also help to open classroom doors and create more collaboration and sense of community among teachers in a school. When compared with many other approaches, school-based coaching seems to meet many of these criteria remarkably well" (p. 2).

So promising is the notion of school-based coaching that many schools, districts, and states across the country have embraced the concept as a practical means for enhancing teacher learning and student outcomes (Knight, 2009). Although the enthusiasm for coaching in professional development activities cannot be denied (Duessen et al., 2007; Poglinco et al., 2003), the descriptive, observational, explanatory, and empirical research on coaching, its impact on educator practices, and effects on student outcomes is meager at best (Cornett &

Knight, 2009; Killion & Harrison, 2006; Poglinco et al., 2003). In fact, an adequate definition of *coaching* or *coach* has yet to be described that satisfies the needs of all interested professionals and addresses the theoretical tenets of the various coaching models currently in place in the nation's school systems (Rush & Shelden, 2005b).

Coaching, according to Joyce and Showers (1981), "usually involves a collegial approach to the analysis of teaching for the purpose of integrating mastered skills and strategies into: a) a curriculum; b) a set of instructional goals; c) a time span; d) a personal teaching style" (p. 170). In their evaluation of America's Choice, a comprehensive school reform model, Poglico et al. (2003, p. 1) define coaching as "a form of inquiry-based learning characterized by a collaboration between individual or groups of teachers and more accomplished peers. Coaching involves professional, ongoing classroom modeling, supportive critiques of practices, and specific observations." Rush and Sheldon (2005a, p. 1), suggest a more generalized definition when stating that "coaching is an adult learning strategy where a coach promotes a learner's ability to reflect on his or her actions as a means to determine the effectiveness of an action or practice and develop a plan for refinement and use of the action in immediate and future situations." Since researchers and practitioners have described various forms of coaching with unique goals and methods to support professional development, it is not surprising that the operational definition of *coach* and *coaching* practices depends upon the different models utilized in practice (Knight, 2009). Taken together, coaching in the broadest sense can be defined as a number of related strategies for improving performance (Brown, Stroh, Fouts, & Baker, 2005).

Coaching within Systems Reform Efforts.

Converging and convincing research suggests that new school-based strategies, evidence-based practices, and systemic reform efforts do not get implemented with integrity unless a consultant, or coach, is continually involved (Lewis & Newcomer, 2002; Metz, Blase, & Bowie, 2007). Thus, in order to build internal capacity for systemic change, many schools and districts have begun to seek training and technical assistance through coaching support (Brown et al., 2005; Neufeld & Roper, 2003a). According to Neufeld and Roper (2003a), *change coaches* or *capacity coaches* have emerged to address whole-school organizational improvement by helping schools examine their resources (e.g., time, personnel, money, schedules) and allocate them more effectively. Change coaches develop the leadership skills of school staff members such as teachers, support services personnel, and administrators. Neufeld and Roper (2003a) distinguish change coaches from *content coaches*, who typically work more directly with teachers to improve instructional strategies in specific content areas such as literacy and mathematics. The role of change coaching does not necessarily exclude direct work with teachers or an interest in classroom instruction, but rather understands classroom instruction as one piece of a larger systemic unit requiring change. Thus, change coaches work with district and school leadership to build capacity within the system to create an evolution in the professional environment toward enhanced student outcomes.

Since the concept of coaching to build capacity for innovations has only emerged in the past few years (Brown et al., 2005), no rigorously sound empirical studies to date have investigated the impact of coaching on systems reform outcomes in schools (Deussen et al., 2007; Neufeld & Roper, 2003a; Sugai & Horner, 2006). However, emerging evaluations of whole-school reform models that include forms of coaching to facilitate implementation have presented promising results. For instance, reform initiatives such as the Pennsylvania High School Coaching Initiative (Brown et al., 2008), America's Choice Schools (Poglinco et al., 2003), Boston's Collaborative Coaching and Learning (CCL) (Neufeld & Roper, 2003b), the Bay Area School Reform Collaborative (BASRC) (Barr, Simmons, & Zarrow, 2003; Coggins, Stoddard, & Cutler, 2003), and the Accelerated Schools Coaching Model (Mims, 2000) have all used coaches in a variety of ways to support their specific reform initiatives.

SWPBS: An example of coaching within systems reform efforts. Schoolwide Positive Behavior Supports (SWPBS) is another example of a school-wide initiative in which coaching is embedded within a systems change model (Sugai & Horner, 2002; Sugai, Horner, & McIntosh, 2008). The purpose of SWPBS is to improve the general climate of a school by implementing a system-wide positive behavioral support process. SWPBS is a component of a larger imitative called Positive Behavior Support (PBS). PBS is a "systems approach to enhancing the capacity of schools to adopt and sustain the use of effective practices for all students (Lewis & Sugai, 1999, p. 4). In other words, PBS is a service delivery framework for developing effective interventions for individuals who display challenging behavior within a school system in order to improve the behavioral atmosphere for students, staff, and parents (Anderson & Freeman, 2000).

Three intervention levels structure the positive behavior support framework within a school system: universal support, targeted support, and individual support (Lewis & Sugai, 1999). According to Anderson and Kincaid (2005), SWPBS is typically considered the universal level, and provides a foundation within which more targeted, intensive, and individualized supports can be put into place for students who are not successful within the general behavioral curriculum. Targeted levels of support provide interventions for groups of students who are at-risk for behavioral problems and school failure, while individualized support is provided for those students who require more intensive intervention, progress monitoring, and skill development. SWPBS is a comprehensive support system that is put into action within all areas of a school, such as classrooms, cafeterias, hallways, gymnasiums, and school buses. The goals of SWPBS include preventing the development of problematic behavior, decreasing or extinguishing current behavioral difficulties, and increasing the adaptive and prosocial behaviors of all students (Anderson & Kincaid, 2005).

It is the role of SWPBS coaches to assist schools and districts in implementing functional rules, routines, and other procedures with consistency and fidelity (Lewis & Sugai, 1999). One of the fundamental responsibilities of SWPBS coaches is to make sure their schools utilize data to guide decision-making within the process to evaluate the effects of their efforts. Although a limited body of research currently exists that has examined the impact of coaching on SWPBS outcomes, a significant amount of information is available on the role of the coach in training, implementation, and sustainability efforts (Sugai & Horner, 2006). Specifically, coaching has been identified as an important variable that facilitates the generalization of PBS related to training in real-world, school-based settings. Sugai and Horner (2006) have described how the role of a coach may change over time. The authors suggest that coaching efforts may naturally become more intensive and direct as schools begin to build their capacity for change, while become less intensive and indirect as school personnel acquire more experience and further develop their skills.

Scott and Martinek (2006) published the results of two empirical studies investigating PBS coaching related functions within elementary schools. The first study examined the frequency and type of coaching assistance requested by 42 school-based PBS teams. Twenty-six of the 42 school teams (62%) identified “data entry” as the issue that required the most assistance from coaches. “Data analysis and decision making” was the second most endorsed area, while “agreeable systems of student reinforcement” was the third most endorsed area.

Based upon this information, four elementary schools that identified “data entry” as their primary area of requested coaching assistance were selected to participate in a follow-up study (Scott & Martinek, 2006). Taking place during the second year of PBS implementation for each school, this study’s independent variable was the nature of coaching activities in each school. A multiple-baseline-across-subjects (schools) design was incorporated to determine the effects of different coaching activities, varying by four different treatment conditions, on the amount of student behavioral data entered into a comprehensive database. The four treatment conditions included the following: (1) coach made weekly phone contact with school-based data entry person; (2) coach made in-person visit to school to talk with data entry person and provide verbal prompts; (3) coach visited school, sat with the data entry person, and provided modeling of data entry procedures; and (4) coach reverted to phone contact condition as a measure of maintenance. Data were collected using the “monitoring and decision-making” subscale score and total score on the *School-wide Evaluation Tool* (SET; Sugai, Lewis-Palmer, Todd, & Horner, 2001), a measure used to assess the fidelity of SWPBS implementation.

Results revealed that three out of four schools (Schools 1, 2, and 3) improved their data entry behaviors during the “in-person with verbal prompts” coaching phase, though only one school (School 1) maintained improvements throughout the course of this phase. However, the other two schools (Schools 2 & 3) were able to demonstrate consistent data entry behaviors during the “physical modeling” phase. With the “return to phone-call” phase, data entry remained 100% for Schools 1, 2, & 3. School 4 neglected to consistently enter data throughout the course of the four treatment conditions. The data entry behaviors of the four schools coincided with their SET scores, in that Schools 1, 2, and 3 all had monitoring and decision-making SET subscale scores above 75%. School 4, the only school that neglected data entry throughout the course of the study, received a lower subscale SET score of 50%. Results suggest that schools that are implementing components of PBS with greater fidelity are more likely to respond to and benefit from coaching assistance than schools with lower levels of implementation fidelity. Using SWPBS as an example of educational innovation, this information provides foundational support for the use of coaching to enhance implementation and fidelity of system reform efforts in schools.

Theoretical Basis for Coaching

Coaching as a concept has historically emerged in the context of athletics (Guiney, 2001; Rush & Shelden, 2005b), and more recently business (Doyle, 1999; Flaherty, 1999; Kinlaw, 1999). Although the literature describes a surge of interest in coaching related to professional development during the last few decades (Deussen et al., 2007), variants of coaching in education date back to the 1930s (Hall, 2004). A standard model of coaching does not appear to exist; a variety of forms of coaching, with an assortment of applications and context-specific derivatives, permeate the literature. Fundamental to all notions of coaching and coaching processes, however, is that of effective adult learning techniques (Darling-Hammond & McLaughlin, 1995; Lieberman, 1995; Miller, 1995). Coaching has evolved from the literature on adult learning; whereby research suggests optimal teaching methods and environment conditions exist that promote learning among mature students.

In general, *adult learning* refers to a compilation of theories, techniques, and methods for describing circumstances that enhance learning processes (Trotter, 2006; Yang, 2003). Literature related to adult learning, and teacher professional development specifically, indicates that learning and general knowledge acquisition is context dependent and strongly associated with the learner's social interactions (Putnam & Borko, 2001). Learning theory suggests that learners should be active participants in their own skill development, be allowed opportunities to dialogue and reflect upon new material, observe more experienced peers model new strategies, practice the application of new skills, and receive constructive feedback from experts on performance (Darling-Hammond & McLaughlin, 1995; Lieberman, 1995). Allowing learners to converse about the new ideas and reflect upon the material encourages development of deeper understanding (Vaughan, 1996). Providing learners opportunities for practice and feedback from an experienced teacher also enhances skill development, especially when practiced in authentic contexts (Brown, Collins, & Dugrid, 1989; Lave & Wenger, 1991). Expert modeling of new practices also increases a learner's understanding, allowing for a representation of the behavior that can be referenced in the future (Lave, 1988).

A research synthesis on adult learning and skill development conducted by the National Research Council (NRC) identified three essential elements related to "the science of learning" (Donovan, Bransford, & Pellegrino, 1999). First, new material is more easily learned when it is related to the learner's prior knowledge and is made explicitly relevant to him or her. Second, in order for the learner to develop a deep understanding of the new material, he or she must hold a firm knowledge base of factual information, understand such facts in the context of a theoretical framework, and arrange the new information in a way that facilitates efficient recall, use, and transfer to other situations. Finally, when the learner engages in ongoing progress mentoring, self-assessment, and reflection while practicing the new material, a greater depth of understanding is developed that enhances the likelihood that he or she will continue application of the material over time. According to Bransford et al. (2000), instructors, mentors, and trainers have a “critical role in assisting learners to engage their understanding, building on learners’ understanding, correcting misconceptions, and observing and engaging with learners during the process of learning” (p. 238). In sum, the characteristics of coaching appear consistent with the NRC’s findings on adult learning as well as the theoretical underpinnings of teacher professional development (Rush & Sheldon, 2005b). The following provides a brief overview of the empirical literature on coaching models and their application within the schools.

Coaching Models and Outcomes

The literature has described several unique models of school-based coaching such as classroom management coaching (Reinke, Sprick, & Knight, 2009; Sprick, Knight, Reinke, & McKale, 2006), content-focused coaching (West, 2009; West & Staub, 2003), differentiated coaching (Kise, 2005, 2009), peer coaching (Showers, 1984), leadership coaching (Reiss, 2006, 2009), and blended coaching (Bloom, Castagna, Moir, & Warren, 2005). According to Knight (2009), coaching models that are particularly common in the nation’s school systems include: cognitive coaching (Costa & Garmston, 2002), instructional coaching (Knight, 2007), and literacy coaching (Hall, 2004; Moran, 2007).

The current research on school-based coaching is largely anecdotal and descriptive in nature, much of it involving case studies, observations, and interviews (Knight, 2009; Neufeld & Roper, 2003a). There are several reasons for this lack of sound empirical evidence for outcomes of school-based coaching. First, there exist extensive challenges when attempting to isolate the effects of coaching (Cornett & Knight, 2009; Johnson, Berg, & Donaldson, 2005; Whisnant, Elliot, & Pynchon, 2005). Many forms of coaching exist in theory and practice, thereby making it difficult to identify a consistent “treatment” definition within and across studies (Erickson & Gutierrez, 2002). In other words, the coaching “treatment” (i.e., the coaching that was delivered) varies by setting and individual coach. Second, there exist a plethora of systems variables that inherently confound empirical investigation in school settings. The extent to which the coaching practice is voluntary, the level of leadership support for coaching practices, as well as the nature of the reform effort being employed are all examples of systemic factors that may impact coaching performance in schools. Finally, coaching is often implemented as one component of a broader systemic reform effort, which makes evaluating the impact of coaching in isolation from changes in school structures, curricular focus, and leadership vision cumbersome at best (Neufeld & Roper, 2003a). With these concerns noted, the following provides a review of empirical studies highlighting positive effects of the application of four popular school-based coaching models on various teacher and student outcomes: Peer Coaching, Cognitive Coaching, Literacy Coaching, and Instructional Coaching.

Peer coaching. Peer coaching occurs when teachers observe one another and provide support, feedback, and assistance to enhance instructional practices, and "is commonly defined as two or more professional colleagues working together to improve their professional knowledge and skills" (Poglinco et al., 2003, p.2). In 1984, Bush presented findings from a five year longitudinal study investigating the impact of various approaches to professional development. This study has since been identified as a seminal investigation in the area of coaching for teacher learning (Bush, 1984). Bush examined the extent to which peer coaching increased teachers' implementation of newly learned skills. The impact of the following incremental components of professional development was examined in the context of training teachers to implement a new skill within their classrooms: (1) description of the new skill, (2) modeling/demonstration, (3) practice, (4) feedback, and (5) peer coaching. Findings indicated that when participants were given just a description of the new skill, only approximately 10% attempted skill application in the classroom. However, when they received additional modeling by an experienced implementer, 2-3% more accurately applied the skill within the classroom. When the component of practice was added to instruction, an additional 2-3% of participants performed the skill. Further, when feedback was included, another 2-3% more skill transfer occurred. However, when coaching was included within the staff development process, up to 95% of the teacher participants transferred the new skill to the classroom setting. Therefore, coaching within the staff development process was a critical element to successful transfer of newly learned skills to classroom instruction.

Showers (1982) similarly found that providing peer coaching to teachers following training was much more effective at facilitating the application of new skills and practices in classrooms than without such coaching. A total of 17 sixth, seventh, and eighth grade teachers were trained on three different teaching models. After initial training, nine teachers were randomly assigned to receive coaching for an additional six weeks, while eight teachers were assigned to an observed but not coached control group. Teacher observations revealed that non-coached teachers were much less likely to utilize the new instructional practices than coached teachers, and discontinued the use of the new models more frequently after initial trainings.

In the same study, Showers (1982) investigated the degree of transfer of training in relation to student learning. Findings indicated that students instructed by teachers with high implementation rates performed significantly better on recall tests than students of teachers with low implementation rates. Further, none of the “high implementing” teachers were members of the non-coached control group. Therefore, coaching appeared to be a prerequisite to high rates of implementation of newly learned teaching practices.

Showers (1984) conducted another study to better understand the possible impact of coaching on student achievement. Paralleling Shower’s (1982) earlier study, teachers were randomly assigned to either work with a peer coach or not. Participants were further split into groups when 10 teachers received coaching from six peer coaches, four teachers received only partial coaching, and five teachers received no coaching after training. Results indicated two notable findings. First, coached teachers were more likely to transfer new teaching practices into classroom use than partially coached or non-coached teachers. Second, students of coached teachers performed significantly better on a measure of concept attainment than did students of non-coached teachers.

More recently, Truesdale (2003) investigated the transfer of newly learned skills into classroom settings using both coached and non-coached conditions. In this 15-week study, teachers in two elementary schools attended a professional development workshop. The control group consisted of five teachers in school A who did not receive peer coaching after the workshop. The experimental group consisted of ten teachers who volunteered for follow-up coaching in school B. Findings indicated that teachers who received peer coaching had a higher transferability of newly learned skills into classroom practice than non-coached teachers. Non-coached teachers, on the other hand, lost interest in the newly learned skills and failed to consistently apply them in their classrooms. Thus, coaching as follow-up to a workshop was found to positively impact both teachers' interest in and application of newly presented skills.

Cognitive coaching. Cognitive coaching as a process was developed by Arthur Costa and Robert Garmston in 1984 as a means for school principals to support their teachers' professional development (Ellison & Hayes, 2009). Cognitive coaching has been identified as one of the most widely used forms of coaching in the nation's schools (Knight, 2007), and is based upon the assumption that an individual’s behavior changes once his or her beliefs change (Costa & Garmston, 2002). Specifically, Costa and Garmston (2002) suggest that “all behavior is determined by a person’s perceptions and…a change in perception and thought is prerequisite to a change in behavior…human beings construct their own meaning through reflecting on experience and through dialogue with others” (p.7). Cognitive coaches collaborate with teachers to enhance their ability for reflection in self-directed learning. The goal is to generate self-directed teacher learners with the capacity to achieve high performance standards both individually and within the school community.

A number of studies have investigated the effects of cognitive coaching, with positive effects for general education classroom teachers (Edwards & Newton, 1995), Title I teachers (Hagopian, Williams, Carrillo, & Hoover, 1996), new teachers involved in mentoring relationships (Barnett, 1995), and university professors (Garmston & Hyerle, 1988). Teachers using cognitive coaching have been found to have higher teaching efficacy (Edwards & Newton, 1995; Krpan, 1997), which is a goal of the cognitive coaching process (Costa & Garmston, 2002). Teachers have self-reported increases in job and career satisfaction following cognitive coaching (Edwards & Newton, 1995). Additionally, teachers supervised via a cognitive coaching approach perceived their experiences more positively than those supervised with traditional techniques (Edwards, 1993; Mackie, 1998).

Edwards, Green, Lyons, Rogers, and Swords (1998) investigated the relationship between aspects of training in both cognitive coaching (Costa &

Garmston, 1994) and Nonverbal Classroom Management (Grinder, 1996) and measures of teacher efficacy and school climate. Participants were K-12 teachers involved in a three-year grant to assist them in implementing State Content Standards. Both treatment and control group participants received instruction in implementing Standards-Based Education from the school district. Participants in the treatment group also received training in cognitive coaching and Nonverbal Classroom Management, and coached each monthly while meeting in Dialogue Groups. Results indicated that teachers who received training in cognitive coaching and Nonverbal Classroom Management and also attended monthly Dialogue Groups displayed significant growth in teaching efficacy over time when compared to the control group. Significant differences were demonstrated between years 1-2 and 1-3, but not years 2-3. Since Nonverbal Classroom Management was introduced in year 2, results appear to suggest the effects are more attributable to the cognitive coaching intervention than the Nonverbal Classroom intervention. Results suggest that the interventions of cognitive coaching and monthly Dialogue Groups resulted in increases in self-reported teaching efficacy and attitude toward school culture. Further, teacher efficacy and school culture were positively correlated with the use of coaching skills. These results support previous research findings indicating positive outcomes for teachers as a result of cognitive coaching.

Veenman and Denessen (2001) conducted five training studies evaluating the effects of a coaching program based upon Costa and Garmston's (1994) cognitive coaching model in Dutch primary and secondary schools. These studies involved the following groups of participants that were trained to be coaches: school counselors, principals, mentors of beginning teachers, mentors of pre-service teachers, and secondary school teachers. Findings indicated training to have an effect on coaching skills and that trained coaches appeared to display a number of skills considered important within the cognitive coaching model when working with teachers. The coached teachers also appeared to value the time working with both trained and untrained coaches, with their work with trained coaches rated as higher in this area. These studies also suggest that different school-based personnel from a variety of disciplines can be trained to function as a coach. However, it is unknown whether the coaching skills displayed by trained coaches or valued by teachers actually impact changes in teacher decision-making or instructional behavior that enhances student outcomes.

Literacy coaching. Another popular method used in schools is literacy coaching, which generally refers to a number of processes and practices used to enhance teachers' instructional practices to improve student learning related to literacy (Knight, 2009). Although the terms *literacy coach* and *reading coach* are used in a number of ways to describe various activities in schools, most individuals have varied and fragmented understandings of literacy coaching as a discipline (Toll, 2009). Researchers suspect this occurs because literacy coaching is not so much a model of coaching per se, but rather an approach to teacher professional development that uses various coaching models within a number of different programs, practices, and reform efforts. Toll (2009) states that literacy coaching is actually a “category of instructional coaching that focuses on literacy and related aspects of teaching and learning; various programs of literacy coaching implement a variety of coaching models” (p. 57).

According to Dole (2004), a literacy coach is a professional who “supports teachers in their daily work-planning, modeling, team-teaching, and providing feedback on completed lessons in collaboration with classroom teachers in a school” (p. 462). The International Reading Association (IRA) has adopted Dole’s definition of a literacy coach, and developed guidelines outlining the role and qualification of the literacy coach as well as recommendations for related policy in schools (International Reading Association, 2004). As mentioned above, many researchers agree that literacy coaching is not so much a model defined by a specific theory or set of behaviors, but a conglomeration of a number of approaches used to enhance teachers’ literacy instruction to impact student outcomes in reading (Knight, 2009).

In an extensive literature search conducted by Cornett & Knight (2009), the researchers found the majority of empirical evidence in support of literacy coaching relies on findings from other models of coaching (i.e., peer coaching, cognitive coaching, instructional coaching). Further, the researchers found no studies that incorporated sound methodological practices, such as randomized-control-style studies of effectiveness on outcomes like teacher practices or student achievement. Studies are emerging, however, that evaluate the effects of literacy coaches in Reading First, a federal project that supports literacy instruction for students in low-performing K-3 schools (U.S. Department of

Education, 2002). Reading First mandates grantees use a reading/literacy coach to provide ongoing professional development to teachers with hope of increasing student reading outcomes.

One example of an extensive evaluation of literacy coaches in Reading First schools is *Supporting Literacy Across the Sunshine State: A Study of Florida Middle School Reading Coaches* (Marsh et al., 2008). The researchers investigated the implementation and impact of literacy coaches in Florida middle schools. Such coaches were supported by a state-wide initiative called “Just Read Florida,” which offered the researchers a unique opportunity to study such variables from a large-scale, state-level platform. The researchers used both qualitative and quantitative methods in their investigation with a purposive sample of eight large school districts that ranged in experience with and application of coaching within their middle schools during the 2006-2007 school year. The researchers conducted interviews and surveyed the principal, reading coach, reading teachers, and social studies teachers in the participating schools (n = 113), as well as case studies in two districts. Because all districts across Florida were implementing a reading coach program simultaneously, the researchers were unable to utilize experimental analysis to ascertain the effects on student achievement. Instead, two alternative analyses were conducted to examine links between coaching and achievement. The first included a longitudinal, pre-post design that included all middle schools employing coaches from 2002 to 2006, in attempt to identify a treatment effect of providing coaches to schools across Florida. The second analysis was cross-sectional, linking survey data collected during the 2005-2006 school year with student test scores while examining correlations among coaching activities, student outcomes, teacher practices, and other variables.

Marsh et al. (2008) revealed several salient findings. First, it appeared as though districts across Florida set up similar policies and support for coaches. School principals were generally in charge of hiring coaches, and considered the following skills important: knowledge and expertise in reading, interpersonal and communication skills, and experience working in similar content areas and grade levels. Seven of the eight school districts reported having formalized coaching evaluation procedures in place, and most all the coaches indicated understanding their job expectations. Coaches generally received professional development from both the state and district levels, and tended to value professional development methods that emphasized collaboration and focused on adult learning strategies, teaching special populations such as English Language Learners (ELLs), working with teachers to improve practice, and incorporating literacy across content areas. Coaches typically divided their time among many different activities, including both formal and informal coaching of teachers, coaching-related administrative activities, data analysis, and professional development. However, coaches also spent time in non-coaching related duties such as substitute teaching, unrelated administrative tasks, and cafeteria supervision.

When considering the perceived impact of coaching on teacher practice, survey findings indicated that 47% of all reading teachers and 40% of all social studies teachers reported that the coach had influenced them to make instructional changes either to a moderate or great extent (Marsh et al., 2008). A majority of principals also reported positive effects. Specifically, 80% of principals agreed or strongly agreed that the reading coach deepened their understanding of reading instruction and best practice, helped them identify best practice approaches in the classroom, and helped them to better critique and provide feedback to teachers. Eighty-four percent of principals reported that the coach took the lead on the school's reading initiative, allowing the principal more time to focus on other areas. Additionally, over 90% of principals indicated the coach had a positive impact on the quality of reading-related professional development offered to teachers, and over 80% indicated that the coach helped build a stronger sense of community in the school.

The researchers employed least squares regression analysis to model various school-level predictors for perceived influence on teacher practice, principals' knowledge and skills, school climate, and student motivation to read (Marsh et al., 2008). Findings suggested that a number of coaching factors were related to perceived coaching influence when controlling for other factors. For example, teachers' perceptions of the quality of the coaches' knowledge and skills were associated with teachers' reports of the coaches' influence on their instruction as well as the coaches' influence on student motivation to read. Coaches' ability to support adult learners (as rated by principals) was positively associated to teachers' perception of coaches' influence on instruction, and on principals' perceptions of coaches' influence on their knowledge and skills, on school climate, and on students. Further, the number of years a school employed a coach had a small positive relationship with teachers' reports of a coach's influence on student motivation to read. In sum, teachers and principals generally perceived that the coaches positively impacted a variety of school variables.

When considering the impact of coaching on student reading achievement (as measured by state-wide reading tests), Marsh et al. (2008) found mixed results. Specifically, having a state-funded coach was related to small yet statistically significant improvement in the average annual gains on the state standardized reading test for both the 2003 and 2004 cohorts, with no statistically significant associations found for the 2004 or 2006 cohorts. Only a few coaching factors were positively associated with student achievement. Specifically, the number of years a school had a coach as well as the act of coaches reviewing assessment data with reading teachers were associated with improved reading scores. Interestingly, although the effects were small, coaches' experience teaching reading was negatively associated with student achievement in both reading and mathematics. The researchers hypothesized that coaches with more experience teaching students may continue to use teaching strategies effective for children regardless of their effectiveness with adults. Finally, many features of coaching were not found to have differential impact on low-achieving students. Taken together, aside from reviewing data, very few coaching activities were associated with student achievement in this investigation.

Marsh et al. (2008) caution readers when interpreting the findings of this evaluation due to the inherent limitations of their data set and methodology.

First, the non-experimental nature of the study's design makes it impossible to ascertain causal effects of coaching on student achievement. The study of coaches in only one state limits the generalizability of findings to other states. However, these data offer insight into the development and implementation of a large-scale coaching model to policymakers, administrators, and educators across the nation. Future researcher should consider assessing coaching implementation and student outcome data for a period longer than one academic school year. A longitudinal analysis would likely be more sensitive to uncovering relationships among coaching, educators' perceptions, and student outcomes. Measures of achievement beyond state-wide standardized tests may also provide a more sensitive indicator of incremental growth in student achievement. Additionally, Marsh et al. (2008) examined changes in teacher and administrator behavior, as well as school climate, via perceptions and self-report ratings. Measurement of such variables using direct observational techniques would provide more objective data related to changes over time. Despite these limitations, this investigation and related findings provides a foundation to springboard future research on the impact of literacy coaching on a number of student-, educator-, and school-related variables.

Instructional coaching. Instructional coaching is a process that provides intensive, ongoing, differentiated support to teachers to enhance the implementation of evidence-based practices to improve student outcomes (Knight, 2007, 2009). Instructional coaching was developed by Jim Knight and colleagues at the University of Kansas Center on Research and Learning.

Instructional coaches focus their efforts on a broad range of instructional issues within the school such as classroom management, specific instructional practices, reading and mathematics content, and formative assessment. Regardless of the focus, instructional coaches assist teachers in implementing and refining evidence-based practices to enhance student learning. According to this model, instructional coaches employ seven practices while working with teachers: *enrolling* the teacher to build rapport and establish expectations, *collaborative planning* with the teacher, *modeling* the lesson for the teacher, *teacher-directed post conferencing* to discuss the modeled lesson, *observing the lesson* being taught by the teacher, *collaboratively exploring the data* collected during the observation with the teacher, and *providing continued support* while the teacher builds fluency with the new skill or practice. A specific theoretical framework, or the "partnership approach," ties together these seven components into a comprehensive model of support that guides coaches on how to interact with educators. The seven theoretical principles are as follows: *equality, choice, voice, dialogue, reflection, praxis*, and *reciprocity.*

Knight (2007) and colleagues investigated teachers' perceptions of the value of model lessons provided by instructional coaches. Teachers who had observed an instructional coach (IC) provide a model lesson in the previous year were surveyed. Results of the 10-item informal survey indicated teachers felt that the ICs' model lessons helped them with fidelity to research-based practices, increased their confidence about new practices, made it easier to implement new practices, and provided opportunities to learn other teaching practices. However, they generally did not feel ICs were prepared to teach all content areas in a classroom.

Overall, Knight's (2007) study suggested that teachers perceived model lessons as beneficial to their instructional practices. Although this investigation was informal in nature and used a measure that had not been empirically validated, the researcher conducted a series of follow up interviews to provide qualitative support for the above findings. A total of 13 teachers were interviewed on their perspectives regarding the value of the model lessons conducted by instructional coaches. All 13 participants agreed that the model lessons were an essential part of the coaching process, and provided a number of benefits for their professional practice in the classroom.

Due to a lack of rigorous empirical research on instructional coaching, Knight and Cornett (2009) designed a mixed methods study to investigate the merits of instructional coaching as a professional development mechanism for teachers. The purposes of this study were threefold: 1) determine the extent to which instructional coaching facilitates teachers' use of new practices, 2) investigate the ways in which instructional coaching impacts the quality of new practices, and 3) determine if the effects of instructional coaching continue after termination of coaching supports. Fifty teachers in six middle schools and two high schools volunteered to participate in this study. All teachers attended a professional development workshop to learn how to use a scientifically-based teaching routine called the Unit Organizer Routine along with the Unit Organizer Device (Lenz, Bulgren, Deshler, & Schumaker, 1994). Participants were randomly assigned within each school to one of two conditions: a) instructional coaching support following the workshop, or b) no coaching support following the workshop. An observation form developed by the researchers was used to determine if the teachers were utilizing the new practice and the quality of practice implementation. Additionally, follow-up interviews were conducted two to three months after the initial workshop to examine if implementation and quality of the new teaching practices persisted over time.

Knight and Cornett (2009) used a two-way contingency analysis to evaluate whether teachers were more likely to implement the new practice if they had follow-up coaching support compared to if they did not. Professional development and observed behavior were found to be significantly related [χ^2 (2, N = 547) = 184.57, p < .001]. The proportion of days the new practices were used by coached teachers and non-coached teachers were 91.5 and 36.2, respectively. Further, teachers implemented the practice at a higher quality when supported by coaches [t(40.25) = 5.975, p < .0001). In other words, teachers in the workshop only condition employed the new practice at a lower quality on average (M = 1.08, SD = 1.18) than those in the coached condition (M = 2.82, SD = .81). The effect size of instructional coaching on teacher quality of implementation was large (d = .96). Follow-up semi-structured interviews indicated that coached teachers continued to use the new teaching practice much more frequently following training than those who did not research such support.

Several limitations tempered Knight and Cornett (2009)'s study. First, the generalizability of these findings are limited in that only a small sample of secondary teachers who volunteered for participation were used in this study. Also, the effects of the new practices on student achievement are unknown and measurement of such outcomes was beyond the scope of this study. Regardless of these limitations, the results clearly suggest that teachers supported by instructional coaches were more likely to use new practices in their classrooms, and use those practices with fidelity, than those who attended the workshop only. Future research should strive to employ similar rigorous empirical investigative methodologies to further the understanding of coaching impact.

Regardless of the model embraced by a school or district, the literature on school-based coaching suggests that several commonalities exist among all models (Knight, 2009; Rush & Sheldon, 2005). Knight (2009) list the following common elements: focus on advancement of professional practices of educators to improve student outcomes; facilitation of professional learning experiences embedded within the ongoing, day-to-day work of educators in school settings; provision of differentiated support that is ongoing, intensive, and specific to learner needs; collaboration with educators within a dynamic of equality and partnership; engagement of reflective, dialogical conversations with coachees; non-evaluative role in educator behaviors; confidentiality with respect to open and honest conversations; and facilitation of impact via highly effective and respectful communication. Rush and Sheldon (2005) include the following general characteristics: joint planning between coaches and coachees, coach observation of staff members, implementation of new practices, joint reflection between coach and coachee, and constructive feedback from coach to coachee regarding progress. Regardless of the specific goals and methods utilized, the fundamental tenets of the coaching process appear to remain similar across theories, content focus, and procedures utilized within a school-based coaching relationship.

Coaches Knowledge, Skills, and Activities

Converging literature on school based coaching suggests that the knowledge, skills, and abilities held by coaches contribute to their effectiveness (Marsh et al, 2008). However, the preponderance of literature on this topic is limited to informal case studies of individual coaching programs, observational and descriptive data, and interviews with teachers and coaches (Kowal & Steiner, 2007; Neufeld & Roper, 2003). Nonetheless, current knowledge in the field suggests that coaches must hold three broad classes of talents: pedagogical knowledge, content expertise, and interpersonal skills (King et al., 2004; Kowal & Steiner, 2007). First, if coaches are to be effective, researchers agree that they must hold a deep understanding of how students learn and various instructional practices within school settings (Neufeld & Roper, 2003; Poglinco et al, 2003). Coaches must also have a strong knowledge base regarding adult learning processes (Norton, 1999; King et al, 2004). Further, coaches must have a thorough understanding of the subject they are coaching (i.e., literacy, mathematics, science) as well as how the content area instruction must vary at different grade levels (i.e., elementary, middle, high). Finally, coaches focusing on changing practices within schools must have a comprehensive understanding of the reform efforts of which they are facilitating implementation (Neufeld & Roper, 2003a; Poglinco et al, 2003).

In addition to pedagogical and content area expertise, authors emphasize the importance of highly developed interpersonal skills among coaches (Kowal & Steiner, 2007; King et al., 2004). Characteristics such as tactfulness, flexibility, supportiveness, approachability, trustworthiness, and communication skills are essential (Brown, Reumann-Moore, Hugh, du Plessis, & Christman, 2006; Poglinco et al, 2003; Wong & Nicotera, 2006). In a 2003 survey of professional development coaches, “people skills” was identified as the most frequently mentioned characteristic of effective coaches, including building relationships, establishing trust, and tailoring assistance to individuals. Coaches themselves ranked interpersonal skills as more important that content and pedagogical knowledge, suggesting that pedagogical and content knowledge could be more easily learned through professional development than interpersonal skills (Ertmer et al, 2005).

Coaches roles and responsibilities. While modeling instructional practice, observing educational staff, and providing critical feedback to adult learners are typical duties of school-based coaches, the literature suggests they take on a wide variety of additional responsibilities as well. For instance, authors have indicated that coaches plan and implement professional development activities (Killion & Harrison, 1997); consult with and mentor teachers (Costa & Garmston, 2002); select and develop new curricular programs (Poglinco et al., 2003); lead discussion and study groups (Sweeney, 2003; Walpole & McKenna, 2004); conduct action research and write grants (Walpole & McKenna, 2004); analyze student data and facilitate curricular adjustments (Brown et al., 2006); consult with school and district leaders on administrative tasks (Deussen et al., 2007; Killion & Harrison, 1997), and serve as liaisons between teachers and administrators (Feger, Woleck, & Hickman, 2004).

Wong and Nicotera (2006) found that the complex and multifaceted nature of the roles and responsibilities of school-based coaches is strongly dependent upon school context. Elements such as grade level, geographic location, ongoing reform efforts, history with innovations, and teacher climate all influence the daily work of the coach. Based on their extensive experience developing, leading, and evaluating coaching programs, Killion and Harrison (2006) identified 10 roles of school-based coaches: (1) resource provider, (2) data coach, (3) instructional specialist, (4) curriculum specialist, (5) classroom supporter, (6) learning facilitator, (7) mentor, (8) school leader, (9) catalyst for change, and (10) learner. While the roles are described as distinct, the authors explain that coaches typically fulfill multiple roles simultaneously based upon the needs of schools.

Although there is no agreed-upon list of standardized roles and responsibilities of coaches across the nation, researchers agree that a lack of clarity of a coach’s individual responsibilities within his or her assignment can be a significant challenge (Brown et al., 2006; Killion & Harrison, 2006; Knight, 2009; Neufeld & Roper, 2003; Poglinco et al., 2003; Wong & Nicotera, 2006). Such confusion about job specification can lead to frustration, particularly when coaches are pulled into activities not aligned with the initiative's primary goals (e.g., substitute teaching, administrative duties, paperwork). Without a clear framework for their job, coaches find their time fragmented, their activities misguided, and their effectiveness diluted (Rivera, Burley, & Sass, 2004).

Conditions that impact coaching performance. The success of coaching depends not only on the skills and abilities of the individual coaches, but also on a number of school-, district-, and state-level factors that vary considerably within and throughout our nation's educational institutions (Killion & Harrison, 2006; Marsh et al., 2008; Neufeld & Roper, 2003). The literature suggests that "buy-in" to, and support for, the coaching process from educators at both school and district levels are critical to successful outcomes (Coggins, 2005). As teachers are the ultimate consumers of coaching processes, it is necessary for coaches to have strong working relationships with educators at the school level. However, research suggests that gaining teacher trust and buy-in for the process is difficult, and that teachers often resist such a relationship for a variety of reasons (Brown et al., 2006; Darling-Hammond & McLaughlin). For instance, teachers often fear that a coach may take on an evaluative role, thus diminishing the trust necessary in such a relationship (Poglinco et al., 2003). Teacher resistance can also emerge from a history of working in isolation, and seeing a pattern of similar innovations come and go without follow-through in the past (Tung & Feldman, 2001). Thus, it is vital that school and district leaders emphasize the non-evaluative role of the coach, publicize their commitment to the process, and develop a safe and collaborative environment for educators to participate in coaching relationships (Neufeld & Roper, 2003).

The literature also suggests that the support of principals and district administrators is necessary to enable positive coaching processes (Poglinco et al., 2003; Trubowitz, 2004). Principals who publicize their support for coaches and their commitment to the coaching process by attending coaching workshops, observing coaches during various activities, speaking frequently about the importance of the coaching relationship and professional learning, and meeting frequently with coaches to continue working toward a common vision of professional learning facilitate the success of coaching processes (Knight, 2009). However, as with teachers, establishing principal buy-in can be difficult. Researchers have found that principals often do not trust coaches to oversee the implementation of a new practice or innovation, and often have difficulty relegating authority to a coach (Poglico et al., 2003).

Buy-in and support from district level administration is also crucial for the coaching process. Neufeld and Roper (2003a) state that, “without question, the most important condition for successful coaching is district support for the coaches’ work” (p. 16). Coaching must be embedded within and throughout a school system, and the superintendent, central office leaders, and school administrators all must carry a consistent message regarding their commitment and expected outcomes of the coaching initiative (King et al., 2004; Knight, 2009). When conflicting information regarding the role and purpose of the coaching innovation is allowed to reach coaches, teachers, principals, and other stakeholders, the resulting confusion and frustration can negatively impact the credibility of the coach and the effectiveness of his or her activities (Neufeld & Roper, 2003; Poglinco et al., 2003).

Research indicates that appropriating adequate time for coaching activities is a major facilitator to effective outcomes (Neufeld & Roper, 2003; Marsh et al., 2008). According to Knight (2009), “the single most powerful way to increase the effectiveness of coaches is to ensure they have sufficient time for coaching” (p. 19). However, researchers have identified that time to coach is often diminished by infringing factors such as having difficulty scheduling time with stakeholders, being pulled into other duties like substitute teaching, and being assigned too many schools (Knight, 2009; Neufeld & Roper, 2003; Rivera, Burley¸& Sass, 2004). Another factor identified as facilitating positive coaching outcomes is the issue of educator and coach continuity over time (Hatch, 2002; Marsh et al., 2008; Neufeld & Roper, 2003). Schools with infrequent staff turnover and consistent coach assignments often have a better chance at seeing results. Additionally, coaching has a higher likelihood of effectiveness if educators view their participation as voluntary (Killion & Harrison, 2009; Knight, 2009).

Professional development for coaches. Given the vast array of skills and competencies required of a school-based coach, the need for ongoing professional development for coaches emerges in the literature (Neufeld & Roper, 2003; Killion & Harrison, 2009). Authors have suggested the following topics be included in a professional development curriculum for school-based coaches: clear understanding of coaches' role and function (Knight, 2009; Marsh et al., 2008); forum for networking and ongoing communication among coaches (Neufeld & Roper, 2003; Kowal & Steiner, 2007); time and focus to develop expertise in "what" they are coaching (Borman, Geger, & Kawakami, 2006); and opportunities for differentiated focus for new and experienced coaches (Ricahard, 2003; Feger, Woleck, & Hickman, 2004). Further, coaches require training in how to create and provide professional development opportunities for others (e.g., teachers, administrators, school support personnel) to enhance skills required of the new initiative (Sansosti & Noltemeyer, 2008; Brown-Chidsey & Steege, 2005). Coaches are the primary strategy for delivering professional development to educators in some districts, while just one part of a multifaceted professional development model in others (Gusky, 1995). Further, coaches require training in how to deliver professional development in various formats such as one-on-one, small group, whole-school, and district/state-wide forums (Borman, Feger, & Kawakami, 2006).

Effects of coaching time and activity. It is reasonable to assume that for the process of coaching to be effective, coaches must spend time working with educators in schools (Marsh et al., 2008). Emerging research indicates a link between the number of hours a coach spends with teachers per day, as well as higher coach-to-teacher ratios, and general coaching effectiveness (Neufeld and Roper, 2003). Further, studies have demonstrated that difficulties in scheduling time to work with teachers impede coaching effectiveness (Poglinco et al, 2003).

Ross (1992) considered the impact of time teachers spend with instructional coaches on student outcomes with a small sample of seventh and eighth grade history teachers in rural Ontario. Teachers were asked to implement a new history curriculum, with coaching as a resource to assist with implementation. Results indicated that student achievement was higher in classrooms of teachers who had more contact with coaches. However, the researcher encourages caution with interpretation when stating "although it is reasonable to infer that coaching practices contributed to higher achievement, it is possible that teachers who were enjoying greater success in the classroom might have sought out their coaches and/or coaches might have responded more enthusiastically to success stories" (p. 60). Additionally, this study was exploratory in nature and limited by a small sample size and unclear delineation of coaching methods utilized by participants. The use of student outcome data as the dependent variable can also be called into question, in that direct observation of teachers' change in practice after consultation with a coach may be a better measure of coaching impact. Further, coaching was measured through self-reported perceptions and recall of interactions. A daily log of coaching behaviors that indicate specific types of activities as well as length of time with teachers may have provided a more robust measurement of coaching processes. Regardless of these weaknesses, this study provides another source of support for a positive link between time spent coaching and implementation of a new innovation.

Shidler (2009) also investigated the effects of time spent coaching for professional development. Specifically, the researcher examined a possible link between hours spent coaching teachers in the classroom to enhanced teacher efficacy in content instruction and student outcomes. Participants were 360 students enrolled in 12 Head Start classrooms over a three year period. A coach was randomly assigned to each classroom prior to the first year of the study. Results indicated that in year one, a significant correlation emerged between coaching hours and students' alphabet letter recognition. Specifically, those classrooms receiving greater amounts of coaching were more likely to produce higher scores on students' letter identification tests. However, no significant correlation was found in year two or three. Therefore, since the coaching model for year one focused on instructional efficacy in specific content areas and teaching methods with direct coaching support, the researcher concluded that "a more focused, honed approach to coaching teachers in enhancing child outcomes in specific measures was more effective" (p. 459).

Though Shidler (2009) should be applauded for investigation is this area, several limitations permeated this study. First, it is unclear what type of activities the coaches and teachers undertook beyond the brief description offered by the author. This study would have been enhanced by noting the types and frequency of activies that encompassed the "hours spent coaching," and how variations of these different types of activities impacted student outcomes. Additionally, the notion of fidelity of coaching practices was not addressed in this article, thus limiting the validity of the results. Finally, an observational measure of changing teacher practices would have possibly illuminated effects of coaching on teacher efficacy more directly than student outcome data. Regardless of these limitations, the results suggest that enhancing the quantity of teachers' interactions with coaches does not automatically link to the increased student outcomes. The types of interactions with coaches as well as the quality of those interactions are likely important variables to consider when researching such strategies.

Just as it is reasonable to assume a link between time spent coaching and coaching effectiveness, the way coaches spend their time in schools may also impact effectiveness (Marsh et al., 2008; Deussen, Coskie, Robinson, & Autio, 2007). Deussen et al. (2007) suggest that before coaching can be linked to teacher practices or student outcomes, data must be gathered to illuminate the types of activities in which coaches engage on a regular basis. In their mixed-method study of Reading First coaches, the researchers sought to identify the types of activities that define their roles within schools. Surveys were administered to K-3 teachers and literacy coaches in 203 Reading First schools across five western states in North America over a two-year period. The surveys included over 200 items measuring attitudes and practices in Reading First schools, as well as descriptive checklist items for coaches regarding how they spend their time. Additionally, semi-structured interviews were conducted with 77 coaches and 300 K-3 teachers and principals at 77 Reading First schools in the same states. Cluster analytic methods were used for the quantitative survey data and thematic coding was used to analyze the qualitative interview transcripts.

Full-time reading coaches reported working an average of 49 hours per week, while some reported working up to 60-70 hours per week. Although typical state level expectations indicated that coaches were to spend 60-80% of their time working directly with teachers in tasks such as observation, providing feedback, and demonstrating lessons in classrooms, survey data indicated that coaches spent only 28% of their time in this activity. Data- and assessment-related tasks consumed another 25% of the coaches typical work week, reflecting activities such as administering and coordinating student assessments, entering and analyzing data, as well as reviewing data with staff. Other tasks included the following: (a) planning for and attending meetings (14%), (b) paperwork (11%), (c) planning and providing interventions (10%), (d) attending professional development activities (5%), and (e) non-coaching related tasks such as bus duty and substitute teaching.

Deussen et al.'s (2007) survey findings suggest that the coaches held multifaceted roles and responsibilities within the schools, and were involved in a vast range of assorted tasks across schools, districts, and states. Because of this large variation reported by coaches, the researchers noted that attending to only the overall average of reported time spent in specific tasks fails to illuminate specific patterns in use of time for various subgroups of coaches surveyed. In order to address this issue, the researchers used cluster analysis to develop different categories of coaches based upon the percentage of time spent on various activities. A total of five categories were created: (a) data-oriented coaches spent almost half their work week (45%) on responsibilities such as coordination and administration of assessments, data management, and data use and interpretation; (b) student-oriented coaches spent 12% of their time providing direct interventions to students; (c) managerial coaches disproportionately spent their time on paperwork, meetings, and administrative activities (35% of their time); (d) teacher-oriented coaches (group) spent 41% of their time working with teachers in a group setting; and (e) teacher-oriented coaches (individual) spent 52% of their time working with individual teachers.

Deussen et al.'s (2007) findings underscore the variable and nebulous conception of "coaching" within the school setting, and that the use of a coach for professional development activities is far from a uniform intervention across schools, districts, and states. Although these findings are limited by their use of self-report data and a relatively small sample of coaches, this is the first known large-scale study of coaches that sought to develop a portrait of the different types of activities that comprise their roles within schools.

Tung and Feldman (2001) examined the role of the coach at the Center for Collaborative Education (CCE). CCE is described as a "non-profit organization whose mission is to work collaboratively with urban schools and districts to improve student learning by promoting and facilitating models of whole school reform" (Tung & Feldman, 2001, p. 4). The CCE coaches function as external facilitators who deliver ongoing and intensive services to staff within schools to assist school reform efforts and build internal capacity for sustainable change. Participants included 18 CCE coaches. Data were collected via coaching logs, interviews with coaches, and observations of coaches within their school settings. Coaches were asked to complete a log for each activity they completed in their assigned school. The logs included who and how many others were involved in each activity, the duration, type and content of the activity, as well as any resources used. Logs were examined over a 10-week period. The interview consisted of questions related to their experience as a coach such as understanding of the role, development of goals, and facilitators and barriers to their progress. One of the researchers informally observed each coach for one full day, “shadowing” the coach and noting details of his or her daily activities.

Descriptive data from the logs indicated that the majority of reported activities were meetings (72%), followed by classroom-based modeling or observations (12%), informal conversations with staff (11%), and workshops (3%) (Tung & Feldman, 2001). Coaches were likely to assume the role of facilitator when meeting with groups of teachers (74% of the time), as well as with groups of teachers and administrators together (80% of the time). When meeting with teachers, coaches were most likely to engage in reviewing student/teacher work (34% of the time), followed by curriculum planning (22%), and data-based decision-making (15%). The time spent on such activities was similar when meeting with teachers and administrators together: reviewing student/teacher work (25%), curriculum planning (24%), and data-based decision-making (6%). However, a different pattern emerged when coaches met with administrators only, with the majority of time spent planning/checking-in/debriefing (59% of the time), followed by curriculum planning (14%), and literacy planning (12%).

Tung and Feldman’s (2001) analysis of qualitative data gathered through interviews and observations suggested that an integral first step to developing a working relationship with school staff is to become familiar with the school culture. Although most coaches felt that integrating themselves into the school culture was critical, they also felt that their “outsider” status allowed them the objectivity necessary to be effective. Most coaches stressed the importance of informal conversations with school staff as a key to integrating successfully into the school culture and to build trust with faculty. With regard to interpretation of their role, the majority of coaches indicated that facilitating the change process was the fundamental responsibility of their job. Coaches rarely described their role as that of an expert, and more often identified themselves as collaborative problem-solvers. Some noted that challenges to their effectiveness included teacher resistance toward change, multiple competing initiatives within the school, and time to collaborate with staff.

In sum, Tung and Feldman’s study provides a snapshot of the role of a coach in one particular school reform effort. However, this study is limited in that it does not capture how the role of the coach changes over time and throughout the reform effort process. Further, these data may have provided a narrow conception of the coach role since only self-reports from coaches themselves were used in this study. Input from teachers and principals would have provided a more robust depiction of the role of the coach in the CCE innovation efforts. Finally, the study provided only descriptive data. Therefore, coaching impact on particular outcomes of interest could not be evaluated.

Evaluation Methods for Coaching Impact

According to Killion and Harrison (2006), school districts that invest in coaching "have a responsibility to evaluate the coaching program in order to assess its merit, worth, and impact; improve the program; and provide accountability for the investment" (p. 141). However, many districts launch a coaching program without adequate plans or procedures to evaluate the effectiveness of their coaches or coaching models (Killion & Harrison, 2006). Further, there is a substantial lack of empirical direction on how to best evaluate a coaching program (Killion, 2010; Kowal & Steiner, 2007; Neufeld & Roper, 2003). Without such infrastructure to properly evaluate the impact of coaching on specific professional development outcomes, districts often rely on chance alone to determine results.

Although empirical evidence related to evaluation of coaching programs is lacking, some authors have offered suggestions on how districts can measure the impact of their specific coaching models (e.g., Killion, 2010; Killon & Harrison, 2006; Kowal & Steiner, 2007; Neufeld & Roper, 2003). Neufeld & Roper (2003a) recommend that districts develop and communicate clear criteria that will be used to evaluate coaches, and create an evaluation instrument that offers summative and formative information of coaching quality and impact. Killion (2010) suggests that an annual evaluation of a coaching program should include analysis of the following: number of teachers who interacted with each coach; the kinds of interactions that took place; the focus of interactions; and changes in culture, teaching quality, and student outcomes in schools. Killion and Harrison

(2006) suggest that if coaches cannot be formally evaluated, at a minimum, coaches should have opportunity to reflect on their work, receive feedback from supervisors, and establish personal goals to guide their professional development.

Tools used to evaluate coaches and coaching programs are also emerging in the literature. Such tools include teacher surveys, classroom observation forms, coach self-report surveys, interview protocols, and coaching activity/interaction logs (Killion & Harrison, 2006; Kowal & Steiner, 2007). For example, the National Staff Development Council (NSDC) has developed the *Coach Interaction Record* to track the frequency and type of daily interactions coaches have with teachers (Killion & Harrison, 2006). The *Coach Interaction Record* includes 10 coding categories derived from the NSDC's field experience with coaching programs, and was created to compile data on how coaches spend their time. However, the technical adequacy of this tool is unknown, and examples of how it has been utilized to evaluate school-based coaches or coaching models have not been found.

The Kansas Coaching Project has also developed a series of *Coaching Surveys* that assess educator perceptions of coaches' performance and impact on various outcomes (e.g., *Coaching Effectiveness Survey*, *Teaching Practices Survey, School/District Support Survey, Implementation Survey, Student Achievement Survey*) (Instructional Coaching Kansas Coaching Project, 2008). Although these measures were developed to provide districts guidance in defining coaching competencies and evaluating coaching programs (J. Cornett, personal communication, November 4, 2010), there is no published technical adequacy information available for these instruments (J. Knight, personal communication, November 3, 2010).

As with other education personnel, evaluating individual coaches is typically regarded as performance evaluation (Killion & Harrison, 2006). Professional organizations such as state education agencies and teacher associations often require annual performance evaluations for all individuals working in the schools who hold licenses or certificates. The most frequently used means to conduct a performance evaluation is for a supervisor or principal to provide ratings of the professional’s behavior based upon specific standards or criteria tied directly to a job description (Peterson, 2000). Thus, the use of informal rating-scales to evaluate the performance of school-based coaches is emerging in practice.

In sum, the literature provides extensive arguments for summative and formative evaluation of school-based coaches and coaching models. Further, authors put forth a number of recommendations regarding elements to include in such evaluations (i.e., criteria for evaluation, method for feedback, professional development plans) as well as methods to collect such data (e.g., surveys, interviews, coaches logs). However, empirical support for the means to best evaluate coaches and coaching programs is lacking.

Conclusion

Successful PS/RtI implementation in schools requires a major conceptual and practical shift from traditional educator behaviors, thereby necessitating significant ongoing professional development at many levels (e.g., teachers, administrators, support service personnel, district leaders). Emerging data on building-based coaching as a vehicle for intensive professional development suggests positive results in the areas of new skill application, pedagogical and instructional changes, implementation integrity, and educator job satisfaction. So promising is the concept of coaching for professional development that many systemic reform efforts have recently included a coaching component to enhance implementation and sustainability of practices. However, limited empirical evidence currently exists to suggest that coaching enhances the knowledge, skills, and abilities required of educational staff to effectively implement PS/RtI practices. Further, no known study to date has evaluated the relationship between coaching and the implementation and integrity of PS/RtI practices in schools. Therefore, empirical investigation into how coaching facilitates the successful implementation of the PS/RtI model in schools, as well as the extent to which coaching enhances the fidelity of PS/RtI practices in those schools, is necessary to extend the systems-change and reform implementation knowledge and understanding in the field of education.

Chapter III

Method

The purpose of this study was to examine the extent to which coaching facilitates the successful implementation and fidelity of the PS/RtI model in schools. The intended outcome was to generate information regarding the relationship between the activities and characteristics of coaches and PS/RtI implementation and fidelity levels to inform future professional practice. This chapter outlines the research design, procedures, participants, instruments, and analyses that were used in this investigation.

Research Design

A longitudinal, correlational research design was used to address the research questions proposed in the current study. A subset of data collected from a three-year, statewide school reform initiative entitled the Florida Problem-Solving/Response to Intervention (PS/RtI) Project was utilized to examine the relationship between PS/RtI coaching activities, various educator and school variables, and the outcome measures of PS/RtI implementation and PS/RtI fidelity levels.

Florida Problem-Solving/Response to Intervention Project Description

The Florida Problem-Solving/Response to Intervention (PS/RtI) Project was designed as a collaborative effort between the Florida Department of

Education and the University of South Florida to facilitate the implementation of PS/RtI practices in the 67 public school districts in Florida (Batsche et al., 2007). The Project was composed initially of two initiatives: (a) a district training and evaluation component delivered to a selected number of demonstration sites, and (b) a statewide training component.

The demonstration site component of the Project was implemented to provide school based leadership teams (SBLTs) with the knowledge and skills needed to implement the PS/RtI model in their respective schools, as well as to provide the opportunity to collect data to inform scaling-up the PS/RtI model across Florida. The content of the three-year training sequence (see Appendix A for the three-year professional development curriculum) focused on current legislation, the problem-solving process, and capacity building activities for PS/RtI implementation. Each of the pilot sites received the support of building-level coaches and technical assistance provided by regional RtI Coordinators and other trainers. The purpose of the coaching and technical assistance was to maximize the level of consistency of implementation of PS/RtI in the pilot schools and to maximize the fidelity of implementation. The selected demonstration districts were allowed to determine which grades (K-3) and subject areas (reading, math, and/or behavior) to target for PS/RtI implementation based on the unique needs of each school. Matched comparison schools within each district were identified in order to compare process and outcome data in PS/RtI and non-PS/RtI schools. The comparison schools received no support from the Project, and were expected to delay PS/RtI implementation efforts until after the three-year evaluation process.

The statewide training component of the Project was available to all Florida districts and provided educators with the knowledge and skills needed to implement the PS/RtI model. The content of the voluntary three-year training curriculum was similar to the demonstration training component of the Project. However, due to the nature of the statewide training component, technical assistance and data collection activities from Project staff were limited.

The Florida PS/RtI Project was supported throughout the process by the Project Leadership Team. This Leadership Team included two Co-Directors, one Project Leader, two Project Evaluators, and three Regional Coordinators. The Project Leadership Team members were responsible for planning and delivering training, evaluating district and school level data, and providing technical assistance to support districts in PS/RtI implementation efforts. The three Regional Coordinators organized and supported PS/RtI implementation in their designated Florida regions (i.e., North, Central, South). One of the Project Evaluators was responsible for facilitating data collection according to the Project's evaluation model (see Appendices B and C for a copy of the Project Implementation Plan and Evaluation Model Summary Rubric, respectively).

Each demonstration district received funding for one full-time PS/RtI coach for every three pilot schools (i.e., up to a maximum of two coaches for six pilot schools) in addition to the support delivered by the Project staff. The PS/RtI coaches worked directly with Project staff to facilitate PS/RtI implementation and evaluation.

Participants

Pilot districts and schools. A total of 40 demonstration schools within eight districts were selected to begin implementation of the PS/RtI model during the 2007-2008 school year. A competitive application process was used to select the districts. All 67 school districts in the State of Florida were invited to submit applications and nominate up to six pilot schools to serve as pilot sites for the PS/RtI project implementation (see Appendix D for a copy of the FL PS/RtI application). School districts were also asked to nominate a comparison school for each proposed pilot school to serve as a referent against which to measure impact of PS/RtI implementation. Pilot and comparison school pairs were matched based on each of the pair's philosophy, size, student demographics, student achievement, and presence of other state level initiatives (e.g., Reading First, Positive Behavior Support, Voluntary Pre-Kindergarten). To facilitate the grant application process, grant applications were sent to educators in district leadership positions (e.g., Superintendents, Exceptional Student Education Directors, Assistant Superintendents of Curriculum and Instruction). Additionally, three informational Bidders' Conferences were held to provide a detailed overview of the requirements for submitting the applications to the PS/RtI Project. Of the 67 school districts invited to apply, 12 districts submitted applications (approximately 18% of Florida's school districts).

Each application was reviewed by a minimum of two reviewers from the Florida PS/RtI Project Leadership Team using a standard evaluation rubric (See Appendix E for a copy of the rubric). The 11-item rubric assessed the extent to which the district's application clearly articulated the following: commitment to completing the activities expected by the Project, commitment of resources and personnel, inclusion of pilot and comparison school and district demographic data, and description of previous experience with initiatives and programs. Districts were selected for Project participation based on two criteria: (1) the average score received on the application from the two independent reviewers; and (2) the extent to which the districts were representative of other Florida school districts based on variables such as district size, geographic location, and student demographic data.

Eight school districts were selected for participation in the Project, with a total of 40 demonstration and 36 comparison schools. The number of demonstration schools included in each district ranged from three to seven. To ensure the demonstration schools were representative of other Florida schools, the selected schools varied within and across the districts on such variables as school size, student demographics, and student achievement. One of the eight selected districts discontinued involvement with the Project following the 2007-2008 school year. Thus, the current study includes data collected from the seven districts and 34 pilot schools that continued participation in the 3-year Project. Twenty seven comparison schools in these seven districts also continued participation throughout the 3-year Project. However, comparison schools were not assigned a PS/RtI coach and did not receive coaching support from the PS/RtI Project. Since the purpose of the current study was to examine the extent to which coaching facilitates PS/RtI implementation and fidelity of the process, data collected from comparison schools were included in this investigation. See Table 1 for information on the district size, geographic location, and student demographic characteristics of the seven districts at the time of selection for Project participation.

Table 1

PS/RtI Pilot District Size, Geographic Location, and Student Demographics

District	Size	Location	White	Black	Hispanic	FRL	ELL	Disability
A	34,152	North	79.9%	11.8%	5.6%	24.7%	0.8%	18%
B	8,587	South	64%	10.1%	24.2%	39.4%	5.6%	17%
C	62,768	Central	81.6%	4.7%	11.7%	43.5%	3.1%	18%
D	112,127	Central	68.1%	19.6%	8.3%	40.3%	3%	15%
E	89,483	Central	57%	22%	19.5%	57.6%	6.5%	14%
F	25,734	North	85.5%	8.8%	3.6%	17.8%	0.4%	14%
G	6,892	North	87.1%	8%	3.5%	47.5%	1.5%	13%

Note. Size is the number of students in the Pre-kindergarten through 12th grade population. White, Black, and Hispanic represents percentage of students ethnically identified as white, black, and Hispanic. ELL represents percentage of students considered English language learners. FRL represents percentage of students receiving free-reduced lunch. Disability represents the percentage of students identified with disabilities age 6-21. Data derived from the Florida Department of Education (2007).

PS/RtI Coaches.

Coaches' role. Each PS/RtI pilot district was provided funding for three years to hire PS/RtI coaches to facilitate the implementation of PS/RtI practices at the building level. Coaching has been identified as an essential component of effective professional development within the school setting (Joyce & Showers, 2002; Neufeld & Roper, 2003a). Each pilot district was funded to provide one full-time PS/RtI Coach for every three pilot schools participating in the Project. Although supported by the Project, each PS/RtI coach was an employee of the local school district. The primary responsibility of the coach was to facilitate implementation of the PS/RtI model with fidelity at the school level. Specifically, each PS/RtI coach was tasked with four broad responsibilities: Staff training, technical assistance, data collection and management, and consultation and teaching (see Appendix P for a rubric that describes the links between PS/RtI coach job descriptions, literature-based activities, and specific *Coaching Evaluation Survey* items). The Coaches were trained and provided technical assistance by Project staff on PS/RtI practices as well as strategies to facilitate implementation of the model in their designated schools (see below for a detailed description of frequency and type of training received). Each coach was responsible for providing ongoing training, technical assistance, and general follow-up support to School-Based Leadership Teams (SBLTs). SBLTs were trained directly by Project trainers over a three-year period of time (see Appendix A for the multi-year professional development plan). Coaches also were encouraged to provide PS/RtI-related training to staff in their pilot schools.

Further, coaches were responsible for data collection at pilot and comparison schools to support Project evaluation, as well as to facilitate the management and interpretation of data to support local implementation efforts. Coaches worked directly with the Project's Regional Coordinators and evaluator to facilitate the implementation of PS/RtI practices.

Coach demographic characteristics**.** A range of 13 to 16 PS/RtI coaches were hired each year within the seven participating pilot school districts, with a total of 21 individuals serving as coaches over the three-year implementation period. All Coaches had a Bachelor's degree (B.S./B.A.) or higher in the field of education or a related field. Of the 21 coaches, seven served their schools for three years, eight served their schools for two years, and six served their schools for one year.

School-based Leadership Teams. Each participating pilot school was required to establish a School-Based Leadership Team (SBLT). SBLTs were comprised of approximately 6-8 staff members selected to take a leadership role in facilitating PS/RtI implementation in their school. The Project staff recommended SBLTs to have representation of the following roles: administration (e.g., principals, vice-principals), general education teachers, special education teachers, and content specialists (e.g., reading, math, behavior specialists), and student services personnel (e.g., school psychologists, social workers, counselors).

Comprehensive Program Evaluation Model

A comprehensive program evaluation model was developed to guide the collection of data to evaluate the impact of PS/RtI implementation. The overarching evaluation design for the three-year PS/RtI Project included both summative and formative measures with the focus on the: (1) beliefs, knowledge, skills, and satisfaction of educators; (2) implementation of PS/RtI activities and processes; and (3) impact of the PS/RtI model on student academic and behavioral outcomes as well as special education outcomes in the demonstration districts and schools. The Project staff adopted a three-stage model to assist schools in the facilitation of systemic implementation of PS/RtI practices. The PS/RtI Project program evaluation model involved assessing the development of three elements: *consensus* among key stakeholders responsible for utilizing PS/RtI (e.g., principals, teachers, instructional support personnel, student service personnel), the building of *infrastructure* supports necessary to sustain implementation (e.g., comprehensive data collection and analysis system, coaching, problem-solving model), and then *implementation* of PS/RtI across the three tiers of service delivery. To assess components of consensus building, infrastructure development, and degree of PS/RtI implementation, a variety of instruments were developed and data collection strategies were employed over the three-year evaluation process.

Measures

Because large-scale, system-wide applications of the PS/RtI model have only recently been attempted in schools, empirically validated measures of the

PS/RtI process are not yet presented in the literature. To inform the development of such measures, the PS/RtI Project staff identified and reviewed existing information on district and state initiatives as well as scholarly presentations to gather and analyze instruments used across the nation to evaluate facets of PS/RtI implementation. Such instruments collected from other initiatives were utilized by the Project, in addition to other information, as the foundation for the evaluation tools developed by the Florida PS/RtI Project.

Project staff also reviewed existing systems-change and professional development literature on facilitating and implementing large-scale school reform initiatives, such as PS/RtI, in order to determine relevant variables to evaluate both formatively and summatively. Previous literature emphasized the critical importance of building consensus related to the proposed reform, involving all stakeholder groups in the change process, and collecting formative data to measure the implementation efforts (Curtis, Castillo, & Cohen, 2008; Hall & Hord, 2006). Implementation integrity also emerged from the literature as a critical component to consider when pursuing PS/RtI activities (Noell & Gansle, 2006). Project staff then created a number of PS/RtI instruments based on this information.

The PS/RtI project staff developed two measures to address consensus issues that were utilized in the present study. The surveys were created to measure consensus related to (1) beliefs held by participants regarding student learning and service delivery in schools, and (2) educators' perceived skills with PS/RtI practices. Both measures were reviewed by an Educator Expert

Validation Panel (EEVP) comprised of educators from a neighboring school district with exposure to and experience with PS/RtI practices. Prior to distribution for review, Project staff outlined types of school- and district-based individuals who would likely be involved in implementation of a PS/RtI model in order to create a representative sample of professionals. A district contact then provided the names and contact information for individuals who fit the description provided. EEVP members were asked to provide feedback on the content and clarity of each item on the two surveys, as well as recommendations for addition or deletion of items (See Appendix F for a copy of example validation forms). Project staff then reviewed the EEVP feedback, and made the appropriate revisions to the surveys. A description of the measures developed by the Project staff that were used in the current study follows.

Beliefs Survey. The 27-item *Beliefs Survey* (see Appendix G) was designed to assess educators' beliefs about service delivery to students in schools. Specifically, items assess beliefs regarding assessment practices, core instruction, intervention, and special education eligibility determination. The first five items on the survey ask for the respondent's background information (both education and work-related). The remaining items take the form of belief statements to which respondents are asked to rate their extent of agreement/disagreement with each using a 5-point Likert-type scale ranging from 1 *(strongly disagree)* to 5 *(strongly agree)*. Evidence for content validity was obtained through the EEVP process discussed above.

In order to obtain evidence on the internal structure of the *Beliefs Survey*, an exploratory common factor analysis procedure was used to determine the underlying factor structure using the responses gathered from a sample of 2,430 educators in 62 schools from 7 districts across the State of Florida in the fall of 2007. Principal axes technique was used for factor extraction purposes. Examination of eigenvalues and a scree plot were used to determine the number of factors to retain. Three factors were retained and rotated using oblique rotation (Promax) to aid interpretation. All but four items loaded onto one of the three factors. The three factors collectively accounted for 72% of the common variance in participant ratings. The three factors were labeled: 1) *Academic Abilities and Performance of Students with Disabilities,* 2) *Data-Based Decision-Making,* and 3) *Functions of Core and Supplemental Instruction.* Therefore, the factor analysis suggested that the *Beliefs Survey* assessed educator beliefs in three broad domains: beliefs about *the academic ability and performance of students with disabilities*, beliefs about *data-based decision making*, and beliefs about *functions of core and supplemental instruction*. Internal consistency reliability estimates using Cronbach's alpha were computed for each of the three factors. The resultant reliability estimates were high (Factor 1: $\alpha = .87$, Factor 2: $\alpha = .79$, and Factor 3: $\alpha = .85$).

Perceptions of RtI Skills Survey. The *Perceptions of RtI Skills Survey* (see Appendix H) is a self-report measure developed by Project staff to assess educators' perceptions of the skills they possess to successfully implement Problem-Solving/Response to Intervention (PS/RtI) practices. Specifically, the

20-item instrument was designed to assess educator skills in applying PS/RtI practices to academic and behavior content as well as skills in manipulation and use of data for decision-making and technology use. Examples of skills assessed include, but are not limited to, the following activities: accessing and using student data to make decisions related to academic and behavioral instruction/intervention, utilizing the problem-solving process to address student concerns, and constructing and interpreting graphs to monitor student progress. Survey respondents were asked to indicate their perceived level of skill development using a 5-point response scale ranging from NS *(I do not have this skill at all)* to VHS *(I am highly skilled in this area and could teach others this skill*). Evidence for content validity of the *Perceptions of RtI Skills Survey* was obtained using the EEVP procedures discussed above.

In order to obtain evidence on the internal structure of the *Perceptions of RtI Survey*, an exploratory common factor analysis procedure was used to determine the underlying factor structure using the responses gathered from a sample of 2,184 educators in 62 schools from 7 districts across the State of Florida in the fall of 2007. The principal axes technique was used for factor extraction purposes. Examination of eigenvalues and a scree plot were used to determine the number of factors to retain. Three factors were retained and rotated using oblique rotation (Promax) to aid interpretation. The three factors collectively accounted for 80% of the common variance in participant ratings. The three factors were labeled as follows: 1) *Perceptions of RtI Skills Applied to Academic Content*, 2) *Perceptions of RtI Skills Applied to Behavior Content*, and

3) *Perceptions of Data Manipulation and Technology Skills.* Therefore, the factor analysis results suggested that the *Perception of RtI Skills Survey* assesses educator skills in three broad domains: *applying RtI skills to academic content, applying RtI skills to behavior content, and skills in manipulating data and using technology to assist in data-based decision-making*. Internal consistency reliability estimates using Cronbach's alpha were computed for each of the three factors. The resultant reliability estimates were very high (Factor 1: $\alpha = .97$, Factor 2: $\alpha = .97$, and Factor 3: $\alpha = .94$).

Tier I and II Critical Components Checklist. Project staff developed the *Tier I and II Critical Components Checklist* (see Appendix I) to document the degree to which the steps of the PS/RtI process are present when educators evaluate core (Tier 1) and supplemental (Tier II) instruction. PS/RtI Project Coaches examined permanent products from meetings targeting Tier I and II instruction, and completed the *Tier I and II Critical Components Checklist* by assessing the degree to which critical components of the PS/RtI process were present using a standard rubric. Each checklist item utilizes a 3-point response scale: 0 = *absent, 1=partially present*, 2 = *present.* Evidence for content validity was obtained by comparing the items on the checklist to the major steps of PS/RtI described in the literature (e.g., Batsche, Elliott, Graden, et al., 2005; Bergan & Kratochwill, 1990). Three internal consistency reliability estimates were computed by analyzing item ratings on the checklist at three different time points--Fall of 2007, Winter of 2008, and Spring of 2008 to derive Cronbach's alpha estimates. The resultant reliability estimates were consistently high (Fall 2007: $\alpha = .90$, Winter 2008: $\alpha = .91$, and Spring 2008: $\alpha = .90$).

Further, the ability of reviewers to provide reliable data on implementation levels using the *Tier I and II Critical Components Checklist* has been supported by high levels of inter-rater agreement among Project PS/RtI coaches completing the instrument. In order to obtain inter-rater agreement, two coaches independently assessed the same permanent products derived from randomly selected Tier I and II data meetings at Project schools using the *Tier I and II Critical Components Checklist*. Inter-rater agreement estimates were then computed by dividing the number of agreements by the number of agreements plus disagreements. The average percent agreement from *Tier I and II Critical Components Checklists* independently completed by pairs of coaches during the 2008-09 and 2009-10 school years ($n = 108$) was 91.16%.

Self-Assessment of Problem Solving Implementation (SAPSI). The *Self-Assessment of Problem Solving Implementation* (see Appendix J) is a needs assessment and progress monitoring tool used to evaluate the implementation of a PS/RtI model at the school level. The 27-item *SAPSI* requires educators to rate the extent to which their school had reached consensus regarding implementation of a PS/RtI model, had the infrastructure required to implement the model, and had started implementing PS/RtI practices. School-based Leadership Teams (SBLTs) complete the items collaboratively using the following response options: *N = not started (the activity occurs less than 25% of the time); I = in progress (the activity occurs approximately 25% to 74% of the* *time); A = Achieved (the activity occurs approximately 75% to 100% of the time); and M = maintaining (the activity was rated as achieved last time and continues to occur approximately 75% to 100% of the time).* Only one instrument is completed for each school representing the collective response of the SBLT on the level of implementation of PS/RtI practices at the school.

The Project's version of the instrument was adapted from the IL-ASPIRE SAPSI v. 1.6. Internal consistency reliability estimates were computed for each of the three domains measured by the instrument. Specifically, items within each of the three *SAPSI* domains of "*Consensus*", "*Infrastructure Development*", and "*Implementation*" were examined separately. *SAPSIs* administered during the Winter of 2010 to 34 pilot schools were used to obtain internal consistency estimates. The following Cronbach's alpha coefficients were obtained for each of the three domains: Consensus $\alpha = .64$, Infrastructure Development $\alpha = .89$, and Implementation $\alpha = .91$. The resultant reliability estimates were considered high for the domains of Infrastructure Development and Implementation, and moderate for the Consensus domain.

Coaching Evaluation Survey. The 27-item *Coaching Evaluation Survey* was developed by the Project staff to evaluate educators' perceptions of the PS/RtI coaching received by the school, as well as the extent to which PS/RtI coaches possessed the skills highlighted in the systems coaching literature (e.g., Brown et al, 2005; Nuefield & Roper, 2003). *The Coaching Evaluation Survey* (see Appendix K) contains a mix of both closed-ended items and open-ended items requiring written responses. Twenty-two of the items require respondents to rate the extent of their agreement/disagreement with the statement using a 5-point Likert-type scale ranging from 1 *(strongly disagree)* to 5 *(strongly agree).* There is also a response option of "*Do Not Know"* if respondents believed they had not observed or did not have knowledge of a given behavior represented in each item. The three remaining items assess overall satisfaction or effectiveness and use a different response scale, or require open-ended responses.

Project staff reviewed relevant literature, professional presentations, instruments, and previous program evaluation projects to inform the development of the *Coaching Evaluation Survey.* Additionally, literature on various coaching models (e.g. instructional coaching, systems coaching) was accessed to determine the knowledge and skill sets required of successful coaches, as well as relevant activities of effective coaches. Project staff utilized such information to develop items on the *Coaching Evaluation Survey* representative of knowledge, skills, and activities considered relevant when evaluating PS/RtI coaching practices.

An exploratory common factor analysis was conducted to determine the internal structure of the *Coaching Evaluation Survey* using responses gathered from a sample of 506 SBLT members participating in the Florida PS/RtI Project during the Spring of 2008 and Spring of 2009. The principal axes technique was used for factor extraction purposes. Examination of eigenvalues and a scree plot were used to determine the number of factors to retain. Three factors were retained and rotated using oblique rotation (Promax) to aid interpretation. The three factors collectively accounted for 95% of the common variance in participant ratings. The three factors were labeled as follows: 1) *Role, Function, and Activities of the PS/RtI Coach*; 2) *Modeling of the Problem Solving Process*, and 3) *Consultation Skills.* Therefore, the factor analysis results suggested that the *Coaching Evaluation Survey* assesses coaching in three broad domains: the role, function, and activities of PS/RtI Coaches; modeling the problem-solving process; and consultation skills. Internal consistency reliability estimates using Cronbach's alpha were computed for each of the three factors. The resultant reliability estimates were very high (Factor 1: α = .97, Factor 2: α = .97, and Factor 3: α = .96).

PS/RtI Coaches Log System. The PS/RtI coaches were asked to enter their daily activities into a web-based data collection system using FileMaker® Pro software that uploaded information to a central database (see Appendix L for the *Coaches Log System* Manual). Although PS/RtI coaches were given a choice regarding how frequently they entered data within a given month (i.e., daily, weekly, at the end of each month), they were required to document activities on a daily basis to enhance accuracy of reporting. Five activity types were available to choose from that represented activities PS/RtI coaches were to complete. The options were as follows*: Training, Technical Assistance, Project Data Collection, Meeting,* and *Other*.

Activities were entered under the *Training* category when a coach facilitated or assisted with training related to PS/RtI practices. Examples of *Training* activities included, but were not limited to, School-based Leadership Team (SBLT) trainings provided by Project staff in which the coach was a participant, trainings that the coach provided that focused on PS/RtI skill development, and trainings on related topics such as assessment and intervention strategies.

Activities were entered under the *Technical Assistance* category when a coach provided assistance to educators on PS/RtI related knowledge, skills, and/or procedures. In other words, coaches entered activities under *Technical Assistance* when they helped an educator transfer the knowledge/skills on which they had previously been trained into daily practice. Examples of *Technical Assistance* included, but were not limited to, assisting educators throughout the completion of the steps in the problem-solving process, providing assistance on implementing PS/RtI to individuals in a school, and providing ongoing support to individuals on PS/RtI related activities such as data collection, intervention implementation, and consensus building strategies.

The *Project Data Collection* category was used when a coach engaged in data collection for the Project. Examples of activities that fall under this category include, but are not limited to, facilitating the administration of Project data collection tools to staff at pilot schools, completing the Project's implementation integrity measures, as well as any additional data collection activity completed.

Activities were logged under the *Meeting* category when PS/RtI coaches participated in any meeting related to PS/RtI implementation or training. The *Meeting* category is distinguished from the *Technical Assistance* category in that the coach in a *Meeting* activity is a passive participant, whereas the coach in a *Technical Assistance* activity takes on an active, facilitating role. Examples of activities logged in the *Meeting* category included, but were not limited to, meetings with other PS/RtI coaches, meetings with Regional Coordinators, and PS/RtI planning meetings.

Finally, coaches logged activities under the category of *Other* when they were either not captured by any of the above four categories or were not related to the PS/RtI Project. Examples of activities logged under this category were email correspondence, traveling to another location, and school-based meetings not directly related to the Project.

Training

Coaches training. The PS/RtI coaches hired by the districts participated in an initial five-day training in July of 2007. This training was facilitated by Project staff, and consisted of the following components: overview of the Project, policy and legislative issues supporting PS/RtI implementation, how to incorporate systems-change principles to enhance the probability of successful PS/RtI implementation, effective coaching practices, procedures for collecting Project data, and the problem-solving process. Since three of the 15 coaches were not able to attend this initial five-day training, they attended three and one-half days of training in August of 2007. This training contained the same content as the five-day session, but the time was shortened due to the small number of participating coaches. All coaches participated in one and a half days of training in March of 2008 that included the following topics: review of PS/RtI related content, review of data collection tools and procedures, training on new data collection tools, and group sharing and discussion sessions.

PS/RtI coaches continued to receive formal training from Project staff during the 2008-2009 school year. Coaches received three days of training in August of 2008 focusing on the following topics: review of PS/RtI related content, review of data collection procedures, training on new data collection tools, and group sharing and discussion sessions. The coaches received an additional three days of training in March of 2009. The focus of this training session included: review of existing Project data, individual and group action-planning, and group sharing and discussion sessions.

Two formal coaches training sessions took place during the 2009-2010 school year. In August of 2009, the coaches received three days of training from Project staff focusing on data collection and interpretation, review of new data collection tools, as well as group sharing and discussion sessions. The coaches received an additional two and one half days of training in March of 2010, which focused on Project updates, trouble-shooting, and group sharing and discussion sessions. In sum, a total of 126 hours of direct formal training was delivered to the PS/RtI Coaches over the course of the 3-year Project.

In addition to the formal training received twice a year, the coaches received ongoing training and technical assistance from their Regional Coordinator and one of the Project Evaluators. These sessions took place as needed either on site or via conference calls. Further, coaches who could not attend the formal training sessions received similar training content at a later time either through on-site trainings or conference calls with their Regional Coordinator and the Project Evaluator. Coaches hired during the course of the three-year Project received training on all content received by coaches up until that point in the process. See Appendix M for a copy of the PS/RtI Coaches Training and Curriculum Outline.

SBLT Demonstration site training and technical assistance. Project staff provided primary training to the School Based Leadership Teams (SBLTs) and Coaches of the participating pilot schools. During the 2007-2008 school year, the primary trainings followed an established format (i.e., 2 days of training provided early in the fall, 1 day provided later in the fall, 1 day provided in the winter, and 1 day provided in the spring). Content covered during the 2007-2008 trainings included an overview of the PS/RtI model, legislative and policy issues supporting the model, systems-change principles, the four step problem-solving process, and Tier I assessment and instruction.

The primary trainings during Year 2 (2008-2009) and Year 3 (2009-2010) of the Project also followed an established format (one day of training provided in early fall, one day of training provided in late fall, one day of training provided in winter, and one day of training provided in the spring). Content provided during Year 2 included a review of Year 1 training content, Tier II assessment and instruction, the problem-solving processes, intervention development and implementation, and intervention integrity. Content provided during Year 3 included a review of Year 1 and 2 training content, Tier III assessment and intervention, and eligibility decisions. More information on the content of the SBLT trainings is available at www.floridarti.usf.edu.

PS/RtI coaches in the demonstration districts provided additional training and technical assistance to staff in their assigned pilot schools. The frequency, content, and target audience of the trainings varied based on the unique needs and requests of schools. Trainings provided by the coaches typically included review of the content provided by Project staff in the formal SBLT trainings. Coaches also provided skill training on various PS/RtI processes such as assessment practices and procedures, data-based decision-making, and intervention design. Such training and technical assistance sessions were provided to SBLT members, school staff, or a combination of the two groups.

Data Collection Procedures

Data to address the research questions this study were drawn from data collected for a larger comprehensive longitudinal evaluation of the Florida PS/RtI Project. The data were gathered by multiple individuals and from various sources. Individuals responsible for data collection, the sources from which data were obtained, as well as the frequency with which various data elements were collected varied (see Appendix N for PS/RtI Project Data Collection Timeline). The surveys developed by the PS/RtI Project staff (i.e., *Beliefs Survey, Perceptions of RtI Skills Survey*) were administered one or two times per year throughout the three-year evaluation process. These surveys were completed by members of the School-Based Leadership Team (SBLT) in each of the pilot schools, as well as the entire school staff in each of the pilot and comparison schools. Regional Coordinators collected the surveys from SBLT members at the PS/RtI trainings. Coaches collected surveys from school staff members at pilot and comparison schools via various administration venues (e.g., staff meetings, faculty mailboxes). Graduate Assistants employed and trained by the Florida PS/RtI Project were responsible for manually entering survey data into a database developed by the Project staff. Data entry accuracy checks were conducted by Graduate Assistants on a regular basis by randomly selecting ten percent of entered survey data and checking for errors. In the event that data entry accuracy estimates fell below 90%, all data for the given instrument was rechecked and errors corrected.

PS/RtI coaches were responsible for collecting the needs assessment and implementation integrity data (i.e., the *SAPSI* and *Tiers I and II Critical Components Checklist*) for each school. *SAPSI* administration training occurred through conference calls lasting approximately 90-minutes. A Project Evaluator reviewed administration procedures as well as the nature of each item on the SAPSI. Each coach was encouraged to ask questions for clarification purposes during this training. Additionally, Project staff members were available for follow-up assistance after the initial trainings. The *SAPSI* was completed by PS/RtI coaches in concurrence with SBLTs at the pilot schools twice during each year of the Project. The *SAPSI* was completed at the beginning and end of Year 1, and during the middle and end of Years 2 and 3. The coaches sent a copy of each completed *SAPSI* to the Project staff, and Graduate Assistants entered the data into the Project database. The data entry accuracy criterion for the SAPSI was .90. Accuracy checks on data entry were conducted as described above.

PS/RtI coaches were also responsible for completing the *Tiers I & II Critical Components Checklist*. Each checklist was completed three times per year for each content area (i.e., reading, math, behavior), and grade level (i.e., K-3) targeted by the pilot school to provide information on implementation integrity over time. PS/RtI coaches were provided training on the *Tiers I & II Critical Components Checklist* focusing on administration, scoring, and inter-rater agreement procedures. PS/RtI coaches practiced completing the integrity measures, with feedback provided by one of the Project Evaluators. Further, the Project Evaluator traveled to each PS/RtI Coaches' district to provide additional practice and feedback for checklist completion with actual permanent products from schools.

During the second data-collection time point each year, inter-rater agreement estimates for scoring accuracy were calculated for randomly selected schools. The PS/RtI coach contacted another PS/RtI coach or his/her Regional Coordinator to complete the *Tiers I & II Critical Components Checklist* using the same permanent products. The inter-rater agreement target criterion was .80. The two professionals completing the checklists discussed the items for which differences occurred to reach consensus when this criterion was not met.

Graduate Assistants entered the *Tiers I & II Critical Components Checklist* data into the Project database. Fifteen percent of the protocols were randomly selected for data entry accuracy checks. In the event that data entry accuracy estimates fell below the .90 criterion, a Graduate Assistant rechecked all data and errors were corrected as described above.

Principals at each of the pilot schools were responsible for collecting the *Coaching Evaluation Survey* at the end of each school year. Each principal received a cover letter from the Project detailing the administration procedures to be utilized. The principals were asked to distribute one copy of the *Coaching Evaluation Survey* with a return envelope to each SBLT member, and then have each completed survey returned to him or her in a sealed envelope to ensure confidentiality of each rater. After collecting each survey, the principals mailed the surveys back to the Project staff. Graduate Assistants manually entered the *Coaching Evaluation Survey* data into the Project database, and data entry accuracy checks were conducted on a random sample of 10% of the protocols. In the event that data accuracy estimates fell below this .90 criterion, a Graduate Assistant rechecked all of the manually entered data and corrected any data entry errors.

PS/RtI coaches were responsible for entering their daily activities into the online *Coaches Log System*. PS/RtI Coaches were required to record their activities as completed. Although data were expected to be entered into the web-based system on a monthly basis, the Coaches could input data as frequently as they preferred (e.g. daily, weekly). Data entered into the *Coaches Log System* were immediately uploaded into a central database. The *Coaches Log System* became functional in December 2007. Therefore, data on coaching activities from August through November of Year 1 are not available.

Coaches received initial training on how to use the *Coaches Log System* in December of 2007. One of the Project Evaluators conducted the trainings, providing demonstration, modeling, and feedback on data entry processes, activity content selection, and trouble-shooting. PS/RtI Coaches practiced coding activities into each of the five data categories (i.e., *Training, Technical Assistance, Project Data Collection, Meeting,* and *Other*); corrective feedback was provided by the Project Evaluator to ensure accuracy and fidelity of reporting. The Project Evaluator also provided ongoing training and technical assistance to coaches throughout the 3-year Project via on-site demonstrations and/or conference call discussions to maintain fidelity of reporting over time.

Data Analysis Procedures

Descriptive and inferential data analyses were utilized to address each research question. Research question 1 investigated the relationship between coaching and level of PS/RtI implementation in schools across the three years of the Florida PS/RtI Project. Research question 2 examined the relationship between coaching and level fidelity of PS/RtI implementation in schools across the three years of the Project. Descriptive data included means and standard deviations for continuous variables to facilitate data interpretation, and frequency data for all categorical variables.

Multi-level modeling (MLM) was the inferential analysis utilized to address each research question. MLM allows for the analysis of nested data by investigating the relationship between variables at multiple levels of the dependent variables(s). Each model was built hierarchically, where variables entered at higher levels of the model were used to indirectly predict outcomes at the lower levels of the model. To address each research question in this study, a two-level multilevel model was developed as data for the study were nested at levels of time and school.

Data for each research question were examined prior to descriptive and inferential analysis to determine the degree to which assumptions of multilevel modeling procedures are met. Statistical assumptions of multilevel modeling procedures are the degree to which the data are (1) normally distributed, (2) randomly distributed, and (3) nested. First, skewness and kurtosis values were computed and examined for all predictors and dependent measures entered into the multilevel models. Such statistics were used to identify the degree to which the data met the normality assumption for individual variables. Obtained values close to zero indicated relatively normally distributed data, while values further away from zero indicated non-normally distributed data. In order to examine the assumption of randomly distributed missing data, correlations between present and missing data for school-level variables were calculated. Significant correlations indicated related missing data clusters, while non-significant correlations suggested random missing data. Further, intra-class correlation coefficients (ICCs) were calculated to examine the degree to which data were nested. ICCs estimate the amount of shared variance across levels of the model, and are calculated by dividing the amount of shared variance that can be explained by amount of total explained variance in outcomes. A higher ICC indicated that multilevel modeling was an appropriate statistical procedure. The assumption of normality of residual variances was examined by visual analysis. A scatterplot and a q-q plot of the predicted residuals were analyzed to examine the degree to which residual variances were normally distributed in each model.

The two-level models were used to address each of the sub-questions for research question 1(i.e., RQ 1a-c). The dependent measure, level of PS/RtI implementation, was scores obtained on the *Self-Assessment of Problem Solving Implementation (SAPSI)* for each school. Each sub-question associated with research question 1 had as its dependent measure the mean scores on one of the three domains of the *SAPSI* ; *Consensus* development (RQ 1a), *Infrastructure* Development (RQ 1b), and *Implementation* development (RQ 1c). For each model, the mean domain score (*Consensus, Infrastructure,* and *Implementation)* across the three data collection time points for each pilot school was entered. Time (i.e., end of Year 1, end of Year 2, and end of Year 3) was the unit of analysis for this model. Time as the Level 1 predictor variable was centered at zero when entered into the MLM, and intercepts and slopes were initially allowed to vary. Examination of both the regression coefficient and Likelihood Ratio test were utilized to determine if the mean level of implementation changed over time. The Likelihood Ratio test alpha level was set at .05.

SBLT's perceptions of coaching received by the school as measured by the *Coaching Evaluation Survey* were included as a level-1 time-varying covariate in this model. These data were collected at each pilot school at the end of each school year (i.e., end of Year 1, end of Year 2, and end of Year 3). School level variables were also examined in this model. Data from the *Training* and

Technical Assistance categories of the *Coaches Log System* were entered at level-2 for each school. Specifically, the frequency (total number) and duration (number of hours) of *Training* and *Technical Assistance* received for each school across the end of each of the three years of the Project were entered as level-2 predictors. The continuity of coaches assigned to pilot schools across the three years of the Project was considered as a level-2 predictor and was coded 1 or 0, where 1 indicated that a given school had the same coach across the three years of Project implementation, and 0 indicated a change or changes in the coach assigned to a given school over the course of the 3-year Project.

SBLTs' changes in perceptions over time were also considered in this model. School-level changes in beliefs and perceived skills of the SBLTs were entered as level-2 predictors. To compute change in PS/RtI beliefs for each school over the three-year period, ordinary least square regression was used to obtain the slope of regression line for each of the three respective domains (i.e., academic abilities and performance of students with disabilities, data-based decision-making, and functions of core and supplemental instruction) for each school across the three time points (i.e., end of Year 1, end of Year 2, and end of Year 3). The computed slope coefficient for a given school was used as a measure of change for each of the respective domains across the three years. The same procedure was used to compute the change in perception of RtI skills for each of the three domains of this measure (i.e., perceptions of RtI skills applied to academic content, perceptions of RtI skills applied to behavior content, and perceptions of data manipulation and technology skills).

School variables were also entered into this model as predictors. School size (small, medium, large), school socio-economic status (measured by the percent of students who qualified for free or reduced lunch), 2007-2008 school grade (i.e., Florida School Grade), and district membership (i.e., school affiliation with a specific district). Each of the seven districts was entered as separate dummy coded variables (1, 0) where 1 indicated district membership and 0 indicated non-district membership. School grade was scored on a 5-point scale where Grade A = 4, B = 3, C = 2, D = 1, and F = 0 at the end of Year 1. School size was based upon the number of students enrolled in a school, where 0 = less than 600 students, 1 = 600-799 students, and 2 = 800 or more students. School socio-economic status (SES) was scored 0 or 1 based on the percent of students in the school who qualified for free or reduced lunch, where a school with 50% or more student on free or reduced lunch was coded 0; and a school with less than 50% of students qualifying for free- or reduced-lunch was coded 1.

The regression coefficients and Likelihood Ratio tests for each model were examined to determine which variables significantly enhance the predictive power of the model. The alpha level for the Likelihood Ratio tests was .05. Since change over time was of specific interest, interactions between each of the predictors and time were entered into the model. These interaction effects were examined to determine if any of the coaching or school level variables significantly predicted PS/RtI implementation outcomes over time. See Table 2 for a summary of the variables entered into the multilevel models for research questions 1a-c. All models were examined using Hierarchical Linear and Nonlinear Modeling– Student Version 6 (HLM v. 6).

Table 2

Multilevel Model Information: Research Questions 1a-c

Level & Measures	Metric	Intercept Effects	Slope Effects[e]	Centering
1 = Time				
PS/RtI Implementation	Mean domain score[a]	Random	Fixed/Random	Zero
Coaching Quality	Mean factor score	-	Fixed/Random	Grand
2 = School				
Coach Log: Train Freq	Sum	-	Fixed/Random	Zero
Coach Log: Train Dur	Sum	-	Fixed/Random	Zero
Coach Log: TA Freq	Sum	-	Fixed/Random	Zero
Coach Log: TA Dur	Sum	-	Fixed/Random	Zero
Coach Continuity	Coded 1 or 0[b]	-	Fixed/Random	Zero
School Size	Median sum student enrollment	-	Fixed/Random	Zero
School SES	Median percentage of students qualifying for free/reduced lunch	-	Fixed/Random	Zero
School Grade	Year 1Grade Coded 0-4[c]	-	Fixed/Random	Zero
District Membership	Dummy coded[d]	-	Fixed/Random	Zero
Change in Beliefs	Mean factor slope	-	Fixed/Random	Grand
Change Per of Skills	Mean factor slope	-	Fixed/Random	Grand

[a] The mean implementation score will was derived from the three domains of the *Self-Assessment of Problem Solving Implementation.*
[b] Coach Continuity was be coded by year (1, 0) where 1 indicates the same coach all 3 years and 0 indicates a change in coach during the 3 years.
[c] School Grade was scored on a 5-point scale where Grade A = 4, B = 3, C = 2, D = 1, and F = 0.
[d] Dummy coded variables are coded with a value of 0 or 1. A value of 0 represents no membership in a given category. A value of 1 represents membership for a given category.
[e]Slope effects for each variable were based upon best fit data.

Descriptive data reported include univariate information such as means and standard deviations for continuous variables, and frequency data for all categorical variables. Further, skewness and kurtosis measures were included for all continuous variables. With regard to inferential statistics, the ICCs were reported for each unconditional model. A complete listing of the parameter estimates (fix and random effects) were reported, with standard errors estimating the precision of each parameter estimate. Deviance statistics, AICs, and BICs were the reported fit indices. Fit indices estimate the degree to which data are consistent with multivariate modeling assumptions, as well as the sensitivity of parameter estimates to model specification changes and influence of outliers (Ferron et al., 2008). In other words, fit indices provide information regarding fidelity of the resultant model.

Four two-level models were used to address each of the three sub-questions for research question 2 (i.e., RQ 2a-d). The dependent measure of PS/RtI fidelity were scores derived from the *Tiers I and II Critical Components Checklist (CCCs).* Each of the sub-questions addressed one domain of implementation fidelity (problem identification, problem analysis, intervention development and implementation, and program evaluation/RtI). For each model, the mean domain score across the three data collection time points for each pilot school in six of seven pilot districts was entered. Since only one pilot district focused on mathematics while the other six pilot districts focused on reading for data collection, *CCC* scores from ratings of permanent products in the area of reading were used as the dependent measure in this analysis. Time (i.e., end of

Year 1, end of Year 2, and end of Year 3) was the unit of analysis for this model. Time as the Level 1 predictor variable was centered at zero when entered into the MLM, and intercepts and slopes initially were allowed to vary. Examination of both the regression coefficient and Likelihood Ratio test was utilized to determine if the mean level of implementation fidelity changed over time. The Likelihood Ratio test alpha level was set at .05. Coaching related variables and school level variables were also examined in this model using the same procedures described above for research questions 1a-c.

The regression coefficients and Likelihood Ratio tests for each model were examined to determine which variables significantly enhance predictive power of the model. The alpha level for the Likelihood Ratio tests was .05. Since change over time is of specific interest, interactions between each of the predictors and time were entered into the model. These interaction effects were examined to determine if any of the school level variables significantly predict PS/RtI implementation fidelity outcomes over time. See Table 3 for a summary of the variables entered into the multilevel models for research questions 2a-d. All models were examined using Hierarchical Linear and Nonlinear Modeling–Student Version 6 (HLM v. 6).

Table 3

Multilevel Model Information: Research Questions 2a-d

Level & Measures	Metric	Intercept Effects	Slope Effects[e]	Centering
1 = Time				
PS/RtI Fidelity	Mean domain score[a]	Random	Fixed/Random	Zero
Coaching Quality	Mean factor score	-	Fixed/Random	Grand
2 = School				
Coach Log: Train Freq	Sum	-	Fixed/Random	Zero
Coach Log: Train Dur	Sum	-	Fixed/Random	Zero
Coach Log: TA Freq	Sum	-	Fixed/Random	Zero
Coach Log: TA Dur	Sum	-	Fixed/Random	Zero
Coach Continuity	Coded 1 or 0[b]	-	Fixed/Random	Zero
School Size	Median sum student enrollment	-	Fixed/Random	Zero
School SES	Median percentage of students qualifying for free/reduced lunch	-	Fixed/Random	Zero
School Grade	Year 1Grade Coded 0-4[c]	-	Fixed/Random	Zero
District Membership	Dummy coded[d]	-	Fixed/Random	Zero
Change in Beliefs	Mean factor slope	-	Fixed/Random	Grand
Change Per of Skills	Mean factor slope	-	Fixed/Random	Grand

[a] The mean fidelity score will was derived from the four domains of the *Tier I and II Critical Components Checklist.*

[b] Coach Continuity was be coded by year (1, 0) where 1 indicates the same coach all 3 years and 0 indicates a change in coach during the 3 years.

[c] School Grade was scored on a 5-point scale where Grade A = 4, B = 3, C = 2, D = 1, and F = 0.

[d] Dummy coded variables are coded with a value of 0 or 1. A value of 0 represents no membership in a given category. A value of 1 represents membership for a given category.

[e]Slope effects for each variable were based upon best fit data.

As with research questions 1a-c, descriptive data reported include univariate information such as means and standard deviations for continuous variables, and frequency data for all categorical variables. Further, skewness and kurtosis measures were included for all continuous variables. With regard to inferential statistics, the ICCs were reported for each unconditional model. A complete listing of the parameter estimates (fixed and random effects) were reported, with standard errors estimating the precision of each parameter estimate. Deviance statistics, AICs, and BICs are the reported fit indices.

Chapter IV

Results

This study was designed to examine the extent to which coaching facilitates the successful implementation of the Problem-Solving/Response to Intervention (PS/RtI) model in schools, as well as the extent to which coaching enhances the fidelity of implementation of PS/RtI practices in those schools. This chapter begins with a discussion of how the data were examined to determine the degree to which statistical assumptions of multilevel models were met as well as the descriptive statistics derived and reviewed. A description of the general procedures used to build each multilevel model utilized in this study is detailed. Finally, the results of the data analyses conducted to answer each research question are reported.

Statistical assumptions underlying multilevel models examined were the degree to which (1) data are normally distributed, (2) missing data are randomly distributed, and (3) data are nested (Raudenbush & Bryk, 2002). In order to investigate the normality assumption, skewness and kurtosis values were computed and examined for all continuous predictors and dependent measures entered into each multilevel model. These statistics were used to investigate the degree to which the data met the normality assumption. Values close to zero indicated relatively normally distributed data while values further away from zero indicated non-normally distributed data. Although the degree to which the data were normally distributed is discussed below for each model examined, multilevel modeling procedures are relatively robust to violations of this assumption (Raudenbush & Bryk, 2002).

Correlations between present and missing data for all level-1 and level-2 variables were calculated to examine the assumption of randomly distributed missing data. Significant correlations within or across data sources indicated related missing data clusters. Non-significant correlations indicated random missing data. Given that multilevel modeling procedures are less robust to violations of this assumption (Raudenbush & Bryk, 2002), any analyses that include non-randomly distributed missing data should be interpreted with caution.

Intraclass correlation coefficients (ICCs) were calculated to examine the degree to which data were nested. The ICC measures the proportion of variance in the outcome variable that is accounted for by groups (i.e., the level-2 units) (Luke, 2004). ICCs were calculated by dividing the amount of shared variance that could be explained by the amount of total explained variance in outcomes. Since an assumption of multilevel modeling procedures is that data are nested (Raudenbush & Bryk, 2002), higher ICCs typically indicate that multilevel modeling procedures are appropriate to use. The calculated ICCs, in combination with theoretical justification and analysis of the structural properties of the data (Luke, 2004), were used to evaluate the appropriateness of multilevel modeling for each research question.

Finally, the assumption of normality of the residual variances was also examined. Two visual analyses were employed for each final multilevel model:

(a) a scatterplot of the predicted residuals and (b) a q-q plot of the observed and expected values.

Prior to conducting the multilevel analyses, descriptive statistics were computed for all dependent and predictor variables. Means and standard deviations were computed for continuous variables; skewness and kurtosis values were also examined. For categorical variables, frequency counts and corresponding percentages were computed. These descriptive analyses for all level-1 variables were further disaggregated by data collection year (i.e., Year 1, Year 2, and Year 3), when appropriate.

Building the Multilevel Models

Given the exploratory nature of the study, each research question was addressed by building a multilevel model from the bottom up (Luke, 2004). In other words, each research question was first analyzed using the most basic (unconditional) model structure, and then additional predictors were added sequentially to produce increasingly complex models. Thus, a series of multilevel models were constructed, analyzed, and compared to identify which model best fits the data and to answer each research question. Specifically, fit indices were used to evaluate model integrity and selection of the most appropriate model to answer each research question. The fit indices used in the following analyses include the deviance statistic, the Akaike Information Criterion (AIC), and the Bayesian Information Criterion (BIC) (Luke, 2004). In addition to fit indices, the researcher considered the number of significant predictors that resulted from each model, as well as the degree to which each model parsimoniously answered each research question, in order to select the most appropriate model for final analysis. All models were developed using Hierarchical Linear and Nonlinear Modeling– Student Version 6 (HLM v. 6). The researcher computed the AIC and BIC fit indices separately and based upon the defiance statistic provided by the HLM software.

For each of the seven research questions, the unconditional model was first examined for each dependent variable to identify the degree to which the data were nested. Then, a model with time as a level-1 predictor was examined first to determine if the outcome assessed significantly changed over the three years of the Project. Then, SBLT's perceptions of the quality of coaching received at each of the three time points were entered as time-varying covariates in the models. Next, level-2 variables were added to determine what factors predicted outcomes. Given that all research questions were focused on the trajectory of the dependent variables' change over time, all time-varying covariates and level-2 predictor variables were included in the prediction of the slopes rather than intercepts. Level-2 variables were grouped together by common constructs and measurement tools, and then added sequentially to produce increasingly complex models. Specifically, all level-2 predictors related to coaching were entered simultaneously into each model (i.e., frequency and duration of training and technical assistance received by each school and coach continuity), followed by school-related variables (i.e., SES, size, and grade), SBLTs' *Beliefs Survey* data, SBLTs' *Perceptions of RtI Skills Survey* data, and finally district membership. Next, a fully complex model was constructed that included all available level-2 predictors. Both main effects and interaction terms were included in the models to determine the combination of factors that best predicted the outcome variable of interest. Finally, the most appropriate model was selected based upon the criteria described previously to answer each research question.

Each model examined required decisions to be made regarding the extent to which intercepts and slopes would be allowed to vary. The researcher hypothesized that intercepts and slopes across the predictors included in all analyses would likely vary across all levels (i.e., time and schools). Therefore, all models with time as the level-1 predictor were first examined with an unstructured covariance matrix that allowed intercepts and slopes to vary freely. Then, all models that included time as a level-1 predictor were examined where intercepts were allowed to vary while slopes remained fixed. The researcher then evaluated and compared the integrity of the two models, making decisions regarding the most appropriate time as a level-1 predictor model to be used as the foundation on which all subsequent models were built. Alpha was set at .05 for all models, and restricted maximum likelihood (REML) estimation was used in all analyses. Continuous and categorical predictors were grand mean centered and zero centered, respectively, to facilitate interpretation of the estimates produced by the multilevel models.

Relationship between Coaching and Perceived Level of PS/RtI Implementation in Schools Over Time

Research Questions 1a -1c examined the relationship between coaching and the perceived level of reported PS/RtI implementation in the pilot schools as measured by three domains of the *Self-Assessment of Problem-Solving Implementation (SAPSI)* across three data collection time points. PS/RtI implementation is measured at the school-level*.* Each of the research questions (1a-1c) used mean scores on one of the three respective domains of the SAPSI *(consensus development, infrastructure development, and implementation development*) as its dependent measure. All three questions examined a common set of level-1 predictor variables and level-2 predictor variables in building the multilevel models. Level-1 predictors in the model included time and perceived quality of coaching (as measured by the *Coaching Evaluation Survey*), which was used as a time-varying covariate in the models. Level-2 continuous predictors included data from the *Coaches Log System* (i.e., frequency and duration of training, and frequency and duration of technical assistance received by each school), change in SBLTs' beliefs across the three years on each of the three domains of the *Beliefs Survey*, and change in SBLTs' perceptions of skills across three years on each of the three domains of the *Perceptions of RtI Skills Survey*. To compute change in SBLT's beliefs on a given domain for each school over the three-year period, ordinary least square regression was used to obtain the slope of the regression line derived from the regression of each school's mean belief domain score on *Beliefs Survey* over the number of years of Project implementation. The computed regression slope for a given school was used as a measure of change across the three years for the given domain (i.e., change in beliefs for Domain 1, Domain 2, and Domain 3 over the 3-year period). Similar procedures were used to compute each SBLT's change in perceptions of skills over the three-year period for each of the three domains measured by the *Perceptions of RtI Skills Survey*.

Level-2 categorical predictors included school socio-economic status based upon the proportion of students receiving free- and reduced-lunch in the given school, school grade level at the end of Year 1, school size based upon student population, coach continuity across the three years of data collection, and district membership of each school. School size was scored on a 3-point scale based upon number of students enrolled, where 0 = less than 600 students, 1 = 600-799 students, and 2 = 800 or more students. School socio-economic status (SES) was coded 0 or 1 based upon the percent of students who qualified for free or reduced lunch, where a school with 50% or more students qualifying for free or reduced lunch was assigned a code of 0, and a school with less than 50% students qualifying for free or reduced lunch was assigned a code of 1.

Research Question 1a: What is the relationship between coaching and level of PS/RtI consensus development in schools over time? This research question examined the relationship between coaching and reported level of consensus development in schools over time. The mean *Consensus* development domain score obtained from the *Self-Assessment of Problem-*

Solving Implementation (SAPSI) for each school across the three data collection time points was used as the dependent measure for the model.

Assumptions. Prior to conducting inferential analysis, assumptions of multilevel models procedures were examined. The normality assumption was examined for the *Consensus* development domain data, and the level-1 and level-2 predictors to be entered into the model. Skewness and kurtosis values for the *Consensus* development domain measure, the perceived quality of coaching measure (level-1 predictor), and the continuous level-2 predictors by year (or data collection time point) for the total sample of schools (n = 34) are reported in Tables 1 - 3. Examination of these data show that the *Consensus* domain measure (Table 4) indicate relatively normal distributions for each of the respective three data time points.

Table 4

Self Assessment of Problem-Solving Implementation (SAPSI) Descriptive Data: Consensus Domain Scores by Year for Total Sample of Schools

Variable/End of Year	Mean (*SD*)	Skewness	Kurtosis
Consensus Year 1	1.60 (.46)	.01	-.61
Consensus Year 2	2.30 (.54)	-.37	-.99
Consensus Year 3	2.55 (.45)	-.61	-.97

Note. n = 34

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In the case of the level-1 perceived quality of coaching data (Table 5), the skewness and kurtosis values ranged from -1.19 to -2.31, and 2.01 to 5.69, respectively, across the three data collection points. Although these data do not indicate a relatively normal distribution across the three time points, multilevel modeling procedures are relatively robust to violations of this assumption (Raudenbush & Bryk, 2002). The data for the level-2 predictors (Table 6) indicate relatively normal distributions across the three data points

Table 5

Coaching Evaluation Survey Descriptive Data – Overall Rating of Quality of Coaching as Reported by Total Sample of Schools by Year- Level 1 Variable

Variable/End of Year	Mean (*SD*)	Skewness	Kurtosis
Quality of Coaching Year 1	4.43 (.37)	-1.19	2.01
Quality of Coaching Year 2	4.32 (.72)	-2.31	5.69
Quality of Coaching Year 3	4.51 (.40)	-1.37	2.46

Note. n = 34

Table 6

Summary Descriptive Statistics for Level-2 Continuous Predictors for Total Sample

Level 2 Predictors	Mean (SD)	Skewness	Kurtosis
Coaches Log System Data			
Training: Frequency (Total Sessions)	8.94 (7.66)	1.60	2.29
Training: Duration (Total Hours)	40.13 (28.1)	.63	-.58
Technical Assistance: Frequency	37.27 (30.50)	1.32	1.76
Technical Assistance: Duration	81.88 (52.06)	.41	-.65
Change in SBLT Beliefs [a]			
Beliefs Domain 1	.06 (.20)	-.30	-.38
Beliefs Domain 2	.02 (.12)	.14	-.16
Beliefs Domain 3	-.03 (.17)	.16	1.04
Change in SBLT Perception of Skills [b]			
Perception of Skills Domain 1	.08 (.16)	.41	.35
Perception of Skills Domain 2	.03 (.20)	.46	-.50
Perception of Skills Domain 3	.14 (.24)	.68	-.33

Note. n = 34
[a] Values are derived from slopes of regression lines calculated by ordinary least square regression to represent changes in *Beliefs Survey* data for each school over three years.
[b] Values are derived from slopes of regression lines calculated by ordinary least square regression to represent changes in *Perception of Skills Survey* data for each school over three years.

The assumption that missing data were randomly distributed was examined next using the procedures described previously. Significant correlations as high as .70 (p < .0001) among items on an administration of the *SAPSI* were found. These findings indicate that missing data at level-1 were related, resulting in a violation of the randomly distributed missing data assumption. However, given that the dependent measure for this model was calculated using the mean *Consensus* domain score of the *SAPSI* across the three time points for each pilot school, there were no missing data entered into the model at level-1. Further, all data were present at level-2. Therefore, the assumption for randomly missing data was met for all variables in this model.

Finally, the ICC was calculated from the unconditional *Consensus* development model to examine the assumption that the data were nested. The derived ICC was .006, which suggests that the observations are relatively independent. However, statistical justification of pursuing multilevel modeling comes from recognizing that the data in the current study are not independent because they are nested in time and within schools (Luke, 2004). Further, it is reasonable to hypothesize that characteristics unique to each school sampled in this study may influence consensus development over time, thereby suggesting theoretical justification for multilevel modeling.

Descriptive data: level-1 and level-2 variables. The mean score on the *Consensus* development domain of the *SAPSI* was calculated for each pilot school across the three data collection time points. Table 4 reports the overall mean *Consensus* domain score for the 34 schools for each of the three time points. The average reported level of *Consensus* development changed over the course of the Project, steadily increasing from end of Year 1 (M = 1.60; SD = 46), through end of Year 2 (M = 2.30; SD = .54), and to end of Year 3 (M = 2.55; SD = .45).

The mean score for each of the pilot school's perceived quality of coaching as measured by the *Coaching Evaluation Survey* was calculated at the end of the year for each of the three years (i.e., end of Year 1, end of Year 2, and end of Year 3) and was included as a time-varying covariate in the model. The relationship between perceived quality of coaching and the dependent variable at each time point was taken into account prior to estimating the effects of the level-2 predictors in selected models. Overall means and standard deviations of perceived quality of coaching ratings for the sample of schools (n = 34) by data collection time point are reported in Table 5.

Descriptive data were also examined for the level-2 predictor variables (i.e., time invariant school level predictors) to be entered into the model for predicting level of consensus development over time. Sample means for the level-2 continuous variables, the frequency (total number of sessions) and duration (total number of hours) of *Training* and *Technical Assistance* coaching received for each school across three years as measured by the *Coaches Log System*, each SBLT's change in beliefs about PS/RtI practices over three years as measured by the *Beliefs Survey* and change in perceptions of PS/RtI skills as measured by the *Perception of RI Skills Survey* are reported in Table 6. The frequency and percent of schools at each level of the respective level- 2 categorical variables --district membership, school socio-economic status, school size, school grade at the end of Year 1, and coach continuity across the three years, are reported in Table 7.

Table 7

Descriptive Statistics for Level-2 Categorical Predictors

Predictors	Frequency	Percent
Socio-economic Status (SES)[a]		
High SES	15	44.1
Low SES	19	55.9
School Grade Level		
A	24	70.6
B	5	14.7
C	4	11.8
D	1	2.9
F	0	0
School Size (Student Enrollment)		
Small (< 600)	6	17.6
Medium (600 - 799)	17	50.0
Large ($\geq$ 800)	11	32.4
Coach Continuity		
Continuous	19	55.9
Discontinuous	15	44.1
District Membership		
District A[b]	3	8.8
District B	6	17.6
District C	7	20.6
District D	6	17.6
District E	3	8.8
District F	6	17.6
District G	3	8.8

Note. [a] SES was scored on a 2-point scale based upon the median percent of student who qualified for free or reduced lunch across the three data collection time points, where 0 = 50% or more and 1 = 49% or less students qualifying for free- or reduced-lunch. [b] Data from this district were not included in multilevel modeling procedures for research questions 2a-2d.

Consensus development multilevel model results. A series of 2-level growth models was constructed and examined to determine what factors best predicted PS/RtI consensus development. Fixed effects estimates, variance estimates, and fit statistics for all models predicting PS/RtI consensus development are reported in Table 8. The average *Consensus* development domain score on the *SAPSI* was calculated for each school across the three data collection time points and entered as the dependent variable in the analysis. First, the unconditional model was estimated to determine the degree to which the data were nested. As previously indicated, the ICC for the unconditional model was .006. For Model 1, Time (i.e., end of Year 1, end of Year 2, and end of Year 3) was entered as the level-1 predictor of consensus development. Time was zero centered to facilitate interpretation of the results, and slopes and intercepts were allowed to vary. Results of Model 1 suggest that *Time* was a significant predictor of consensus development (π_{10} = .46, t = 8.52, p <.001). The positive estimate indicates that, in terms of change over time, consensus development significantly increased over the three time points. However, results of Model 1 indicate that schools did not vary significantly in their rate of change in consensus between Year 1 and Year 3, $\chi^2(33, N = 34) = 44.56$, p = .09. Given that schools did not appear to vary in their rate of change in consensus development over time, another model (Model 2) was constructed that allowed intercepts to vary but fixed the slopes. Comparisons between the number of estimated parameters and fit indices of both models indicated that Model 2, or the simpler model, was more parsimonious and better fit the data. Therefore, the slopes for Time remained fixed throughout all subsequent models.

Table 8

Fixed Effects Estimates and Variance Estimates for Models of the Predictors of PS/RtI Consensus Development

Parameter	Unconditional	Model 1	Model 2	Model 3	Model 4
Intercept (π_{00})	2.16 (.06)***	1.70 (.08)***	1.70 (.08)***	1.70 (.08)***	1.71 (.07)***
Level 1					
(π_{10}) Time		.46 (.05)***	.46 (.05)***	.46 (.05)***	.60 (.13)***
(π_{20}) Coach Quality				.14 (.09)	.16 (.08)
Level 2					
(β_{11})Training Frequency*Time					.04 (.02)*
(β_{12}) Training Duration*Time					-.01 (.01)*
(β_{13})TA Frequency*Time					-.01 (.00)*
(β_{14}) TA Duration*Time			.		.00 (.00)
(β_{15}) Continuity *Time					.03 (.11)
(β_{16}) SES*Time					
(β_{17}) Grade*Time					
(β_{18}) Size*Time					
(β_{19}) Change in Beliefs D1*Time					
(β_{110}) Change in Beliefs D2*Time					
(β_{111}) Change in Beliefs D3*Time					
(β_{112}) Change in Per. Skills D1*Time					
(β_{113}) Change in Per. Skills D2*Time					
(β_{114}) Change in Per. Skills D3*Time					
(β_{115}) District B*Time					
(β_{116}) District C*Time					
(β_{117}) District D*Time					
(β_{118}) District E*Time					
(β_{119}) District F*Time					
(β_{120}) District G*Time					
Variances					
(σ^2)	.39	.15	.18	.18	.16
(r_{00}) Intrcpt	.00	.09**	.07***	.07***	.04*
(r_{11}) Time Slp		.02			
Deviance	193.98	144.01	144.86	143.74	167.62
Parameters	2	4	2	2	2
AIC		152.01	148.86	147.74	171.62
BIC		158.11	151.91	150.80	174.67
ICC	.006				

Table 8 (continued)

Fixed Effects Estimates and Variance Estimates for Models of the Predictors of PS/RtI Consensus Development

Parameter	Model 5	Model 6	Model 7	Model 8	Model 9
Intercept (π_{00})	1.71 (.07)***	1.71 (.07)***	1.70 (.07)***	1.70 (.07)***	1.70 (.07)***
Level 1					
(π_{10}) Time	.34 (.27)	.58 (.14)***	.60 (.14)***	.34 (.17)	.21 (.40)
(π_{20}) Coach Quality	.19 (.09)*	.16 (.09)	.15 (.10)	.13 (.10)	.13 (.10)
Level 2					
(β_{11})Training Frequency*Time	.03 (.02)	.05 (.02)*	.04 (.02)*	.01 (.03)	.02 (.04)
(β_{12}) Training Duration*Time	-.01 (.01)	-.01 (.01)*	-.01 (.01)*	-.01 (.01)	-.01 (.01)
(β_{13})TA Frequency*Time	-.01 (.00)*	-.01 (.00)*	-.01 (.01)	-.00 (.01)	-.01 (.01)
(β_{14}) TA Duration*Time	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
(β_{15}) Continuity *Time	.11 (.13)	.01 (.13)	.01 (.12)	-.04 (.16)	.04 (.23)
(β_{16}) SES*Time	.13 (.08)				.21 (11)
(β_{17}) Grade*Time	.04 (.05)				.00 (.10)
(β_{18}) Size*Time	-.02 (.07)				-.02 (.07)
(β_{19}) Change in Beliefs D1*Time		.25 (.24)			.33 (.29)
(β_{110}) Change in Beliefs D2*Time		-.59 (.42)			-.27 (.49)
(β_{111}) Change in Beliefs D3*Time		.13 (.31)			.06 (.40)
(β_{112}) Change in Per. Skills D1*Time			.08 (.40)		.22 (.65)
(β_{113}) Change in Per. Skills D2*Time			-.10 (.30)		-.27 (.38)
(β_{114}) Change in Per. Skills D3*Time			.16 (.28)		.02 (.39)
(β_{115}) District B*Time				.26 (.30)	.23 (.38)
(β_{116}) District C*Time				.29 (.17)	.29 (.23)
(β_{117}) District D*Time				-.02 (.20)	.05 (.27)
(β_{118}) District E*Time				.30 (.32)	.30 (.42)
(β_{119}) District F*Time				.45 (.24)	.41 (.35)
(β_{120}) District G*Time				.42 (.25)	.42 (.36)
Variances					
(σ^2)	.16	.16	.16	.18	.17
(r_{00}) Intrcpt	.03	.05**	.04*	.00	.02
(r_{11}) Time Slp					
Deviance	172.13	164.60	167.29	167.08	170.36
Parameters	2	2	2	2	2
AIC	176.13	168.60	171.29	171.08	174.36
BIC	179.19	171.65	174.35	174.14	177.42

Note. Values based on HLM 6 using restricted maximum likelihood (REML) estimation. Entries show parameter estimates with standard errors in parentheses.
* p < .05. ** p < .01. *** p < .001.

In Model 3, the mean coaching quality score was grand mean centered and entered at each of the three time points as a time-varying covariate; intercepts were allowed to vary, slopes were fixed. Time remained a significant predictor of growth in consensus development (π_{10} = .46, *t* = 8.99, *p* <.001). In terms of the time-varying covariate, the perceived quality of coaching as measured by the *Coaching Evaluation Survey* was positively but not significantly related to growth in consensus development across the three years (π_{20} = .14, *t* = 1.49, *p* = .14). That is, the school level SBLTs' ratings of coaching quality received, as well as the extent to which coaches displayed required skills, were positively but not significantly related to growth in consensus development over time. Although not significant, the relationship between perceptions of coaching quality and the dependent variable at each time point was taken into account prior to estimating the effects of level-2 predictors in all subsequent models. Specifically, in the following models, all coefficients represent the effects of each variable after having controlled for the effect of the SBLTs' ratings of the PS/RtI coaching received.

The level-2 predictors related to instances in which PS/RtI Coaches provided training and technical assistance to schools, as well as the continuity of PS/RtI coaches in schools over the course of the Project, were included in Model 4. Specifically, the frequency (total number of sessions) and duration (total number of hours) of both training and technical assistance provided by PS/RtI coaches over the three years were entered as continuous variables. Coach continuity was entered as a dichotomous variable, where a 1 was entered for schools that received coaching from the same individual over the course of the three years, while a 0 was entered for schools that had a change in coaches and thus received coaching from more than one individual over the three years of the Project. Time remained a significant predictor of growth in consensus development (π_{10} = .60, t = 4.60, p < .001). Of the level-2 variables, the frequency of training sessions (β_{11} = .04, t = 2.30, p = .02) and technical assistance sessions (β_{13} = -.01, t = -2.31, p = .02), as well as duration of training (in hours) received (β_{12} = -.01, t = -2.08, p = .04) significantly contributed to predicting consensus development in the model. The duration of technical assistance received (β_{14} = .00, t = 1.51, p = .14) as well as the continuity of coaching (β_{15} = .03, t = 0.29, p = .77) did not significantly contribute to predicting consensus development. Results indicate that after controlling for the perceived quality of coaching, growth in consensus over time was predicted positively by the frequency of training sessions provided by the PS/RtI coaches. Growth in consensus development was shown to decrease, however, by the frequency of technical assistance sessions by PS/RtI coaches as well as the duration in hours of the training provided. In addition, neither the duration of the technical assistance or the continuity of coaching added any independent predictive power when examined in this model. A significant amount of variance in the intercept, χ^2 (33, N = 34) = 53.51, p = .01, remained unexplained by the variables included in Model 4. Therefore, a decision was made to examine the impact of additional level-2 variables on the predictive power of the model.

In Model 5, school grade, school SES, and school size were added as level-2 predictors to Model 4. Time was no longer a significant predictor of growth in consensus development (π_{10} = .34, t = 1.27, p = .21). Of all the level-2 variables in this model, the frequency of technical assistance sessions (β_{13} = -.01, t = -2.52, p = .01) was the only coaching-related predictor that remained significant. Further, school SES (β_{16} = .13, t = 1.60, p = .16), school grade (β_{17} = .04, t = 0.90, p = .37), and school size (β_{18} =- .02, t = -0.28, p = .78) did not significantly contribute to the model.

In Model 6, the SBLTs' change in beliefs over the three-year period for each of the three *Beliefs* domains were added as level-2 predictors to Model 4. Time was again a significant predictor of growth in consensus development (π_{10} = .58, t = 4.04, p < .001) in Model 6. Further, the Level-2 coaching variables of frequency of training and technical assistance received, as well as duration of training received significantly predicted consensus development over time. However, duration of technical assistance received as well as coach continuity did not significantly predict consensus development over time. Further, the SBLT's change in beliefs on Domain 1 (*Academic Ability and Performance of Students with Disabilities*; β_{19} = .24, t = 1.03, p = .31), Domain 2 (*Data-Based Decision-Making*; β_{110} = -.59, t = -1.39, p = .17), or Domain 3 (*Functions of Core and Supplemental Instruction*; β_{111} = .13, t = 0.42, p = .68) of the *Beliefs Survey* did not significantly contributed to predicting consensus development in this model.

In Model 7, the SBLTs' change in perceptions of RtI skills on each of the three domains measured by the *Perception of RtI Skills Survey* were added as level-2 predictors to Model 4. Time was again a significant predictor of growth in consensus development (π_{10} = .60, t = 4.25, p < .001) in Model 7. Further, the level-2 coaching variables of frequency and duration of training significantly predicted consensus development over time. However, the frequency and duration of technical assistance received as well as coach continuity did not significantly predict consensus development over time. Further, the SBLT's change in perceptions of skills on Domain 1 (*Perceptions of RtI Skills Applied to Academic Content*; β_{112} = .08, t = .19, p = .85), Domain 2 (*Perceptions of RtI Skills Applied to Behavior Content*; β_{113} = -.10, t = -.32, p = .75), or Domain 3 (*Perceptions of Data Manipulation and Technology* Use; β_{114} = .16, t = .56, p = .58) as measured by the *Perception of RtI Skills Survey did not* significantly contribute to the model.

To construct Model 8, each school's district membership affiliation was added to Model 4 as level-2 predictors of consensus development over time. Schools situated in six of the seven districts (districts B-G) were entered as separate dummy coded variables (1, 0), where 1 indicated district membership and 0 indicated non-district membership. District A was the referent against which all other districts were compared in this process. In Model 8, time was no longer a significant predictor of growth in consensus development (π_{10} = .33, t = .17, p = .053). Further, none of the coaching-related level-2 predictors (i.e., training and technical assistance frequency and duration, and coaching continuity) or district membership predictors significantly contributed to the model.

Finally, Model 9 was constructed by adding all available level-2 predictors simultaneously to Model 4. Time was no longer a significant predictor of growth in consensus development (π_{10} = .21, *t* = .53, *p* = .60). Further, none of the level-2 predictors significantly contributed to the model.

To determine which of the nine multilevel models best explained the growth of consensus development over time, three evaluative methods were utilized in combination: (1) comparison of each model's deviance statistic, AIC, and BIC fit indices; (2) comparison of the number of significant predictors resulting from each model; and (3) the degree to which each model parsimoniously explained growth in consensus over time. Based upon these criteria, the following equation tested in Model 4 was determined to best explain the relationship between coaching and consensus development over time:

$$Y_{ti} = \beta_{00} + \beta_{10} Time_{ti} + \beta_{11} Training\ Frequency_i{*}Time_{ti} + \beta_{12} Training\ Duration_i{*}Time_{ti} + \beta_{13} TA\ Frequency_i{*}Time_{ti} + \beta_{14} TA\ Duration_i{*}Time_{ti} + \beta_{15}\ Continuity_i{*}Time_{ti} + \beta_{20}\ Coach\ Quality_{ti} + r_{0i} + e_{ti}$$

Therefore, results indicate that after controlling for the SBLT's evaluation of quality of coaching performance, growth in consensus development over time was predicted positively by the frequency of training sessions provided by the PS/RtI coaches. Specifically, greater numbers of training sessions provided by the coaches predicted increases in consensus development over time in schools. Conversely, fewer numbers of technical assistance sessions as well as shorter duration (in hours) of training provided by coaches predicted growth in consensus over time. However, a significant amount of variance in the intercept, $\chi^2(33, N = 34) = 53.97$, $p = .01$, remains unexplained by the variables within this model.

Residual analysis of final consensus development model. Given that multilevel modeling procedures assume that the residuals of predicted values are normally distributed, the distribution of the Model 4 level-1 residuals was examined. Figure 3 displays the level-1 residuals in a scatterplot of the predicted residual variances, and Figure 4 displays a q-q plot of the observed and expected values. Analysis of a visual scan of the scatterplot and q-q plot suggests that Model 4's level-1 residuals are normally distributed. A test of homogeneity of the level-1 residuals as a function of time did not demonstrate significance, $\chi^2(33, N = 104) = 1.50$, $p > .50$, suggesting that the residuals demonstrated constant variance.

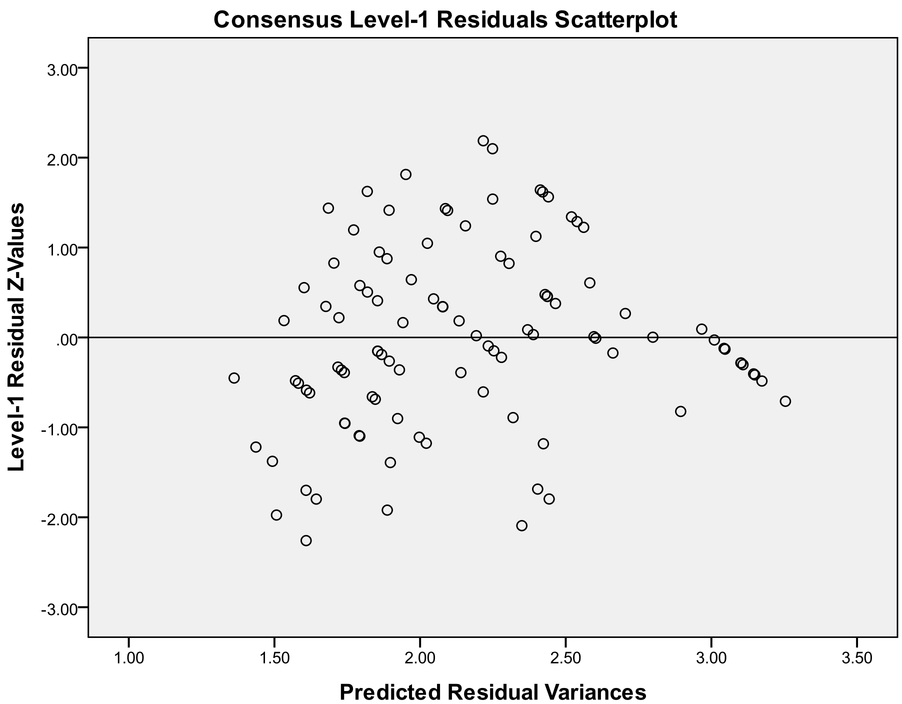

Figure 3. Consensus Development Level-1 Residual Scatterplot

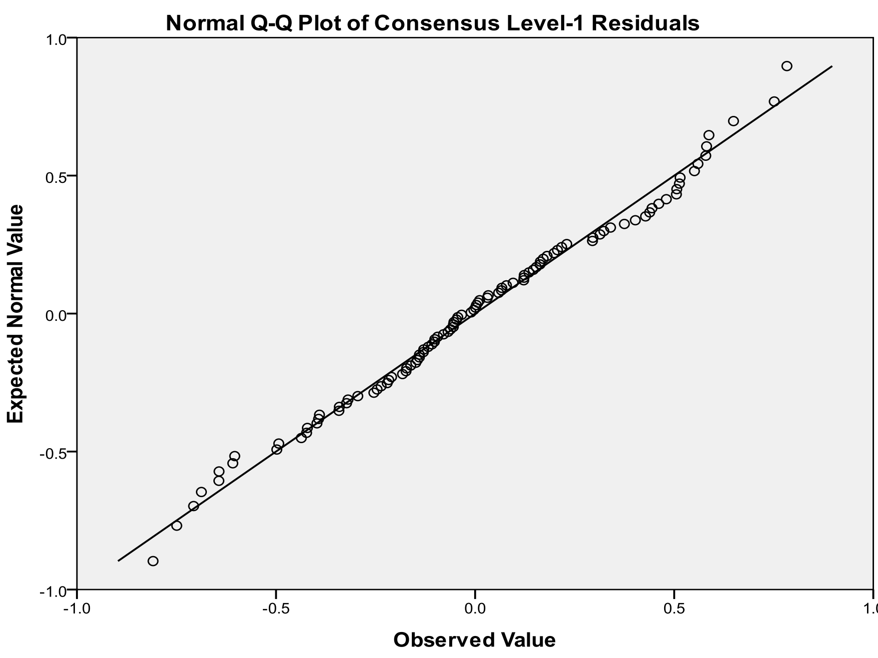

Figure 4 .Consensus Development Q-Q Plot of Observed and Expected Values

Research question 1b: What is the relationship between coaching and level of PS/RtI infrastructure development in schools over time? This research question examined the relationship between coaching and reported level of infrastructure development in schools over time. The mean *Infrastructure* domain score obtained from the *Self-Assessment of Problem-Solving Implementation (SAPSI)* for each school across the three data collection time points was used as the dependent measure for the model.

***Assumptions*.** Prior to conducting inferential analysis, assumptions of multilevel models procedures were examined. The normality assumption was examined for the *Infrastructure* development domain data Table 9 reports summary descriptive data for the dependent measure, *Infrastructure* domain score, by year (or data collection time point) for the total sample of schools (n = 34). Examination of these data shows that skewness and kurtosis values indicate relatively normal distribution of scores for each of the three respective data collection time points.

Table 9

Self Assessment of Problem-Solving Implementation (SAPSI) Descriptive Data: Infrastructure Domain Scores by Year for Total Sample of Schools

Variable/End of Year	Mean (SD)	Skewness	Kurtosis
Infrastructure Year 1	1.43 (.35)	.27	-.01
Infrastructure Year 2	2.23 (.49)	-.68	-.20
Infrastructure Year 3	2.63 (.32)	-.93	.72

Note. n = 34

The extent to which the distributions for the level-I and level-2 predictor variables met the normality assumption were discussed previously in addressing Research Question 1a.The assumption that missing data were randomly distributed was examined next using the procedures described previously. Significant correlations as high as .70 ($p < .0001$) among items on an administration of the *SAPSI* were found. These findings indicate that missing data at level-1 were related, resulting in a violation of the randomly distributed missing data assumption. However, given that the dependent measure for this model was calculated using the mean *Infrastructure* domain score of the *SAPSI* across the three time points for each pilot school, there were no missing data entered into the model at level-1. Further, all data were present at level-2. Therefore, the assumption for randomly missing data was met for all variables in this model.

Finally, the ICC from the unconditional *Infrastructure* development model was calculated to examine the assumption that the data were nested. The derived ICC was .001, suggesting that the observations are relatively independent. However, statistical justification of pursuing multilevel modeling comes from recognizing that the data in the current study are not independent because they are nested within schools (Luke, 2004). Further, it is reasonable to hypothesize that characteristics unique to each school sampled in this study may influence infrastructure development over time, thereby suggesting theoretical justification for multilevel modeling.

Descriptive data: level-1 and level-2 variables. The mean score on the *Infrastructure* development domain of the *SAPSI* was calculated for each pilot school across the three data collection time points. Table 9 reports the overall mean *Infrastructure development* domain score for the 34 schools for each of the three time points. The average reported level of *Infrastructure* changed over the course of the Project, steadily increasing from end of Year 1 (M = 1.43; SD = .35), through end of Year 2 (M = 2.23; SD = .49), and to end of Year 3 (M = 2.63; SD = .32).

The mean score for each pilot school's reported perceived quality of coaching as measured by the *Coaching Evaluation Survey* was calculated at the end of year for each of the three years (i.e., end of Year 1, end of Year 2, and end of Year 3) and was included as a time-varying covariate in selected models (see Table 5). Level-2 variables to be included in the models are reported in Tables 6 & 7.

Infrastructure development multilevel model results. A series of 2-level growth models were constructed and examined to determine what factors best predicted PS/RtI infrastructure development. Fixed effects estimates, variance estimates, and fit statistics for all models predicting PS/RtI infrastructure development are reported in Table 10. The average *Infrastructure* domain score on the *SAPSI* was calculated for each school across the three data collection time points and entered as the dependent variable in the analysis. First, the unconditional model was estimated to determine the degree to which the data were nested. As previously indicated, the ICC for the unconditional model was

.001. For Model 1, Time (i.e., end of Year 1, end of Year 2, and end of Year 3) was entered as the level-1 predictor of infrastructure development. Time was zero centered to facilitate interpretation of the results, and slopes and intercepts were allowed to vary. Results of Model 1 suggest that Time was a significant predictor of infrastructure development ($\pi_{10} = .60$, $t = 19.17$, $p <.001$). The positive estimate indicates that infrastructure development significantly increased over the three time points. However, results of Model 1 indicate that schools did not vary significantly in their rate of change in infrastructure development between Year 1 and Year 3, $\chi^2(33, N = 34) = 28.74$, $p > .50$. Given this observation, another model (Model 2) was constructed that allowed intercepts to vary but fixed the slopes. Comparisons between the number of estimated parameters and fit indices of both models indicated that Model 2, or the simpler model, was more parsimonious and better fit the data. Therefore, the slopes for Time remained fixed throughout all subsequent models.

Table 10

Fixed Effects Estimates and Variance Estimates for Models of the Predictors of PS/RtI Infrastructure Development

Parameter	Unconditional	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept (π_{00})	2.08 (.06)***	1.48 (.07)***	1.48 (.07)***	1.48 (.07)***	1.48 (.07)***	1.48
Level 1						
(π_{10}) Time		.60(.03)***	.60 (.03)***	.60 (.03)***	.61 (.10)***	.61 (.10)***
(π_{20}) Coach Quality				.03 (.06)		.06 (.07)
Level 2						
(β_{11})Training Frequency*Time					.02 (.01)	.02 (.01)
(β_{12}) Training Duration*Time					-.00 (00)	-.00 (.00)
(β_{13})TA Frequency*Time					-.00 (00)	-.00 (.00)
(β_{14}) TA Duration*Time			.		.00 (.00)	.00 (.00)
(β_{15}) Continuity *Time					.09 (.08)	.09 (.09)
(β_{16}) SES*Time						
(β_{17}) Grade*Time						
(β_{18}) Size*Time						
(β_{19}) Change in Beliefs D1*Time						
(β_{110}) Change in Beliefs D2*Time						
(β_{111}) Change in Beliefs D 3*Time						
(β_{112}) Change in Per. Skills D1*Time						
(β_{113}) Change in Per. Skills D2*Time						
(β_{114}) Change in Per. Skills D3*Time						
(β_{115}) District B*Time						
(β_{116}) District C*Time						
(β_{117}) District D*Time						
(β_{118}) District E*Time						
(β_{119}) District F*Time						
(β_{120}) District G*Time						
Variances						
(σ^2)	.41	.07	.07	.07	.07	.07
(r_{00}) Intrcpt	.00	.10***	.10***	.10***	.09***	.08***
(r_{11}) Time Slp		.00				
Deviance	198.80	78.40	78.40	79.97	112.70	117.40
Parameters	2	4	2	2	2	2
AIC		86.40	82.40	83.97	116.70	121.40
BIC		92.51	85.45	87.03	119.75	124.46
ICC	.001					

Table 10 (continued)

Fixed Effects Estimates and Variance Estimates for Models of the Predictors of PS/RtI Infrastructure Development

Parameter	Model 6	Model 7	Model 8	Model 9	Model 10
Intercept (π_{00})	1.48 (.06)***	1.48 (.07)***	1.48 (.07)***	1.48 (.06)***	1.17 (.33)**
Level 1					
(π_{10}) Time	.38 (.21)	.59 (.11)***	.62 (.10)***	.49 (.14)***	.44 (.33)
(π_{20}) Coach Quality					.07 (.07)
Level 2					
(β_{11})Training Frequency*Time	.01 (.01)	.01 (.02)	.01 (.02)	.01 (.02)	-.01 (.03)
(β_{12}) Training Duration*Time	-.00 (.00)	-.00 (.00)	-.00 (.00)	-.00 (.00)	.00 (.01)
(β_{13})TA Frequency*Time	-.00 (.00)	-.00 (.00)	-.00 (.00)	.00 (.00)	.00 (.01)
(β_{14}) TA Duration*Time	.00 (.00)	.00 (.00)	.00 (.00)	-.00 (.00)	-.00 (.00)
(β_{15}) Continuity *Time	.16 (.10)	.16 (.10)	.02 (.09)	-.04 (.13)	.07 (.19)
(β_{16}) SES*Time	.07 (.06)				.12 (.09)
(β_{17}) Grade*Time	.04 (.04)				-.01 (.09)
(β_{18}) Size*Time	.01 (.05)				-.02 (.06)
(β_{19}) Change in Beliefs D1*Time		-.20 (.18)			-.21 (.24)
(β_{110}) Change in Beliefs D2*Time		.05 (.33)			.09 (.40)
(β_{111}) Change in Beliefs D3*Time		.24 (.24)			.40 (.33)
(β_{112}) Change in Per. Skills D1*Time			-.18 (.30)		.23 (.53)
(β_{113}) Change in Per. Skills D2*Time			-.20 (.23)		-.25 (.31)
(β_{114}) Change in Per. Skills D3*Time			.30 (.22)		.04 (.32)
(β_{115}) District B*Time				.12 (.25)	.27 (.31)
(β_{116}) District C*Time				.07 (.14)	.00 (.18)
(β_{117}) District D*Time				.13 (.16)	.04 (.23)
(β_{118}) District E*Time				.29 (.27)	.32 (.34)
(β_{119}) District F*Time				.26 (.20)	.29 (.28)
(β_{120}) District G*Time				.36 (.20)	.39 (.29)
Variances					
(σ^2)	.07	.07	.07	.07	.07
(r_{00}) Intrcpt	.09***	.09***	.09***	.08***	.08***
(r_{11}) Time Slp					
Deviance	123.95	116.33	116.59	122.01	133.71
Parameters	2	2	2	2	2
AIC	127.95	120.33	120.59	126.01	137.71
BIC	131.00	123.38	123.64	129.06	140.76

Note. Values based on HLM 6 using restricted maximum likelihood (REML) estimation. Entries show parameter estimates with standard errors in parentheses.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Quality of coaching was grand mean centered and entered at each of the three time points as a time-varying covariate in Model 3; intercepts were allowed to vary, slopes were fixed. Time remained a significant predictor of growth in infrastructure development (π_{10} = .60, t = 18.86, p < .001). In terms of the time-varying covariate, perceived quality of coaching was positively but not significantly related to growth in infrastructure development across the three years (π_{20} = .03, t = 0.52, p = .61). That is, SBLTs' ratings of coaching quality received were positively but not significantly related to growth in infrastructure development over time. Further, as there was a slight increase in the AIC and BIC statistics from Model 2 to Model 3, the addition of the coaching quality time-varying covariate did not add predictive power to Model 2. Therefore, the relationship between perceptions of coaching and the dependent variable at each time point was not taken into account prior to estimating the effects of level-2 predictors in the next model (Model 4).

The level-2 predictors related to instances in which PS/RtI coaches provided training and technical assistance to schools, as well as the continuity of PS/RtI coaches in schools over the course of the Project, were included in Model 4. Time remained a significant predictor of growth in infrastructure development (π_{10} = .61, t = 6.34, p < .001). However, none of the level-2 variables significantly contributed to predicting infrastructure development in the model. A significant amount of variance in the intercept, χ^2 (33, N = 34) = 161.19, p < .001, remained unexplained by the variables included in Model 4. Therefore, a decision was made to examine the impact of coaching quality as a time-varying covariate on the predictive power of Model 4 (Model 5). Although Time remained a significant predictor of infrastructure development (π_{10} = .61, t = 6.29, p < .001), none of the level-2 variables (i.e., training and technical assistance frequency and duration, and coaching continuity) nor the time-varying coaching quality covariate (π_{20} = .06, t = 0.89, p = .34) significantly contributed to the model. Further, as there was a five point increase in the AIC and BIC statistics from Model 4 to Model 5, it was determined that the addition of the coaching quality time-varying covariate did not add predictive power to Model 5. Therefore, the relationship between perceptions of coaching quality and the dependent variable at each time point was not taken into account prior to estimating the effects of level-2 predictors in the next series of models (Models 6-9).

School grade, school SES, and school size were added as level-2 predictors to Model 4 (Model 6). Time was no longer a significant predictor of growth in infrastructure development (π_{10} = .38, t = 1.83, p = .07). Additionally, none of the level-2 predictors (i.e., training and technical assistance frequency and duration, coaching continuity, school grade, school SES, and school size) significantly contributed to the model.

In Model 7, the changes in SBLTs' beliefs over the three-year period for each of the three *Beliefs Survey* domains were added as level-2 predictors to Model 4. Time was again a significant predictor of growth in infrastructure development (π_{10} = .59, t = 5.42, p < .001) in Model 7. However, none of the coaching-related level-2 predictors (i.e., training and technical assistance frequency and duration, and coaching continuity) significantly predicted infrastructure development over time. Further, the change in SBLT's beliefs over the three years on Domain 1 (*Academic Ability and Performance of Students with Disabilities*; β_{19} = -.20, *t* = -1.06, *p* = .29), Domain 2 (*Data-Based Decision-Making*; β_{110} = .05, *t* = .14, *p* = .89), and Domain 3 (*Functions of Core and Supplemental Instruction*; β_{111} = .24, *t* = 1.02, *p* = .31) of the *Beliefs Survey* did not significantly contribute to predicting infrastructure development in this model.

The SBLT's changes in beliefs over the three years on each of the three domains as measured by the *Perception of RtI Skills Survey* were added as level-2 predictors to Model 4 to construct Model 8. Time was again a significant predictor of growth in infrastructure development (π_{10} = .62, *t* = 5.96, *p* < .001) in Model 8. However, none of the coaching-related level-2 variables (i.e., training and technical assistance frequency and duration, and coach continuity) significantly predicted infrastructure development over time in this model. In addition, the SBLT's change in beliefs on neither Domain 1 (*Perceptions of RtI Skills Applied to Academic Content*; β_{112} = -.18, *t* = -.60, *p* = .55), Domain 2 (*Perceptions of RtI Skills Applied to Behavior Content*; β_{113} = -.19, *t* = -.85, *p* = .40), nor Domain 3 (*Perceptions of Data Manipulation and Technology* Use; β_{114} = .30, *t* = 1.39, *p* = .17) of the *Perception of RtI Skills Survey* significantly contributed to the model.

Model 9 included each school's district membership affiliation added to Model 4 as level-2 predictors of infrastructure development over time. Schools situated in six of the seven districts (districts B-G) were entered as separate dummy coded variables (1, 0), where 1 indicated district membership and 0 indicated non-district membership. District A was the referent against which all other districts were compared in this process. Time remained a significant predictor of growth in infrastructure development (π_{10} = .49, t = 3.58, p < .001). However, none of the coaching-related level-2 predictors (i.e., training and technical assistance frequency and duration, and coach continuity) or district membership predictors significantly contributed to the model.

Finally, Model 10 was constructed by adding the coaching quality time-varying covariate and all available level-2 predictors simultaneously to Model 4. Time was no longer a significant predictor of growth in infrastructure development (π_{10} = .44, t = 1.36, p = .18). Further, none of the level-2 predictors or the coaching quality covariate significantly contributed to the model.

To determine which of the 10 multilevel models best explained the growth of infrastructure development over time, three evaluative methods were utilized in combination: (1) comparison of each model's deviance statistic, AIC, and BIC fit indices; (2) comparison of the number of significant predictors resulting from each model; and (3) the degree to which each model parsimoniously explained growth in implementation over time. Based upon these criteria, the following equation tested in Model 3 was determined to best explain the relationship between coaching and infrastructure development over time:

$$Y_{ti} = \beta_{00} + \beta_{10} Time_{ti} + \beta_{20} Coach\ Quality + r_{0i} + e_{ti}$$

Therefore, results indicate that while controlling for the SBLT's perception of coaching quality, time was the only significant predictor of infrastructure development. Therefore, a significant amount of variance in the intercept, χ^2(33, N = 34) = 178.00, p < .001, remains unexplained within this model.

Residual analysis of final infrastructure development model. Given that multilevel modeling procedures assume that the residuals of predicted values are normally distributed, the level-1 residuals were examined. Figure 5 displays the level-1 residuals in a scatterplot of the predicted residual variances, and Figure 6 displays a q-q plot of the observed and expected values. A visual scan of the scatterplot and q-q plot suggests that Model 4's level-1 residuals are normally distributed. A test of homogeneity of the level-1 residuals as a function of time did not demonstrate significance, χ^2 (33, N = 104) = .31, p > .50, suggesting that the residuals demonstrated constant variance.

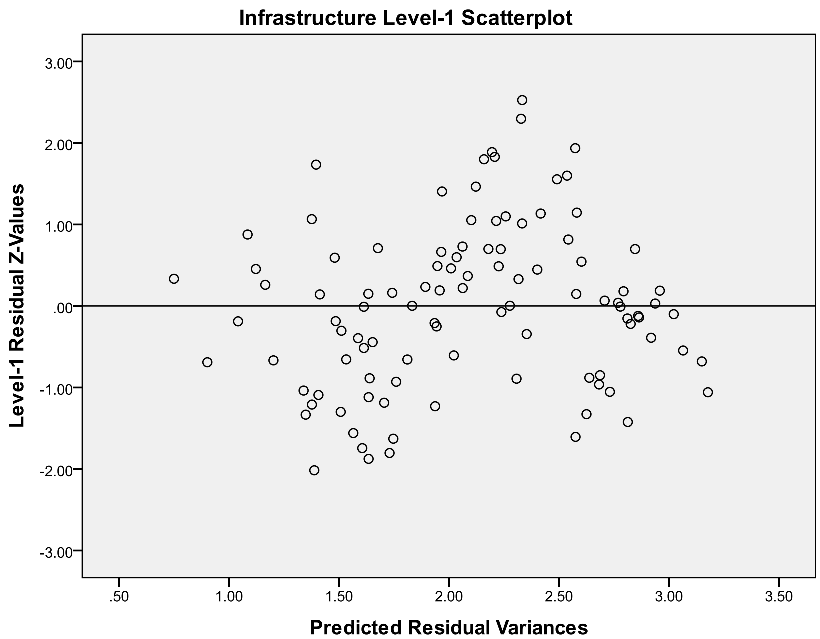

Figure 5. Infrastructure Level-1 Residual Scatterplot

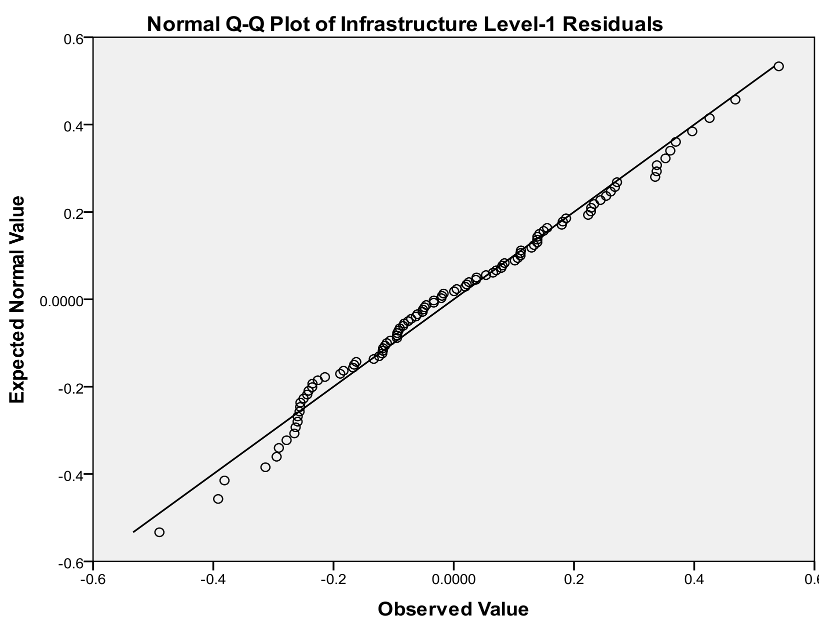

Figure 6. Infrastructure Q-Q Plot of Observed and Expected Values

Research Question 1c: What is the relationship between coaching and level of PS/RtI implementation development in schools over time? This research question examined the relationship between coaching and reported level of implementation development in schools over time. The mean *Implementation* development domain score obtained from the *Self-Assessment of Problem-Solving Implementation (SAPSI)* for each school across the three data collection time points was used as the dependent measure for the model.

***Assumptions*.** Prior to conducting inferential analysis, assumptions of multilevel models procedures were examined. The normality assumption was examined for the *Implementation* domain data, and the level-1 and level-2 predictor variables, as reported earlier in Research Question 1a. Table 11 reports summary descriptive data for the dependent measure, *Implementation* development by year (or data collection time point) for the total sample of schools (n = 34). Examination of the skewness and kurtosis values for the *Implementation* domain measure indicate relatively normal distributions of scores for each of the three respective data time points.

Table 11

Self Assessment of Problem-Solving Implementation (SAPSI) Descriptive Data: Implementation Domain Scores by Year for Total Sample of Schools

Variable/End of Year	Mean (*SD*)	Skewness	Kurtosis
Implementation Year 1	1.14 (.33)	-.72	.06
Implementation 2	1.88 (.53)	-.22	-.25
Implementation 3	2.42 (.36)	-.25	-1.02

Note. n = 34

The extent to which the distributions for the level-I and level-2 predictor variables met the normality assumption were discussed previously in addressing Research Question 1a. The assumption that missing data were randomly distributed was examined next using the procedures described previously. Significant correlations as high as .70 (p < .0001) among items on an administration of the *SAPSI* were found. These findings indicate that missing data at level-1 were related, resulting in a violation of the randomly distributed missing data assumption. However, given that the dependent measure for this model was calculated using the mean *Implementation* domain score of the *SAPSI* across the three time points for each pilot school, there were no missing data entered into the model at level-1. Further, all data were present at level-2. Therefore, the assumption for randomly missing data was met for all variables in this model.

Finally, the ICC from the unconditional *Implementation* model was calculated to examine the assumption that the data were nested. The derived

ICC was .0003, which indicates that the observations are relatively independent. However, statistical justification of pursuing multilevel modeling comes from recognizing that the data in the current study are not independent because they are nested within time and schools (Luke, 2004). Further, it is reasonable to hypothesize that characteristics unique to each school sampled in this study may influence implementation over time, thereby suggesting theoretical justification for multilevel modeling.

Descriptive data: level-1 and level-2 variables. The mean score on the *Implementation* domain of the *SAPSI* was calculated for each pilot school across the three data collection time points. Table 11 reports the overall mean *Implementation* domain score for the 34 schools for each of the three time points. The average reported level of *Implementation* changed over the course of the Project, steadily increasing from end of Year 1 (M = 1.14; SD = .33), through end of Year 2 (M = 1.88; SD = .53), and to end of Year 3 (M = 2.42; SD = .36).

The mean score for each of the pilot school's reported perceived quality of coaching as measured by the *Coaching Evaluation Survey* was calculated at the end of year for each of the three years (i.e., end of Year 1, end of Year 2, and end of Year 3) and was included as a possible time-varying covariate in select models (see Table 5). Level-2 variables to be included in the models are reported in Tables 6 and 7.

Implementation development multilevel model results. A series of 2-level growth models were constructed and examined to determine what factors best predicted PS/RtI implementation development. Fixed effects estimates, variance estimates, and fit statistics for all models predicting PS/RtI implementation development are reported in Table 12. The average *Implementation* domain score on the *SAPSI* was calculated for each school across the three data collection time points and entered as the dependent variable in the analysis. First, the unconditional model was estimated to determine the degree to which the data were nested. As previously indicated, the ICC for the unconditional model was .0003. For Model 1, Time (i.e., end of Year 1, end of Year 2, and end of Year 3) was entered as the level-1 predictor of implementation development. Time was zero centered to facilitate interpretation of the results, and slopes and intercepts were allowed to vary. Results of Model 1 suggest that Time was a significant predictor of implementation development (π_{10} = .64, t = 16.60, p <.001). The positive estimate indicates that implementation development was perceived to significantly increase over the three time points. However, results of Model 1 indicate that schools did not vary significantly in their rate of change in implementation development between Year 1 and Year 3, $\chi^2(33, N = 34) = 33.95$, p = .42. Given this observation, another model (Model 2) was constructed that allowed intercepts to vary but slopes to be fixed. Comparisons between the number of estimated parameters and fit indices of both models indicated that Model 2, or the simpler model, was more parsimonious and better fit the data. Therefore, the slopes for Time remained fixed throughout all subsequent models.

Table 12

Fixed Effects Estimates and Variance Estimates for Models of the Predictors of PS/RtI Implementation Development

Parameter	Unconditional	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept (π_{00})	1.81 (.07)***	1.17 (.06)***	1.17 (.07)***	1.22 (.33)***	1.17 (.06)***	1.18**
Level 1						
(π_{10}) Time		.64 (.04)***	.64 (.04)***	.64 (.04)***	.64 (.11)***	.64 (.11)***
(π_{20}) Coach Quality				-.01 (.07)		-.00 (.07)
Level 2						
(β_{11})Training Frequency*Time					.00 (.01)	.00 (.01)
(β_{12}) Training Duration*Time					-.00 (00)	-.00 (.00)
(β_{13})TA Frequency*Time					-.00 (00)	-.00 (.00)
(β_{14}) TA Duration*Time			.		-.00 (.00)	.00 (.00)
(β_{15}) Continuity *Time					.22 (.09)*	.22 (.09)*
(β_{16}) SES*Time						
(β_{17}) Grade*Time						
(β_{18}) Size*Time						
(β_{19}) Change in Beliefs D1*Time						
(β_{110}) Change in Beliefs D2*Time						
(β_{111}) Change in Beliefs D3*Time						
(β_{112}) Change in Per. Skills D1*Time						
(β_{113}) Change in Per. Skills D2*Time						
(β_{114}) Change in Per. Skills D3*Time						
(β_{115}) District B*Time						
(β_{116}) District C*Time						
(β_{117}) District D*Time						
(β_{118}) District E*Time						
(β_{119}) District F*Time						
(β_{120}) District G*Time						
Variances						
(σ^2)	.45	.10	.10	.10	.10	.10
(r_{00}) Intrcpt	.00	.19**	.08***	.08***	.05***	.08***
(r_{11}) Time Slp		.00				
Deviance	209.13	100.71	101.54	103.04	127.13	132.33
Parameters	2	4	2	2	2	2
AIC		108.71	105.54	107.04	131.13	138.33
BIC		114.81	108.59	110.09	134.19	139.38
ICC	.0003					

Table 12 (continued)

Fixed Effects Estimates and Variance Estimates for Models of the Predictors of PS/RtI Implementation Development

Parameter	Model 6	Model 7	Model 8	Model 9	Model 10
Intercept (π_{00})	1.17 (.06)***	1.17 (.06)***	1.17 (.06)***	1.17 (.06)***	1.18 (.06)***
Level 1					
(π_{10}) Time	.38 (.23)	.60 (.12)***	.66 (.11)***	.53 (.15)***	.34 (.36)
(π_{20}) Coach Quality					.01 (.07)
Level 2					
(β_{11})Training Frequency*Time	-.01 (.01)	-.00 (.01)	-.00 (.02)	-.03 (.02)	-.04 (.03)
(β_{12}) Training Duration*Time	.00 (.00)	.00 (.00)	-.00 (.00)	.00 (.00)	.01 (.01)
(β_{13})TA Frequency*Time	.00 (.00)	-.00 (.00)	.00 (.00)	.00 (.00)	-.00 (.01)
(β_{14}) TA Duration*Time	-.00 (.00)	-.00 (.00)	-.00 (.00)	-.00 (.00)	-.00 (.00)
(β_{15}) Continuity *Time	.29 (.11)*	.27 (.11)*	.19 (.10)	.17 (.14)	.25 (.20)
(β_{16}) SES*Time	-.00 (.07)				-.02 (.10)
(β_{17}) Grade*Time	.05 (.04)				.03 (.09)
(β_{18}) Size*Time	.03 (.06)				.01 (.07)
(β_{19}) Change in Beliefs D1*Time		-.11 (.20)			-.09 (.26)
(β_{110}) Change in Beliefs D2*Time		-.25 (.36)			-.01 (.44)
(β_{111}) Change in Beliefs D3*Time		.18 (.26)			.18 (.36)
(β_{112}) Change in Per. Skills D1*Time			-.25 (.32)		-.16 (.58)
(β_{113}) Change in Per. Skills D2*Time			-.16 (.25)		-.33 (.34)
(β_{114}) Change in Per. Skills D3*Time			.34 (.24)		.21 (.35)
(β_{115}) District B*Time				.16 (.27)	.13 (.34)
(β_{116}) District C*Time				-.02 (.15)	-.04 (.20)
(β_{117}) District D*Time				-.07 (.17)	-.09 (.24)
(β_{118}) District E*Time				-.08 (.28)	-.10 (.37)
(β_{119}) District F*Time				.22 (.21)	.23 (.31)
(β_{120}) District G*Time				.21 (.22)	.19 (.32)
Variances					
(σ^2)	.10	.10	.10	.10	.12
(r_{00}) Intrcpt	.04**	.05***	.05***	.03*	.03
(r_{11}) Time Slp					
Deviance	139.38	130.94	130.42	133.31	147.72
Parameters	2	2	2	2	2
AIC	143.38	134.94	134.42	137.31	151.72
BIC	146.44	137.99	137.47	140.37	154.77

Note. Values based on HLM 6 using restricted maximum likelihood (REML) estimation. Entries show parameter estimates with standard errors in parentheses.
* $p < .05$. ** $p < .01$. *** $p < .001$.

The quality of coaching variable was grand mean centered and entered at each of the three time points as a time-varying covariate in Model 3; intercepts were allowed to vary, slopes were fixed. Time remained a significant predictor of growth in implementation development (π_{10} = .64, t = 16.66, p <.001). In terms of the time-varying covariate, perceived quality of coaching as measured by *Coaching Evaluation Survey,* was not significantly related to growth in implementation development across the three years (π_{20} = 0.01, t = -0.13, p = .90). Further, as there was a slight increase in the AIC and BIC statistics from Model 2 to Model 3, the addition of the coaching quality time-varying covariate did not add predictive power to Model 2. Therefore, the relationship between perceptions of coaching and the dependent variable at each time point was not taken into account prior to estimating the effects of level-2 predictors in the next model (Model 4).

The level-2 predictors related to instances in which PS/RtI coaches provided training and technical assistance to schools, as well as PS/RtI coach continuity in schools over the course of the Project, were included in Model 4. Specifically, the frequency (total number of sessions) and duration (total number of hours) of both training and technical assistance provided by PS/RtI coaches over the three years were entered as continuous variables. Coach continuity was entered as a dichotomous variable, where a 1 was entered for schools that received coaching from the same individual over the course of the three years, while a 0 was entered for schools that received coaching from more than one individual over the three years of the Project. Time remained a significant predictor of growth in implementation development (π_{10} = .64, t = 6.02, p < .001). Additionally, coach continuity was found to significantly contribute (β_{15} = .23, t = 2.46, p = .02) to predicting implementation development. However, none of the level-2 variables related to frequency or duration of coaching training and technical assistance significantly contributed to predicting implementation development in the model. Results indicate that growth in implementation over time was predicted positively by the continuity of the coach, or the degree to which coaching was delivered by the same individual over the three years of the Project. However, neither the frequency nor duration of the training or technical assistance received, added any independent predictive power when examined in this model. A significant amount of variance in the intercept, χ^2 (33, N = 34) = 78.75, p < .001, remained unexplained by the variables included in Model 4. Therefore, a decision was made to examine the impact of coaching quality as a time-varying covariate on the predictive power of Model 4 (Model 5).

Although Time (π_{10} = .64, t = 5.97, p < .001) and coach continuity (β_{15} = .23, t = 2.44, p = .02) remained significant predictors of implementation development in Model 5, none of the other level-2 variables (i.e., training and technical assistance frequency and duration) or the time-varying perceived coaching quality covariate (π_{20} = -.00, t = -0.02, p = .98) significantly contributed to the model. Further, as there was a seven point increase in the AIC statistic and a five point increase in the BIC statistic from Model 4 to Model 5, the addition of the coaching quality time-varying covariate did not add predictive power to Model 5. Therefore, the relationship between perceptions of coaching quality and the dependent variable at each time point was not taken into account prior to estimating the effects of level-2 predictors in the next series of models (Models 6-9).

School grade, school SES, and school size were zero-centered and added as level-2 predictors to Model 4 to construct Model 6. Coach continuity remained a significant predictor of reported implementation development over time (β_{15} = .29, t = 2.59, p = .01). Time was no longer a significant predictor of growth in implementation development (π_{10} = .38, t = 1.66, p = .10). None of the other level-2 predictors (i.e., training and technical assistance frequency and duration, school grade, school SES, and school size) significantly contributed to the model.

In Model 7, the SBLT's change in beliefs over the three-year period on each of the three domains measured by the *Beliefs Survey* was grand mean centered and added as level-2 predictors to Model 4. Time was again a significant predictor of growth in implementation development (π_{10} = .60, t = 5.00, p < .001) in Model 7. Coach continuity was also a significant predictor of reported implementation development over time (β_{15} = .27, t = 2.45, p = .02). However, none of the other coaching-related level-2 predictors (i.e., training and technical assistance frequency and duration) significantly predicted implementation development over time. In addition, the SBLT's change in beliefs over the three-year period on neither Domain 1 (*Academic Ability and Performance of Students with Disabilities*; β_{19} = -.11, t = -.55, p = .58), Domain 2 (*Data-Based Decision-Making*; β_{110} = -.25, t = -.71, p = .48), nor Domain 3 (*Functions of Core and

Supplemental Instruction; $\beta_{111} = .18$, $t = .70$, $p = .49$) of the *Beliefs Survey* significantly contributed to predicting implementation development in this model.

The SBLT's change in perceptions of PS/RtI skills over the three-year period on each of the three domains measured by the *Perception of RtI Skills Survey* was grand mean centered and added as level-2 predictors to Model 4 to construct Model 8. Time was again a significant predictor of growth in implementation development ($\pi_{10} = .66$, $t = 5.74$, $p < .001$) in Model 8. However, none of the coaching-related level-2 variables (i.e., training and technical assistance frequency and duration, and coaching continuity) significantly predicted implementation development over time. Further, the SBLT's change in perceptions of RtI skills over the three-year period on neither Domain 1 (*Perceptions of RtI Skills Applied to Academic Content*; $\beta_{112} = -.25$, $t = -.76$, $p = .45$), Domain 2 (*Perceptions of RtI Skills Applied to Behavior Content*; $\beta_{113} = -.16$, $t = -.62$, $p = .54$), nor Domain 3 (*Perceptions of Data Manipulation and Technology* Use; $\beta_{114} = .33$, $t = 1.42$, $p = .16$) of the *Perception of PS/RtI Skills Survey* significantly contributed to the model.

Model 9 included each school's district membership affiliation zero-centered and added to Model 4 as level-2 predictors of implementation development over time. Schools situated in six of the seven districts (districts B-G) were entered as separate dummy coded variables (1, 0), where 1 indicated district membership and 0 indicated non-district membership. District A was the referent against which all other districts were compared in this process. Time remained a significant predictor of growth in infrastructure development (π_{10} =

.53, t = 3.61, p < .001). However, none of the coaching-related level-2 predictors (i.e., training and technical assistance frequency and duration, and coaching continuity) or district membership predictors significantly contributed to the model.

Finally, Model 10 was constructed by adding the coaching quality time-varying covariate and all available level-2 predictors simultaneously to Model 4. Time was no longer a significant predictor of growth in implementation development (π_{10} = .34, t = .96, p = .34). Further, none of the level-2 predictors or the coaching quality covariate significantly contributed to the model.

To determine which of the 10 multilevel models best explained the growth of implementation over time, three evaluative methods were utilized in combination: (1) comparison of each model's deviance statistic, AIC, and BIC fit indices; (2) comparison of the number of significant predictors resulting from each model; and (3) the degree to which each model parsimoniously explained growth in implementation over time. Based upon these criteria, the following equation tested in Model 4 was determined to best explain the relationship between coaching and reported implementation development over time:

$$Y_{ti} = \beta_{00} + \beta_{10}Time_{ti} + \beta_{11}Training\ Frequency_i{*}Time_{ti} + \beta_{12}Training\ Duration_i{*}Time_{ti} + \beta_{13}TA\ Frequency_i{*}Time_{ti} + \beta_{14}TA\ Duration_i{*}Time_{ti} + \beta_{15}Continuity_i{*}Time_{ti} + r_{0i} + e_{ti}$$

Therefore, results indicate that while not controlling for the SBLTs' perception of coaching performance, growth in implementation over time was predicted positively by the continuity of individuals providing PS/RtI coaching in schools over the course of the three-year Project. Specifically, the degree to which coaching was delivered by the same individual throughout the Project positively predicted growth in implementation over time. However, as time and coach continuity were the only significant predictors of implementation development, a significant amount of variance in the intercept, $\chi^2(33, N = 34) = 78.75$, $p < .001$, remains unexplained within this model.

Residual analysis of final implementation model. Given that multilevel modeling procedures assume that the residuals of predicted values are normally distributed, the level-1 residuals were examined. Figure 7 displays the level-1 residuals in a scatterplot of the predicted residual variances, and Figure 8 displays a q-q plot of the observed and expected values. Visual scans of the scatterplot and q-q plot suggest that Model 4's level-1 residuals are normally distributed. A test of homogeneity of the level-1 residuals as a function of time did not demonstrate significance, $\chi^2(33, N = 104) = .78$, $p > .50$, suggesting that the residuals demonstrated constant variance.

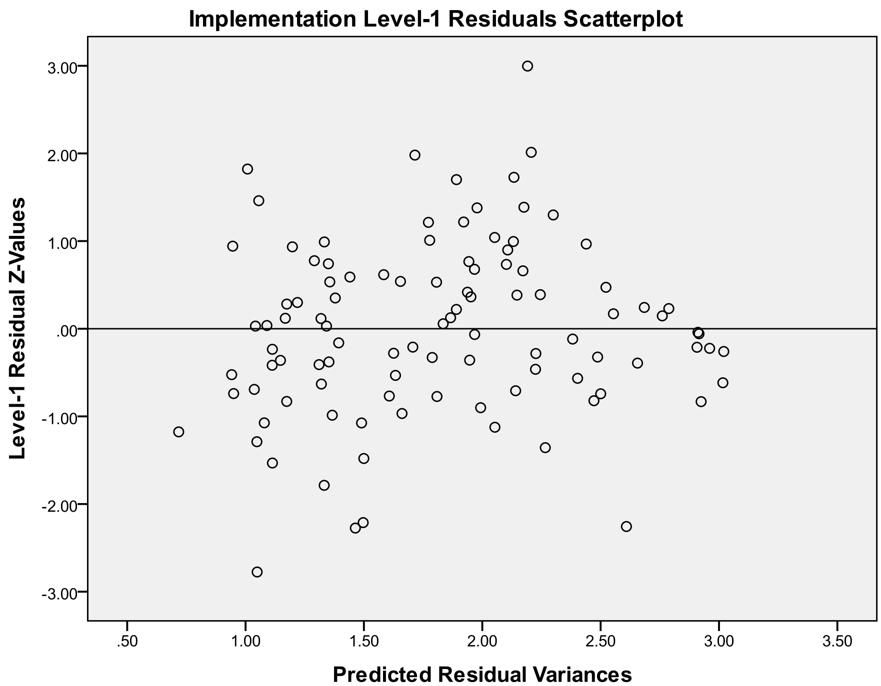

Figure 7. Implementation Level-1 Residual Scatterplot

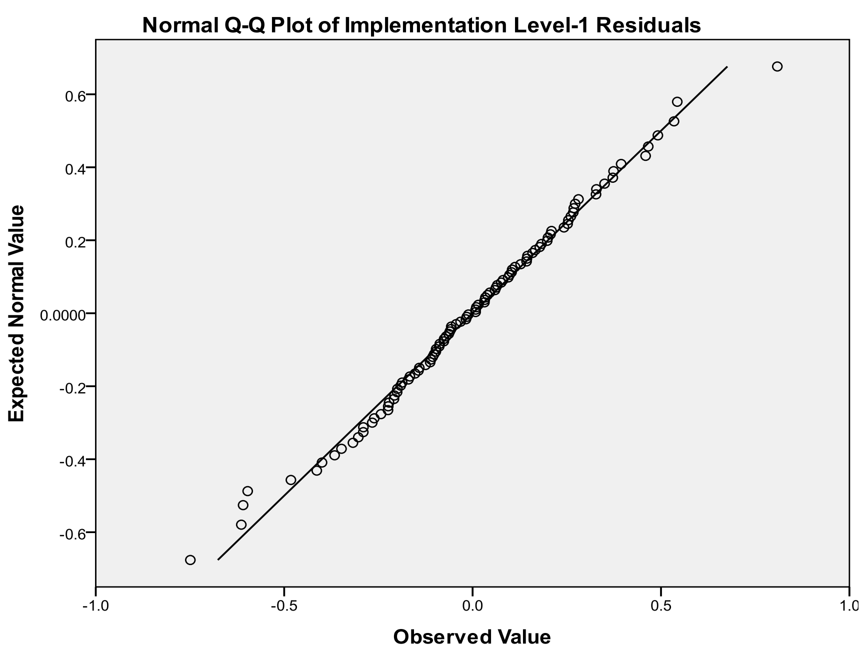

Figure 8. Implementation Q-Q Plot of Observed and Expected Values

Relationship between Coaching and Evidence of Fidelity of PS/RtI Implementation in Schools Based on Assessment of Permanent Products Over Time

Research Questions 2a -2d examined the relationship between coaching and evidence of PS/RtI implementation fidelity in schools (*n* = 31) as measured by the *Tier I and II Critical Components Checklist (Tier I & II CCC)* across three data collection time points. For each of the research questions (2a-2d) scores on one of the four domains of the Tier I & II CCC (*problem identification, problem analysis, intervention development and implementation*, and *program evaluation/response to intervention*) as its dependent measure. Reading data from schools in six of the seven pilot districts were used since only one pilot district focused on mathematics while the other six pilot districts focused on reading for data collection.

All four questions examined a common set of level-1 predictor variables and level-2 predictor variables in building the multilevel models. Level-1 predictors included time and perceived quality of coaching (*Coaching Evaluation Survey*), which was used as a time-varying covariate in the models. Level-2 continuous predictors included data from the *Coaches Log System* (i.e., frequency and duration of training, and frequency and duration of technical assistance received by each school), change in SBLT's beliefs across the three years on each of the three domains of the *Beliefs Survey*, and change in SBLT's perceptions of skills across three years on each of the three domains of the *Perceptions of PS/RtI Skills Survey*. As was noted previously, to compute change in SBLT's beliefs on a given domain for each school over the three-year period, ordinary least square regression was used to obtain the slope of the regression line derived from the regression of each school's mean belief domain score on the number of years of project implementation. The computed regression slope for a given school was used as a measure of change across the three years for the respective domain (i.e., change in beliefs for Domain 1, Domain 2, and Domain 3 over the 3-year period). Similar procedures were used to compute each school's change in perceptions of skills over the three-year period for each of the three domains measured by the Perceptions of PS/RtI Skills Survey.

Level-2 categorical predictors included school socio-economic status based upon the proportion of students receiving free- and reduced-lunch in the given school, school grade at the end of Year 1, school size based upon student population, coach continuity across the three years of data collection, and district membership of each school. School size was based upon the number of students enrolled, where 0 = less than 600 students (small size school), 1 = 600-799 students (medium size school), and 2 = 800 or more students (large size school). School socio-economic status (SES) was scored on a 2-point scale based upon the percent of student who qualified for free or reduced lunch, where 0 = 50% or more and 1 = 49% or less students qualifying for free- or reduced lunch.

Research Question 2a: What is the relationship between coaching and level of fidelity of problem identification implementation in schools over time? This research question examined the relationship between coaching and level of problem identification implementation fidelity observed in schools over time. The mean *Problem Identification* domain score obtained from the *Tier I and II Critical Components Checklist (Tier I & II CCC)* for each school across the three data collection time points was used as the dependent measure for the model.

***Assumptions*.** Prior to conducting inferential analysis, assumptions of multilevel models procedures were examined. The normality assumption was examined for the *Problem Identification* domain data, the coaching quality data, and the level-2 predictors to be entered into the model. Table 13 reports summary descriptive data for the dependent measure, *Problem Identification* domain score, by year (or data collection time point) for the total sample of schools (n = 31). Examination of skewness and kurtosis values for the *Problem Identification* domain measure at each of the respective data collection time points indicate that the distributions did not deviate markedly from normality.

Table 13

Tier I and II Critical Components Checklist (Tier I & II CCC) Descriptive Data: Overall Mean Problem Identification Domain Scores by Year for Total Sample of Schools

Variable/End of Year	n^a	Mean (*SD*)	Skewness	Kurtosis
Problem Identification Year 1	31	1.08 (.83)	-1.20	-1.71
Problem Identification Year 2	31	1.26 (.73)	-.63	-.92
Problem Identification Year 3	28	1.52 (.59)	-1.33	-1.27

Note. [a]*n represents the number of schools*

Skewness and kurtosis values for the perceived quality of coaching measure across the three data collection time points and the level-2 predictor variables to be used in the models are reported in Tables 2 and 3, and have been discussed previously. The assumption that missing data were randomly distributed was examined next using the procedures described previously. Significant correlations as high as .81 ($p < .0001$) among items on an administration of the *Tier I and II CCC* were found. These findings indicate that missing data at level-1 were related, resulting in a violation of the randomly distributed missing data assumption. Further, *Tier I and II CCC* data for the end of Year 3 were not available for three pilot schools. Therefore, given that the dependent measure for this model was calculated using the mean *Problem Identification* domain score of the *Tier I and II CCC* across the three time points for each pilot school, there were three missing data points entered into the model at level-1. Although all data were present at level-2, the assumption for randomly missing data was not met for all variables in this model. Given that multilevel models are sensitive to violations of this assumption, findings from the multilevel models procedures discussed below should be interpreted with caution (Raudenbush & Bryk, 2002).

Finally, the ICC from the unconditional *Problem Identification* model was calculated to examine the assumption that the data were nested. The derived ICC was .43, which suggests that the observations are relatively dependent and lend themselves to multilevel modeling procedures (Luke, 2004).

Descriptive data: level-1 and level-2 variables. The mean score on the *Problem Identification* domain of the *Tier I and II CCC* was calculated for each pilot school across the three data collection time points. Table 10 reports the overall mean *Problem Identification* domain score for the 31 schools included in Years 1 and 2, and the 28 schools included in Year 3. As is shown, the average level of *Problem Identification* implementation changed over the course of the three-year period, steadily increasing from end of Year 1 (M = 1.07; SD = .83), through end of Year 2 (M = 1.26; SD = .73), and to the end of Year 3 (M = 1.52; SD = .59).

The mean score for perception of coaching quality by each school as measured by the *Coaching Evaluation Survey* was calculated at the end of the year for each of the three years (i.e., end of Year 1, end of Year 2, and end of Year 3) and was included as a time-varying covariate in select models. The relationship between coaching quality and the dependent variable at each time point was taken into account prior to estimating the effects of the level-2 predictors in selected models (see Table 5). Descriptive data for all level-2 predictors to be entered into the model are reported in Tables 6 and 7 above, and have been discussed previously.

Problem identification fidelity multilevel model results. A series of 2-level growth models was constructed and examined to determine what factors best predicted PS/RtI problem identification implementation fidelity. Fixed effects estimates, variance estimates, and fit statistics for all models predicting PS/RtI problem identification implementation fidelity are reported in Table 11. The average *Problem Identification* domain score on the *Tier I and II CCC* was calculated for each school across the three data collection time points and entered as the dependent variable in the analysis. First, the unconditional model was estimated to determine the degree to which the data were nested. As previously indicated, the ICC for the unconditional model was .43. For Model 1, Time (i.e., end of Year 1, end of Year 2, and end of Year 3) was entered as the level-1 predictor of problem identification implementation fidelity. Time was zero centered to facilitate interpretation of the results, and slopes and intercepts were allowed to vary. Results of Model 1 suggest that Time was a significant predictor of fidelity of implementation of problem identification (π_{10} = .24, t = 3.20, p =.003). The positive estimate indicates that in terms of average change over time in schools, fidelity of implementation of problem identification increased significantly across the three time points. Further, results of Model 1 indicate that schools varied significantly in their rate of change in problem identification fidelity between Year 1 and Year 3, $\chi^2(30, N = 31) = 48.58$, p = .02. Although schools appeared to vary in their rate of change in problem identification over time, another model (Model 2) was constructed that allowed intercepts to vary but fixed the slopes in order to identify if a significantly better fit for the data emerged with the inclusion of fewer parameters. The inclusion of fewer parameters in Model 2 did not significantly enhance the data fit when considering the deviance statistic, the AIC, and the BIC indexes. Therefore, such comparisons between the number of estimated parameters and fit indices of both models indicated that Model 1, or the more complex model, better fit the data. Therefore, the slopes for Time remained varying throughout all subsequent models.

Table 14

Fixed Effects Estimates and Variance Estimates for Models of the Predictors of PS/RtI Problem Identification Implementation

Parameter	Unconditional	Model 1	Model 2	Model 3	Model 4
Intercept (π_{00})	1.29 (.11)***	1.06 (.15)***	1.06 (.13)***	1.07 (.15)***	1.07 (.07)***
Level 1					
(π_{10}) Time		.24 (.07)**	.24 (.07)***	.23 (.07)**	.61 (.17)***
(π_{20}) Coach Quality				.15 (.12)	.13 (.12)
Level 2					
(β_{11})Training Frequency*Time					.01 (.02)
(β_{12}) Training Duration*Time					-.01 (01)
(β_{13})TA Frequency*Time					-.01 (00)
(β_{14}) TA Duration*Time			.		.00 (.00)
(β_{15}) Continuity *Time					-.21 (.13)
(β_{16}) SES*Time					
(β_{17}) Grade*Time					
(β_{18}) Size*Time					
(β_{19}) Change in Beliefs D1*Time					
(β_{110}) Change in Beliefs D2*Time					
(β_{111}) Change in Beliefs D3*Time					
(β_{112}) Change in Per. Skills D1*Time					
(β_{113}) Change in Per. Skills D2*Time					
(β_{114}) Change in Per. Skills D3*Time					
(β_{116}) District C*Time					
(β_{117}) District D*Time					
(β_{118}) District E*Time					
(β_{119}) District F*Time					
(β_{120}) District G*Time					
Variances					
(σ^2)	.32	.19	.25	.19	.18
(r_{00}) Intrcpt	.24	.52***	.27***	.14***	.52***
(r_{11}) Time Slp		.07*		.07**	.08**
Deviance	187.22	174.50	180.18	173.52	193.78
Parameters	2	4	2	4	4
AIC		182.49	184.18	181.52	201.78
BIC		188.23	187.05	187.26	207.51
ICC	.43				

Table 14 (continued)

Fixed Effects Estimates and Variance Estimates for Models of the Predictors of PS/RtI Problem Identification Implementation

Parameter	Model 5	Model 6	Model 7	Model 8	Model 9
Intercept (π_{00})	1.07 (.15)***	1.06 (.14)***	1.06 (.15)***	1.06 (.15)***	1.06 (.15)***
Level 1					
(π_{10}) Time	.47 (.31)	.66 (.18)**	.73 (.20)***	.61 (.40)	.80 (.71)
(π_{20}) Coach Quality	.14 (.12)	.13 (.12)	.12 (.12)	.14 (.12)	.12 (.12)
Level 2					
(β_{11})Training Frequency*Time	.01 (.02)	.02 (.02)	-.00 (.02)	-.02 (.03)	-.05 (.05)
(β_{12}) Training Duration*Time	-.01 (.01)	-.01 (.01)	-.01 (.01)	-.00 (.01)	.00 (.01)
(β_{13})TA Frequency*Time	-.01 (.00)	-.00 (.00)	.00 (.01)	-.01 (.01)	.00 (.01)
(β_{14}) TA Duration*Time	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
(β_{15}) Continuity *Time	-.15 (.15)	-.25 (.15)	-.34 (15)*	-.10 (.16)	-.12 (.24)
(β_{16}) SES*Time	.08 (.09)				.14 (.11)
(β_{17}) Grade*Time	.01 (.05)				-.07 (.11)
(β_{18}) Size*Time	.03 (.07)				.10 (.08)
(β_{19}) Change in Beliefs D1*Time		.40 (.24)			.57 (.28)
(β_{110}) Change in Beliefs D2*Time		-.50 (.47)			.07 (.62)
(β_{111}) Change in Beliefs D3*Time		.16 (.31)			.05 (.40)
(β_{112}) Change in Per. Skills D1*Time			-.59 (.45)		-.30 (.65)
(β_{113}) Change in Per. Skills D2*Time			-.33 (.34)		-.32 (.41)
(β_{114}) Change in Per. Skills D3*Time			.79 (.31)*		.34 (.41)
(β_{116}) District C*Time				-.01 (.28)	-.17 (.43)
(β_{117}) District D*Time				-.34 (.37)	-.60 (.55)
(β_{118}) District E*Time				-.20 (.46)	-.41 (.52)
(β_{119}) District F*Time				-.03 (.37)	-.09 (.43)
(β_{120}) District G*Time				-.07 (.39)	-.04 (.42)
Variances					
(σ^2)	.18	.17	.16	.18	.17
(r_{00}) Intrcpt	.51***	.52***	.53***	.51***	.52***
(r_{11}) Time Slp	.08**	.08**	.06**	.12***	.10***
Deviance	201.27	188.78	187.86	194.25	194.33
Parameters	4	4	4	4	4
AIC	209.27	196.78	195.86	202.25	202.33
BIC	215.00	202.51	201.60	207.98	208.07

Note. Values based on HLM 6 using restricted maximum likelihood (REML) estimation. Entries show parameter estimates with standard errors in parentheses.
* $p < .05$. ** $p < .01$. *** $p < .001$.

In Model 3, the school level coaching quality variable was grand mean centered and entered at each of the three time points as a time-varying covariate. Time remained a significant predictor of growth in problem identification implementation fidelity (π_{10} = .23, t = 3.07, p = .005). In terms of the time-varying covariate, quality of coaching as measured by the *Coaching Evaluation Survey* was positively but not significantly related to growth in problem identification fidelity across the three years (π_{20} = .15, t = 1.26, p = .22). That is, SBLTs' ratings of coaching quality received by the school, as well as the extent to which coaches displayed required skills, were positively but not significantly related to growth in problem identification implementation fidelity over time. Although not significant, the relationship between perceptions of coaching and the dependent variable at each time point was taken into account prior to estimating the effects of level-2 predictors in all subsequent models because the deviance statistic, AIC, and BIC slightly decreased from Model 1 to Model 3. Specifically, in the following models, all coefficients represent the effects of each variable after having controlled for the effect of the SBLTs' perceptions of the PS/RtI coaching received.

The level-2 predictors related to instances in which PS/RtI coaches provided training and technical assistance to schools, as well as the continuity of PS/RtI coaches in schools over the course of the Project, were included in Model 4. Specifically, the frequency (total number of sessions) and duration (total number of hours) of both training and technical assistance provided by PS/RtI Coaches over the three years were entered as continuous variables. Coach continuity was entered as a dichotomous variable, where a 1 was entered for schools that received coaching from the same individual over the course of the three years, while a 0 was entered for schools that received coaching from more than one individual over the three years of the Project. Time remained a significant predictor of problem identification fidelity (π_{10} = .61, t = 3.65, p = .001). However, none of the level-2 coaching related variables significantly contributed to predicting problem identification in the model. A significant amount of variance in the intercept, χ^2 (30, N = 31) = 132.74, p < .001, as well as the slope, χ^2 (25, N = 31) = 49.88, p = .002, remained unexplained by the variables included in Model 4. Therefore, a decision was made to examine the impact of additional level-2 variables on the predictive power of the Model 4.

School grade, school SES, and school size were added as level-2 predictors to Model 4 to create Model 5. Time was no longer a significant predictor of growth in problem identification fidelity (π_{10} = .47, t = 1.49, p = .15). None of the level-2 coaching-related predictors significantly contributed to this model. Further, school SES (β_{16} = .08, t = .95, p = .35), school grade (β_{17} = .01, t = .12, p = .90), and school size (β_{18} = .03, t = 0.37, p = .72) did not significantly contribute to the model.

In Model 6, the SBLT's change in beliefs average score for each of the three *Beliefs Survey* domains were added as level-2 predictors to Model 4. Time was again a significant predictor of growth in problem identification implementation fidelity (π_{10} = .66, t = 3.61, p = .002) in Model 6. However, none of the coaching-related level-2 variables contributed significantly to the model.

Further, the SBLT's perceived skills on neither Domain 1 (*Academic Ability and Performance of Students with Disabilities*; β_{19} = .40, t = 1.65, p = .11), Domain 2 (*Data-Based Decision-Making*; β_{110} = -.50, t = -1.07, p = .30), nor Domain 3 (*Functions of Core and Supplemental Instruction*; β_{111} = .16, t = 0.52, p = .61) of the *Beliefs Survey* significantly contributed to predicting PS/RtI problem identification fidelity in this model.

The SBLT's perceived skill change for each of the three *Perception of PS/RtI Skills Survey* domains were added as level-2 predictors to Model 4 to create Model 7. Time was again a significant predictor of growth in problem identification implementation fidelity (π_{10} = .73, t = 3.67, p = .001) in Model 7. Further, the level-2 coach continuity significantly contributed to the model (β_{15} = -.34, t = -2.27, p = .03). Further, the SBLT's perceived change in skills on Domain 3 (*Perceptions of Data Manipulation and Technology* Use; β_{114} = .79, t = 2.58, p = .01) of the *Perception of PS/RtI Skills Survey* significantly contributed to the predictive power of the model. Results indicate that after controlling for the perceived coaching quality, growth in problem identification implementation fidelity over time was negatively related to the degree to which PS/RtI coaching was delivered by the same individual over the course of the three years. Growth in problem identification implementation fidelity was predicted positively, however, by a positive change in SBLT's reported PS/RtI skills in data manipulation and use of technology.

To construct Model 8, each school's district membership affiliation was added to Model 4 as level-2 predictors of problem identification implementation fidelity over time. Schools situated in five of the six districts (districts C-G) were entered as separate dummy coded variables (1, 0), where 1 indicated district membership and 0 indicated non-district membership. District B was the referent against which all other districts were compared in this process, as data from District A were not used in this analysis. Time was no longer a significant predictor of growth in problem identification fidelity (π_{10} = .61, t = 1.51, p = .15) in Model 8. Further, none of the coaching-related level-2 predictors (i.e., training and technical assistance frequency and duration, and coaching continuity) or district membership predictors significantly contributed to the model.

Finally, Model 9 was constructed by adding all available level-2 predictors simultaneously to Model 4. Time was no longer a significant predictor of growth in consensus development (π_{10} = .80, t = 1.11, p = .29). Further, none of the level-2 predictors or the coaching quality covariate significantly contributed to the model.

To determine which of the nine multilevel models best explained the growth of problem identification implementation fidelity over time, three evaluative methods were utilized in combination: (1) comparison of each model's deviance statistic, AIC, and BIC fit indices; (2) comparison of the number of significant predictors resulting from each model; and (3) the degree to which each model parsimoniously explained growth in problem identification implementation fidelity over time. Based upon these criteria, the following equation tested in Model 7 was determined to best explain the relationship between coaching and problem identification implementation fidelity over time:

$$Y_{ti} = \beta_{00} + \beta_{10}Time_{ti} + \beta_{11}Training\ Frequency_i{*}Time_{ti} + \beta_{12}Training\ Duration_i{*}Time_{ti} + \beta_{13}TA\ Frequency_i{*}Time_{ti} + \beta_{14}TA\ Duration_i{*}Time_{ti} + \beta_{15}Continuity_i{*}Time_{ti} + \beta_{16}Skills\_1_i{*}Time_{ti} + \beta_{17}Skills\_2_i{*}Time_{ti} + \beta_{18}Skills\_3_i{*}Time_{ti} + \beta_{20}Coach\ Quality_{ti} + r_{0i} + r_{1i}{*}Time_{ti} + e_{ti}$$

Therefore, results indicate that in terms of average change over time, after controlling for the SBLTs' evaluation of coaching performance, growth in problem identification fidelity over time was predicted positively by reported change in skill levels on Domain 3 (*Perceptions of Data Manipulation and Technology Use)* of the *Perception of PS/RtI Skills Survey*. Specifically, the increased positive change in perceived PS/RtI skill levels related to manipulation of data and use of technology in schools predicted increases in implementation fidelity of problem identification over time. Further, after controlling for SBLT's evaluation of coaching performance, the degree to which PS/RtI coaching was delivered by the same individual across the three years was related to a decline in fidelity of identification implementation over time. However, a significant amount of variance in the intercept, χ^2 (30, N = 31) = 146.27, p < .001, as well as the slope, χ^2 (22, N = 31) = 39.95, p = .011, remains unexplained in this model.

Residual analysis of final problem identification model. Given that multilevel modeling procedures assume that the residuals of predicted values are normally distributed, the level-1 residuals were examined. Figure 9 displays the level-1 residuals in a scatterplot of the predicted residual variances, and Figure 10 displays a q-q plot of the observed and expected values. Visual scans of the scatterplot and q-q plot suggest that Model 7's level-1 residuals are normally distributed. A test of homogeneity of the level-1 residuals as a function of time did not demonstrate significance, χ^2 (27, N = 90) = .60, p > .50, suggesting that the residuals demonstrated constant variance.

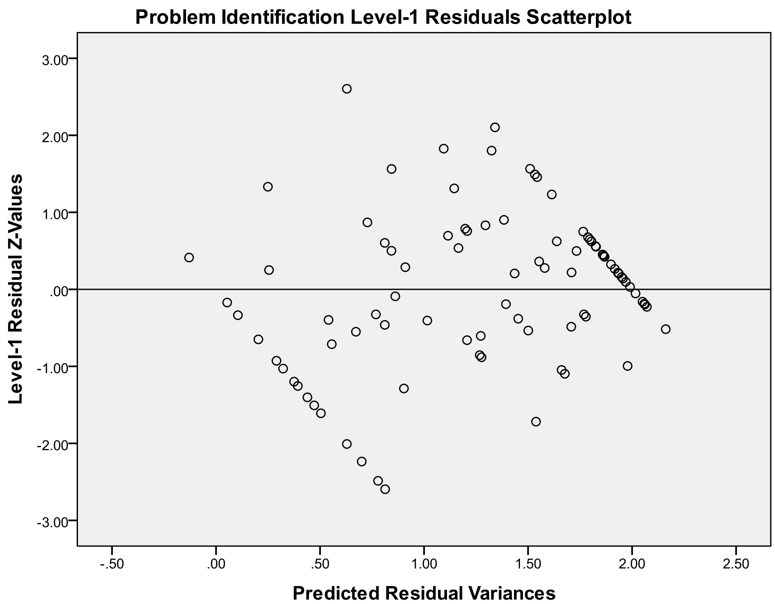

Figure 9. Problem Identification Level-1 Residual Scatterplot

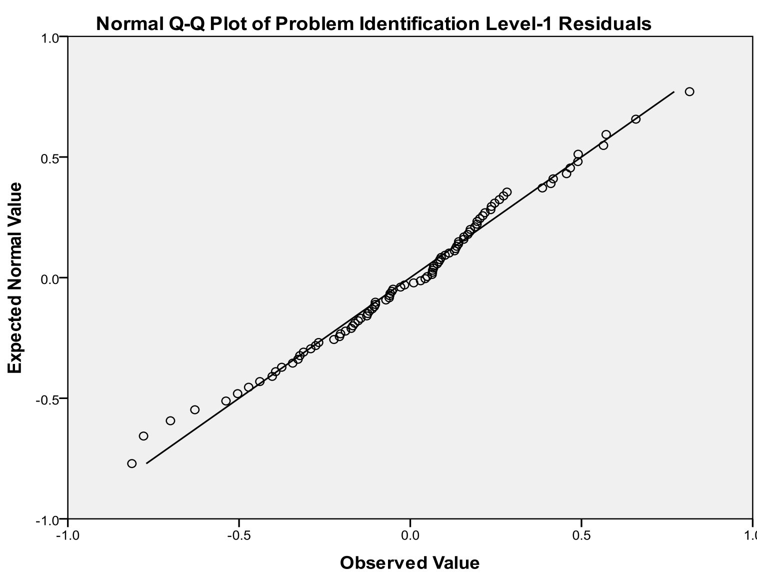

Figure 10. Problem Identification Q-Q Plot of Observed and Expected Values

Research Question 2b: What is the relationship between coaching and level of fidelity of problem analysis implementation in schools over time? This research question examined the relationship between coaching and level of problem analysis implementation fidelity displayed in schools over time. The mean *Problem Analysis* domain score obtained from the *Tier I and II Critical Components Checklist (Tier I & II CCC)* for each school across the three data collection time points was used as the dependent measure for the model.

***Assumptions*.** Prior to conducting inferential analysis, assumptions of multilevel models procedures were examined. The normality assumption was examined for the *Problem Analysis* domain data, the coaching quality data, and the level-2 predictors to be entered into the model. Table 12 reports summary descriptive data for the school-level dependent measure, *Problem Analysis* domain score, by year (or data collection time point) for the total sample of schools (n = 31). These data indicate that the score distributions did not deviate markedly from normality for the three time points.

Table 15

Tier I and II Critical Components Checklist (Tier I & II CCC) Descriptive Data: Problem Analysis Domain Score by Year for Total Sample of Schools

Variable/End of Year	n^a	Mean (*SD*)	Skewness	Kurtosis
Problem Analysis Year 1	31	1.20 (.49)	1.20	-.05
Problem Analysis Year 2	31	.49 (.76)	.49	-1.40
Problem Analysis Year 3	28	.91 (.76)	.02	-1.54

Note. [a]*n represents the number of schools*

Skewness and kurtosis values for the quality of coaching score distributions and continuous level-2 variables across the three data time points (see Tables 2 and 3) have been discussed previously. The assumption that missing data were randomly distributed was examined next using the procedures described previously. Significant correlations as high as .81 ($p < .0001$) among items on an administration of the *Tier I and II CCC* were found. These findings indicate that missing data at level-1 were related, resulting in a violation of the randomly distributed missing data assumption. Further, *Tier I and II CCC* data for the end of Year 3 were not available for three pilot schools. Therefore, given that the dependent measure for this model was calculated using the mean *Problem Analysis* domain score of the *Tier I and II CCC* across the three time points for each pilot school, there were three missing data points entered into the model at level-1. Although all data were present at level-2, the assumption for randomly missing data was not met for all variables in this model. Given that multilevel models are sensitive to violations of this assumption, findings from the multilevel models procedures discussed below should be interpreted with caution (Raudenbush & Bryk, 2002).

Finally, the ICC from the unconditional *Problem Analysis* model was calculated to examine the assumption that the data were nested. The derived ICC was .35, which suggests that the observations are relatively dependent and lend themselves to multilevel modeling procedures (Luke, 2004).

Descriptive data. The mean score on the *Problem Analysis* domain of the *Tier I and II CCC* was calculated for each pilot school across the three data collection time points. Table 15 reports the overall mean *Problem Analysis* domain score for the 31 schools included in Years 1 and 2, and the 28 schools included in Year 3. The average reported level of *Problem Analysis* implementation changed over the course of the Project, steadily increasing from end of Year 1 (M = .32; SD = .49), through end of Year 2 (M = .73; SD = .76), and to end of Year 3 (M = .91; SD = .76).

The mean score for each of pilot school's perceived quality of coaching measure was calculated at the end of year for each of the three years (i.e., end of Year 1, end of Year 2, and end of Year 3) and was included as a time-varying covariate in the model. The relationship between perceived quality of coaching and the dependent variable, problem analysis identification, at each time point was taken into account prior to estimating the effects of the level-2 predictors in selected models. Descriptive data were also examined for the level-2 variables to be entered into the model (see Tables 6 and 7) for predicting fidelity of problem analysis implementation over time.

Problem analysis fidelity multilevel model results. A series of 2-level growth models was constructed and examined to determine what factors best predicted school–level fidelity of PS/RtI problem analysis implementation. Fixed effects estimates, variance estimates, and fit statistics for all models predicting fidelity of PS/RtI problem analysis implementation are reported in Table 16. The average *Problem Analysis* domain score on the *Tier I and II CCC* was calculated for each school across the three data collection time points and entered as the dependent variable in the analysis. First, the unconditional model was estimated to determine the degree to which the data were nested. As previously indicated, the ICC for the unconditional model was .35. For Model 1, Time (i.e., end of Year 1, end of Year 2, and end of Year 3) was entered as the level-1 predictor of problem analysis implementation fidelity. Time was zero centered to facilitate interpretation of the results, and slopes and intercepts were allowed to vary. Results of Model 1 suggest that Time was a significant predictor of fidelity of problem analysis implementation (π_{10} = .33, t = 4.89, p <.001). The positive estimate indicates that in terms of the average change over time fidelity of implementation of problem analysis increased significantly over the three time points. However, results of Model 1 indicate that schools did not vary significantly in their rate of change in problem analysis implementation between Year 1 and Year 3, $\chi^2(30, N = 31) = 31.26$, p = .40. Given this observation, another model (Model 2) was constructed that allowed intercepts to vary but slopes to be fixed. Comparisons between the number of estimated parameters and fit indices of both models indicated that Model 2, or the simpler model, was more parsimonious and better fit the data. Therefore, the slopes for Time remained fixed throughout all subsequent models.

Table 16

Fixed Effects Estimates and Variance Estimates for Models of the Predictors of PS/RtI Problem Analysis Implementation

Parameter	Unconditional	Model 1	Model 2	Model 3	Model 4
Intercept (π_{00})	.65 (.10)***	.35 (.10)**	.35 (.12)**	.36 (.12)**	.36 (.10)**
Level 1					
(π_{10}) Time		.33 (.07)***	.32 (.06)***	.30 (.06)***	.72 (.21)**
(π_{20}) Coach Quality				.20 (.12)	.17 (.13)
Level 2					
(β_{11})Training Frequency*Time					.06 (.02)*
(β_{12}) Training Duration*Time					-.02 (.01)**
(β_{13})TA Frequency*Time					-.01 (.00)
(β_{14}) TA Duration*Time			.		.01 (.00)
(β_{15}) Continuity *Time					-.34 (.17)
(β_{16}) SES*Time					
(β_{17}) Grade*Time					
(β_{18}) Size*Time					
(β_{19}) Change in Beliefs D1*Time					
(β_{110}) Change in Beliefs D2*Time					
(β_{111}) Change in Beliefs D3*Time					
(β_{112}) Change in Per. Skills D1*Time					
(β_{113}) Change in Per. Skills D2*Time					
(β_{114}) Change in Per. Skills D3*Time					
(β_{116}) District C*Time					
(β_{117}) District D*Time					
(β_{118}) District E*Time					
(β_{119}) District F*Time					
(β_{120}) District G*Time					
Variances					
(σ^2)	.33	.21	.23	.23	.23
(r_{00}) Intrcpt	.18	.12*	.23***	.22***	.12***
(r_{11}) Time Slp		.02			
Deviance	185.61	166.37	170.67	168.56	192.78
Parameters	2	4	2	2	2
AIC		174.37	174.67	172.56	196.78
BIC		180.10	177.54	175.43	199.65
ICC	.35				

Table 16 (continued)

Fixed Effects Estimates and Variance Estimates for Models of the Predictors of PS/RtI Problem Analysis Implementation

Parameter	Model 5	Model 6	Model 7	Model 8	Model 9
Intercept (π_{00})	.36 (.10)**	.36 (.10)**	.36 (.10)**	.35 (.09)***	.35 (.09)***
Level 1					
(π_{10}) Time	.44 (.41)	.64 (.23)**	.61 (.26)*	.75 (.50)	1.03 (.94)
(π_{20}) Coach Quality	.18 (.13)	.18 (.13)	.15 (.13)	.18 (.12)	.19 (.13)
Level 2					
(β_{11})Training Frequency*Time	.05 (.03)	.05 (.03)*	.07 (.03)*	.00 (.03)	-.06 (.06)
(β_{12}) Training Duration*Time	-.02 (.01)*	-.02 (.01)*	-.02 (.01)*	-.01 (.01)	.01 (.01)
(β_{13})TA Frequency*Time	-.01 (.01)	-.01 (.01)	-.01 (.01)	-.01 (.01)	-.00 (.01)
(β_{14}) TA Duration*Time	.01 (.00)*	.01 (.00)	.01 (.00)*	.01 (.00)	.00 (.01)
(β_{15}) Continuity *Time	-.32 (.21)	-.26 (.21)	-.27 (.21)	-.11 (.20)	-.08 (.32)
(β_{16}) SES*Time	-.09 (.12)				-.02 (.15)
(β_{17}) Grade*Time	.08 (.07)				-.11 (.15)
(β_{18}) Size*Time	.01 (.10)				.06 (.11)
(β_{19}) Change in Beliefs D1*Time		.05 (.33)			-.04 (.38)
(β_{110}) Change in Beliefs D2*Time		-.94 (.63)			-.06 (.82)
(β_{111}) Change in Beliefs D3*Time		.47 (.42)			.75 (.54)
(β_{112}) Change in Per. Skills D1*Time			.50 (.62)		-.18 (.86)
(β_{113}) Change in Per. Skills D2*Time			-.21 (.47)		-.17 (.54)
(β_{114}) Change in Per. Skills D3*Time			-.03 (.42)		-.20 (.54)
(β_{116}) District C*Time				.06 (.35)	-.24 (.56)
(β_{117}) District D*Time				-.58 (.45)	-.99 (.72)
(β_{118}) District E*Time				-.24 (.57)	-.33 (.69)
(β_{119}) District F*Time				.02 (.46)	.26 (.57)
(β_{120}) District G*Time				-.23 (.48)	-.11 (.55)
Variances					
(σ^2)	.24	.22	.24	.23	.24
(r_{00}) Intrcpt	.11**	.14***	.13***	.05	.07
(r_{11}) Time Slp					
Deviance	198.49	187.79	190.16	180.46	182.73
Parameters	2	2	2	2	2
AIC	202.49	191.79	194.16	184.46	186.73
BIC	205.36	194.66	197.02	187.33	189.60

Note. Values based on HLM 6 using restricted maximum likelihood (REML) estimation. Entries show parameter estimates with standard errors in parentheses.
* $p < .05$. ** $p < .01$. *** $p < .001$.

In Model 3, the coaching quality variable was grand mean centered and entered at each of the three time points as a time-varying covariate. Time remained a significant predictor of growth in problem analysis implementation fidelity (π_{10} = .30, t = 4.74, p < .001). In terms of the time-varying covariate, the perceived coaching quality as measured by the *Coaching Evaluation Survey* was positively but not significantly related to growth in fidelity of problem analysis across the three years (π_{20} = .20, t = 1.62, p = .11). That is, SBLTs' perception of the quality of coaching received by their school, as well as the extent to which coaches displayed required skills, were positively but not significantly related to growth in fidelity of problem analysis implementation over time. Although not significant, the relationship between perceptions of coaching quality and the dependent variable at each time point was taken into account prior to estimating the effects of level-2 predictors in all subsequent models since the deviance statistic, the AIC, and the BIC decreased from Model 2 to Model 3. Specifically, in the following models, all coefficients represent the effects of each variable after having controlled for the effect of the SBLTs' ratings of the perceived quality of PS/RtI coaching received by their school.

The level-2 predictors related to instances in which PS/RtI coaches provided training and technical assistance to schools, as well as the continuity of PS/RtI coaches in schools over the course of the Project, were included in Model 4. Time remained a significant predictor of problem analysis fidelity (π_{10} = .72, t = 3.42, p = .001). Of the level-2 variables, the frequency of training sessions (β_{11} = .06, t = 2.36, p = .02) as well as duration of training (in hours) received (β_{12} = -

.02, t = -2.88, p = .01) significantly contributed to predicting fidelity of problem analysis implementation in the model. However, the frequency and duration of technical assistance as well as coach continuity did not significantly contribute to predicting problem analysis implementation. Results indicate that after controlling for perceived coaching quality, growth in fidelity of problem analysis implementation over time was predicted positively by the frequency of training sessions provided by the PS/RtI coaches. Growth was predicted negatively, however, by the duration of training sessions (in hours) conducted by PS/RtI coaches. In addition, the frequency and duration of the technical assistance, as well as coach continuity did not add any independent predictive power when examined in this model. A significant amount of variance in the intercept, χ^2 (30, N = 31) = 69.40, p < .001, remained unexplained by the variables included in Model 4. Therefore, a decision was made to examine the impact of additional level-2 variables on the predictive power of the model.

School grade, school SES, and school size were added as level-2 predictors to Model 4 to create Model 5. Time was no longer a significant predictor of growth fidelity of problem analysis (π_{10} = .44, t = 1.09, p = .28). The duration of training sessions received (β_{12} = -.02, t = -2.44, p = .02) significantly negatively predicted fidelity of problem analysis implementation, while the duration of technical assistance sessions received (β_{14} = .01, t = 2.07, p = .04) positively predicted fidelity of problem analysis implementation. Further, school SES (β_{16} = -.09, t = -.79, p = .43), school grade (β_{17} = .08, t = .07, p = .25), and school size (β_{18} = .01, t = 0.07, p = .94) did not significantly contribute to the model.

In Model 6, the SBLT's change over time in reported *Beliefs Survey* domains were added as level-2 predictors to Model 4. Time was again a significant predictor of growth in fidelity of problem analysis implementation (π_{10} = .64, t = 2.73, p = .01) in Model 6. The frequency of training sessions (β_{11} = .05, t = 2.05, p = .05) as well as duration of training (in hours) received (β_{12} = -.02, t = -2.26, p = .03) significantly contributed to predicting fidelity of problem analysis implementation in the model. However, the SBLTs' change in beliefs on neither Domain 1 (*Academic Ability and Performance of Students with Disabilities*; β_{19} = .05, t = .15, p = .88), Domain 2 (*Data-Based Decision-Making*; β_{110} = -.94, t = -1.50, p = .14), nor Domain 3 (*Functions of Core and Supplemental Instruction*; β_{111} = .47, t = 1.11, p = .27) of the *Beliefs Survey* significantly contributed to predicting problem analysis in this model.

The SBLTs' changes in the three Perception of RtI Skills Survey domains were added as level-2 predictors to Model 4 to create Model 7. Time was again a significant predictor of growth in fidelity of problem analysis implementation (π_{10} = .60, t = 2.31, p = .03) in Model 7. The frequency of training sessions (β_{11} = .07, t = 2.44, p = .02), duration of training (in hours) (β_{12} = -.02, t = -2.69, p = .01), and duration of technical assistance (β_{14} = .01, t = 2.02, p = .05) received significantly contributed to predicting problem analysis implementation fidelity in the model. However, the SBLT's reported skill changes on neither Domain 1 (*Perceptions of RtI Skills Applied to Academic Content*), Domain 2 (*Perceptions of RtI Skills*

Applied to Behavior Content) nor Domain 3 (*Perceptions of Data Manipulation and Technology Use*) of the *Perception of RtI Skills Survey* significantly contributed to the model.

To construct Model 8, each school's district membership affiliation was added to Model 4 as level-2 predictors of fidelity of problem analysis implementation over time. Schools situated in five of the six districts (districts C-G) were entered as separate dummy coded variables (1, 0), where 1 indicated district membership and 0 indicated non-district membership. District B was the referent against which all other districts were compared in this process. Time was no longer a significant predictor of growth in fidelity of problem analysis implementation (π_{10} = .75, t = 1.51, p = .14) in Model 8. Further, none of the coaching-related level-2 predictors (i.e., training and technical assistance frequency and duration, and coach continuity) or district membership predictors significantly contributed to the model.

Finally, Model 9 was constructed by adding all available level-2 predictors simultaneously to Model 4. Time was no longer a significant predictor of growth in fidelity of problem analysis (π_{10} = 1.03, t = 1.10, p = .28). Further, none of the level-2 predictors or the coaching quality covariate significantly contributed to the model.

To determine which of the nine multilevel models best explained the growth of problem analysis implementation fidelity over time, three evaluative methods were utilized in combination: (1) comparison of each model's deviance statistic, AIC, and BIC fit indices; (2) comparison of the number of significant predictors resulting from each model; and (3) the degree to which each model parsimoniously explained growth in problem identification implementation fidelity over time. Although the deviance statistic, the AIC, and the BIC were approximately five points lower in Model 6 compared to Model 4, Model 4 included three fewer predictor variables and was more parsimonious. Therefore, the following equation tested in Model 4 was determined to best explain the relationship between coaching and problem analysis implementation fidelity over time:

$$Y_{ti} = \beta_{00} + \beta_{10} * Time_{ti} + \beta_{11} Training\ Frequency_i * Time_{ti} + \beta_{12} Training\ Duration_i * Time_{ti} + \beta_{13} TA\ Frequency_i * Time_{ti} + \beta_{14} TA\ Duration_i * Time_{ti} + \beta_{15} Continuity_i * Time_{ti} + \beta_{20} Coach\ Quality_{ti} + r_{0i} + e_{ti}$$

Therefore, results indicate that after controlling for school-level SBLTs' perception of coaching quality received, growth in fidelity of problem analysis implementation over time was positively related to the frequency of training sessions received and negatively associated to the duration of training (in hours) received. A significant amount of variance in the intercept, χ^2 (30, N = 31) = 69.40, p < .001, remained unexplained by the variables included in Model 4.

Residual analysis of final problem analysis model. Given that multilevel modeling procedures assume that the residuals of predicted values are normally distributed, the Model 4 level-1 residuals were examined. Figure 11 displays the level-1 residuals in a scatterplot of the predicted residual variances, and Figure 12 displays a q-q plot of the observed and expected values. Visual scans of the scatterplot and q-q plot suggest that Model 7's level-1 residuals are relatively normally distributed. A test of homogeneity of the level-1 residuals as a function of time did not demonstrate significance, χ^2 (30, N = 90) = 3.24, p > .50, suggesting that the residuals demonstrated constant variance.

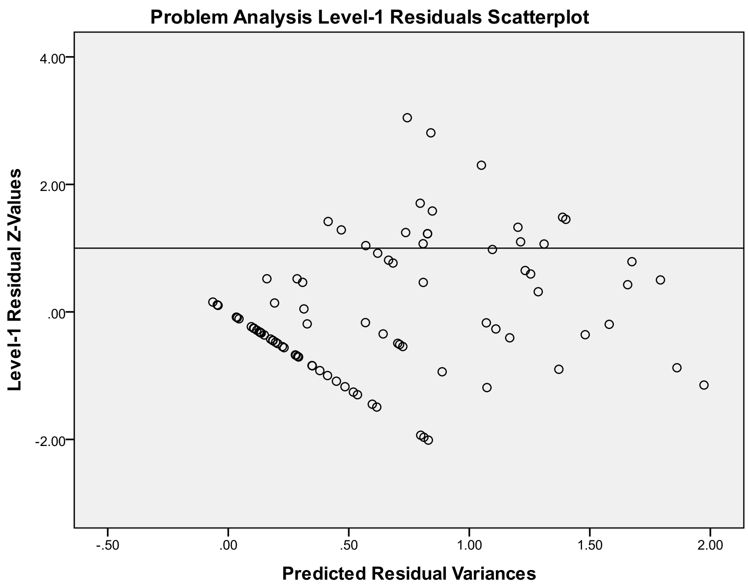

Figure 11. Problem Analysis Level-1 Residual Scatterplot

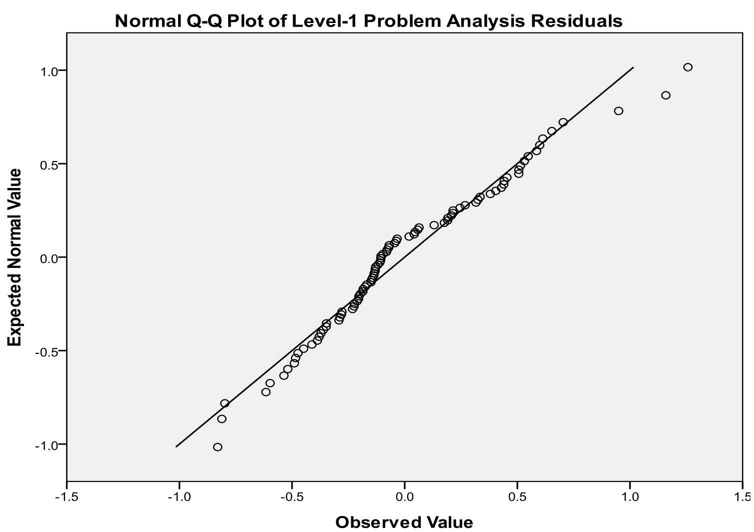

Figure 12. Problem Analysis Q-Q Plot of Observed and Expected Values

Research Question 2c: What is the relationship between coaching and level of fidelity of intervention development and implementation in schools over time? This research question examined the relationship between coaching and fidelity of level of intervention development and implementation displayed in schools over time. The mean *Intervention Development and Implementation* domain score obtained from the *Tier I and II Critical Components Checklist (Tier I & II CCC)* for each school across the three data collection time points was used as the outcome measure for the model.

***Assumptions*.** Prior to conducting inferential analysis, assumptions of multilevel models procedures were examined. The normality assumption was examined for the *Intervention Development and Implementation* domain data, the coaching quality data, and the level-2 predictors to be entered into the model. Table 17 reports summary descriptive data for the dependent measure, *Intervention Development and Implementation* domain score, by year (or data collection time point) for the total sample of schools (n = 31). Examination of skewness and kurtosis values for the *Intervention Development and Implementation* domain measure at each of the respective data collection time points indicated that the distributions did not deviate markedly from normality.

Table 17

Tier I and II Critical Components Checklist (Tier I & II CCC) Descriptive Data: Intervention Development and Implementation Domain Scores by Year for Total Sample of Schools

Variable/End of Year	n^a	Mean (*SD*)	Skewness	Kurtosis
Intervention Development and Implementation Year 1	31	.40 (.46)	1.09	.44
Intervention Development and Implementation Year 2	31	.77 (.64)	.36	-1.05
Intervention Development and Implementation Year 3	28	.97 (.68)	.09	-1.46

Note: [a]*n* indicates number of schools

Skewness and kurtosis values for the perceived coaching quality measure across the three data collection time points and the level-2 predictor variables to be used in the models are reported in Tables 2 and 3, and have been discussed previously. The assumption that missing data were randomly distributed was examined next using the procedures described previously. Significant correlations as high as .81 ($p < .0001$) among items on an administration of the *Tier I and II CCC* were found. These findings indicate that missing data at level-1 were related, resulting in a violation of the randomly distributed missing data assumption. Further, *Tier I and II CCC* data for the end of Year 3 were not available for three pilot schools. Therefore, given that the dependent measure for this model was calculated using the mean *Intervention Development and Implementation* domain score of the *Tier I and II CCC* across the three time points for each pilot school, there were three missing data points entered into the model at level-1. Although all data were present at level-2, the assumption for randomly missing data was not met for all variables in this model. Given that multilevel models are sensitive to violations of this assumption, findings from the multilevel models procedures discussed below should be interpreted with caution (Raudenbush & Bryk, 2002).

Finally, the ICC from the unconditional *Intervention Development and Implementation* model was calculated to examine the assumption that the data were nested. The derived ICC was .28, which suggests that the observations are relatively dependent and lend themselves to multilevel modeling procedures (Luke, 2004).

Descriptive data. The mean score on the *Intervention Development and Implementation* domain of the *Tier I and II CCC* was calculated for each pilot school across the three data collection time points. Table 17 reports the overall mean *Intervention Development and Implementation* domain score for the 31 schools included in Years 1 and 2, and the 28 schools included in Year 3. The average reported level of fidelity of *Intervention Development and Implementation* changed over the course of the Project, steadily increasing from end of Year 1 (M = .40; SD = .46), through end of Year 2 (M = .77; SD = .64), and to end of Year 3 (M = .97; SD = .68).

The mean score for the perception of coaching quality received by each school was calculated at the end of year for each of the three years (i.e., end of Year 1, end of Year 2, and end of Year 3) and was included as a time-varying covariate in selected models. The relationship between coaching quality and the dependent variable at each time point was taken into account prior to estimating the effects of the level-2 predictors in selected models (see Table 5). Descriptive data for all level-2 predictors to be entered into the model are reported in Tables 6 and 7 above, and have been discussed previously.

***Intervention development and implementation multilevel model results*.** A series of 2-level growth models was constructed and examined to determine what factors best predicted fidelity of PS/RtI intervention development and implementation. Fixed effects estimates, variance estimates, and fit statistics for all models predicting PS/RtI intervention development and implementation are reported in Table 18. The average *Intervention Development and Implementation* domain score on the *Tier I and II CCC* was calculated for each school across the three data collection time points and entered as the dependent variable in the analysis. First, the unconditional model was estimated to determine the degree to which the data were nested. As previously indicated, the ICC for the unconditional model was .28. For Model 1, Time (i.e., end of Year 1, end of Year 2, and end of Year 3) was entered as the level-1 predictor of intervention development and implementation fidelity. Time was zero centered to facilitate interpretation of the results, and slopes and intercepts were allowed to vary. Results of Model 1 suggest that Time was a significant predictor of intervention development and implementation (π_{10} = .32, t = 5.01, p <.001) over time. The positive estimate indicates that the fidelity of intervention development and implementation increased significantly over the three time points. Further, results of Model 1 indicate that schools varied significantly in their rate of change in intervention development and implementation fidelity between Year 1 and Year 3, $\chi^2(30, N = 31) = 45.61$, $p = .03$. Although schools appeared to vary in their rate of change in problem analysis over time, another model (Model 2) was constructed that allowed intercepts to vary but fixed the slopes in order to identify if a significantly better fit for the data emerged with the inclusion of fewer parameters. The inclusion of fewer parameters in Model 2 did not significantly enhance the data fit when considering the deviance statistic, the AIC, and the BIC indexes. Therefore, such comparisons between the number of estimated parameters and fit indices of both models indicated that Model 1, or the more complex model, better fit the data. Therefore, the slopes for Time remained varying throughout all subsequent models.

Table 18

Fixed Effects Estimates and Variance Estimates for Models of the Predictors of PS/RtI Intervention Development and Implementation

Parameter	Unconditional	Model 1	Model 2	Model 3	Model 4
Intercept (π_{00})	.71 (.83)***	.42 (.08)***	.42 (.10)***	.22 (.47)	.42 (.08)***
Level 1					
(π_{10}) Time		.32 (.06)***	.30 (.06)***	.31 (.06)***	.61 (.22)**
(π_{20}) Coach Quality				.05 (.11)	
Level 2					
(β_{11})Training Frequency*Time					-.01 (.02)
(β_{12}) Training Duration*Time					-.01 (.01)
(β_{13})TA Frequency*Time					.00 (.01)
(β_{14}) TA Duration*Time			.		.00 (.00)
(β_{15}) Continuity *Time					-.10 (.18)
(β_{16}) SES*Time					
(β_{17}) Grade*Time					
(β_{18}) Size*Time					
(β_{19}) Change in Beliefs D1*Time					
(β_{110}) Change in Beliefs D2*Time					
(β_{111}) Change in Beliefs D3*Time					
(β_{112}) Change in Per. Skills D1*Time					
(β_{113}) Change in Per. Skills D2*Time					
(β_{114}) Change in Per. Skills D3*Time					
(β_{116}) District C*Time					
(β_{117}) District D*Time					
(β_{118}) District E*Time					
(β_{119}) District F*Time					
(β_{120}) District G*Time					
Variances					
(σ^2)	.29	.17	.20	.17	.16
(r_{00}) Intrcpt	.11	.07*	.16***	.07	.08*
(r_{11}) Time Slp		.03*		.03	.29*
Deviance	167.65	146.30	151.66	146.93	168.92
Parameters	2	4	2	4	4
AIC		154.30	155.66	154.93	176.92
BIC		160.04	158.53	160.66	182.66
ICC	.28				

Table 18 (continued)

Fixed Effects Estimates and Variance Estimates for Models of the Predictors of PS/RtI Intervention Development and Implementation

Parameter	Model 5	Model 6	Model 7	Model 8	Model 9
Intercept (π_{00})	.41 (.08)***	.41 (.01)***	.41 (.08)***	.40 (.08)***	.40 (.08)***
Level 1					
(π_{10}) Time	.57 (.46)	.72 (.25)**	.75 (.25)**	.11 (.55)	-.13 (1.00)
(π_{20}) Coach Quality					
Level 2					
(β_{11})Training Frequency*Time	-.00 (.03)	.01 (.03)	-.01 (.03)	-.03 (.04)	-.03 (.06)
(β_{12}) Training Duration*Time	-.01 (.01)	-.02 (.01)	-.01 (.01)	.00 (.01)	-.00 (.01)
(β_{13})TA Frequency*Time	.00 (.01)	.00 (.01)	.01 (.01)	-.00 (.01)	-.00 (.01)
(β_{14}) TA Duration*Time	.00 (.00)	.00 (.00)	-.00 (.00)	.00 (.00)	.01 (.01)
(β_{15}) Continuity *Time	-.09 (.23)	-.25 (.22)	-.27 (.20)	-.02 (.23)	-.23 (.34)
(β_{16}) SES*Time	-.08 (.13)				-.18 (.16)
(β_{17}) Grade*Time	.02 (.08)				.02 (.16)
(β_{18}) Size*Time	.01 (.11)				.07 (.12)
(β_{19}) Change in Beliefs D1*Time		.66 (.35)			.86 (.41)
(β_{110}) Change in Beliefs D2*Time		-.11 (.67)			.74 (.87)
(β_{111}) Change in Beliefs D3*Time		-.42 (.46)			-.63 (.59)
(β_{112}) Change in Per. Skills D1*Time			-.21 (.59)		-1.29 (.95)
(β_{113}) Change in Per. Skills D2*Time			-.22 (.45)		-.15 (.58)
(β_{114}) Change in Per. Skills D3*Time			.78 (.40)		.53 (.59)
(β_{116}) District C*Time				-.03 (.37)	.31 (.61)
(β_{117}) District D*Time				-.12 (.49)	.14 (.77)
(β_{118}) District E*Time				.02 (.63)	-.02 (.74)
(β_{119}) District F*Time				.69 (.51)	1.06 (.62)
(β_{120}) District G*Time				.29 (.53)	.64 (.61)
Variances					
(σ^2)	.16	.15	.16	.14	.14
(r_{00}) Intrcpt	.08*	.08*	.08*	.09**	.09**
(r_{11}) Time Slp	.05**	.05**	.01	.09***	.10***
Deviance	178.97	166.73	164.67	164.73	157.38
Parameters	4	4	4	4	4
AIC	186.97	174.73	172.67	172.73	165.38
BIC	192.71	180.46	178.41	178.46	171.12

Note. Values based on HLM 6 using restricted maximum likelihood (REML) estimation. Entries show parameter estimates with standard errors in parentheses.
* $p < .05$. ** $p < .01$. *** $p < .001$.

The perceived quality of coaching variable was grand mean centered and entered at each of the three time points as a time-varying covariate in Model 3. Time remained a significant predictor of growth in fidelity of intervention development and implementation (π_{10} = .31, t = 4.94, p < .001). In terms of the time-varying covariate, the perceptions of coaching quality were positively but not significantly related to growth in fidelity of intervention development and implementation across the three years (π_{20} = .05, t = .43, p = .67). That is, SBLTs' ratings of coaching quality received at their school, as well as the extent to which coaches displayed required skills, were positively but not significantly related to growth in fidelity of intervention development and implementation over time. Given that the coaching quality covariate did not significantly add predictive power to the model as evidenced by comparison of the fit indexes in Models 2 and 3, the relationship between perceptions of coaching and the dependent variable at each time point was not taken into account prior to estimating the effects of level-2 predictors in all subsequent models.

The level-2 predictors related to instances in which PS/RtI Coaches provided training and technical assistance to schools, as well as PS/RtI coach continuity in schools over the three year period of the Project, were included in Model 4. Time remained a significant predictor of fidelity of intervention development and implementation (π_{10} = .61, t = 2.73, p = .01). However, none of the level-2 variables significantly contributed to predicting intervention development and implementation. Specifically, results indicated that the frequency and duration of the training and technical assistance received, as well as coach continuity, did not add any independent predictive power when examined in this model. A significant amount of variance in the intercept, χ^2 (30, N = 31) = 45.94, p = .031, and the slope, χ^2 (24, N = 31) = 39.08, p = .036, remained unexplained by the variables included in Model 4. Therefore, a decision was made to examine the impact of additional level-2 variables on the predictive power of the model.

School grade, school SES, and school size were added as level-2 predictors to Model 4 to create Model 5. Time was no longer a significant predictor of growth in intervention development and implementation fidelity (π_{10} = .57, t = 1.24, p = .23). None of the coaching related level-2 predictors significantly contributed to the model. Further, school SES (β_{16} = -.08, t = -.59, p = .56), school grade (β_{17} = .02, t = .24, p = .82), and school size (β_{18} = .01, t = 0.05, p = .96) did not significantly contribute to the model.

In Model 6, the SBLT's changes in beliefs on each of the three *Beliefs Survey* domains were added as level-2 predictors to Model 4. Time was again a significant predictor of growth in fidelity of intervention development and implementation (π_{10} = .72, t = 2.86, p = .009) in Model 6. None of the coaching-related level-2 variables significantly contributed to predicting intervention development and implementation in the model. Further, the SBLT's reported changes in beliefs on neither Domain 1 (*Academic Ability and Performance of Students with Disabilities*; β_{19} = .66, t = 1.88, p = .07), Domain 2 (*Data-Based Decision-Making*; β_{110} = -.11, t = -.16, p = .88), nor Domain 3 (*Functions of Core and Supplemental Instruction*; β_{111} = -.42, t = -.91, p = .37) of the *Beliefs Survey* significantly contributed to predicting intervention development and implementation in this model.

The SBLT's reported changes in skills on the three *Perception of RtI Skills Survey* domains were added as level-2 predictors to Model 4 to create Model 7. Time was again a significant predictor of growth in fidelity of intervention development and implementation (π_{10} = .75, t = 2.97, p = .007) in Model 7. However, none of the level-2 coaching related variables significantly contributed to predicting intervention development and implementation fidelity in the model. Further, the SBLT's reported changes in skills on neither Domain 1 (*Perceptions of RtI Skills Applied to Academic Content*), Domain 2 (*Perceptions of RtI Skills Applied to Behavior Content*) nor Domain 3 (*Perceptions of Data Manipulation and Technology Use*) of the *Perception of PS/RtI Skills Survey* significantly contributed to the model.

To construct Model 8, each school's district membership affiliation was added to Model 4 as level-2 predictors of fidelity of intervention development and implementation over time. Schools situated in five of the six districts (districts C-G) were entered as separate dummy coded variables (1, 0), where 1 indicated district membership and 0 indicated non-district membership. District B was the referent against which all other districts were compared in this process. Time was no longer a significant predictor of growth in problem identification fidelity (π_{10} = .11, t = .21, p = .84) in Model 8. Further, none of the coaching-related level-2 predictors (i.e., training and technical assistance frequency and duration, and coach continuity) or district membership predictors significantly contributed to the model.

Finally, Model 9 was constructed by adding all available level-2 predictors simultaneously to Model 4. Time was no longer a significant predictor of growth in fidelity of intervention development and implementation (π_{10} = -.13, t = -.13, p = .90). Further, none of the level-2 predictors significantly contributed to the model.

To determine which of the nine multilevel models best explained the growth of intervention development and implementation fidelity over time, three evaluative methods were utilized in combination: (1) comparison of each model's deviance statistic, AIC, and BIC fit indices; (2) comparison of the number of significant predictors resulting from each model; and (3) the degree to which each model parsimoniously explained growth in intervention development and implementation fidelity over time. Based upon these criteria, the following equation tested in Model 3 was determined to best explain the relationship between coaching and fidelity of intervention development and implementation over time:

$$Y_{ti} = \beta_{00} + \beta_{10} * Time_{ti} + \beta_{20} * Coach\ Quality + r_{0i} + r_{1i} * Time_{ti} + e_{ti}$$

Therefore, results indicate that while controlling for the SBLT's perception of coaching quality, time was the only significant predictor of fidelity of intervention development and implementation. However, a significant amount of variance in the intercept, $\chi^2(30, N = 31) = 41.95$, p = .07, and the slope, $\chi^2(30, N = 31) = 42.87$, p = .06, does not remain unexplained within this model.

Residual analysis of final intervention development and implementation model. Given that multilevel modeling procedures assume that the residuals of predicted values are normally distributed, the skewness and kurtosis values of the Model 4 level-1 residuals were examined. Figure 13 displays the level-1 residuals in a scatterplot of the predicted residual variances, and Figure 14 displays a q-q plot of the observed and expected values. Visual scans of the scatterplot and q-q plot suggest that Model 4's level-1 residuals are relatively normally distributed. A test of homogeneity of the level-1 residuals as a function of time did not demonstrate significance, χ^2 (27, N = 90) = .22, p > .50, suggesting that the residuals demonstrated constant variance.

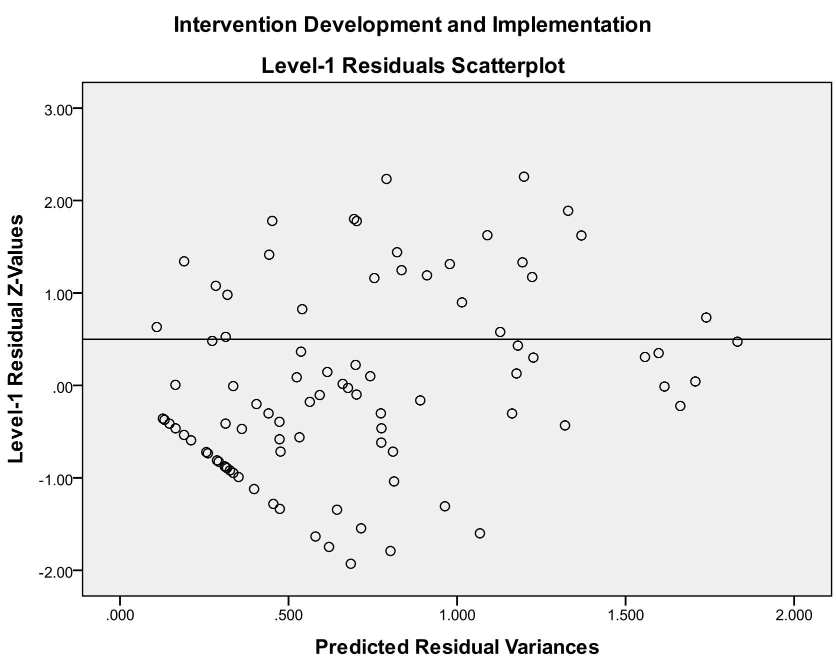

Figure 13. Intervention Development and Implementation Level-1 Residual Scatterplot

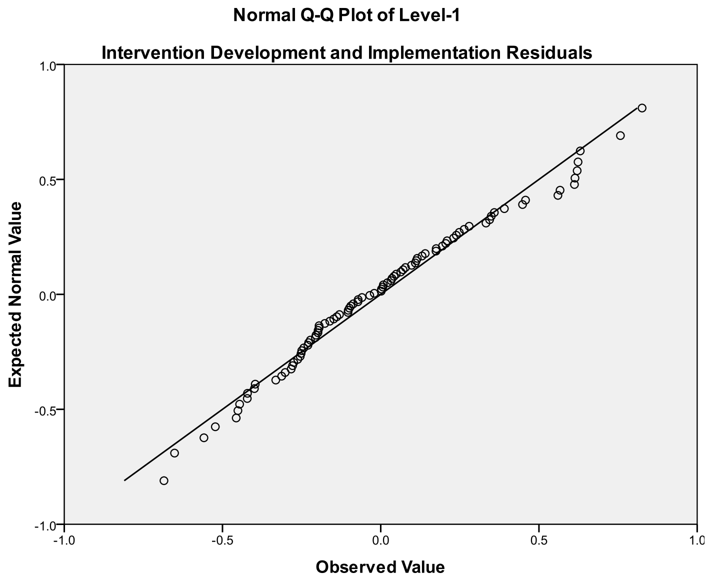

Figure 14. Intervention Development and Implementation Q-Q Plot of Observed and Expected Values

Research Question 2d: What is the relationship between coaching and level of fidelity of program evaluation/response to intervention implementation in schools over time? This research question examined the relationship between coaching and level of fidelity of program evaluation/response to intervention displayed in schools over time. The mean *Program Evaluation/RtI* domain score obtained from the *Tier I and II Critical Components Checklist (Tier I & II CCC)* for each school across the three data collection time points was used as the outcome measure for the model.

***Assumptions*.** Prior to conducting inferential analysis, assumptions of multilevel models procedures were examined. The normality assumption was examined for the *Program Evaluation/RtI* domain data, the coaching quality data, and the level-2 predictors to be entered into the model. Table 19 reports summary descriptive data for the dependent measure, *Program Evaluation/RtI* domain score, by year (or data collection time point) for the total sample of schools (n = 31). Examination of skewness and kurtosis values for the *Program Evaluation/RtI* domain measure at each of the respective data collection time points indicate that the distributions did not deviate markedly from normality.

Table 19

Tier I and II Critical Components Checklist (Tier I & II CCC) Descriptive Data: Program Evaluation/RtI Domain Scores by Year for Total Sample of Schools

Variable/End of Year	n^a	Mean (*SD*)	Skewness	Kurtosis
Program Eval/RtI Year 1	31	.57 (.60)	.73	-.71
Program Eval/RtI Year 2	31	.83 (.67)	.14	-1.47
Program Eval/RtI Year 3	28	1.38 (.58)	-.83	-.23

Note: [a]*n* represents the number of schools

Skewness and kurtosis values for the perceived quality of coaching measure across the three data collection time points and the level-2 predictor variables to be used in the models are reported in Tables 2 and 3, and have been discussed previously. The assumption that missing data were randomly distributed was examined next using the procedures described previously. Significant correlations as high as .81 (p < .0001) among items on an administration of the *Tier I and II CCC* were found. These findings indicate that missing data at level-1 were related, resulting in a violation of the randomly distributed missing data assumption. Further, *Tier I and III CCC* data for the end of Year 3 were not available for three pilot schools. Therefore, given that the outcome measure for this model was calculated using the mean *Program Evaluation/RtI* domain score of the *Tier I and II CCC* across the three time points for each pilot school, there were three missing data points entered into the model at level-1. Although all data were present at level-2, the assumption for randomly missing data was not met for all variables in this model. Given that multilevel models are sensitive to violations of this assumption, findings from the multilevel models procedures discussed below should be interpreted with caution (Raudenbush & Bryk, 2002).

Finally, the ICC from the unconditional *Program Evaluation/RtI* model was calculated to examine the assumption that the data were nested. The derived ICC was .25, which suggests that the observations are relatively dependent and lend themselves to multilevel modeling procedures (Luke, 2004).

Descriptive data. The mean score on the *Program Evaluation/RtI* domain of the *Tier I and II CCC* was calculated for each pilot school across the three data collection time points. Table 19 reports the overall mean *Program Evaluation/RtI* domain score for the 31 schools included in Years 1 and 2, and the 28 schools included in Year 3. The average reported level of *Program Evaluation/RtI* implementation fidelity changed over the course of the Project, steadily increasing from end of Year 1 (M = .57; SD = .60), through end of Year 2 (M = .83; SD = .67), and to end of Year 3 (M = 1.38; SD = .58).

The mean score for perception of coaching quality for each school was calculated at the end of year for each of the three years (i.e., end of Year 1, end of Year 2, and end of Year 3) and was included as a time-varying covariate in some of the models. The relationship between coaching quality and the fidelity of program evaluation/RtI at each time point was taken into account prior to estimating the effects of the level 2 predictors in selected models (see Table 5). Descriptive data for all level-2 predictors to be entered into the model are reported in Tables 6 and 7 above, and have been discussed previously.

Program evaluation/rti fidelity multilevel model results. A series of 2-level growth models was constructed and examined to determine what factors best predicted PS/RtI program evaluation/RtI implementation fidelity. Fixed effects estimates, variance estimates, and fit statistics for all models predicting PS/RtI program evaluation/RtI implementation fidelity are reported in Table 20. The average *Program Evaluation/RtI* domain score on the *Tier I and II CCC* was calculated for each school across the three data collection time points and entered as the dependent variable in the analysis. First, the unconditional model was estimated to determine the degree to which the data were nested. As previously indicated, the ICC for the unconditional model was .25. For Model 1, Time (i.e., end of Year 1, end of Year 2, and end of Year 3) was entered as the level-1 predictor of program evaluation/RtI implementation fidelity. Time was zero centered to facilitate interpretation of the results, and slopes and intercepts were allowed to vary. Results of Model 1 suggest that Time was a significant predictor of program evaluation/RtI (π_{10} = .44, t = 7.85, p <.001). The positive estimate indicates that fidelity of program evaluation/RtI significantly increased over the three time points. However, results of Model 1 indicate that schools did not vary significantly in their rate of change in fidelity of program evaluation/RtI implementation between Year 1 and Year 3, $\chi^2(30, N = 31) = 30.35, p = .45$. Therefore, another model (Model 2) was constructed that allowed intercepts to vary but fixed the slopes to identify if a simpler, more parsimonious model better fit the data. Comparisons between the number of estimated parameters and fit indices of both models indicated that Model 2, or the simpler model, better fit the data. Therefore, the slopes for Time remained fixed throughout all subsequent models.

Table 20

Fixed Effects Estimates and Variance Estimates for Models of the Predictors of PS/RtI Program Evaluation and Response to Intervention Fidelity

Parameter	Unconditional	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept (π_{00})	.92 (.88)***	.51 (.11)***	.51 (.11)***	-.67 (.47)	-.90 (.47)	-.78 (45)
Level 1						
(π_{10}) Time		.44 (.06)***	.44 (.05)***	.42 (.05)***	.50 (.18)**	1.12 (.34)**
(π_{20}) Coach Quality				.27 (.10)*	.32 (10)**	.29 (.10)**
Level 2						
(β_{11})Training Frequency*Time					-.02 (.02)	-.00 (.02)
(β_{12}) Training Duration*Time					.00 (.01)	-.00 (.01)
(β_{13})TA Frequency*Time					-.00 (.00)	-.00 (.00)
(β_{14}) TA Duration*Time			.		-.00 (.00)	-.00 (.00)
(β_{15}) Continuity *Time					.17 (.15)	.03 (.17)
(β_{16}) SES*Time						-.08 (.10)
(β_{17}) Grade*Time						-.01 (.06)*
(β_{18}) Size*Time						-.04 (.08)
(β_{19}) Change in Beliefs D1*Time						
(β_{110}) Change in Beliefs D2*Time						
(β_{111}) Change in Beliefs D3*Time						
(β_{112}) Change in Per. Skills D1*Time						
(β_{113}) Change in Per. Skills D2*Time						
(β_{114}) Change in Per. Skills D3*Time						
(β_{116}) District C*Time						
(β_{117}) District D*Time						
(β_{118}) District E*Time						
(β_{119}) District F*Time						
(β_{120}) District G*Time						
Variances						
(σ^2)	.37	.16	.17	.15	.14	.13
(r_{00}) Intrcpt	.12**	.25***	.23***	.24***	.20***	.24***
(r_{11}) Time Slp		.01				
Deviance	186.49	149.59	149.73	144.21	173.35	174.85
Parameters	2	4	2	2	2	2
AIC		157.59	153.73	148.21	177.35	178.85
BIC		163.33	156.59	151.08	180.22	181.72
ICC	.25					

Table 20 (continued)

Fixed Effects Estimates and Variance Estimates for Models of the Predictors of PS/RtI Program Evaluation and Response to Intervention Fidelity

Parameter	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11
Intercept (π_{00})	-.87 (.48)	-.84 (.48)	-.76 (.46)	-.83 (.08)***	-.79 (.46)	-.72 (.49)
Level 1						
(π_{10}) Time	.51 (.21)*	.27 (.22)	.35 (.45)	.88 (.30)	.73 (.38)	.13 (.87)
(π_{20}) Coach Quality	.31 (.11)**	.31 (.10)**	.29 (.10)**	.30 (.10)**	.30 (.10)	.28 (.11)
Level 2						
(β_{11})Training Frequency*Time	-.03 (.02)	-.01 (.02)	.00 (.03)	-.00 (.02)	-.00 (.02)	.00 (.06)
(β_{12}) Training Duration*Time	-.01 (.01)	.01 (.01)	.00 (.01)	.00 (.01)	.00 (.01)	.00 (.01)
(β_{13})TA Frequency*Time	-.00 (.01)	-.01 (.01)	-.01 (.01)	-.00 (.01)	-.01 (.01)	-.02 (.01)
(β_{14}) TA Duration*Time	-.00 (.00)	.00 (.00)	.00 (.00)	-.00 (.00)	.21 (.19)	.01 (.00)
(β_{15}) Continuity *Time	.22 (.18)	.32 (.17)	.46 (.17)*	.16 (.16)	-.23 (.34)	.42 (.29)
(β_{16}) SES*Time						-.14 (.14)
(β_{17}) Grade*Time				-.11 (.06)	-.09 (.06)	.04 (.14)
(β_{18}) Size*Time						.00 (.10)
(β_{19}) Change in Beliefs D1*Time	-.03 (.29)					.23 (.35)
(β_{110}) Change in Beliefs D2*Time	.17 (.55)					.51 (.76)
(β_{111}) Change in Beliefs D3*Time	.23 (.37)					-.41 (.50)
(β_{112}) Change in Per. Skills D1*Time		.50 (.52)			.27 (.54)	-.34 (.80)
(β_{113}) Change in Per. Skills D2*Time		-.08 (.39)*		-.27 (.25)	-.49 (.45)	-.53 (.50)
(β_{114}) Change in Per. Skills D3*Time		.12 (.35)			.06 (.35)	.30 (.51)
(β_{116}) District C*Time			.23 (.32)			.32 (.52)
(β_{117}) District D*Time			.10 (.41)			.14 (.67)
(β_{118}) District E*Time			-.42 (.52)			-.54 (.64)
(β_{119}) District F*Time			-.32 (.42)			-.15 (.53)
(β_{120}) District G*Time			-.22 (.44)			-.13 (.51)
Variances						
(σ^2)	.15	.13	.13	.12	.13	.14
(r_{00}) Intrcpt	.21***	.22***	.23***	.23***	.24***	.22***
(r_{11}) Time Slp						
Deviance	171.32	167.59	170.15	171.51	171.01	174.62
Parameters	2	2	2	2	2	2
AIC	175.32	171.59	174.15	175.51	175.01	178.62
BIC	178.18	174.46	177.02	178.38	177.87	181.49

Note. Values based on HLM 6 using restricted maximum likelihood (REML) estimation. Entries show parameter estimates with standard errors in parentheses.
* $p < .05$. ** $p < .01$. *** $p < .001$.

The coaching quality variable was grand mean centered and entered at each of the three time points as a time-varying covariate in Model 3. Time remained a significant predictor of growth in program evaluation/RtI implementation fidelity (π_{10} = .42, t = 8.10, p < .001). In terms of the time-varying covariate, the perceived coaching quality was significantly related to growth in program evaluation/RtI fidelity across the three years (π_{20} = .27, t = 2.58, p = .01). That is, SBLTs' ratings of coaching quality received, as well as the extent to which coaches displayed required skills, positively predicted fidelity of program evaluation/RtI implementation over time. Therefore, the relationship between perceptions of coaching and the dependent variable at each time point was taken into account prior to estimating the effects of level-2 predictors in all subsequent models. Specifically, in the following models, all coefficients represent the effects of each variable after having controlled for the effect of the SBLTs' ratings of the PS/RtI coaching received.

The level-2 predictors related to instances in which PS/RtI coaches provided training and technical assistance to schools, as well as the continuity of PS/RtI coaches in schools over the course of the Project, were included in Model 4. Specifically, the frequency (total number of sessions) and duration (total number of hours) of both training and technical assistance provided by PS/RtI coaches over the three years were entered as continuous variables. Coach continuity was entered as a dichotomous variable, where a 1 was entered for schools that received coaching from the same individual over the course of the three years, while a 0 was entered for schools that received coaching from more than one individual over the three years of the Project. Time remained a significant predictor of fidelity of program evaluation/RtI (π_{10} = .50, t = 2.78, p = .01). Although none of the level-2 coaching related variables significantly contributed to predicting program evaluation/RtI in the model, coaching quality remained a significant predictor of growth in fidelity of program evaluation/RtI across the three years (π_{20} = .32, t = 3.06, p = .003). A significant amount of variance in the intercept, χ^2 (30, N = 31) = 142.91, p < .001 remained unexplained by the variables included in Model 4. Therefore, a decision was made to examine the impact of additional level-2 variables on the predictive power of the Model 4.

School grade, school SES, and school size were added as level-2 predictors to Model 4 to create Model 5. Time (π_{10} = 1.12, t = 3.32, p = .002) as well as perceived coaching quality (π_{20} = .29, t = 2.91, p = .005) remained significant predictors of growth in fidelity of program evaluation/RtI implementation. Further, school grade (β_{17} = -.11, t = -2.04, p < .05) negatively predicted program evaluation/RtI implementation fidelity over time. Specifically, after controlling for coaching quality, lower school grades at the end of Year 1 of the PS/RtI project were associated with higher rates in growth in program evaluation/RtI implementation fidelity over time. However, none of the level-2 coaching-related predictors (i.e., training and technical assistance frequency and duration, and coach continuity) or the school-related factors of school SES and school size significantly contributed to the model.

The SBLT's changes in reported beliefs on the three *Beliefs Survey* domains were added as level-2 predictors to Model 4 to develop Model 6. Time (π_{10} = .51, t = 2.48, p = .016) as well as perceived coaching quality (π_{20} = .31, t = 2.95, p = .005) remained significant predictors of growth in fidelity of program evaluation/RtI implementation in Model 6. However, none of the coaching-related level-2 variables contributed significantly to the model. Further, the SBLT's changes in beliefs on neither Domain 1 (*Academic Ability and Performance of Students with Disabilities*), Domain 2 (*Data-Based Decision-Making*), nor Domain 3 (*Functions of Core and Supplemental Instruction*) of the *Beliefs Survey* significantly contributed to predicting program evaluation/RtI implementation fidelity in this model.

The SBLT's changes in skills on the three *Perception of RtI Skills Survey* domains were added as level-2 predictors to Model 4 to create Model 7. Coach quality (π_{20} = .31, t = 2.95, p = .005) remained a significant predictor of growth in fidelity of program evaluation/RtI implementation in Model 7. Further, the SBLTs' average change in skills on Domain 2 (*Perceptions of RtI Skills Applied to Behavior Content*; β_{113} = -.81, t = -2.05, p < .05) of the *Perception of RtI Skills Survey* significantly contributed to the model. Results indicate that after controlling for the perceived coaching quality, growth in fidelity of program evaluation/RtI implementation over time was predicted negatively by the SBLT members' change over time in reported PS/RtI skills applied to behavior issues within schools. None of the level-2 coaching-related predictors (i.e., training and technical assistance frequency and duration, and coach continuity) or Domain 1

(*Perceptions of RtI Skills Applied to Academic Content)* and Domain 3 *(Perceptions of Data Manipulation and Technology Use)* of the *Perceptions of RtI Skills Survey* significantly contributed to Model 7.

To construct Model 8, each school's district membership affiliation was added to Model 4 as level-2 predictors of fidelity of program evaluation/RtI implementation over time. Schools situated in five of the six districts (districts C-G) were entered as separate dummy coded variables (1, 0), where 1 indicated district membership and 0 indicated non-district membership. District B was the referent against which all other districts were compared in this process. Although Time was no longer a significant predictor (π_{10} = .35, t = .77, p = .44) in Model 8, the perceived coaching quality covariate (π_{10} = .29, t = 2.79, p < .01) significantly predicted growth in fidelity of program evaluation/RtI implementation over time. Coach continuity was also a significant predictor of problem evaluation/RtI over time (β_{15} = .27, t = 2.45, p = .02). However, none of the other coaching-related level-2 predictors (i.e., training and technical assistance frequency and duration) or district membership predictors significantly contributed to the model.

Given that school grade (Model 5) and changes in skills on Domain 2 of the *Perception of RtI Skills Survey* (Model 7) significantly predicted program evaluation/RtI implementation fidelity over time in previous models, Model 9 was constructed by adding these two predictors simultaneously to Model 4. Time (π_{10} = .88, t = 2.90, p = .006) and perceived coaching quality (π_{20} = .30, t = 3.05, p = .004) remained significant predictors of fidelity of program evaluation/RtI implementation over time. However, none of the level-2 predictors significantly contributed to the model. Changes in skills on Domain 1 and Domain 3 of the *Perception of RtI Skills Survey* were then added to Model 9 to create Model 10 in order to identify if predictive power increased. Although perceived coaching quality remained a significant predictor of fidelity of program evaluation/RtI implementation, none of the other level-1 or level-2 predictors significantly contributed to Model 10.

Finally, Model 11 was constructed by adding all available level-2 predictors simultaneously to Model 4. Perceived coaching quality was the only significant predictor of program evaluation/RtI implementation fidelity over time (π_{20} = .28, t = 2.55, p = .015).

To determine which of the 11 multilevel models best explained the growth in fidelity of program evaluation/RtI implementation over time, three evaluative methods were utilized in combination: (1) comparison of each model's deviance statistic, AIC, and BIC fit indices; (2) comparison of the number of significant predictors resulting from each model; and (3) the degree to which each model parsimoniously explained growth in program evaluation/RtI implementation fidelity over time. Based upon these criteria, the following equation tested in Model 7 was determined to best explain the relationship between coaching and level of fidelity of program evaluation/RtI implementation over time:

$$Y_{ti} = \beta_{00} + \beta_{10}{*}Time_{ti} + \beta_{11}Training\ Frequency_i{*}Time_{ti} + \beta_{12}Training\ Duration_i{*}Time_{ti} + \beta_{13}TA\ Frequency_i{*}Time_{ti} + \beta_{14}TA\ Duration_i{*}Time_{ti} + \beta_{15}Continuity_i{*}Time_{ti} + \beta_{16}Skills\_1_i{*}Time_{ti} + \beta_{17}Skills\_2_i{*}Time_{ti} + \beta_{18}Skills\_3_i{*}Time_{ti} + \beta_{20}Coach\ Quality_{ti} + r_{0i} + e_{ti}$$

Therefore, results indicate that fidelity of program evaluation/RtI implementation was positively predicted by perceived coaching quality across the three time points. That is, SBLT's positive evaluations of their coach's skills and performance across the three years of the Project were associated with higher levels of program evaluation/RtI implementation fidelity in schools. After controlling for coaching quality, fidelity of program evaluation/RtI implementation was predicted negatively by changes in SBLT's reported skills on Domain 2 (*Perceptions of RtI Skills Applied to Behavior Content)* of the *Perception of RtI Skills Survey*. Specifically, the decrease in perceived PS/RtI skill levels related to behavior content and issues in schools predicted increases in fidelity of program evaluation/RtI implementation over time. It is important to note, however, that a significant amount of variance in the intercept, χ^2 (30, N = 31) = 152.44, p < .001, remains unexplained by the variables in this model.

Residual analysis of final program evaluation/rti model. Given that multilevel modeling procedures assume that the residuals of predicted values are normally distributed, the Model 7 level-1 residuals were examined. Figure 15 displays the level-1 residuals in a scatterplot of the predicted residual variances, and Figure 16 displays a q-q plot of the observed and expected values. A visual analysis of the scatterplot and q-q plot suggests that Model 7's level-1 residuals are relatively normally distributed. A test of homogeneity of the level-1 residuals as a function of time did not demonstrate significance, χ^2 (30, N = 90) = 1.23, p > .50, suggesting that the residuals demonstrated constant variance.

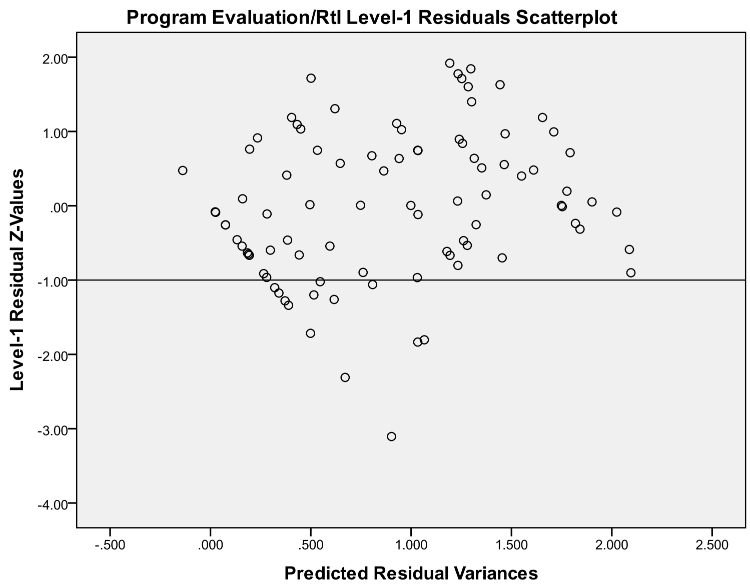

Figure 15. Program Evaluation/RtI Level-1 Residual Scatterplot

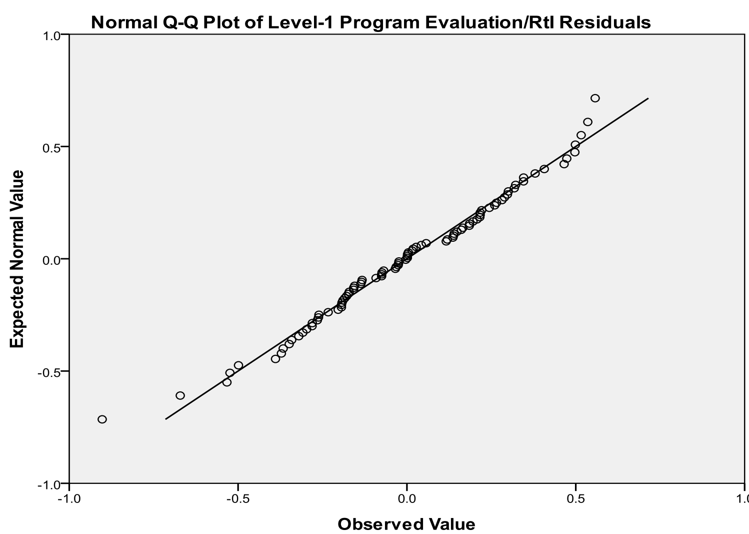

Figure 16. Program Evaluation/RtI Q-Q Plot of Observed and Expected Values

Chapter V

Discussion

This study examined the extent to which coaching facilitates the successful implementation of the Problem-Solving/Response to Intervention (PS/RtI) model in schools, as well as the extent to which coaching enhances the fidelity of implementation of PS/RtI practices in those schools. Data from schools participating in three years of a statewide initiative to implement PS/RtI practices with assistance of a PS/RtI coach were used to evaluate the relationship between coaching activities and levels of implementation and integrity outcomes. First, using the research questions as an organizing structure, potential explanations for the extent to which coaching was related to the levels of PS/RtI implementation and fidelity in schools are discussed. Next, possible implications for future PS/RtI coaching practices and methods used to monitor and evaluate PS/RtI coaching activities are outlined, followed by implications for future research. Limitations to the current study are then reviewed in terms of potential impact on the analyses conducted and interpretations of the results. Finally, general conclusions related to the use of coaching to enhance PS/RtI processes and outcomes are discussed.

Coaching and PS/RtI Implementation

The Florida Problem-Solving/Response to Intervention (PS/RtI) Project utilized a three-stage change model to assist schools in the systematic implementation of PS/RtI practices: (1) *Consensus Development,* (2) *Infrastructure Development,* and (3) *Implementation* (Batsche, Curtis, Dorman, Castillo, & Porter, 2007; Kurns & Tilly, 2008). Results from the analysis of the relationship between coaching-related variables and *Consensus Development* indicate that after controlling for the SBLTs' perceptions of coaching quality received in schools, growth in consensus over time was predicted positively by the frequency of training sessions provided by school-based PS/RtI coaches. Given that PS/RtI coaches were expected to provide ongoing training and support to school staff to facilitate consensus for systemic change, this finding is not surprising. However, consensus development was found to correlate negatively with duration (in hours) of the training sessions provided by PS/RtI coaches. Taken together, the data suggest that coaching in the form of shorter but more frequent training sessions appeared to produce higher levels of staff consensus over time after controlling for the perceived quality of the coaching delivered. This finding is consistent with literature suggesting that professional development in the form of lengthy, "one-shot" workshops with narrowed opportunities for follow-up discussion and reflection is limited in its impact to facilitate professional learning and change in schools (Duessen, Coskie, Robinson, & Autio, 2007; Knight, 2009a; Russo, 2004). Findings from several studies suggest that providing educators with sustained, ongoing, and intensively focused training with frequent opportunities to reflect, collaborate, and discuss how new practices relate to their unique personal and professional needs enhances professional learning (Darling-Hammond & McLaughlin, 1995; Neufeld & Roper, 2003a).

Growth in consensus development was predicted negatively by the frequency of technical assistance sessions by PS/RtI coaches. Specifically, after controlling for SBLTs' perceptions of the coaching quality, consensus development across time was associated with fewer technical assistance sessions provided by PS/RtI coaches. Since PS/RtI coaches used the *Technical Assistance* category when logging activities that assisted educators in transferring previously learned knowledge and skills into daily practice, one possible explanation for this finding is that buy-in from staff continued to grow as their skills to apply PS/RtI practices increased over time. PS/RtI coaches were instructed to engage in technical assistance activities that matched the goals and needs of the educators in the schools they supported. Given that consensus development was inversely associated with the frequency of technical assistance required by school staff over time, educators may have required less frequent technical assistance from coaches as both their buy-in for, and skills related to, PS/RtI practices strengthened over time. Gusky (2000) contends that educator attitudes change following practicing new behavior, particularly when that behavior results in improved student outcomes. Based on Gusky's approach, one hypothesis for this finding is that continued opportunities to practice newly learned skills resulted in increases in consensus for PS/RtI practices over time.

The development of infrastructure for PS/RtI practices involves creating the structures required to facilitate and support implementation of the model (Batsche et al., 2005; Castillo, Batsche, Curtis, Stockslager, March, & Minch, 2010). Results from the analysis of the relationship between coaching-related variables and *Infrastructure Development* indicate that time was the only significant predictor of growth in this area across the three years of the Project. The reason for this lack of relationship between coaching-related variables and infrastructure development over time is unknown. However, anecdotal reports provided by Project staff and PS/RtI coaches suggest that there were many variables that served as barriers to facilitating infrastructure development. For example, many coaches reported the continuing need to focus on staff consensus development even well into the third and final year of the Project, thereby taking away opportunities to directly focus efforts on infrastructure development. Coaches and PS/RtI Project staff also reported instances of inconsistent or absent leadership from the school and district levels, impeding the decision-making power required to make the necessary changes to facilitate the development and adoption of various PS/RtI structural supports. Further, PS/RtI coaches indicated that an overreliance on the coach to facilitate various implementation efforts was a barrier to capacity building at many sites. Specifically, coaches reported that educators at some schools perceived them as responsible for carrying out all PS/RtI related activities, which again took time away from providing the training and technical assistance necessary to build required structural capacity. Thus, although infrastructure development generally increased in schools over the course of the Project, a hypothesis could be made that barriers such as those mentioned above diluted any relationship between coaching activities and growth in PS/RtI infrastructure.

Results from the analysis of the relationship between coaching-related variables and *Implementation Development* indicate growth in implementation over time was predicted positively by coach continuity, or the degree to which coaching was delivered by the same individual over the three years of the Project. This finding is consistent with the literature on coaching for school change; in that positive coaching outcomes are facilitated by coach continuity over time (Marsh et al., 2008; Neufeld & Roper, 2003a) and that schools with consistent coaching assignments often have a better chance at seeing results (Hatch, 2002). Further, research on effective coaching for systemic reform suggests that a coach should initially focus his or her efforts on building trust and strong individual relationships with school staff prior to engaging in difficult reform activities (Brown et al., 2005). Therefore, it appears that schools which had a coach who remained at his or her assignment throughout the entirety of the three-year Project were at an advantage over those that had a change in coach (or coaches). The long-term coaches may have had more time to build the necessary relationships with staff prior to working on more challenging reform efforts. Those coaches who entered during the second or third year of the Project had relatively limited time to establish positive staff relationships while simultaneously focusing on PS/RtI implementation development. Anecdotal reports from coaches who entered the role late in the Project provide support for this hypothesis, perceiving they did not have enough time to adequately build staff relationships necessary to effectively engage in facilitating PS/RtI implementation.

Coaching and Fidelity of PS/RtI Implementation

The Florida Problem-Solving/Response to Intervention (PS/RtI) Project defines the presence of fidelity of implementation when educators accurately employ the four-step problem-solving process to make educational decisions within a PS/RtI model. The four major stages of the problem-solving process include: (1) *Problem Identification,* (2) *Problem Analysis*, (3) *Intervention Development and Implementation*, and (4) *Program Evaluation/Response to Intervention* (Bergan & Kratochwill, 1990). Results from the analysis of the relationship between coaching-related variables and *Problem Identification* indicate that, after controlling for the SBLTs' perceptions of coaching quality, growth in problem identification fidelity over time was predicted positively by more positive change in skills on Domain 3 (*Perceptions of Data Manipulation and Technology Use)* of the *Perception of PS/RtI Skills Survey*. Specifically, when SBLTs' perceptions of the quality of coaching received were taken into account, their perceived PS/RtI skill levels related to manipulation of data and use of technology in schools were associated with increases in fidelity of problem identification implementation over time. This finding makes sense in that many of the processes used to accurately conduct problem identification rely on skills related to collecting, analyzing, synthesizing, displaying/graphing and interpreting student data (Burns, Wiley, & Viglietta, 2008; Kratochwill, 2008), and consuming data in electronic formats (Shinn, 2008). However, after controlling for SBLTs' perception of coaching quality, the degree to which PS/RtI coaching was delivered by the same individual across the three years associated negatively with growth in fidelity of problem identification over time. The reason for this relationship is unclear. One hypothesis is that the acquisition of skills related to fidelity of problem identification increased rapidly and then leveled over time, while the influence of coach continuity continued to grow. More investigation of this relationship is needed to determine additional potential explanations for this finding.

Results from the analysis of the relationship between coaching-related variables and *Problem Analysis* indicate that after controlling for the SBLTs' perception of quality of coaching, growth in fidelity of problem analysis over time was predicted positively by the frequency of training sessions conducted by PS/RtI coaches. This finding makes sense given that PS/RtI coaches were responsible for providing ongoing training to school staff regarding the four steps of the problem-solving process, including problem analysis. However, problem analysis was predicted negatively by the duration (in hours) of the training sessions provided by PS/RtI coaches. In other words, coaching in the form of shorter yet more frequent training sessions appeared to relate to higher levels of fidelity of problem analysis implementation over time after controlling for the perceived quality of the coaching. Similar to findings related to consensus development over time, this finding is consistent with literature suggesting that professional development in the form of lengthy, “one-shot” workshops with few opportunities for follow-up discussion and reflection is limited in its impact to facilitate professional learning and change in schools (Duessen, Coskie, Robinson, & Autio, 2007; Knight, 2009a; Russo, 2004). When provided with sustained, ongoing, and intensively focused training with frequent opportunities to reflect, collaborate, and discuss how reform efforts relate to their unique personal and professional needs (Darling-Hammond & McLaughlin, 1995; Neufeld & Roper, 2003a), professional development flourishes. As such, one hypothesis for this finding is that PS/RtI coaches who offered short yet frequent training sessions to staff were adhering to effective professional development practices (e.g., more frequent feedback, opportunities for reflection), thereby increasing educators' ability to accurately employ problem analysis when making educational decisions within the PS/RtI model.

Results from the analysis of the relationship between coaching-related variables and fidelity of *Plan Development and Implementation* indicate that time was the only significant predictor of growth in this area across the three years of the Project. The reason for this lack of relationship between coaching-related variables and fidelity of plan development and implementation over time is unclear. However, and as with the *Infrastructure* results described above, anecdotal reports provided by Project staff and PS/RtI coaches suggest that there were many variables that served as barriers to facilitating problem-solving processes and implementation in general. For instance, many coaches reported the continuing need to focus on staff consensus and buy-in for PS/RtI practices even well into the third and final year of the Project, thereby taking away opportunities to directly focus efforts on fidelity of the problem-solving process. Further, PS/RtI coaches indicated that an overreliance on the coach to facilitate various implementation efforts was a barrier to capacity building for the problem-solving process in many schools. Specifically, some coaches reported that schools perceived the coach as responsible for carrying out all PS/RtI related activities, including the monitoring of fidelity of the process, which took considerable time away from providing the training and technical assistance necessary to build capacity. Therefore, although the fidelity of plan development and implementation generally increased in schools over the course of the Project, a hypothesis could be made that barriers such as those mentioned above diluted any possibility of significant relationships between coaching activities and growth in this area. Another potential hypothesis is that SBLTs' reported scores on plan development and implementation were generally lower across time when compared to other stages of the problem-solving process, thereby weakening any potential relationships between coaching and growth in this area.

Results from the analysis of the relationship between coaching-related variables and fidelity of *Program Evaluation/RtI* implementation was predicted by the SBLTs' perceptions of coaching quality across the three Project years. That is, SBLTs' more positive evaluations of their coach's skills and performance across the three years of the Project were associated with higher levels of fidelity of program evaluation/RtI implementation in schools. This finding is not particularly surprising as converging literature on school-based coaching suggests that the knowledge, skills, and abilities held by coaches contribute to their effectiveness (Marsh et al., 2008; Knight, 2009).

After controlling for coaching quality, fidelity of program evaluation/RtI implementation was predicted negatively by SBLTs' reported skills on Domain 2 (*Perceptions of RtI Skills Applied to Behavior Content)* of the *Perception of RtI Skills Survey*. Specifically, lower perceived skill levels related to behavior content predicted increases in fidelity of program evaluation/RtI implementation over time. A potential explanation for this finding is that since a limited number of schools targeted behavior issues, only data from those Project schools targeting reading as a focus of their PS/RtI implementation efforts were analyzed to answer this research question. PS/RtI coaches were instructed to engage in training and technical assistance activities that matched the goals and needs of the educators in the schools they supported. Therefore, coaches in schools selected for this analysis likely focused their efforts on enhancing problem-solving skills related to student academic issues, thereby limiting their support for skills applied to behavior content. Another potential hypothesis could be that the coaches' skills in behavior content areas were less well developed than their skills in academic content areas, thereby limiting the quantity and quality of behavior support delivered to school staff.

Implications for Future PS/RtI Coaching Practices

Given the correlational research design used, the lack of comparison groups, and the exploratory nature of analyses conducted, the content of the discussion above should be considered potential explanations of the relationships found in this study rather than a series of cause-and-effect chains. Despite the need for interpretive caution, the results of this study suggest several implications for future PS/RtI coaching and evaluation activities. First, after controlling for the quality of coaching, coaching provided in the form of short and frequent training sessions predicted increases in components of PS/RtI implementation (consensus development) and fidelity of the problem-solving processes (problem analysis). Given that these findings parallel the literature supporting effective professional development activities (e.g., ongoing support facilitated through frequent opportunities for demonstration, modeling, practice, feedback, and reflective discussions) (Darling-Hammond & McLaughlin, 1995; Joyce and Showers, 2002; Neufeld & Roper, 2003a), future PS/RtI coaching models should consider adhering to similar professional development structures and schedules when providing training to educators in schools.

Coach continuity in schools predicted increases in PS/RtI implementation. Specifically, schools receiving coaching support from the same individual for the entirety of the Project (three years total) achieved higher scores on measures of implementation than schools receiving coaching from two or more individuals sequentially over the years. Since coach continuity has also been identified as an important factor in the literature for facilitating positive outcomes in schools (Hatch, 2002; Marsh et al., 2008; Neufeld & Roper, 2003a), this finding has several implications for schools and districts when selecting personnel and creating coaching supports for PS/RtI practices. It may be advantageous to avoid switching coaching assignments yearly, allowing for coaches to support the same groups of educators over multiple school years. As coaches require time to initially build trusting relationships with the educators prior to focusing deliberately on changing practices (Brown et al., 2005), it also may be advantageous to consider a history of positive professional relationships when selecting and assigning coaches to particular schools and/or groups of educators. Coaches assigned to individuals with whom positive working relationships, mutual trust, and collaborative rapport has already been established may be in a better position than others to more rapidly produce implementation outcomes when facilitating a PS/RtI model. This finding may also have implications for schools and districts that do not have resources to create a specific PS/RtI coach position and/or hire an individual tasked only with this responsibility. Understanding the importance of coach continuity, schools and districts may consider assigning selected coaching "duties" to current employees who already have the prerequisite relationships with school staff and continuity in a particular building.

For the purposes of this Project and within the context of this investigation, a coach was responsible for facilitating the implementation and fidelity of PS/RtI through ongoing training, technical assistance, and support at the school level (see Castillo, Batsche, Curtis, Stockslager, March, and Minch, 2010). The *Coaching Evaluation Survey* was developed by the Project staff to evaluate educators' perceptions of the PS/RtI coaching received, as well as the extent to which PS/RtI coaches possessed the skills highlighted in the systems coaching literature (e.g., Brown et al., 2005; Neufield & Roper, 2003). The *Coaching*

Evaluation Survey was utilized in the current study as a measure of the quality of coaching received, given that use of rating-scales is one of the more frequently recommended means to evaluate the performance of school-based coaches (Peterson, 2000; Killion & Harrison, 2006).

As described above, the finding that SBLTs' more positive evaluations of their coach's skills and performance, or the quality of coaching, across the three years of the Project were associated with higher levels of program evaluation/RtI implementation fidelity in schools was not particularly surprising. Anecdotal and descriptive literature on school-based coaching suggests that the knowledge, skills, and abilities held by coaches contribute to their effectiveness (Marsh et al., 2008; Neufield & Roper, 2003; Knight, 2009).

However, perceived coaching quality did not independently predict any other component of PS/RtI implementation or fidelity outcome in this study. Findings indicated that instances emerged when other coaching-related variables predicted implementation and fidelity outcomes after taking into account the predictive power of the coaching quality measure. Specifically, and as discussed above, both consensus development and problem analysis outcomes were predicted by coaching frequency and duration *after* the predictive power of coaching quality was taken into account. This information suggests that relying solely on perceptions of coaching quality at the school level may not adequately inform evaluations of coaching impact on implementation and fidelity outcomes in schools. These findings parallel Killion and Harrison (2006)'s recommendations that schools and districts should gather information from a number of different stakeholders and through a variety of means such as coaching logs, interviews, and survey data when evaluating coaches and coaching programs.

The finding that SBLTs' reported skills related to use of technology and manipulation of data in schools positively predicted growth in fidelity of problem identification over time, *after* controlling for SBLTs' perceptions of quality of coaching received, also may have implications for schools and districts as they plan for how to effectively evaluate the impact of coaches and coaching programs. Specifically, relying only on educator ratings of coaching quality to predict fidelity of problem identification was inadequate. When educators' perceived skills related to those required to accurately conduct problem identification were incorporated in addition to a measure of coaching quality, a significantly predictive relationship emerged. In addition to the data elements suggested above, schools and districts may also consider stakeholder skill development when determining impact of coaches and coaching programs. Since coaches are primarily tasked with providing training and technical assistance to facilitate knowledge and skill development among other professionals (e.g., Batsche et al., 2007; Neufeld & Roper, 2003a), evaluating the skills of stakeholders as aligned with the goals and objectives of the coaching program may allow for a more robust assessment of impact.

The literature suggests that success of coaching depends not only on the knowledge, skills, and activities of the coaches, but also on a number of contextual factors that vary considerably within and across individual schools and districts (Killion & Harrison, 2006; Marsh et al., 2008; Poglinco et. al., 2003;

Neufeld & Roper, 2003). School contextual factors examined in this study were school size (i.e., median number of students enrolled across time), school socioeconomic status (i.e., median percent of students qualifying for free/reduced lunch across time), school grade (i.e., median Florida school grade across time), and district affiliation. These contextual factors consistently failed to add any predictive power to the models developed to answer this study's research questions. Although these findings suggest that such school level contextual factors did not influence the relationship between coaching factors and levels of PS/RtI implementation and fidelity in the current study, schools and districts should continue to consider such factors when designing and employing coaching practices since informal, descriptive, and anecdotal reports in the literature suggest their importance.

Finally, although increases in all measures of PS/RtI implementation and fidelity outcomes emerged over the course of the Project, results indicated that no school involved in the study demonstrated full PS/RtI implementation or evidence of fidelity of problem-solving processes at the close of the three years. This finding is not surprising in that researchers have suggested that systemic school reform efforts such as PS/RtI implementation take at least 4-6 years in most cases (Batsche et al, 2005; Hall & Hord, 2006). Further, it has been suggested that coaching takes at least two years to begin to impact educator practices (Killion & Harrison, 2006). Therefore, schools and districts utilizing coaching to facilitate PS/RtI practices must remember to expect evidence of positive impact only within a reasonable timeframe.

Implications for Future Research

The potential implications for future PS/RtI coaching practices discussed above are based on the findings of an exploratory study following three years of pilot project implementation. However, the literature suggests that coaching for change (Killion & Harrison, 2006; Brown et al., 2005) and education reform initiatives in general (e.g., Batsche et al., 2005; Hall & Hord, 2006) require years before sufficient outcomes are evidenced. Given this information, findings following the three years should continue to be examined if possible to determine how the relationships between coaching and PS/RtI implementation and fidelity outcomes sustain or change over time. Additionally, the results of the current study suggest some other research topics should be considered.

One component of coaching that was examined in this study was the relationship between the frequency and duration of training and technical assistance provided to schools and levels of PS/RtI implementation and fidelity outcomes over time. Results suggested that the frequency and duration of training and technical assistance were related to some implementation and fidelity outcomes. Several potential explanations for these findings were discussed above. However, examining the specific activities the coaches engaged in at times when they reported training and technical assistance support to schools was beyond the scope of the current study. Further, since the current study was limited in the number of covariates to be entered into each MLM model, the frequency and duration of coaching activities over the three year period had to be consolidated into two level-2 variables, respectively. Future studies should consider introducing more specific and detailed coaching activities as level-1 time-varying covariates to provide potentially more robust predictors of PS/RtI implementation and fidelity levels.

The relationship between coach continuity and PS/RtI implementation and fidelity outcomes was also examined. Findings indicated that coach continuity significantly predicted levels of PS/RtI implementation, and potential explanations for this finding are discussed above. However, one component of the problem-solving process (problem identification) was predicted negatively by this variable. Further, coach continuity did not significantly related to any other outcome variable examined in this study. Considering the importance of continuity in the literature (e.g., Killion & Harrison; Marsh et al., 2008; Neufeld & Roper, 2003a), the negative relationship to problem identification and the lack of relationship with other outcome variables is surprising. Given the exploratory nature of the current study, examining the relationship between coach continuity and PS/RtI outcomes independent of other coaching variables may expand upon the current findings. Additionally, as with the training and technical assistance coaching activities described above, the variable of continuity over three years was dichotomized and collapsed into one level-2 predictor. Future studies may wish to enter this variable as a level-1 time-varying covariate to further illuminate any potential relationships with PS/RtI outcomes.

Finally, the relationship between perceived coaching quality and levels of PS/RtI implementation and fidelity over time was examined in this study. Coaching quality predicted fidelity of program evaluation/RtI, and contributed to predictions of consensus development, problem identification, and problem analysis outcomes. Potential explanations for these findings are discussed above. Given the importance the literature has placed on coaches' knowledge and skills as contributing to their effectiveness (Marsh et al., 2008; Neufield & Roper, 2003; Knight, 2009), as well as the popularity of using quality indicators (e.g., rating-scales) as evaluation of coaching impact (Peterson, 2000; Killion & Harrison, 2006), examining the relationship between PS/RtI outcomes and additional measures of quality would expand upon the findings of the current study.

Limitations

A number of limitations to the current study must be considered when interpreting findings and considering implications for future PS/RtI coaching practices. First, the longitudinal, correlational research design used in which schools and districts were selected via a competitive application processes did not allow for cause and effect relationships to be established. The lack of random assignment and control groups did not allow extraneous variables beyond the training, technical assistance, and coaching provided by the Project to be discounted. Further, although all PS/RtI coaches received similar training from Project staff and were responsible for similar activities at their schools, PS/RtI coaches were instructed to engage in technical assistance activities that matched the various goals and unique needs of the educators in the schools they supported. Therefore, this study was not able to control for any inconsistencies in the nature of the training and technical assistance provided to educators, or the match between the type of support required and that delivered by PS/RtI coaches. The Project was also unable to control for any data entry accuracy issues coaches may have experienced when entering activities into the database. Further, although the Project staff made recommendations to district leadership related to the skills required of an effective coach, the fact that the Project staff did not have control over the selection or hiring of the PS/RtI coaches is another potential limitation to this study.

Another potential limitation to the current study is the manner in which the data were collected. Project staff designed self-report measures to collect information about PS/RtI implementation factors, educator beliefs, educator perception of skills, and quality of the coaching received. Although these measures allowed for efficient data collection and entry processes, self-report measures tend to be positively biased (Noell & Gansle, 2006). Another limitation is evident in the fact that many of the PS/RtI coaches participated in the collection of data used in the current study. Specifically, many of the PS/RtI coaches facilitated the completion of the *SAPSI* with their SBLTs, and conducted the permanent product reviews required for the *Tier I and II CCCs* – the two sources for all dependent measures used in the current study. Although the coaches received extensive training and ongoing support on the method, administration, and use of these instruments, the Project could not control for instances in which a coach may have encouraged socially desirable responses on self-report instruments or scored permanent product reviews in a positively biased manner.

Another limitation of this study is that it includes only three waves of data collection, the minimum necessary for analyzing growth over time. As discussed previously, the number of data points available restricts the number of level-1 time-varying covariates that can be included in a growth curve equation. Further, including only three data points did not allow for cubic or quadratic growth curve analysis, which may have provided a more robust analysis of the predictive power of the variables included in the current models. Although multilevel modeling procedures are relatively robust to violations of the normality assumption (Raudenbush & Bryk, 2002), the level-1 perceived coaching quality data used in this study did not indicate relatively normal distribution. Therefore, this violation of the normality assumption may have limited the power of the perceived coaching quality variable as a predictor of implementation and fidelity outcomes in this study.

There exist several threats to external validly as well. Since this study was conducted in the State of Florida, the extent to which the current findings can be generalized to other schools, districts, and states depends upon the degree to which such institutions have comparable demographic characteristics to those that participated in the current examination. The extensive amount of resources, training, technical assistance, and support provided to the PS/RtI coaches as well as the schools and districts that participated in the Project is another threat to external validity. It is likely that a typical school or district may find it difficult to allocate a similar amount of resources to their own coaching and implementation endeavors, thereby limiting the extent to which the current findings could be generalized to other settings.

Conclusions

Many schools, districts, and states are currently in the process of implementing and expanding the Problem-Solving/Response to Intervention (PS/RtI) model. A number of PS/RtI initiatives are utilizing coaching as a component of professional development to enhance PS/RtI implementation and sustainability in schools. However, previous research has not effectively demonstrated that coaching enhances the knowledge, skills, and abilities required of educational staff to effectively implement PS/RtI practices. Further, previous research has not evaluated the impact of coaching on the implementation and fidelity of PS/RtI practices in schools.

The present study found that a number of coaching variables were related to growth in PS/RtI implementation and fidelity over time. Specifically, coaching in the form of shorter yet more frequent training sessions appeared to produce higher levels of staff consensus and fidelity of problem analysis implementation over time after controlling for the coaching quality. However, consensus development was negatively predicted by the frequency of technical assistance sessions by PS/RtI coaches. Growth in implementation over time was predicted positively by the continuity of the coaching received, or the degree to which coaching was delivered by the same individual over the three years of the Project. Educators' perceived PS/RtI skill levels related to manipulation of data and use of technology in schools were associated with increases in fidelity of problem identification implementation over time after controlling for perceived coaching quality. Fidelity of program evaluation/RtI implementation was predicted by the perceived quality of coaching received across time. The relationship between coaching and infrastructure development, as well as the relationship between coaching and fidelity of intervention development and implementation, were not significant. These findings are the result of an exploratory examination of coaching to support PS/RtI practices, and additional investigation of the questions addressed and proposed in the current study should be conducted to further the research in this area.

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Appendices

Appendix A: PS/RtI 3 Year Professional Development Training Plan

Problem Solving - Response to Instruction/Intervention Training Outline

	Year One	Year Two	Year Three
Day 1	**Curriculum** Change Model - Consensus, Infrastructure, Implementation Big ideas of Problem Solving Four Problem Solving Steps – Overview Problem Identification Problem Analysis Intervention Design/Implementation Response to Instruction/Interventions Three Tiered Model of Service Delivery Law – NCLB, IDEA, Florida Rule/Statute Formation, Function and Purpose of Problem Solving Teams **Data Collection** Beliefs Survey Perception of Practices School Personnel Satisfaction	**Curriculum** Review of Year 1 Training Consensus Focus on Tier One Four Problem Solving Step State RtI Plan National RtI Data Review Data from Year One SAPSI Data Survey Data Skill Assessment Data Strategies for Consensus Roles for Team Members **Data Collection** Perception of Practices School Personnel Satisfaction Skill Assessment Training Evaluation	**Curriculum** Problem Solving Case Study Example Tier Three Problem Identification T1, T2, T3 data source Linking the Tiers in context Using Tier Two data to determine effectiveness of Tier Two and appropriateness of Tier Three intervention T3 Problem Analysis Hypothesis Generation, Validation, Prediction Statements Worksheet - Problem Identification, Problem Analysis School Blueprint - Consensus **Data Collection** Skill Assessment Training Evaluation
	Days 1 & 2 back to back	Technical Assistance Session (s)	Technical Assistance Session (s)
Day 2	**Curriculum** Step I – Problem Identification Tier One Data Sources Academic, Behavioral Replacement Behaviors Current Performance Benchmark Performance Peer Performance Gap Analysis **Data Collection** Perception of Skills Beliefs Survey Skill Assessment Training Evaluation	**Curriculum** Data Feedback Activity Examples: Tier 1 Data Indicating Tier 2 Needs Tier 2 Defined & Characterized Standard Treatment Protocol Strategies for Identifying Tier 2/Standard Protocol Needs Tier 2 and the K-12 Reading Plan Decision Making at Tier 2 **Data Collection** Skill Assessment Training Evaluation	**Curriculum** Case Study Review Review Y3D1 Content Skill Assessment Performance Review Integrated Tier One, Tier Two, Tier Three Scheduling with examples Review of Master Schedule & Resource Maps Tier Three Intervention Development Characteristics of Tier Three Interventions Intervention Support Comprehensive Intervention Plan Tier Three: Components 1 & 2 Green Book Examples/References Worksheet - Intervention Development School Blueprint – Infrastructure Collect School Blueprint – Consensus **Data Collection** Skill Assessment Training Evaluation
	Technical Assistance Session (s)	Technical Assistance Session (s)	Technical Assistance Session (s)

Day 3	**Curriculum** Step II – Problem Analysis Data Feedback Activity Review: Problem Identification Big Ideas/Concepts of Problem Analysis Hypothesis/Prediction Statement Assessment & Hypothesis Validation Examples of Hypothesis Generation and Evaluation **Data Collection** Skill Assessment Training Evaluation	**Curriculum** Data Feedback Activity Intervention Evaluation Protocol Resource Maps Intervention Evaluation Plan Goal Setting Resource Mapping Activity Intervention Integrity Types Barriers Improving Assessing **Data Collection** Skill Assessment Training Evaluation	**Curriculum** Case Study Review Review Y3D2 Content Skill Assessment Performance Review Tier Three Intervention Design Intervention Integrity Documentation Examination of Integrity measures currently used to assess Tier Three Tier Three RtI Progress Monitoring Arrangements (frequency, data source, who, etc.) Content specific measures Decision Rules Actions when RtI is Positive, Questionable, Poor Movement among Tiers relative to student need Complete Comp. Intervention Plan with supporting Resource Map & Schedule SLD TAP School Blueprint - Implementation Collect School Blueprint – Infrastructure **Data Collection** School Personnel Satisfaction Survey Perceptions of Practices Skill Assessment Training Evaluation
	Technical Assistance Session (s)	Technical Assistance Session (s)	Technical Assistance Session (s)

Day 4	**Curriculum** Step III – Intervention Design and Implementation Data Feedback Activity Review: Consensus, Infrastructure, Implementation Linking Problem Analysis to Intervention Intervention Design Intervention Content Intervention Plan Intervention Integrity, Support, Documentation Integrating Tiers of Intervention **Data Collection** Skill Assessment Training Evaluation	**Curriculum** Review Foundational Concepts Data Feedback Activity Small Group Planning/Problem Solving Goal Setting and Planning **Data Collection** Beliefs Survey Perception of Skills Skill Assessment Training Evaluation	**Curriculum** Review Y3D3 Content Skill Assessment Performance Review Case Study – Eligibility decisions SLD Eligibility Collect School Blueprint - Implementation **Data Collection** Beliefs Survey Perception of Skills Skill Assessment Training Evaluation
	Technical Assistance Session (s)		
Day 5	**Curriculum** Step IV – Response to Intervention Rationale for Progress Monitoring Graphing Goal Setting Interpreting Graphs Decision Making Positive Response to Instruction/Intervention Questionable Response to Instruction/Intervention Poor Response to Instruction/Intervention Review of Problem-Solving Steps **Data Collection** Beliefs Survey Perception of Skills Skill Assessment Training Evaluation		

Appendix B: PS/RtI Project Implementation Plan

Project Administration					
Components	Year 1 (7/1/06 – 9/30/07)	Year 2 (8/1/07-7/31/08) Pilot Year 1	Year 3 (7/1/08-6/30/09) Pilot Year 2	Year 4 (7/1/09-6/30/10) Pilot Year 3	Year 5 7/1/10-6/30/11
1. Infrastructure	• Hired personnel - Project Leaders 7/06 - Graduate Assistants 8/06 - Program Evaluator 8/06 - Technical Support 8/06 - 3 Regional Coordinators 1/07 - Program Assistant 3/07 • Coaches hired/identified by districts 6/07 • DOE Leadership team identified 6/07	• As Needed	• As Needed	• As Needed	• As Needed

Project Administration					
Components	**Year 1 (7/1/06 – 9/30/07)**	**Year 2 (8/1/07-7/31/08) Pilot Year 1**	**Year 3 (7/1/08-6/30/09) Pilot Year 2**	**Year 4 (7/1/09-6/30/10) Pilot Year 3**	**Year 5 7/1/10-6/30/11**
	• Personnel Evaluations 6/07	• Personnel Evaluations 6/08	• Personnel Evaluations 6/09	• Personnel Evaluations 6/10	• Personnel Evaluations 6/11
2. District Finance & Administration	• Minigrants - Establish application process 1/07 - Conduct Bidder's Conferences 2-3/07 - Review District/school applications and select districts 4/07 • Establish contracts 5-7/07 • Establish billing schedule and criteria for district payments 6/07	• Establish contracts 5-7/08 •	• Establish contracts 5-7/09 •		

Project Administration					
Components	**Year 1 (7/1/06 – 9/30/07)**	**Year 2 (8/1/07-7/31/08) Pilot Year 1**	**Year 3 (7/1/08-6/30/09) Pilot Year 2**	**Year 4 (7/1/09-6/30/10) Pilot Year 3**	**Year 5 7/1/10-6/30/11**
		• Reapplication process - Develop Application Protocol 3/08 - Notify districts 3/08 - Review reapplications 4/08 - Finalize renewal of district/school grants 5/08	• Reapplication process - NA - Notify districts 3/09 - Review reapplications 4/09 - Finalize renewal of district/school grants 5/09		
3. DOE Submissions & Reports	• Quarterly reports 3/31, 6/30, 9/30, 12/31 • Renewal of DOE grant 6/06	• Quarterly reports 3/31, 6/30, 9/30, 12/31 • Renewal of DOE grant 6/07	• Quarterly reports 3/31, 6/30, 9/30, 12/31 • Renewal of DOE grant 6/08	• Quarterly reports 3/31, 6/30, 9/30, 12/31 • Renewal of DOE grant 6/09	• Quarterly reports 3/31, 6/30, 9/30, 12/31 • Renewal of DOE grant 6/10

Training and Technical Assistance					
Components	Year 1 (7/1/06 – 6/30/07)	Year 2 (7/1/07-6/30/08) Pilot Year 1	Year 3 (7/1/08-6/30/09) Pilot Year 2	Year 4 (7/1/09-6/30/10) Pilot Year 3	Year 5 7/1/10-6/30/11
1. Training	• Gather/review modules from other states 3/07 • Conduct Regional Coordinators Coaching Training 6/07 • Develop coaches' training modules – Year 1, 6/07 • Organize summer training for coaches 6/07 • Develop Needs Assessment (school sites) 6/07	• Deliver 5-day coaches training 7/9-13/07 • Conduct Needs Assessment (school sites) 8/07	• Deliver 5-day coaches training 7/08 • Conduct Needs Assessment (school sites) 8/08	• Deliver 5-day coaches training 07/09 • Conduct Needs Assessment (school sites) 8/09	

Project Administration					
Components	**Year 1** **(7/1/06 – 9/30/07)**	**Year 2** **(8/1/07-7/31/08)** **Pilot Year 1**	**Year 3** **(7/1/08-6/30/09)** **Pilot Year 2**	**Year 4** **(7/1/09-6/30/10)** **Pilot Year 3**	**Year 5** **7/1/10-6/30/11**
		• District- and school-based personnel trainings – Session 1 - Develop school- and district-based personnel training modules for first 3 days – Year 1 08/07 - Schedule and arrange training sessions for each district – Session 1 07/07 - Deliver Session 1 training (3 days) – 09/07	• District- and school-based personnel trainings – Session 1 - Develop school- and district-based personnel training modules for first 3 days – Year 2 08/08 - Schedule and arrange training sessions for each district – Session 1 07/08 - Deliver session 1 training (3 days) – 09/08	• District- and school-based personnel trainings – Session 1 - Develop school-and district- based personnel training modules for first 3 days – Year 3 08/09 - Schedule and arrange training sessions for each district – Session 1 07/09 - Deliver session 1 training (3 days) – 09/09	

Project Administration					
Components	**Year 1 (7/1/06 – 9/30/07)**	**Year 2 (8/1/07-7/31/08) Pilot Year 1**	**Year 3 (7/1/08-6/30/09) Pilot Year 2**	**Year 4 (7/1/09-6/30/10) Pilot Year 3**	**Year 5 7/1/10-6/30/11**
		● District- and school-based trainings – Session 2 - Develop school- and district-based personnel training modules for day 4 (session 2) – Year 1 12/07 - Schedule and arrange training sessions for each district – Session 2 11/07 - Deliver Session 2 training (1 day) – 1/08	● District- and school-based trainings – Session 2 - Develop school- and district-based personnel training modules for day 4 (session 2) – Year 2 12/08 - Schedule and arrange training sessions for each district – Session 2 11/08 - Deliver Session 2 training (1 day) – 1/09	● District- and school-based trainings – Session 2 - Develop school- and district-based personnel training modules for day 4 (session 2) – Year 3 12/09 - Schedule and arrange training sessions for each district – Session 2 11/09 - Deliver Session 2 training (1 day) – 1/10	

Project Administration					
Components	**Year 1** **(7/1/06 – 9/30/07)**	**Year 2** **(8/1/07-7/31/08)** **Pilot Year 1**	**Year 3** **(7/1/08-6/30/09)** **Pilot Year 2**	**Year 4** **(7/1/09-6/30/10)** **Pilot Year 3**	**Year 5** **7/1/10-6/30/11**
		• District- and school-based training – Session 3 - Develop school-and district-based personnel trainings for day 5 (Session 3) – Year 1 3/08 - Schedule and arrange training sessions for each district – Session 3 1/08 - Deliver Session 3 training (1 day) 3/08 • Organizing summer training for coaches 6/08	• District- and school-based training – Session 3 - Develop school-and district-based personnel trainings for day 5 (Session 3) – Year 1 3/09 - Schedule and arrange training sessions for each district – Session 3 1/09 - Deliver Session 3 training (1 day) 3/09 • Organizing summer training for coaches 6/09	• District- and school-based training – Session 3 - Develop school-and district-based personnel trainings for day 5 (Session 3) – Year 1 3/10 - Schedule and arrange training sessions for each district – Session 3 1/10 - Deliver Session 3 training (1 day) 3/10	

Project Administration					
Components	Year 1 (7/1/06 – 9/30/07)	Year 2 (8/1/07-7/31/08) Pilot Year 1	Year 3 (7/1/08-6/30/09) Pilot Year 2	Year 4 (7/1/09-6/30/10) Pilot Year 3	Year 5 7/1/10-6/30/11
		• Develop coaches' training modules – Year 2, 6/08 • Supplemental trainings for new personnel – As Needed	• Develop coaches' training modules – Year 3, 6/09 • Supplemental trainings for new personnel – As Needed	• Supplemental trainings for new personnel – As Needed	
2. Technical Assistance	N/A	• Monthly regional TA meetings with coaches facilitated by Regional Coordinators - Schedule and arrange TA sessions with coaches – by the 15th of preceding month - Determine TA focus/content for sessions	• Monthly regional TA meetings with coaches facilitated by Regional Coordinators - Schedule and arrange TA sessions with coaches – by the 15th of preceding month - Determine TA focus/content for sessions	• Monthly regional TA meetings with coaches facilitated by Regional Coordinators - Schedule and arrange TA sessions with coaches – by the 15th of preceding month - Determine TA focus/content for sessions	

Project Administration					
Components	**Year 1** **(7/1/06 – 9/30/07)**	**Year 2** **(8/1/07-7/31/08)** **Pilot Year 1**	**Year 3** **(7/1/08-6/30/09)** **Pilot Year 2**	**Year 4** **(7/1/09-6/30/10)** **Pilot Year 3**	**Year 5** **7/1/10-6/30/11**
		- Deliver TA session ● Quarterly district TA meetings with district leadership and coaches facilitated by Regional Coordinators	- Deliver TA session ● Quarterly district TA meetings with district leadership and coaches facilitated by Regional Coordinators	- Deliver TA session ● Quarterly TA meetings with district leadership and coaches facilitated by Regional Coordinators	

Project Administration					
Components	**Year 1 (7/1/06 – 9/30/07)**	**Year 2 (8/1/07-7/31/08) Pilot Year 1**	**Year 3 (7/1/08-6/30/09) Pilot Year 2**	**Year 4 (7/1/09-6/30/10) Pilot Year 3**	**Year 5 7/1/10-6/30/11**
		- Schedule and arrange TA sessions with district team members and coaches – Schedule first meeting at AO meetings 06/07, schedule next 3 at 09/07 meeting, attempt to schedule first meeting for Year 3 at fourth quarter meeting - Determine TA focus/content for sessions - Deliver TA session	- Schedule and arrange TA sessions with district team members and coaches – Schedule last 3 quarterly meetings at first quarter meeting, attempt to schedule first meeting for Year 4 at fourth quarter meeting - Determine TA focus/content for sessions - Deliver TA session	- Schedule and arrange TA sessions with district team members and coaches – Schedule last 3 quarterly meetings at first quarter meeting - Determine TA focus/content for sessions - Deliver TA session	

Project Administration					
Components	Year 1 (7/1/06 – 9/30/07)	Year 2 (8/1/07-7/31/08) Pilot Year 1	Year 3 (7/1/08-6/30/09) Pilot Year 2	Year 4 (7/1/09-6/30/10) Pilot Year 3	Year 5 7/1/10-6/30/11
		• Weekly TA meetings with school-based leadership facilitated by coaches (Regional Coordinator attendance optional) - Schedule and arrange TA sessions with school-based teams - Determine TA focus/content for sessions - Deliver TA session • Quarterly statewide coaches meetings	• Weekly TA meetings with school-based leadership facilitated by coaches (Regional Coordinator attendance optional) - Schedule and arrange TA sessions with school-based teams - Determine TA focus/content for sessions - Deliver TA session • Quarterly statewide coaches meetings	• Weekly TA meetings with school-based leadership facilitated by coaches (Regional Coordinator attendance optional) - Schedule and arrange TA sessions with school-based teams - Determine TA focus/content for sessions - Deliver TA session • Quarterly statewide coaches meetings	

Project Administration					
Components	**Year 1 (7/1/06 – 9/30/07)**	**Year 2 (8/1/07-7/31/08) Pilot Year 1**	**Year 3 (7/1/08-6/30/09) Pilot Year 2**	**Year 4 (7/1/09-6/30/10) Pilot Year 3**	**Year 5 7/1/10-6/30/11**
		- Schedule and arrange TA sessions with coaches – Immediately following scheduling of quarterly district leadership meetings schedule quarterly meetings for coaches for remainder of year - Provide technology training and determine other TA focus/content for sessions - Deliver TA session	- Schedule and arrange TA sessions with coaches – Immediately following scheduling of quarterly district leadership meetings schedule quarterly meetings for coaches for remainder of year - Provide technology training and determine other TA focus/content for sessions - Deliver TA session	- Schedule and arrange TA sessions with coaches – Immediately following scheduling of quarterly district leadership meetings schedule quarterly meetings for coaches for remainder of year - Provide technology training and determine other TA focus/content for sessions - Deliver TA session	

Project Administration					
Components	Year 1 (7/1/06 – 9/30/07)	Year 2 (8/1/07-7/31/08) Pilot Year 1	Year 3 (7/1/08-6/30/09) Pilot Year 2	Year 4 (7/1/09-6/30/10) Pilot Year 3	Year 5 7/1/10-6/30/11
	• Check with district leadership teams at AO meetings regarding possibility of having a statewide meeting of district leadership teams • Ask school administrators about helpfulness of district and/or regional school administrator meetings	• Statewide district leadership meetings? • Regional school administrator meetings?	• Statewide district leadership meetings? • Regional school administrator meetings?	• Statewide district leadership meetings? • Regional school administrator meetings?	

Communications					
Components	**Year 1** **(7/1/06 – 6/30/07)**	**Year 2** **(7/1/07-6/30/08)** **Pilot Year 1**	**Year 3** **(7/1/08-6/30/09)** **Pilot Year 2**	**Year 4** **(7/1/09-6/30/10)** **Pilot Year 3**	**Year 5** **7/1/10-6/30/11**
1. Quarterly Newsletter	• Developed plan for distribution – 5/07 • Write and distribute first newsletter – 6/15/07	• Contact Project staff for newsletter content and commitments to write sections (Judi)– 08/01/07, 11/01/07, 02/01/08, 05/01/08 • Project staff writes and sends sections to Judi for preparation – 09/01/07, 12/01/07, 03/15/08, 06/01/08	• Contact Project staff for newsletter content and commitments to write sections (Judi)– 08/01/08, 11/01/08, 02/01/09, 05/01/09 • Project staff writes and sends sections to Judi for preparation – 09/01/08, 12/01/08, 03/15/09, 06/01/09	• Contact Project staff for newsletter content and commitments to write sections (Judi)– 08/01/09, 11/01/09, 02/01/10, 05/01/10 • Project staff writes and sends sections to Judi for preparation – 09/01/09, 12/01/09, 03/15/10, 06/01/10	• Contact Project staff for newsletter content and commitments to write sections (Judi)– 08/01/10, 11/01/10, 02/01/11, 05/01/11 • Project staff writes and sends sections to Judi for preparation – 09/01/10, 12/01/10, 03/15/11, 06/01/11

Communications					
Components	**Year 1 (7/1/06 – 6/30/07)**	**Year 2 (7/1/07-6/30/08) Pilot Year 1**	**Year 3 (7/1/08-6/30/09) Pilot Year 2**	**Year 4 (7/1/09-6/30/10) Pilot Year 3**	**Year 5 7/1/10-6/30/11**
		• Dissemination of newsletter to stakeholder groups (see Communication Matrix; Judi) – 09/15/07, 12/15/07, 03/15/08, 06/15/08	• Dissemination of newsletter to stakeholder groups (see Communication Matrix; Judi) – 09/15/08, 12/15/08, 03/15/09, 06/15/09	• Dissemination of newsletter to stakeholder groups (see Communication Matrix; Judi) – 09/15/09, 12/15/09, 03/15/10, 06/15/10	• Dissemination of newsletter to stakeholder groups (see Communication Matrix; Judi) – 09/15/10, 12/15/10, 03/15/11, 06/15/11
2. Weekly Email Updates	• Developed plan for distribution 5/07	• Contact Project staff for email update content (Judi) – Monday of each week • Suggestions for content to Judi – Wednesday of each week	• Contact Project staff for email update content (Judi) – Monday of each week • Suggestions for content to Judi – Wednesday of each week	• Contact Project staff for email update content (Judi) – Monday of each week • Suggestions for content to Judi – Wednesday of each week	• Contact Project staff for email update content (Judi) – Monday of each week • Suggestions for content to Judi – Wednesday of each week

Communications					
Components	**Year 1 (7/1/06 – 6/30/07)**	**Year 2 (7/1/07-6/30/08) Pilot Year 1**	**Year 3 (7/1/08-6/30/09) Pilot Year 2**	**Year 4 (7/1/09-6/30/10) Pilot Year 3**	**Year 5 7/1/10-6/30/11**
		• Email update written and distributed to stakeholders (see Communications Matrix; Judi) – Thursdays of each week)	• Email update written and distributed to stakeholders (see Communications Matrix; Judi) – Thursdays of each week)	• Email update written and distributed to stakeholders (see Communications Matrix; Judi) – Thursdays of each week)	• Email update written and distributed to stakeholders (see Communications Matrix; Judi) – Thursdays of each week)
3. Website	• Initial website created and operational – 03/07 • Content updated periodically • Redesign of website started	• Review and revise website content by 15th of each month (Judi)	• Review and revise website content by 15th of each month (Judi)	• Review and revise website content by 15th of each month (Judi)	• Review and revise website content by 15th of each month (Judi)

Communications					
Components	Year 1 (7/1/06 – 6/30/07)	Year 2 (7/1/07-6/30/08) Pilot Year 1	Year 3 (7/1/08-6/30/09) Pilot Year 2	Year 4 (7/1/09-6/30/10) Pilot Year 3	Year 5 7/1/10-6/30/11
	• Create plan for review and update of website – 5/07				
4. List Serves	• Plan developed for creation of list serves – 5/07	• Create list serves (see Communications Matrix; Judi) – 07/08	• Update list serves (see Communications Matrix; Judi) – 07/09	• Update list serves (see Communications Matrix; Judi) – 07/10	• Update list serves (see Communications Matrix; Judi) – 07/11
5. Boilerplate Articles	• Make contacts with state associations by 6/15/07 (see Communications Matrix; Judi)	• Determine focus of annual article and identify author – 5/01/08	• Determine focus of annual article and identify author – 5/01/09	• Determine focus of annual article and identify author – 5/01/10	• Determine focus of annual article and identify author – 5/01D/11

Communications					
Components	Year 1 (7/1/06 – 6/30/07)	Year 2 (7/1/07-6/30/08) Pilot Year 1	Year 3 (7/1/08-6/30/09) Pilot Year 2	Year 4 (7/1/09-6/30/10) Pilot Year 3	Year 5 7/1/10-6/30/11
	• Send article providing overview of Project and demonstration districts to state associations by 6/30/07 (see Communications Matrix; Mike)	• Write and send articles to Judi – 6/1/08 • Disseminate articles to stakeholders – 6/15/08	• Write and send articles to Judi – 6/1/09 • Disseminate articles to stakeholders – 6/15/09	• Write and send articles to Judi – 6/1/10 • Disseminate articles to stakeholders – 6/15/10	• Write and send articles to Judi – 6/1/11 • Disseminate articles to stakeholders – 6/15/11
6. Statewide PS/RtI Conference		• Create Conference Planning Team 10/07	• Develop plan for statewide conference – 11/08	• Develop plan for statewide conference – 11/09	• Develop plan for statewide conference – 11/10

Communications					
Components	**Year 1** **(7/1/06 – 6/30/07)**	**Year 2** **(7/1/07-6/30/08)** **Pilot Year 1**	**Year 3** **(7/1/08-6/30/09)** **Pilot Year 2**	**Year 4** **(7/1/09-6/30/10)** **Pilot Year 3**	**Year 5** **7/1/10-6/30/11**
7.		• Develop plan for statewide conference – 11/07 • Schedule and organize statewide conference • Hold conference – 6/08?	• • Schedule and organize statewide conference • Hold conference – 6/09?	• • Schedule and organize statewide conference • Hold conference – 6/10?	• • Schedule and organize statewide conference • Hold conference – 6/11?
8. Other Conferences		• Team participation in Innovations Conference – 09/07	• Team participation in Innovations Conference – 09/08	• Team participation in Innovations Conference – 09/09	• Team participation in Innovations Conference – 09/10
		•	• Develop comprehensive conference presentation paln with DOE staff 7/07	•	•

Communications					
Components	**Year 1** **(7/1/06 – 6/30/07)**	**Year 2** **(7/1/07-6/30/08)** **Pilot Year 1**	**Year 3** **(7/1/08-6/30/09)** **Pilot Year 2**	**Year 4** **(7/1/09-6/30/10)** **Pilot Year 3**	**Year 5** **7/1/10-6/30/11**
		• Present at AMM – 09/07 • Discussion of priorities for presentation of Project information – 11/07	• Present at AMM – 09/08 • Discussion of priorities for presentation of Project information – 11/08	• Present at AMM – 09/09 • Discussion of priorities for presentation of Project information – 11/09	• Present at AMM – 09/10 • Discussion of priorities for presentation of Project information – 11/10
8. Collaboration with other State Projects	• On-going meetings held with FCRR, PBS, and VPK	• Continue on-going meetings with FCRR, PBS, and VPK • Have Project Leadership Team meeting to discuss collaboration with other State Projects – 09/07	• Continue on-going meetings with FCRR, PBS, and VPK	• Continue on-going meetings with FCRR, PBS, and VPK	• Continue on-going meetings with FCRR, PBS, and VPK

Evaluation					
Components	**Year 1 (7/1/06 – 6/30/07)**	**Year 2 (7/1/07-6/30/08) Pilot Year 1**	**Year 3 (7/1/08-6/30/09) Pilot Year 2**	**Year 4 (7/1/09-6/30/10) Pilot Year 3**	**Year 5 7/1/10-6/30/11**
1. Planning	• Drafted evaluation plan – 12/06	• Review and update evaluation plan – 6/08	• Review and update evaluation plan – 6/09	• Review and update evaluation plan – 6/10	
2. Instrumentation	• Gathered instruments from other states' evaluation models – 4/07 • Developed drafts of measures (see Evaluation Tool List) – 5/07 • Complete Expert Validation Panel process for Project participant surveys (see Evaluation Tool List) – 6/07	• Finalize drafts of evaluation measures (see Evaluation Tool List) – 7/07	• Revise and/or develop new evaluation measures – 7/08	• Revise and/or develop new evaluation measures – 7/09	

Evaluation					
Components	**Year 1 (7/1/06 – 6/30/07)**	**Year 2 (7/1/07-6/30/08) Pilot Year 1**	**Year 3 (7/1/08-6/30/09) Pilot Year 2**	**Year 4 (7/1/09-6/30/10) Pilot Year 3**	**Year 5 7/1/10-6/30/11**
	• Complete Validation Panel Process for parent survey & RtI Needs Assessment – 06/07	• Pilot test instruments developed and revised as needed – 7/07			
	• Complete web-based databases – 6/07 - School level data - Training survey data - Training/TA logs - Student level outcome data	• Update web-based data-bases (As Needed	• Update web-based data-bases (As Needed	• Update web-based data-bases (As Needed	• Update web-based data-bases (As Needed

Evaluation					
Components	Year 1 (7/1/06 – 6/30/07)	Year 2 (7/1/07-6/30/08) Pilot Year 1	Year 3 (7/1/08-6/30/09) Pilot Year 2	Year 4 (7/1/09-6/30/10) Pilot Year 3	Year 5 7/1/10-6/30/11
	- Intervention integrity?				
3. Data Collection & Analysis	• Developed timeline for data collection – 5/07 • Discuss baseline data elements to be gathered from pilot districts, pilot schools & comparison schools – 6/07	• Collect baseline data from pilot & comparison schools • Collect data from coaches training • Collect data from pilot and comparison schools (see Data Collection Rubric)	• Collect data from coaches training • Collect data from pilot and comparison schools (see Data Collection Rubric)	• Collect data from coaches training • Collect data from pilot and comparison schools (see Data Collection Rubric)	

Evaluation					
Components	Year 1 (7/1/06 – 6/30/07)	Year 2 (7/1/07-6/30/08) Pilot Year 1	Year 3 (7/1/08-6/30/09) Pilot Year 2	Year 4 (7/1/09-6/30/10) Pilot Year 3	Year 5 7/1/10-6/30/11
	• Develop plan for conducting data analyses – 6/07	• Conduct and interpret analyses (See Data Analysis Plan)	• Conduct and interpret analyses (See Data Analysis Plan)	• Conduct and interpret analyses (See Data Analysis Plan)	• Conduct and interpret analyses (See Data Analysis Plan)
4. Reporting	• Identify stakeholders who will receive reports • Develop plan for reporting data to stakeholders – 6/07	• Provide reports to stakeholders (see Data Reporting Plan) - Project Leadership Team (by 3/31, 6/30, 9/30, 12/31) - DOE Project Liaison (Quarterly report data; 3/15, 6/15, 9/15, 12/15) - Regional Coordinators (by end of each month)	• Provide reports to stakeholders (see Data Reporting Plan) - Project Leadership Team (by 3/31, 6/30, 9/30, 12/31) - DOE Project Liaison (Quarterly report data; 3/15, 6/15, 9/15, 12/15) - Regional Coordinators (by end of each month)	• Provide reports to stakeholders (see Data Reporting Plan) - Project Leadership Team (by 3/31, 6/30, 9/30, 12/31) - DOE Project Liaison (Quarterly report data; 3/15, 6/15, 9/15, 12/15) - Regional Coordinators (by end of each month)	• Provide reports to stakeholders (see Data Reporting Plan) - Project Leadership Team (by 3/31, 6/30, 9/30, 12/31) - DOE Project Liaison (Quarterly report data; 3/15, 6/15, 9/15, 12/15)

Evaluation					
Components	**Year 1** **(7/1/06 – 6/30/07)**	**Year 2** **(7/1/07-6/30/08)** **Pilot Year 1**	**Year 3** **(7/1/08-6/30/09)** **Pilot Year 2**	**Year 4** **(7/1/09-6/30/10)** **Pilot Year 3**	**Year 5** **7/1/10-6/30/11**
		- Statewide conference participants - Annual report (6/30)	- Statewide conference participants - Annual report (6/30)	- Statewide conference participants - Annual report (6/30)	- Statewide conference participants - Final report (7/30)

Appendix C: PS/RtI Project Evaluation Rubric

Component	Evaluation Questions	Data Source	Method	Collection Timeline	Personnel Responsible
Input – Pilot Districts and Schools	1. What were the demographic profiles of students attending the pilot (1) districts and (2) schools? Categories to be examined by grade-level include: a. Race/ethnicity (i.e., Caucasian, Black, Hispanic, Asian/Pacific Islander, Native American/Alaskan Native, & Multiracial)? b. Gender? c. Free-reduced lunch status? d. Disability status? e. English language learner status? 2. To what degree did pilot (1) districts and (2) schools reach consensus regarding participation in the PS/RtI Project?	1. School records 2. District and	1. Records review; district application 2. District application;	1. See Data Collection Rubric 2. See	1. District data contact 2. Coaches collect data

	3. What was the demographic profile of staff at the project and comparison schools and to what extent did turnover occur? 4. To what degree was the infrastructure necessary to support implementation of the PS/RtI (e.g., personnel, technology, financial resources, professional development structures, academic and behavioral programs, policies/procedures) present in pilot: a. Districts? b. Schools?	school personnel 3. Coaches and GAs 4. District leadership teams, school-based teams, and coaches	Modified RtI Needs Assessment 3. Records review from district and school records 4. District application; Modified RtI Needs Assessment; Interviews	Data Collection Rubric 3. See Data Collection Rubric 4. See Data Collection Rubric	and provide to a GA to upload 3. District data contact 4. Coaches collect data and provide to a GA to upload

Input – Coaches	5. To what degree did coaches in the pilot districts meet the requisite qualifications? 6. To what extent did coaches demonstrate coaching and PS/RtI skills?	5. Coaches and district personnel 6. Coaches	5. Coaches' vita; district application 6. Coaching Analogue Assessment; Direct Skill Assessments	5. See Data Collection Rubric 6. Coaches Training	5. TBD 6. Regional coordinators collect data; scoring and entry TBD
Process – PS/RtI Training	7. To what extent was training provided to each of the following key stakeholders: a. District leadership teams? b. School-based teams? c. Coaches? 8. To what extent were the following key stakeholders satisfied with the quality of the training:	7. Regional coordinators and coaches 8. District leadership teams, school-based	7. Regional Coordinator Training Log; Coaches Training Log; Attendance Log 8. Training Evaluation Survey	7. See Data Collection Rubric 8. See Data Collection	7. Regional coordinators & coaches track and upload data via web-based screen 8. Regional coordinators & coaches collect data

	a. District leadership teams? b. School-based teams? c. Coaches? 9. To what extent were the following key stakeholders satisfied with the training content/materials: a. District leadership teams? b. School-based teams? c. Coaches?	teams, and coaches 9. District leadership teams, school-based teams, and coaches	 9. Training Evaluation Survey	Rubric 9. See Data Collection Rubric	and provide to a GA to upload 9. Regional coordinators & coaches collect data and provide to a GA to upload
Process - Technical Assistance & Communication	10. To what extent was technical assistance provided to: a. District leadership teams? b. School-based teams? c. Coaches? 11. To what extent were the following key stakeholders satisfied	10. Regional coordinators and coaches 11. District	10. Regional Coordinator Technical Assistance Log; Coaches Technical Assistance Log 11. Technical Assistance Evaluation Survey;	10. See Data Collection Rubric 11. See	10. Regional coordinators & coaches track and upload data via web-based screen 11. Regional coordinators

	with the technical assistance and communication provided by the project: a. District leadership teams? b. School-based teams? c. Coaches?	leadership teams, school-based teams, and coaches	Coaches Evaluation Survey	Data Collection Rubric	& coaches collect data and provide to a GA to upload
Output – Consensus	12. What was the impact of the Project on the level of consensus for: a. District leadership teams? b. School-based teams? c. Other school personnel? 13. What was the impact of the project on the following key stakeholders' beliefs about PS/RtI: d. District leadership teams? e. School-based teams? f. Other school personnel? 14. To what extent were the following key stakeholders satisfied with service delivery in the PS/RtI	12. District leadership teams, school-based teams, and school personnel 13. District leadership teams, school-based teams, and school personnel	12. Modified RtI Needs Assessment 13. Beliefs Survey	12. See Data Collection Rubric 13. See Data Collection Rubric 14. See	12. Coaches collect data and provide to GAs to upload 13. Regional coordinators & coaches collect data and provide to a GA to upload 14. Regional coordinators & coaches

	model? a. District leadership teams? b. School-based teams? c. Other school personnel? d. Parents? 15. To what extent were the following key stakeholders satisfied with student and systemic outcomes in the PS/RtI model? a. District leadership teams? b. School-based teams? c. Other school personnel? d. Parents?	14. District leadership teams, school-based teams, and school personnel 15. District leadership teams, school-based teams, and school personnel	14. School Personnel Satisfaction Survey; Parent Satisfaction Survey 15. School Personnel Satisfaction Survey; Parent Satisfaction Survey	Data Collection Rubric 15. See Data Collection Rubric	collect data and provide to a GA to upload 15. Regional coordinators & coaches collect data and provide to a GA to upload
Output – Infrastructure	16. What was the impact of the project on creating the infrastructure to support implementation of PS/RtI at the: a. District-level? b. School-level?	16.District leadership teams, school-based teams, and coaches	16. Modified RtI Needs Assessment; Interviews	16. See Data Collection Rubric	16. Coaches collect data and provide to a GA to upload

Output – Implementation	17. What was the impact of the project on the PS/RtI skills of the following key stakeholders: a. Coaches? b. District leadership teams? c. School-based teams? d. Other school personnel?	17. Coaches, district leadership teams, school-based teams, and other school personnel	17. Perceptions of Skills Survey; Direct Skill Assessments; Neutral Interviews; Taped observation	17. See Data Collection Rubric	17. Regional coordinators & coaches collect data and provide to a GA to upload
	18. What was the impact of the project on pilot school implementation of PS/RtI practices (e.g., core curriculum fidelity, intervention practices and fidelity, problem-solving team procedures, assessment practices)?	18. Coaches, school-based teams, and other school personnel	18. Perceptions of Practices Survey; Modified RtI Needs Assessment; Critical Components Checklists; Problem-Solving Team Checklists; Intervention Integrity Log; Anecdotal records	18. See Data Collection Rubric	18. Regional coordinators & coaches collect data and provide to a GA to upload

Output- Student Outcomes	19. What was the impact of implementing PS/RtI on (1) reading and (2) math achievement: a. For all students? b. By race/ethnicity (i.e., Caucasian, Black, Hispanic, Asian/Pacific Islander, American Indian/Alaskan Native, & Multiracial)? c. By gender? d. By free-reduced lunch status? e. By disability status? f. By English language learner status?	19. School records	19. FCAT; SAT-10; CBM; DIBELS; District assessments	19. See Data Collection Rubric	19. District data contact will provide to Project staff
	20. What was the impact of implementing PS/RtI on behavioral outcomes: a. For all students? b. By race/ethnicity (i.e., Caucasian, Black, Hispanic, Asian/Pacific Islander,	20. School records	20. Permanent products from interventions	20. See Data Collection Rubric	20. TBD

	American Indian/Alaskan Native, & Multiracial)? c. By gender? d. By free-reduced lunch status? e. By disability status? f. By English language learner status?				
Output – Systemic Outcomes	21. What was the impact of implementing PS/RtI on office discipline referrals: a. For all students? b. By race/ethnicity (i.e., Caucasian, Black, Hispanic, Asian/Pacific Islander, American Indian/Alaskan Native, & Multiracial)? c. By gender? d. By free-reduced lunch status? e. By disability status? f. By English language learner	21. School records	21. Records review of ODRs	21. See Data Collection Rubric	21. District contact or coach will collect and provide to Project staff 22. District

	status?				contact or coach will collect and provide to Project staff
	22. What was the impact of implementing PS/RtI on the special education referrals, evaluations, and placements: a. For all students? b. By race/ethnicity (i.e., Caucasian, Black, Hispanic, Asian/Pacific Islander, American Indian/Alaskan Native, & Multiracial)? c. By gender? d. By free-reduced lunch status? e. By disability status? f. By English language learner status?	22. School records	22. Records review	22. See Data Collection Rubric	
	23. What was the impact of implementing PS/RtI on student attendance:	23. School records	23. Records review	23. See Data Collection Rubric	23. District contact or coach will collect and provide to Project staff

	a. For all students? b. By race/ethnicity (i.e., Caucasian, Black, Hispanic, Asian/Pacific Islander, American Indian/Alaskan Native, & Multiracial)? c. By gender? d. By free-reduced lunch status? e. By disability status? f. By English language learner status? 24. What was the impact of implementing PS/RtI on retention rates: a. For all students? b. By race/ethnicity (i.e., Caucasian, Black, Hispanic, Asian/Pacific Islander, American Indian/Alaskan Native, & Multiracial)?	24. School records	24. Records review	24. See Data Collection Rubric	24. District contact or coach will collect and provide to Project staff 25. TBD

	c. By gender? d. By free-reduced lunch status? e. By disability status? f. By English language learner status? 25. What the impact of implementing PS/RtI on costs for: a. Training? b. Materials? c. Personnel? d. Technology? e. Other?	25. District, school, and project records	25. Records review	25. See Data Collection Rubric	
Contextual Factors	26. How does school climate/culture impact implementation of PS/RtI?	26. School personnel, coaches, and school records	26. Beliefs Survey; Interviews; RtI Needs Assessment; Critical Components Checklists; Problem-Solving Team Checklists	26. See Data Collection Rubric	26. Coaches and Regional Coordinators

	27. How does leadership impact implementation of PS/RtI?	27. District and school administrators, and school records	27. Beliefs Survey; Interviews; RtI Needs Assessment; Critical Components Checklists; Problem-Solving Team Checklists	27. See Data Collection Rubric	27. Coaches and Regional Coordinators
External Factors	28. How does legislation (e.g., NCLB, IDEIA) impact implementation of PS/RtI?	28. District and school personnel, school records, legislation	28. NCLB and IDEIA; RtI Needs Assessment; Critical Components Checklists; Problem-Solving Team Checklists	28. See Data Collection Rubric	28. Coaches and Regional Coordinators; Other?

	29. How do state and district policies impact implementation of PS/RtI?	29. District and school personnel, state and district policy records	29. State and district regulations; RtI Needs Assessment; Critical Components Checklists; Problem-Solving Team Checklists; Questioinairre	29. See Data Collection Rubric	29. Coaches and Regional Coordinators; Other?
Goals & Objectives	30. How do the goals and objectives of schools (i.e., content area and grade levels targeted) impact implementation of PS/RtI?	30. District and school personnel, and school records 31. District and	30. Grant applications; Interviews; RtI Needs Assessment; Critical Components Checklist; Coaches Observation Checklist 31. FCAT; SAT-10; CBM;	30. See Data Collection Rubric 31. See Data	30. Coaches and Regional Coordinators; Others? 31. Coaches and Regional

	31. How do the goals and objectives of schools (i.e., content area and grade levels targeted) impact student and systemic outcomes?	school personnel, and school records	DIBELS; District assessments; ODRs; Grant application; Interviews; RtI Needs Assess.	Collection Rubric	Coordinators; Others?

Appendix D: PS/RtI Demonstration District Mini-Grant Application

TO: School Districts, State of Florida

FROM: Florida Problem Solving/Response to Intervention Statewide Project

SUBJECT: Problem-Solving/Response to Intervention (PS/RtI) Demonstration Site Mini-Grant Application Procedures

Background

The No Child Left Behind Act (NCLB) and the Individuals with Disabilities Education Improvement Act (IDEIA) of 2004 embrace the use of Problem-Solving and Response to Intervention (Instruction) (PS/RtI) to ensure that ALL students achieve state-approved grade-level benchmarks. In addition, the PS/RtI method has become part of the eligibility requirements for students with disabilities (effective October 13, 2006). The Florida Department of Education (FLDOE) has funded the Florida Problem-Solving/Response to Intervention Project to ensure that all districts in Florida have access to high quality training in the skills necessary to implement this model. The Florida Problem Solving/Response to Intervention Project is funded by a grant from the Florida Department of Education and is administered through the University of South Florida.

The purposes of the FLDOE PS/RtI Project are twofold: 1) organize and deliver statewide training in PS/RtI and 2) evaluate the impact of the PS/RtI model on district, building and student outcomes. The evaluation of the impact of PS/RtI will take place in pilot school sites in demonstration districts throughout Florida.

Demonstration districts will be selected from among those districts completing a Mini-Grant Application. The purpose of this memo is to disseminate information regarding the Mini-Grant Application process.

General Information

Eligible Applicants: Any Florida public school district is eligible to apply to become a PS/RtI Demonstration District.

Pilot Schools: Each district may request funding to support a maximum of six (6) pilot schools within the district. Proposed pilot schools within the district must house at least grades K-3. Demonstration districts may include Reading First schools, Positive Behavior Supports schools, or schools participating in other state or local initiatives. The district must identify one (1) comparison school for each pilot school proposed in the application. The comparison school must contain the same grade levels and share similar student demographics as the pilot school(s). The comparison school data will be used to compare the impact of the PS/RtI Project in schools with and without project implementation.

Start Date: It is estimated that initial implementation activities with the demonstration sites will begin in the spring of 2007, with full implementation starting with the 2007-2008 school year.

Application Deadline: Complete applications must be received by April 1, 2007.
Mail the original and 5 copies to: Judith Hyde

University of South Florida

4202 E. Fowler Avenue, EDU 162

Tampa, FL 33620

No FAX or email copies of proposals will be accepted.

Informational Meetings: All districts interested in completing a mini-grant application to become a demonstration district are invited to attend one of three orientation/informational meetings to be held in the north, central, and south regions of the state (see Appendix A). Each district may send up to three people, including the individual who will be primarily responsible for facilitating the grant writing team, one administrative representative from general education and one administrative representative from special education.

Each meeting is scheduled from 9:00 a.m. to 1:00 p.m. The meeting agenda will include presentations on the Florida Problem Solving/Response to Intervention Project, the responsibilities of participating districts and procedures for completing the mini-grant application. Mini-grant application requirements are described below. District representatives are encouraged to review the application requirements prior to the meeting. A question and answer (Q and A) session will be included in each meeting.

NOTE: Pre-registration is required in order to attend one of the Informational Meetings. To pre-register, go to http://floridarti.usf.edu/biddersconference/, click on "Registration," complete the form and click on "Submit Registration." If you encounter any difficulties with pre-registration, contact Judi Hyde at JHyde@tempest.coedu.usf.edu or 813-974-7448. The schedule for these meetings is as follows:

Monday, February 26
Ft. Lauderdale
Embassy Suites
1100 Southeast 17th Street
Directions:
http://www.embassysuites.com/en/es/hotels/maps_directions.jhtml?ctyhocn=FLLSOES
954-527-2700

Thursday, March 1
Tallahassee
Doubletree Hotel
101 S. Adams St.
Directions: http://doubletree.hilton.com/en/dt/hotels/index.jhtml?ctyhocn=THLAPDT
850-224-5000

Monday, March 5

Orlando

Orlando Airport Marriott

7499 Augusta National Drive

Directions: http://marriott.com/property/propertypage/mcoap

407-851-9000

Attendance at one of the regional meetings is strongly encouraged but not required of districts planning to submit a mini-grant application.

Contact Person: For more information about application procedures, contact Clark Dorman, Project Leader at Dorman@coedu.usf.edu or 813-391-3059**.**

Overview of the Demonstration Site Project

The demonstration site component of the Statewide PS/RtI Project is designed to provide training, technical assistance and implementation support to individual schools within school districts. Statewide Project staff will conduct the training, provide technical assistance and provide other training and implementation supports to the pilot schools. Pilot schools, in turn, will serve as evaluation sites to determine the impact of this project on student and other district and building outcomes.

The demonstration site component of the Project will rely on a "coaching" and "trainers" method for implementation. State Project staff will serve as the "external coaches" to the schools. Funding will be provided for districts to hire one "internal" coach for up to three (3) pilot schools. Each school will create a "school-based" implementation team consisting of six to eight members that includes representatives of general education, special education, instructional support and student services. The building administrator must be included as a member of the team. Building teams will learn how to develop a building implementation plan. The school-based team and the building coach will become "trainers" and "coaches" for the building staff and will be responsible for building-wide implementation.

Services Provided to Demonstration Schools by the Statewide Project Staff

1. Training and technical assistance for school-based teams to implement the Problem Solving/Response to Intervention model in pilot schools
2. Funding for each selected demonstration district for up to two coaches (one for each three schools) to complement training and provide technical assistance to pilot school sites in implementing PS/RtI, data collection and analysis, and dissemination of student outcome data
3. Training of and technical assistance and support for the coaches and building administrators
4. Training, technical assistance and support for the use of school-based data to develop, implement and evaluate core, supplemental and intensive instruction/intervention
5. Training and technical assistance in the use of technology to organize and display building, classroom and student-based data
6. Training and technical assistance in the use of technology to monitor intervention implementation, support data-based decision making and track student progress

7. Support integration of existing and potential state-level, district and school initiatives to facilitate implementation of DOE Strategic *Imperative #3-Improve students' rates of learning*, and Strategic Imperative #5-*Increase the quantity and improve the quality of education options*
8. Provide web-based programs to collect and organize data from the demonstration sites. Internal coaches will be responsible for submitting demonstration site data to the web-based programs

II. Expectations of Demonstration Districts and Pilot Sites

Each demonstration district may identify up to six (6) pilot schools and an equal number of comparison schools within the district. In order to receive the services delineated above, districts and their pilot schools submitting an application under this project initiative must agree to the requirements set forth in "Commitments Needed for Success" in Appendix B. These include certain district- and school-level administrative, curricular, financial, and personnel commitments, as well as parent involvement, data collection and reporting requirements.

Each proposed pilot school must have a comparison school that is similar to it on key demographic variables. Comparison schools will be asked only to participate in certain data collection activities, and must agree to participate in these activities. Coaches will support the collection of data in both pilot and comparison schools.

III. Funding

Each district may submit a mini-grant application for up to $100,000.00 per year in funding for a maximum of three years. The mini-grant is intended to support the employment of district-based coaches and training activities. Districts must commit to a minimum of three years of project implementation. Each application is for one year of funding. Continuing applications will be required each year for years 2 and 3 of the funding cycle. Continuation of funding for years 2 and 3 will be contingent on fulfillment of expectations by the district and pilot and comparison schools.

Mini-Grant Application Requirements

Each proposal must address each of the five components specified below in a narrative format, in the order in which they are presented for a) the demonstration district, and b) **each** of up to six (6) proposed pilot schools within the district. The total narrative (excluding demographic data required in item 2 below) must be double-spaced, using a 12-point font and should not exceed 25 pages in length. Documentation required in 1 and 2 below should be included in appendices to the application and do not count against the 25 page limit.

1. <u>District and Pilot Schools Commitment</u>:
Proposals must outline specific commitments to implementing PS/RtI as a way of work and the activities (i) the district, and (ii) pilot schools will carry out in order to meet the requirements specified in Appendix B. Letters of agreement/commitment from the following individuals must be included in the grant application. (See Appendix B for the minimum required content of these letters).

a) District Superintendent
b) Assistant Superintendent for Curriculum and Instruction
c) Director of Elementary Education
d) Director of Exceptional Student Education
e) Director(s) of district/school-wide Reading First and Positive Behavior Support Programs (if applicable)
f) Principal of each of the proposed pilot schools
g) Principal of each comparison school to provide data requested by Project Staff

2. <u>District, Pilot and Comparison Schools Demographic Data</u>:
Proposals must include an outline of the

a) District demographic data (see Appendix C- “Demonstration District Demographic Profile”)

b) Each proposed pilot school's demographic data (see Appendix D – "Demonstration Pilot School's Demographic Profile"), and
c) Each comparison school's demographic data (see Appendix E- "Comparison School Demographic Profile")

(Appendices C, D, and E outline the minimum required content for this section.)

3. Statement of Need and Expected Outcomes:

Proposals must, for **each** pilot school

a) Describe the school's needs (particularly student academic and/or behavioral needs) that will be addressed through participation in the PS/RtI project, including specific gaps, barriers, or weaknesses
b) Indicate how implementation of the PS/RtI model would impact the academic and/or behavioral outcomes of students in each pilot school
c) Identify measurable student and school outcomes, tied to the identified needs, that will result from participation as a pilot school site
d) Identify outcomes for specific target populations or school goals, including over-representation of minority students in special programs, low-SES and LEP students and/or D/F school status

4. District and Pilot Schools' Experience with Initiatives and Programs:

Proposals must describe the district's and each pilot school's current and/or previous level of involvement in and extent of implementation (e.g., beginning, intermediate, fully implementing) of academic and/or behavioral initiatives and programs (e.g., Just Read Florida, Positive Behavioral Support). Include information for any reading initiatives implemented within the last five years in the district and in each proposed pilot school. Specify any existing curriculum-based measures (e.g., DIBELS, CBM-Math) or data collection tools (e.g., PMRN, SWIS, AIMSweb®) currently in use. In addition, discuss any involvement the district and each proposed pilot school has had with the following FLDOE projects/initiatives:

- Continuous Improvement Model (CIM)
- Reading First
- Just Read Florida
- Voluntary Pre-K (VPK) programs
- Positive Behavior Support
- PS/RtI

Describe any other educational reform initiatives or elements of the above initiatives in which the district or school has been involved within the past five years.

5. **<u>District Personnel Resources and Technology:</u>**
<u>Proposals must, for the district and each proposed pilot school:</u>

a) Identify personnel (e.g., teachers, student support staff, and administrative staff) who will be assigned to this specific initiative at the district level and in each specific pilot school site; identify one coach for each three pilot schools
b) Identify percent FTE each will be assigned
c) Identify experience/qualifications to support implementation of the PS/RtI initiative
d) Include a brief vita for each of the individuals identified as a potential coaches in (a) above in an appendix to the application
e) Briefly describe the technology resources at the building or district levels that will be used in support of this initiative. In particular, describe any data management systems that will be used

(See Appendix B)

The Application Process

<u>Only one</u> (1) mini-grant application will be accepted from each district.

The Application Packet should include:

1) A Cover Letter from the District Superintendent indicating a desire for the district to participate in the PS/RtI Project

2) The School District's response to relevant components of the proposal as specified under Proposal Requirements:
    - Component 1 - District Commitment
    - Component 2 - District Demographic Data
    - Component 4 - District and School Experience with Initiatives and Programs
    - Component 5 - Personnel Resources and Technology
    - Letters of Agreement/ Commitment as described above in sections 1.a) through 1.g)

3) Pilot Schools' Responses – A response for ***<u>each</u>*** proposed pilot school (up to six schools) to relevant components of the proposal as specified under Proposal Requirements:

    - Component 1 - Pilot School Commitment
    - Component 2 - Pilot School Demographic Data and Comparison School Demographic Data
    - Component 3 - Statement of Need and Expected Outcomes for the Pilot School
    - Component 4 - Pilot School's Experience with Initiatives and Programs
    - Component 5 - Personnel Resources and Technology

Proposal Evaluation Scoring Guide

Total points awarded will be an important consideration in the selection of demonstration districts. However, it also is important that a diversity of students, schools, and districts be represented in the demonstration districts and their pilot schools. Therefore, after all applications have been evaluated against the criteria below and have received a final score of from 0 to 175, additional factors will be considered prior to the selection of sites. Districts and pilot schools will be selected to include sites that are diverse with respect to:

1. Size of districts (i.e., small, medium, and large)
2. Geographic location
3. Student population demographics
4. Inclusion of D/F schools

The application from each district will be evaluated using the **Proposal Evaluation Form** according to the following criteria:

1. **District and Pilot Schools Commitment (*50 points*):** The proposal demonstrates clear administrative, programmatic and fiscal commitment (including the required letters of commitment) to fully implementing PS/RtI and a capacity to fulfill the demonstration site's requirements as outlined in Appendix B. ***(Note: District=20, mean rating across pilot schools = 30)***

2. **District and Pilot and Comparison Schools' Demographic Data (*30 points*):** The proposal provides detailed and current demographic data for the district and each proposed pilot school as required in Appendices C, D and E respectively. It provides a clear picture of the district's and pilot and comparison schools' status on the indicators given. ***(Note: District=10, mean rating across pilot schools =15, mean rating across comparison schools =5)***

3. **Statement of Need and Expected Outcomes (*35 points*):** The proposal clearly defines each pilot school's needs that will be addressed through participation as demonstration sites and provides convincing evidence that without assistance from the project, these needs would not be met. The proposal also delineates projected student and school outcomes, including outcomes for specific target populations that: a) are measurable, b) are clearly linked to the identified needs, and c) that demonstrate an increased capacity to support students' academic and behavioral performance in the general education environment. ***(Note: Mean rating across pilot schools=35)***

4. **District and School Experience with Initiatives and Programs (*20 points*):** The proposal describes in detail the level of district and school involvement in academic and/or behavioral initiatives and programs, resulting in a comprehensive picture of the district's and each pilot school's current systemic capacity. ***(Note: District=10, mean rating across pilot schools =10)***

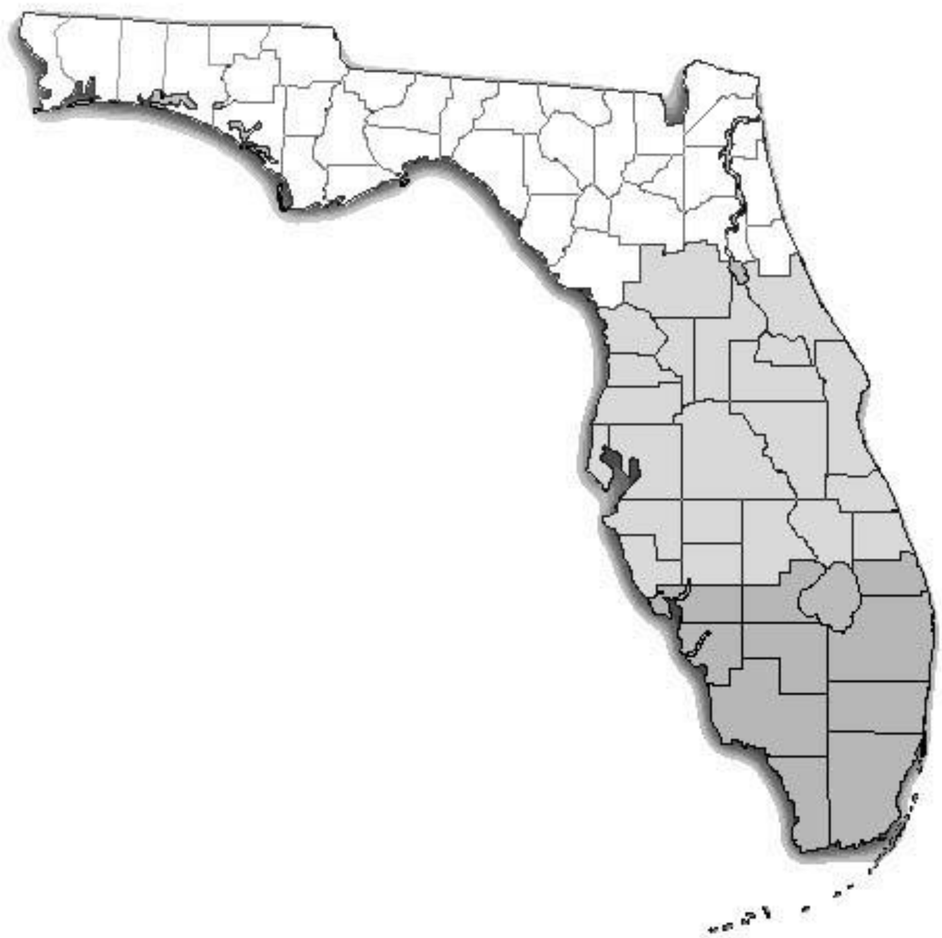
5. **District Personnel Resources and Technology (*15 points*).** The proposal clearly identifies personnel assigned to the PS/RtI initiative at a) the district level, and b) each proposed pilot school site and the percent FTE each is assigned to the initiative. It provides a clear picture of personnel qualifications and experience to support implementation of PS/RtI. Technology resources and a data management system to support the initiative at the district and school site level are clearly delineated. (***Note: District = 6, mean rating across pilot schools =9*)**

6. **Inclusion of D/F Schools (*25 points*).** D or F schools are represented among the proposed pilot school sites.

Total Possible Score = 175 points

APPENDIX A

PS/ RtI Regional Areas



APPENDIX B

Commitments Required for Success

Demonstration District Administration will commit to:

1. Developing and implementing a plan to ensure that general education, special education and other program personnel work together at the district level to effectuate the successful implementation of PS/RtI in the district pilot schools
2. Assigning district personnel with the requisite qualifications and experience to the PS/RtI initiative to support district coordination and implementation of the initiative across the pilot school sites
3. Putting in place a district-level leadership team to help pilot schools with the implementation of the PS/RtI initiative
4. Implementing evidenced-based practices to support learning of all students, including those at risk and ESE students, to achieve AYP and Florida's A^{+} Education Plan
5. Designating funds/resources to implement research-based supplemental instruction and interventions to support students who do not attain expected grade-level outcomes in reading and math
6. Designating resources to adequately support PS/RtI implementation at both the district and pilot school level, including faculty and staff, time, materials for screening, assessment and interventions, and financial support for scientifically-based progress monitoring software (e.g., AIMSweb® or DIBELS)
7. Providing funds/resources (including time) for professional development of district-level personnel and pilot school teachers and staff in PS/RtI, data collection and management, data analysis and interpretation
8. Having in place the technological resources and infrastructure, including personnel, and a data management system to ensure ease of access to student performance data by school level and project personnel and to support the PS/RtI initiative
9. Providing access to district and state-level student performance data for school-level and project reporting purposes
10. Developing and implementing a plan to ensure parent involvement with PS/RtI efforts at the district and pilot school levels
11. Reviewing the district's policies and procedures for general and exceptional student education to ensure that they are consistent with PS/RtI

Pilot School Principal and Administrative Team will commit to:

1. Implementing PS/RtI as a way of work at the pilot school site
2. Assigning personnel with the requisite qualifications and experience to the PS/RtI initiative to support its implementation at the school site
3. Putting in place a school leadership team that is representative of the school's grade level faculty, support staff and parents (consisting of individuals with collective knowledge and experience in leadership, curriculum, data-based decision-making and systems change)

4. Being active participants in the school leadership team (attend PS/RtI trainings and team meetings)
5. Providing for a regularly scheduled time and place for team meetings
6. Securing agreement from the school faculty to commit to PS/RtI Project Initiative training and practices (including identification and selection of appropriate scientifically-based interventions, continuous monitoring of student progress and the systematic review of academic and discipline data for decision-making)
7. Developing and implementing a plan to ensure that general education, special education and other program personnel work together to effectuate the successful implementation of PS/RtI at the pilot school site
8. Allocating required resources (funds, designated time, staff) to facilitate professional development of teachers and other professional personnel at the school site
9. Working collaboratively with the Project Coach and Regional Coordinator in implementing PS/RtI at the school site
10. Providing dedicated time and resources for the Project Coach to work with classroom teachers and other school-based support personnel (as needed) to effectively support PS/RtI implementation at the school site
11. Allocating required personnel and other resources (e.g., teachers, administrative staff, time, materials) for full implementation of PS/RtI at the school site
12. Having in place adequate technology infrastructure and a data management system to support the PS/RtI initiative at the pilot school site
13. Reallocating resources based on data outcomes
14. Budgeting funds for PS/RtI supplies, materials, travel and substitutes for team trainings/meetings, etc.

School Leadership Team will commit to:

1. Implementing a team-based, problem-solving process to provide interventions for all students at the universal, targeted and intensive levels
2. Participating in PS/RtI trainings and networking meetings
3. Working collaboratively with the Project Coach and Regional Coordinator (as needed) to effectively implement PS/RtI at the school site
4. Meeting on a regular basis at specified times for school leadership team meetings
5. Collecting and using student outcome data for decision-making purposes
6. Working collaboratively with parents to ensure their involvement in PS/RtI planning, training and implementation activities
7. Using and submitting required student performance and other data (e.g., satisfaction surveys)
8. Developing an annual action plan for PS/RtI activities based on analysis of collected data

Appendix C

District Demographic Data Outline

1. Total student enrollment
2. Student enrollment
   - By grade level
   - By race/ethnicity
   - By SES (use eligibility for free and reduced lunch)
3. Number and percent (of student population) of LEP students
   - Overall
   - By grade level
4. Number and percent of students with disabilities (elementary level)
   - By grade
   - By race/ethnicity
   - By disability type
   - Analysis of disproportionality in the identification of students eligible for special education, if available
5. Student performance on FCAT in reading and mathematics
   - For all elementary level students
     - By grade level
     - By race/ethnicity
   - For elementary level students with disabilities
     - By grade level
     - By race/ethnicity
     - By disability
   - For LEP students
     - By grade level
6. Percent of students (at elementary level) who attained AYP in AY 2004-05 and AY 2005-06
   - overall
   - by grade level
   - by race/ethnicity
   - SES
   - LEP status
7. Number and percent of students retained in grade 3 based on performance on FCAT reading in
   - AY 2004-05
   - AY 2005-06

Appendix D

Pilot School Demographic Data Outline

(To be completed for <u>each</u> Proposed Pilot School)

1. Grade levels served (school site must at least house grades K – 3)

2. Total student enrollment (report number and percent)
   - By grade level
   - By race/ethnicity
   - By SES (based on eligibility for free and reduced lunch)

3. Number and percent (of student population) of LEP students
   - Overall
   - By grade level

4. Number and percentage of students with disabilities
   - By grade level
   - By disability type
   - By race/ethnicity
   - Analysis of disproportionality in the identification of students as eligible for special education, if available

5. Number and percent of students placed in ESE in AY 2004-05 and AY 2005-06
   - By grade level
   - By disability type
   - By race/ethnicity

6. Educational environment/least restrictive environment data for students with disabilities
   - By grade level
   - By disability type
   - By race/ethnicity
   - Analysis of disproportionality in placement of students, if available

7. Title I status (non-Title I, Title I targeted assistance, or Title I school-wide)

8. Student performance on FCAT in reading and mathematics
   - For all students
     - By grade level

        - By race/ethnicity
    - For students with disabilities
        - By grade level
        - By race/ethnicity
        - By disability
    - Analysis of performance gap between students with and without disabilities

9. Percent of students who attained AYP in AY 2004-05 and AY 2005-06 for reading and mathematics
    - overall
    - by grade level
    - by race/ethnicity
    - SES
    - LEP status

10. Number and percent of students retained in Grade 3 based on performance on FCAT reading in
    - AY 2004-05
    - AY 2005-06

11. School Grade (i.e., A through F) assigned by FLDOE based on 2005-06 school year: _____

12. Does your school currently have or ever had a Reading First Grant?
    _____Yes _____No

13. Does your school have a positive behavior support (PBS) program in place?
    ____ Yes ____No

Appendix E

Comparison School Demographic Data Outline

(To be completed for each Comparison School)

1. Identify pilot school for which school will serve as comparison

2. Grade levels served (school site must at least house grades K – 3)

3. Total student enrollment (report number and percent)
   - By grade level
   - By race/ethnicity
   - By SES (based on eligibility for free and reduced lunch)

4. Number and percent (of student population) of LEP students
   - Overall
   - By grade level

5. Number and percentage of students with disabilities
   - By grade level
   - By disability type
   - By race/ethnicity
   - Analysis of disproportionality in the identification of students as eligible for special education, if available

6. Number and percent of students placed in ESE in AY 2004-05 and AY 2005-06
   - By grade level
   - By disability type
   - By race/ethnicity

7. Educational environment/least restrictive environment data for students with disabilities
   - By grade level
   - By disability type
   - By race/ethnicity

- Analysis of disproportionality in placement of students, if available

8. Title I status (non-Title I, Title I targeted assistance, or Title I school-wide)

9. Student performance on FCAT in reading and mathematics
   - For all students
     - By grade level
     - By race/ethnicity
   - For students with disabilities
     - By grade level
     - By race/ethnicity
     - By disability
   - Analysis of performance gap between students with and without disabilities

10. Percent of students who attained AYP in AY 2004-05 and AY 2005-06 for reading and mathematics
    - overall
    - by grade level
    - by race/ethnicity
    - SES
    - LEP status

10. Number and percent of students retained in Grade 3 based on performance on FCAT reading in
    - AY 2004-05
    - AY 2005-06

11. School Grade (i.e., A through F) assigned by FLDOE based on 2005-06 school year: _____

12. Does your school currently have or ever had a Reading First Grant?
    _____Yes _____No

13. Does your school have a positive behavior support (PBS) program in place?
    _____Yes _____No

Appendix E: PS/RtI Demonstration District Mini-Grant Application

Evaluation Rubric

Proposal Evaluation Scoring Guide

Total points awarded will be an important consideration in the selection of demonstration districts. However, it also is important that a diversity of students, schools, and districts be represented in the demonstration districts and their pilot schools. Therefore, after all applications have been evaluated against the criteria below and have received a final score of from 0 to 175, additional factors will be considered prior to the selection of sites. Districts and pilot schools will be selected to include sites that are diverse with respect to:

1. Size of districts (i.e., small, medium, and large),
2. Geographic location,
3. Student population demographics
4. Inclusion of D/F schools

Evaluate the application from each district on the **Proposal Evaluation Form** according to the following criteria:

1. **District and Pilot Schools Commitment (50 *points*):** The proposal demonstrates clear administrative, programmatic and fiscal commitment (including the required letters of commitment) to fully implementing PS/RtI and a capacity to fulfill the demonstration site's requirements as outlined in Appendix B. ***(Note: District=20, mean rating across pilot schools = 30)***

2. **District and Pilot and Comparison Schools' Demographic Data (*30 points*):** The proposal provides detailed and current demographic data for the district and each proposed pilot school as required in Appendices C, D and E respectively. It provides a clear picture of the district's and pilot and comparison schools' status on the indicators given. ***(Note: District=10, mean rating across pilot schools =15, mean rating across, comparison schools =5)***

3. **Statement of Need and Expected Outcomes (*35 points*):** The proposal clearly defines each pilot school's needs that will be addressed through participation as demonstration sites and provides convincing evidence that without assistance from the project, these needs would not be met. The proposal also delineates projected student and school outcomes, including outcomes for specific target populations that: a) are measurable, b) are clearly linked to the identified needs, and c) that demonstrate an increased capacity to support students' academic and behavioral performance in the general education environment**.*(Note: Mean rating across pilot schools=35)***

4. **District and School Experience with Initiatives and Programs (20 *points*):** The proposal describes in detail the level of district and school involvement in academic and/or behavioral initiatives and programs, resulting in a comprehensive picture of the district's and each pilot school's current systemic capacity. ***(Note: District=10, mean rating across pilot schools =10)***

5. **District Personnel Resources and Technology (*15 points*).** The proposal clearly identifies personnel assigned to the PS/RtI initiative at a) the district level, and b) each proposed pilot school site and the percent FTE each is assigned to the initiative. It provides a clear picture of personnel qualifications and experience to support implementation of PS/RtI. Technology resources and a data management system to support the initiative at the district and school site level are clearly delineated (***Note: District = 6, mean rating across pilot schools =9*)**

6. **Inclusion of D/F Schools (*25 points*).** D or F schools are represented among the proposed pilot schools sites.

Total Possible Score = 175 points

Proposal Evaluation Form

School District: ____________________   **Reviewer: ____________________**

Date of Review: ____________________

Refer to the **Proposal Evaluation Scoring Guide** for an explanation of factors to be considered in evaluating each of the following areas:

1. **District and Pilot Schools Commitment (Total Possible Points = 50)**

District Rating (0 to 20 Points) _____

Pilot Schools (0 to 30 Points Each)

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

<u>Mean</u> Pilot School Rating (0 to 30 Points) _____

Subtotal Points Awarded (District plus Mean Pilot Schools) =

Comments:

2. District and Pilot and Comparison Schools' Demographic Data (Total Possible Points = 30)

District Rating (0 to 10 Points) _____

Pilot Schools (0 to 15 Each)	Comparison Schools (0 to 5 Each)
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____
4. _____	4. _____
5. _____	5. _____
6. _____	6. _____

Mean Pilot School Rating (0 to 15) _____

Mean Comparison School Rating (0 to 5) _____

Subtotal Points Awarded (District, plus Mean Pilot, plus mean Comp) =

Comments:

3. Statement of Need and Expected Outcomes (Total Possible Points = 35)

Pilot School Ratings (0 to 35 Each):

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Subtotal Points Awarded (Mean Rating for Pilot Schools) =

Comments:

4. District and School Experience with Initiatives and Programs (Total Possible Points = 20)

District Rating (0 to 10 Points) ______

Pilot School Ratings (0 to 10 Points Each):

1. ______
2. ______
3. ______
4. ______
5. ______
6. ______

Mean Pilot School Rating (0 to 10) ______

Subtotal Points Awarded (District plus Mean for Pilot Schools) =

Comments:

5. District Personnel Resources and Technology (Total Possible Points = 15)

District Rating (0 to 6 Points) ______

Pilot School Ratings (0 to 9 Points Each):

1. ______
2. ______
3. ______
4. ______
5. ______
6. ______

Mean Pilot School Rating (0 to 9) ______

Subtotal Points Awarded (District plus Mean for Pilot Schools) =

Comments:

6. **Inclusion of D/F Schools**

(Total Possible Points = 25)

Subtotal Points Awarded =

Total Application Points Awarded:

Criterion Area

1. ______
2. ______
3. ______
4. ______
5. ______
6. ______

TOTAL POINTS AWARDED (0 to 175) =

SIZE OF DISTRICT (Small, Medium, Large) __________

GEOGRAPHIC REGION __________

Appendix F: Example Validation Forms

Problem-Solving/Response-to-Intervention Beliefs Survey Content Validation – Item Content and Clarification Rating Form

Directions:

The Problem-Solving/Response-to-Intervention Beliefs Survey is intended to capture the degree to which school and district personnel possess the beliefs necessary for successful implementation of the Problem-Solving/Response-to-Intervention (PS/RtI) model. The items on the survey are designed to assess the beliefs of school and district personnel in one or more of the following domains; overall educational philosophy, assessment practices, core instruction, intervention, and special education eligibility determination. Florida PS/RtI Project staff will use the data derived from the survey to inform the services provided to schools.

A good survey is concise, contains clearly and accurately written items that relate to the purpose of the survey, and avoids duplicate items. To evaluate the degree to which the attached survey meets these criteria, please rate each item on the basis of appropriateness of content, necessity, and clarity. Read each question carefully and rate it by circling one or more of the following descriptors:

G = Good (Item is clearly and accurately written);

R = Redundant (There are items with similar content and meaning);

N = Nonessential (The content is non-related to any of the five PS/RtI belief domains);

PW = Poorly Written (Item has semantic or grammatical errors);

A = **Ambiguous** (Item has abstract or vague content, or double-barreled items that ask two questions in one statement).

If you have found an item to be problematic (i.e., you circled it with **R, N, PW,** or **A**), please provide suggestions by rewriting the item in the space below, or write: **"Delete item"** if you believe the item does not address beliefs related to PS/RtI.

This survey will be completed by school and district personnel participating in PS/RtI training across the state of Florida. Respondents will be asked to rate the degree to which they agree with each PS/RtI belief on a 5-point continuum of strongly disagree to strongly agree. For your information, school and district personnel will use the following ratings:

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

<u>Problem-Solving/Response-to-Intervention Beliefs Survey</u>

G=Good R=Redundant N=Nonessential PW=Poorly Written A=Ambiguous

<u>Essential PS/RtI Beliefs ________________ Content and Clarity Ratings</u>

1. I believe in the philosophy of No Child Left Behind (NCLB) even if I disagree with some of the requirements. G R N PW A

Rewrite:

____

2. Core instruction should be effective enough to result in 80% of the students achieving benchmarks in reading and math. G R N PW A

Rewrite:

____

3. The primary function of supplemental instruction is to ensure that students meet grade-level benchmarks in reading and math. G R N PW A

Rewrite:

____

4. The majority of student with learning disabilities achieve grade-level benchmarks in reading and math. G R N PW A

Rewrite:

5. The majority of students with behavioral problems (EH/SED) achieve grade-level benchmarks in reading and math. G R N PW A

Rewrite:

6. Students with disabilities who are receiving special education services are capable of achieving grade-level benchmarks in reading and math. G R N PW A

Rewrite:

7. General education teachers should implement more differentiated and flexible curricula to address the needs of a more diverse student body. G R N PW A

Rewrite:

8. General education classroom teachers would be able to implement more differentiated and flexible interventions if they had additional staff support. G R N PW A

Rewrite:

9. The availability of additional interventions in the general education classroom would result in success for more students. G R N PW A

Rewrite:

---

10. Prevention activities and early intervention strategies in schools would result in fewer referrals to problem-solving teams and placements in special education. G R N PW A

Rewrite:

---

11. The “severity” of a student’s problem is determined not by how far behind (or inappropriate) a student is but by how quickly a student responds to intervention. G R N PW A

Rewrite:

---

12. The results of IQ and achievement testing can be used to identify effective interventions for students with learning and behavior problems. G R N PW A

Rewrite:

---

13. Many students currently identified as “LD” do not have a disability, but came to school “not ready” or got too far behind for the available interventions to close the gap sufficiently. G R N PW A

Rewrite:

---

14. Using student-based data to determine intervention effectiveness is more accurate than using "teacher judgment." G R N PW A

Rewrite:

---

15. Evaluating a student's response to interventions is a more effective way of determining what a student is capable of than using scores from "tests" (e.g., IQ/Achievement). G R N PW A

Rewrite:

---

16. Time and resources should be given first to students who are not reaching benchmarks before significant time and resources are directed to students who are at or above benchmark. G R N PW A

Rewrite:

---

17. It is easier for me to make decisions about student performance and needed interventions when the student data are graphed. G R N PW A

Rewrite:

---

18. Parents should be involved in the problem-solving process as soon as a teacher has a concern about a particular student. G R N PW A

Rewrite:

19. Students respond better to interventions when the parent is involved in the development and implementation of those interventions. G R N PW A

Rewrite:

20. All students can achieve grade-level benchmarks if they have sufficient support. G R N PW A

Rewrite:

If you believe that there are other important questions not addressed in this survey that would help identify the degree to which school and district personnel posses the beliefs necessary to implement the PS/RtI model, please list them below and state the domain (i.e., overall educational philosophy, assessment practices, core instruction, intervention, and special education eligibility determination) that it characterizes:

Thank you for your assistance with this important step in validating a measure to capture the beliefs of school and district personnel as they relate to PS/RtI.

Perception of Skills Survey Content Validation – Item Content and Clarification Rating Form

Directions:

The Perception of Skills Survey is intended to capture the degree to which school and district personnel perceive that they have the skills needed to function within a Problem-Solving/Response-to-Intervention (PS/RtI) model. The items on the survey are designed to assess school and district personnel perceptions about their skills in one or more of the following domains; data-based decision-making, tiered service delivery, the problem-solving process, data collection procedures, technology use, and special education eligibility determination. Florida PS/RtI Project staff will use the data derived from the survey to inform the services provided to schools.

A good survey is concise, contains clearly and accurately written items that relate to the purpose of the survey, and avoids duplicate items. To evaluate the degree to which the attached survey meets these criteria, please rate each item on the basis of appropriateness of content, necessity, and clarity. Read each question carefully and rate it by circling one or more of the following descriptors:

G = Good (Item is clearly and accurately written);

R = Redundant (There are items with similar content and meaning);

N = Nonessential (The content is non-related to any of the five PS/RtI belief domains);

PW = Poorly Written (Item has semantic or grammatical errors);

A = **Ambiguous** (Item has abstract or vague content, or double-barreled items that ask two questions in one statement).

If you have found an item to be problematic (i.e., you circled it with **R, N, PW,** or **A**), please provide suggestions by rewriting the item in the space below, or write: **"Delete item"** if you believe the item does not address skills needed in a PS/RtI model.

This survey will be completed by school and district personnel participating in PS/RtI training across the state of Florida. Respondents will be asked to rate the degree to which they possess each skill on a 5-point continuum of <u>I do not have this skill at all</u> to <u>I could teach others this skill</u>. For your information, school and district personnel will use the following ratings:

1 = I do not have this skill at all

2 = I need substantial support to use this skill

3 = I have this skill, but still need some support

4 = I can use this skill with little support

5 = I could teach others this skill

Perceptions of Skills Survey

G=Good R=Redundant N=Nonessential PW=Poorly Written A=Ambiguous

Skills Content and Clarity Ratings

1. I know how *to access* the data necessary to determine the percent of students in core instruction who are achieving benchmarks in: G R N PW A
   a. Academics
   b. Behavior

Rewrite: ______________________________

2. I have the skill to use the data *to make decisions* about the effectiveness of the core curriculum for individuals and groups of students for: G R N PW A
   a. Academics
   b. Behavior

Rewrite: ______________________________

3. Please rate your skill level on each of the following steps in the problem identification (i.e., referral reason) stage of problem-solving:
   a. Defining the referral concern in terms of a replacement behavior (what you want the student to be able to do) instead of a referral *problem* for: G R N PW A

    1. Academics
    2. Behavior

Rewrite:

---

b. Using data to define the current level of performance for the target student for: G R N PW A
    1. Academics
    2. Behavior

Rewrite:

---

c. Determining the desired level of performance (i.e., benchmark) for: G R N PW A
    1. Academics
    2. Behavior

Rewrite:

---

d. Determining current level of peer performance on the same behavior as the target student for: G R N PW A
    1. Academics
    2. Behavior

Rewrite:

---

e. Calculating the gap between student performance and the benchmark for: G R N PW A
    1. Academics
    2. Behavior

Rewrite:

---

f. Using gap data to determine whether core instruction should be modified or whether supplemental instruction should be directed to the target student for: G R N PW A
    1. Academics
    2. Behavior

Rewrite:

---

4. I have the skill to identify the appropriate supplemental intervention in my building for a student identified as at-risk for: G R N PW A
    a. Academics
    b. Behavior

Rewrite:

---

5. I have the skill to develop potential reasons (i.e., hypotheses) why a student or group of students is/are not achieving desired levels of performance (i.e., benchmarks) for: G R N PW A
    a. Academics
    b. Behavior

Rewrite:

---

6. I have the skill to determine the most appropriate type(s) of data to use to determine which reasons (i.e., G R N PW A

hypotheses) are likely to be contributing to the problem for:

a. Academics
b. Behavior

Rewrite:

---

7. I have the skills to access sources (e.g., myself, internet sources, professional journals) to develop evidence-based interventions for: G R N PW A
   a. Academic core curricula
   b. Behavioral core curricula
   c. Academic supplemental curricula
   d. Behavioral supplemental curricula
   e. Academic individualized intervention plans
   f. Behavioral individualized intervention plans

Rewrite:

---

8. I have the skill to ensure that any supplemental and/or intensive interventions are integrated with core instruction in the general education classroom: G R N PW A
   a. Academics
   b. Behavior

Rewrite:

---

9. I have the skill to ensure that the proposed intervention plan is supported by the data that were collected: G R N PW A
   a. Academics
   b. Behavior

Rewrite:

10. I have the skill to provide the support necessary to ensure that the intervention is implemented appropriately for: G R N PW A
    a. Academics
    b. Behavior

Rewrite:

---

11. I have the skill to determine if an intervention was implemented the way it was supposed to be for: G R N PW A
    a. Academics
    b. Behavior

Rewrite:

---

12. I have the skill to select appropriate data (e.g., CBM, DIBELS, FCAT, behavioral observations) to use to progress monitor student performance during interventions: G R N PW A
    a. Academics
    b. Behavior

Rewrite:

---

13. I have the skill(s) to demonstrate the following graphing skills for large group, small group, and individual students: G R N PW A
    a. Graph target student data
    b. Graph benchmark data
    c. Graph peer data
    d. Draw an aimline

e. Draw a trendline

Rewrite:

---

14. I have the skill to use progress monitoring data displayed on a graph to make decisions about the degree to which a student is responding to intervention (e.g., positive, questionable or poor response). G R N PW A

Rewrite:

---

15. I have the skill to make intervention recommendations based on the type of student(s) response to intervention. G R N PW A

Rewrite:

---

16. I have the skill to differentiate between students who have not learned skills (e.g., wait to fail, not ready, got too far behind) from those who have barriers to learning due to a disability. G R N PW A

Rewrite:

---

17. I have the skills to conduct the following data collection procedures: G R N PW A
    a. CBM
    b. DIBELS
    c. Accessing data from appropriate district- or school-wide assessments
    d. Standard behavioral observations
    e. Disaggregating data by race, gender,

free/reduced lunch, language proficiency, and disability status

Rewrite:

---

18. I have skills to use technology in the following ways:
    a. Access the internet to locate sources of academic and behavioral evidence-based interventions. G R N PW A
    b. Use electronic data collection tools (e.g., PDAs)
    c. Use the Progress Monitoring and Reporting Network (PMRN)
    d. Use the School-Wide Information System (SWIS) for Positive Behavior Support
    e. Graph and display student and school data

Rewrite:

---

19. I have the skills to facilitate a PS/RtI meeting G R N PW A

Rewrite:

If you believe that there are other important questions not addressed in this survey that would help identify the degree to which school and district personnel perceive they possess the skills needed in a PS/RtI model, please list them below and state the domain (i.e., data-based decision-making, tiered service delivery, the problem-solving process, data collection procedures, technology use, and special education eligibility determination) that it characterizes:

Thank you for your assistance with this important step in validating a measure to capture school and district personnel perceptions about the degree to which they possess skills needed in a PS/RtI model.

Appendix G: Beliefs Survey

Beliefs Survey

1. **Your PS/RtI Project ID:** →

Your PS/RtI Project ID was designed to assure confidentiality while also providing a method to match an individual's responses across instruments. In the space provided (first row), please write in the last four digits of your Social Security Number and the last two digits of the year you were born. Then, shade in the corresponding circles.

0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

***Directions**: For items 2-5 below, please shade in the circle next to the response option that best represents your answer.*

2. Job Description:
   - ○ PS/RtI Coach
   - ○ Teacher-General Education
   - ○ Teacher-Special Education
   - ○ School Counselor
   - ○ School Psychologist
   - ○ School Social Worker
   - ○ Principal
   - ○ Assistant Principal

   Other (Please specify): ______________________________

3. Years of Experience in Education:
   - ○ Less than 1 year
   - ○ 1 – 4 years
   - ○ 5-9 years
   - ○ 10 – 14 years
   - ○ 15-19 years
   - ○ 20-24 years
   - ○ 25 or more years
   - ○ Not applicable

4. Number of Years in your Current Position:
   - ○ Less than 1 year
   - ○ 1 – 4 years
   - ○ 5-9 years
   - ○ 10 – 14 years
   - ○ 15-19 years
   - ○ 20 or more years

5. Highest Degree Earned:
   - ○ B.A./B.S.
   - ○ M.A./M.S.
   - ○ Ed.S.
   - ○ Ph.D./Ed.D.

   Other (Please specify): ______________________________

***Directions**: Using the scale below, please indicate your level of agreement or disagreement with each of the following statements by shading in the circle that best represents your response.*

① = Strongly Disagree (SD)
② = Disagree (D)
③ = Neutral (N)
④ = Agree (A)
⑤ = Strongly Agree (SA)

	SD	D	N	A	SA
6. I believe in the philosophy of No Child Left Behind (NCLB) even if I disagree with some of the requirements.	①	②	③	④	⑤
7. Core instruction should be effective enough to result in 80% of the students achieving benchmarks in					
7.a. reading	①	②	③	④	⑤
7.b. math	①	②	③	④	⑤
8. The primary function of supplemental instruction is to ensure that students meet grade-level benchmarks in					
8.a. reading	①	②	③	④	⑤
8.b. math	①	②	③	④	⑤
9. The majority of students with learning disabilities achieve grade-level benchmarks in					
9.a. reading	①	②	③	④	⑤
9.b. math	①	②	③	④	⑤
10. The majority of students with behavioral problems (EH/SED or EBD) achieve grade-level benchmarks in					
10.a. reading	①	②	③	④	⑤
10.b. math	①	②	③	④	⑤
11. Students with high-incidence disabilities (e.g. SLD, EBD) who are receiving special education services are capable of achieving grade-level benchmarks (i.e., general education standards) in					
11.a. reading	①	②	③	④	⑤
11.b. math	①	②	③	④	⑤
12. General education classroom teachers should implement more differentiated and flexible instructional practices to address the needs of a more diverse student body.	①	②	③	④	⑤

	SD	D	N	A	SA
13. General education classroom teachers would be able to implement more differentiated and flexible interventions if they had additional staff support.	①	②	③	④	⑤
14. The use of additional interventions in the general education classroom would result in success for more students.	①	②	③	④	⑤
15. Prevention activities and early intervention strategies in schools would result in fewer referrals to problem-solving teams and placements in special education.	①	②	③	④	⑤
16. The "severity" of a student's academic problem is determined not by how far behind the student is in terms of his/her academic performance but by how quickly the student responds to intervention.	①	②	③	④	⑤
17. The "severity" of a student's behavioral problem is determined not by how inappropriate a student is in terms of his/her behavioral performance but by how quickly the student responds to intervention.	①	②	③	④	⑤
18. The results of IQ and achievement testing can be used to identify effective interventions for students with learning and behavior problems.	①	②	③	④	⑤
19. Many students currently identified as "LD" do not have a disability, rather they came to school "not ready" to learn or fell too far behind academically for the available interventions to close the gap sufficiently.	①	②	③	④	⑤
20. Using student-based data to determine intervention effectiveness is more accurate than using only "teacher judgment."	①	②	③	④	⑤
21. Evaluating a student's response to interventions is a more effective way of determining what a student is capable of achieving than using scores from "tests" (e.g., IQ/Achievement test).	①	②	③	④	⑤
22. Additional time and resources should be allocated first to students who are not reaching benchmarks (i.e., general education standards) before significant time and resources are directed to students who are at or above benchmarks.	①	②	③	④	⑤
23. Graphing student data makes it easier for one to make decisions about student performance and needed interventions.	①	②	③	④	⑤
24. A student's parents (guardian) should be involved in the problem-solving process as soon as a teacher has a concern about the student.	①	②	③	④	⑤

	SD	D	N	A	SA
25. Students respond better to interventions when their parent (guardian) is involved in the development and implementation of those interventions.	1	2	3	4	5
26. All students can achieve grade-level benchmarks if they have sufficient support.	1	2	3	4	5
27. The goal of assessment is to generate and measure effectiveness of instruction/intervention.	1	2	3	4	5

THANK YOU!

Appendix H: Perceptions of Skills Survey

Perceptions of RtI Skills Survey

1. **Your PS/RtI Project ID:** →
   Your PS/RtI Project ID was designed to assure confidentiality while also providing a method to match an individual's responses across instruments. In the space provided (first row), please write in the last four digits of your Social Security Number and the last two digits of the year you were born. Then, shade in the corresponding circles.

0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

Directions: *Please read each statement about a skill related to assessment, instruction, and/or intervention below, and then evaluate YOUR skill level within the context of working at a school/building level. Where indicated, rate your skill separately for academics (i.e., reading and math) and behavior. Please use the following response scale*:

1 = **I do not have this skill at all (NS)**
2 = **I have minimal skills in this area; need substantial support to use it (MnS)**
3 = **I have this skill, but still need some support to use it (SS)**
4 = **I can use this skill with little support (HS)**
5 = **I am highly skilled in this area and could teach others this skill (VHS)**

The skill to:	NS	MnS	SS	HS	VHS
2. *Access* the data necessary to determine the percent of students in core instruction who are achieving benchmarks (district grade-level standards) in:					
a. Academics	1	2	3	4	5
b. Behavior	1	2	3	4	5
3. Use data *to make decisions* about individuals and groups of students for the:					
a. Core academic curriculum	1	2	3	4	5
b. Core/Building discipline plan	1	2	3	4	5

The skill to:	NS	M nS	SS	HS	V HS
4. Perform each of the following steps when identifying the problem for a student for whom concerns have been raised:					
a. Define the referral concern in terms of a replacement behavior (i.e., what the student should be able to do) instead of a referral *problem* for:					
• Academics	1	2	3	4	5
• Behavior	1	2	3	4	5
b. Use data to define the current level of performance of the target student for:					
• Academics	1	2	3	4	5
• Behavior	1	2	3	4	5
c. Determine the desired level of performance (i.e., benchmark) for:					
• Academics	1	2	3	4	5
• Behavior	1	2	3	4	5
d. Determine the current level of peer performance for the same skill as the target student for:					
• Academics	1	2	3	4	5
• Behavior	1	2	3	4	5
e. Calculate the gap between student current performance and the benchmark (district grade level standard) for:					
• Academics	1	2	3	4	5
• Behavior	1	2	3	4	5
f. Use gap data to determine whether core instruction should be adjusted or whether supplemental instruction should be directed to the target student for:					
• Academics	1	2	3	4	5
• Behavior	1	2	3	4	5
5. Develop potential reasons (hypotheses) that a student or group of students is/are not achieving desired levels of performance (i.e., benchmarks) for:					
a. Academics	1	2	3	4	5
b. Behavior	1	2	3	4	5
6. Identify the most appropriate type(s) of data to use for determining reasons (hypotheses) that are likely to be contributing to the problem for:					
a. Academics	1	2	3	4	5
b. Behavior	1	2	3	4	5

The skill to:	NS	M nS	SS	HS	V HS
7. Identify the appropriate supplemental intervention available in my building for a student identified as at-risk for:					
a. Academics	①	②	③	④	⑤
b. Behavior	①	②	③	④	⑤
8. Access resources (e.g., internet sources, professional literature) to develop evidence-based interventions for:					
a. Academic core curricula	①	②	③	④	⑤
b. Behavioral core curricula	①	②	③	④	⑤
c. Academic supplemental curricula	①	②	③	④	⑤
d. Behavioral supplemental curricula	①	②	③	④	⑤
e. Academic individualized intervention plans	①	②	③	④	⑤
f. Behavioral individualized intervention plans	①	②	③	④	⑤
9. Ensure that any supplemental and/or intensive interventions are integrated with core instruction in the general education classroom:					
a. Academics	①	②	③	④	⑤
b. Behavior	①	②	③	④	⑤
10. Ensure that the proposed intervention plan is supported by the data that were collected for:					
a. Academics	①	②	③	④	⑤
b. Behavior	①	②	③	④	⑤
11. Provide the support necessary to ensure that the intervention is implemented appropriately for:					
a. Academics	①	②	③	④	⑤
b. Behavior	①	②	③	④	⑤
12. Determine if an intervention was implemented as it was intended for:					
a. Academics	①	②	③	④	⑤
b. Behavior	①	②	③	④	⑤
13. Select appropriate data (e.g., Curriculum-Based Measurement, DIBELS, FCAT, behavioral observations) to use for progress monitoring of student performance during interventions:					
a. Academics	①	②	③	④	⑤
b. Behavior	①	②	③	④	⑤

The skill to:	NS	M nS	SS	HS	V HS
14. Construct graphs for large group, small group, and individual students:					
a. Graph target student data	1	2	3	4	5
b. Graph benchmark data	1	2	3	4	5
c. Graph peer data	1	2	3	4	5
d. Draw an aimline	1	2	3	4	5
e. Draw a trendline	1	2	3	4	5
15. Interpret graphed progress monitoring data to make decisions about the degree to which a student is responding to intervention (e.g., positive, questionable or poor response).	1	2	3	4	5
16. Make modifications to intervention plans based on student response to intervention.	1	2	3	4	5
17. Use appropriate data to differentiate between students who have not learned skills (e.g., did not have adequate exposure to effective instruction, not ready, got too far behind) from those who have barriers to learning due to a disability.	1	2	3	4	5
18. Collect the following types of data:					
a. Curriculum-Based Measurement	1	2	3	4	5
b. DIBELS	1	2	3	4	5
c. Access data from appropriate district- or school-wide assessments	1	2	3	4	5
d. Standard behavioral observations	1	2	3	4	5
19. Disaggregate data by race, gender, free/reduced lunch, language proficiency, and disability status	1	2	3	4	5
20. Use technology in the following ways:					
a. Access the internet to locate sources of academic and behavioral evidence-based interventions.	1	2	3	4	5
b. Use electronic data collection tools (e.g., PDAs)	1	2	3	4	5
c. Use the Progress Monitoring and Reporting Network (PMRN)	1	2	3	4	5
d. Use the School-Wide Information System (SWIS) for Positive Behavior Support	1	2	3	4	5
e. Graph and display student and school data	1	2	3	4	5
21. Facilitate a Problem Solving Team (Student Support Team, Intervention Assistance Team, School-Based Intervention Team, Child Study Team) meeting.	1	2	3	4	5

THANK YOU!

Appendix I: Tiers I & II Critical Components Checklist

Tiers I and II Critical Components Checklist

School: ________________________ **Target Area:** ☐ Reading ☐ Math ☐Behavior

Window: ☐ 1 ☐ 2 ☐ 3 **Grade Level (if applicable):** ______________

<u>Directions</u>: For each selected target area and grade-level, please use the scale provided to indicate the degree to which each critical component of a Problem-Solving/Response to Intervention (PS/RtI) model is present in paperwork (i.e., permanent products) derived from data meetings (i.e., meetings in which the PS/RtI model is used to examine Tier I and/or II instruction). See the attached rubric for the criteria for determining the degree to which each critical component is present in the paperwork.

Component	0 = Absent 1 = Partially Present 2 = Present N/A = Not Applicable	Evidence/Comments
Problem Identification		
1. Data were used to determine the effectiveness of core instruction	0 1 2	
2. Decisions were made to modify core instruction or to develop supplemental (Tier II) interventions	0 1 2	
3. Universal screening (e.g., DIBELS, ODRs) or other data sources (e.g., district-wide assessments) were used to identify groups of students in need of supplemental intervention	0 1 2	
Problem Analysis		
4. The school-based team generated hypotheses to identify potential reasons for students not meeting benchmarks	0 1 2	
5. Data were used to determine viable or active hypotheses for why students were not attaining benchmarks	0 1 2	
Intervention Development and Implementation		
6. Modifications were made to core instruction		
a. A plan for implementation of modifications to core instruction was documented	0 1 2 N/A	
b. Support for implementation of modifications to core instruction was documented	0 1 2 N/A	
c. Documentation of implementation of modifications to core instruction was provided	0 1 2 N/A	

Component	**0 = Absent 1 = Partially Present 2 = Present N/A = Not Applicable**	**Evidence/Comments**
7. Supplemental (Tier II) instruction was developed or modified		
a. A plan for implementation of supplemental instruction was documented	0 1 2 N/A	
b. Support for implementation of supplemental instruction was documented	0 1 2 N/A	
c. Documentation of implementation of supplemental instruction was provided	0 1 2 N/A	
Program Evaluation/RtI		
8. Criteria for positive response to intervention were defined	0 1 2	
9. Progress monitoring and/or universal screening data were collected/scheduled	0 1 2	
10. A decision regarding student RtI was documented	0 1 2	
11. A plan for continuing, modifying, or terminating the intervention plan was provided	0 1 2	

Additional Comments:

____
____
____
____
____
____

Appendix J: Self Assessment of Problem-Solving Implementation (SAPSI)

Self-Assessment of Problem Solving Implementation (SAPSI)*

PS/RtI Implementation Assessment

Directions:
In responding to each item below, please use the following response scale:

Not Started (*N*) — (The activity occurs less than 24% of the time)
In Progress (*I*) — (The activity occurs approximately 25% to 74% of the time)
Achieved (*A*) — (The activity occurs approximately 75% to 100% of the time)
Maintaining (*M*) — (The activity was rated as achieved last time and continues to occur approximately 75% to 100% of the time)

For each item below, please write the letter of the option (N, I, A, M) that best represents your School-Based Leadership Team's response in the column labeled "Status". In the column labeled "Comments/Evidence", please write any comments, explanations and/or evidence that are relevant to your team's response. When completing the items on the SAPSI, the team should base its responses on the grade levels being targeted for implementation by the school.

Consensus: ***Comprehensive Commitment and Support***	**Status**	**Comments/Evidence**
1. District level leadership provides active commitment and support (e.g., meets to review data and issues at least twice each year).		
2. The school leadership provides training, support and active involvement (e.g., principal is actively involved in School-Based Leadership Team meetings).		
3. Faculty/staff support and are actively involved with problem solving/RtI (e.g., one of top 3 goals of the School Improvement Plan, 80% of faculty document support, 3-year timeline for implementation available).		
4. A School-Based Leadership Team is established and represents the roles of an administrator, facilitator, data mentor, content specialist, parent, and teachers from representative areas (e.g., general ed., special ed.)		
5. Data are collected (e.g., beliefs survey, satisfaction survey) to assess level of commitment and impact of PS/RtI on faculty/staff.		

Additional Comments/Evidence:

* Adapted from the IL-ASPIRE SAPSI v. 1.6
Center for School Evaluation, Intervention and Training (CSEIT)
Loyola University Chicago

PS/RtI Implementation Assessment (Cont'd)

Scale: Not Started (*N*) — (The activity occurs less than 24% of the time)
In Progress (*I*) — (The activity occurs approximately 25% to 74% of the time)
Achieved (*A*) — (The activity occurs approximately 75% to 100% of the time)
Maintaining (*M*) — (The activity was rated as achieved last time and continues to occur approximately 75% to 100% of the time)

Infrastructure Development: ***Data Collection and Team Structure***	**Status**	**Comments/Evidence**
6. School-wide data (e.g., DIBELS, Curriculum-Based Measures, Office Discipline Referrals) are collected through an efficient and effective systematic process.		
7. Statewide and other databases (e.g., Progress Monitoring and Reporting Network [PMRN], School-Wide Information System [SWIS]) are used to make data-based decisions.		
8. School-wide data are presented to staff after each benchmarking session (e.g., staff meetings, team meetings, grade-level meetings).		
9. School-wide data are used to evaluate the effectiveness of core academic programs.		
10. School-wide data are used to evaluate the effectiveness of core behavior programs.		
11. Curriculum-Based Measurement (e.g., DIBELS) data are used in conjunction with other data sources to identify students needing targeted group interventions and individualized interventions for academics.		
12. Office Disciplinary Referral data are used in conjunction with other data sources to identify students needing targeted group interventions and individualized interventions for behavior.		
13. Data are used to evaluate the effectiveness (RtI) of Tier 2 intervention programs.		
14. Individual student data are utilized to determine response to Tier 3 interventions.		
15. Special Education Eligibility determination is made using the RtI model for the following ESE programs:		
a. Emotional/Behavioral Disabilities (EBD)		
b. Specific Learning Disabilities (SLD)		

* Adapted from the IL-ASPIRE SAPSI v. 1.6
Center for School Evaluation, Intervention and Training (CSEIT)
Loyola University Chicago

PS/RtI Implementation Assessment (Cont'd)

Scale: Not Started (*N*) — (The activity occurs less than 24% of the time)
In Progress (*I*) — (The activity occurs approximately 25% to 74% of the time)
Achieved (*A*) — (The activity occurs approximately 75% to 100% of the time)
Maintaining (*M*) — (The activity was rated as achieved last time and continues to occur approximately 75% to 100% of the time)

Infrastructure Development: ***Data Collection and Team Structure (Cont'd)***	**Status**	**Comments/Evidence**
16. The school staff has a process to select evidence-based practices.		
a. Tier 1		
b. Tier 2		
c. Tier 3		
17. The School-Based Leadership Team has a regular meeting schedule for problem-solving activities.		
18. The School-Based Leadership Team evaluates target student's/students' RtI at regular meetings.		
19. The School-Based Leadership Team involves parents.		
20. The School-Based Leadership Team has regularly scheduled data day meetings to evaluate Tier 1 and Tier 2 data.		

Additional Comments/Evidence:

* Adapted from the IL-ASPIRE SAPSI v. 1.6
Center for School Evaluation, Intervention and Training (CSEIT)
Loyola University Chicago

PS/RtI Implementation Assessment (Cont'd)

Scale: Not Started (*N*) — (The activity occurs less than 24% of the time)
In Progress (*I*) — (The activity occurs approximately 25% to 74% of the time)
Achieved (*A*) — (The activity occurs approximately 75% to 100% of the time)
Maintaining (*M*) — (The activity was rated as achieved last time and continues to occur approximately 75% to 100% of the time)

Implementation: ***Three-Tiered Intervention System and Problem-Solving Process***	**Status**	**Comments/Evidence**
21. The school has established a three-tiered system of service delivery.		
a. Tier 1 Academic Core Instruction clearly identified.		
b. Tier 1 Behavioral Core Instruction clearly identified.		
c. Tier 2 Academic Supplemental Instruction/Programs clearly identified.		
d. Tier 2 Behavioral Supplemental Instruction/Programs clearly identified.		
e. Tier 3 Academic Intensive Strategies/Programs are evidence-based.		
f. Tier 3 Behavioral Intensive Strategies/Programs are evidence-based.		
22. Teams (e.g., School-Based Leadership Team, Problem-Solving Team, Intervention Assistance Team) implement effective problem solving procedures including:		
a. Problem is defined as a data-based discrepancy (GAP Analysis) between what is expected and what is occurring (includes peer and benchmark data).		
b. Replacement behaviors (e.g., reading performance targets, homework completion targets) are clearly defined.		
c. Problem analysis is conducted using available data and evidence-based hypotheses.		
d. Intervention plans include evidence-based (e.g., research-based, data-based) strategies.		
e. Intervention support personnel are identified and scheduled for all interventions.		

* Adapted from the IL-ASPIRE SAPSI v. 1.6
Center for School Evaluation, Intervention and Training (CSEIT)
Loyola University Chicago

PS/RtI Implementation Assessment (Cont'd)

Scale: Not Started (*N*) — (The activity occurs less than 24% of the time)
In Progress (*I*) — (The activity occurs approximately 25% to 74% of the time)
Achieved (*A*) — (The activity occurs approximately 75% to 100% of the time)
Maintaining (*M*) — (The activity was rated as achieved last time and continues to occur approximately 75% to 100% of the time)

Implementation: ***Three-Tiered Intervention System and Problem-Solving Process (Cont'd)***	**Status**	**Comments/Evidence**
f. Intervention integrity is documented.		
g. Response to intervention is evaluated through systematic data collection.		
h. Changes are made to intervention based on student response.		
i. Parents are routinely involved in implementation of interventions.		

Additional Comments/Evidence:

* Adapted from the IL-ASPIRE SAPSI v. 1.6
Center for School Evaluation, Intervention and Training (CSEIT)
Loyola University Chicago

PS/RtI Implementation Assessment (Cont'd)

Scale: Not Started (*N*) — (The activity occurs less than 24% of the time)
In Progress (*I*) — (The activity occurs approximately 25% to 74% of the time)
Achieved (*A*) — (The activity occurs approximately 75% to 100% of the time)
Maintaining (*M*) — (The activity was rated as achieved last time and continues to occur approximately 75% to 100% of the time)

Implementation: ***Monitoring and Action Planning***	**Status**	**Comments/Evidence**
23. A strategic plan (implementation plan) exists and is used by the School-Based Leadership Team to guide implementation of PS/RtI.		
24. The School-Based Leadership Team meets at least twice each year to review data and implementation issues.		
25. The School-Based Leadership Team meets at least twice each year with the District Leadership Team to review data and implementation issues.		
26. Changes are made to the implementation plan as a result of school and district leadership team data-based decisions.		
27. Feedback on the outcomes of the PS/RtI Project is provided to school-based faculty and staff at least yearly.		

Additional Comments/Evidence:

* Adapted from the IL-ASPIRE SAPSI v. 1.6
Center for School Evaluation, Intervention and Training (CSEIT)
Loyola University Chicago

Appendix K: Coaching Evaluation Survey

Coaching Evaluation Survey

Directions: *Using the scale below, please indicate the extent to which you agree or disagree with each of the following statements about the performance of your school's PS/RtI coach during the 2007-08 school year. Please shade in the circle that best represents your response to each item. If you have not observed or do not have knowledge of a given behavior, please respond "Do Not Know" by shading in the circle labeled DK.*

① = **Strongly Disagree *(SD)***
② = **Disagree *(D)***
③ = **Neutral *(N)***
④ = **Agree *(A)***
⑤ = **Strongly Agree *(SA)***
◯ = **Do Not Know (*DK*)**

My school's PS/RtI coach…	SD	D	N	A	SA	DK
1. …is an effective listener.	①	②	③	④	⑤	◯
2. ...communicates clearly with others.	①	②	③	④	⑤	◯
3. …effectively engages team members and other faculty in reflecting upon their professional practices.	①	②	③	④	⑤	◯
4. …is skilled in interpreting student outcome data.	①	②	③	④	⑤	◯
5. …is skilled in facilitating consensus building among school-based personnel.	①	②	③	④	⑤	◯
6. …is skilled in working collaboratively with diverse groups (e.g. SBLT, classroom teachers, grade level teachers).	①	②	③	④	⑤	◯
7. …is skilled in building trust among members of the school-based RtI leadership team.	①	②	③	④	⑤	◯
8. …is skilled in facilitating productive work relationships with other individuals in the school setting.	①	②	③	④	⑤	◯

My school's PS/RtI coach…	SD	D	N	A	SA	DK
9. …when introducing a new skill or concept:						
a. clearly explains the need for the skill/concept.	1	2	3	4	5	◯
b. clearly indicates the sub-skills that are required to use the new skill/concept.	1	2	3	4	5	◯
c. clearly indicates the support that will be provided to the team to help implement the new skill/concept.	1	2	3	4	5	◯
10. …is skilled in modeling steps in the problem-solving process:						
a. Problem Identification	1	2	3	4	5	◯
b. Data Collection and Interpretation	1	2	3	4	5	◯
c. Problem Analysis	1	2	3	4	5	◯
d. Intervention Development	1	2	3	4	5	◯
e. Intervention Support	1	2	3	4	5	◯
f. Intervention Documentation	1	2	3	4	5	◯
g. Response to Intervention Interpretation	1	2	3	4	5	◯
h. Intervention Modification	1	2	3	4	5	◯
11. …provides opportunities for the leadership team to practice steps in the problem-solving process.	1	2	3	4	5	◯
12. …works effectively with the school-based team to implement problem solving.	1	2	3	4	5	◯
13. …works with the school-based team to gradually increase the team's capacity to function independently in implementing the problem-solving process in our school.	1	2	3	4	5	◯
14. …provides ***timely*** feedback to members of the team.	1	2	3	4	5	◯
15. …provides ***useful*** feedback to members of the team.	1	2	3	4	5	◯
16. …works effectively with school-based personnel in using the problem-solving process to identify needs at the ***school-wide*** level.	1	2	3	4	5	◯

My school's PS/RtI coach…	SD	D	N	A	SA	DK
17. …works effectively with school-based personnel in using the problem-solving process to identify needs at the ***classroom*** level.	①	②	③	④	⑤	○
18. …is able to provide the technical assistance necessary (e.g., support related to skills taught) for our school to implement the PS/RtI model.	①	②	③	④	⑤	○
19. …responds to requests for technical assistance in a timely manner.	①	②	③	④	⑤	○
20. …works with the school-based team and faculty to monitor student progress (Tier I).	①	②	③	④	⑤	○
21. …works with the school-based team and faculty to assist in decision making.	①	②	③	④	⑤	○
22. …works effectively with the school-based administrator to facilitate the implementation of the PS/RtI model.	①	②	③	④	⑤	○

23. How satisfied are you with the overall assistance that your school's PS/RtI coach has provided your school in the implementation of PS/RtI?

① Very Dissatisfied ② Dissatisfied ③ Satisfied ④ Very Satisfied ⑤ Not Able to Provide a Rating

24. Overall, how would you rate the effectiveness of the RtI coach in helping your school implement the PS/RtI model?

① Not Effective ② Minimally Effective ③ Somewhat Effective ④ Effective ⑤ Very Effective

25. If there is one area in which I would like to see our PS/RtI coach provide additional assistance it would be…

26. Additional Comments:

____

____

____

____

27. What is your current role in your school?

- ◯ General Education Teacher
- ◯ Administrator
- ◯ Special Education Teacher
- ◯ Other Instructional Personnel (e.g., Reading Teacher, Coach, Interventionist, Speech/Language Therapist)
- ◯ Student Services Personnel (e.g., Guidance Counselor, School Psychologist, Social Worker)
- ◯ Other (please specify) ____

THANK YOU FOR YOUR FEEDBACK!

Appendix L: Coaches Log Manual

PS/RtI Coaches Log Information Manual

As of December 10, 2007, the Florida Problem Solving/Response to Intervention (PS/RtI) Project will be moving to a remote log system to collect data on PS/RtI Coach activities. The new remote system requires Filemaker version 9.0 to run and directly uploads data to a central database at the University of South Florida. Logs for PS/RtI coaches will continue to be **due on the 7th of each month**. However, all coaches will have a choice regarding how frequently data are inputted within a given month (e.g., daily, weekly, at the end of each month). Below is information that is intended to help PS/RtI coaches (1) navigate the remote log system, (2) determine how to input activities within the categories contained in the logs, (3) confirm that the data were entered successfully, and (4) determine who to contact for questions or issues that arise with the logs.

Directions for Inputting Activities Into the Log System

After successfully logging in, the main screen should appear allowing you to begin logging your activities into the system. Five buttons are available for you to choose from that represent the types of activities PS/RtI coaches complete. These buttons are *Training, Technical Assistance, Project Data Collection, Meeting,* and *Other*. Simply click on the button for which you plan to enter activities (e.g., *Training*) and a screen will appear that will allow you to begin inputting data. Provided below are (1) general guidelines for navigating the log system, (2) examples of activities that should be included under each type of activity and (3) a description of the data that should be entered on each screen.

General Navigation of the Log System

The following steps provide a general overview of how to navigate the log system:

1. When on the main screen, click on “Enter New Session” under the activity type for which you want to enter information.

2. Enter the requested information for the type of activity you selected by clicking on the fields provided. Once you select the relevant information and click on another field or somewhere on the screen, the data are automatically uploaded to the central database
3. After entering the requested information for a given activity, click on:
    - "Add Another Session" at the top of the page if you want to input another activity of the same type (e.g., *Training, Technical Assistance*).
    - "Delete this Session" at the top of the page if you do not want the information you entered for a given activity to be uploaded to the central database.
    - "Home" at the top of the page if you want to return to the main screen and enter information for a different type of activity.
    - "View Table of All Sessions" if you want to review the information you have entered thus far.

Training

Activities should be entered under the *Training* category when you facilitate or assist with a training related to PS/RtI. Examples of common activities that should go under this category include:

- School-Based Leadership Trainings provided by Project staff in which you participate
- Trainings you provide that focus on PS/RtI knowledge/skill (e.g., steps of problem-solving, determining student RtI, decision-making, monitoring implementation integrity)
- Trainings you provide on PS/RtI related topics such as:
    - Assessments (e.g., administering and scoring DIBELS)
    - Interventions (e.g., specific intervention program)
    - Facilitating Systems Change (e.g., building consensus, building infrastructure)

The following information will be requested when entering data under the *Training* category:

- **Date**: For each activity click on the field after date and wait for the calendar to appear. Select the date for which the activity corresponds to by clicking on the appropriate date.
- **Attendees**: Select who attended the training by clicking on <u>one or more</u> of the groups provided (i.e., District Leadership Team, Building Leadership Team, Administrators, School Staff). An x will appear in the check box next to any group that you select.
- **Location**: If Building Leadership Team, Administrators, or School staff are included in the attendees for the activity, select the school at which they work by clicking on <u>one or more</u> of the schools provided. An x will appear in the check

box next to any school that you select. Do not select anything under this category if the training was provided only to District Leadership Team personnel.

- **Topic**: Select as many content areas from the topic domain as were covered during the training. For each potential content area, both general (e.g., Problem-Solving – General) and specific (e.g., Problem Identification) topics are provided. An x will appear in the check box next to any topic you select.
- **Time**: Select the amount of time spent on the training. When you click on the field for time, a pop-up will appear with times ranging from .5 to 10 hours in .5 hour intervals. Select the interval that was closest to the amount of time spent on the activity.
- **Comments**: For each activity, you will be provided the option to provide some additional comments. Additional information that you believe would be useful to the Project when interpreting the information provided can be typed here. Comments are not required unless "Other: specify in comments" is selected under **Topic**. If "Other: specify in comments" is selected, provide a few word description of the topic(s) covered during the training.

Technical Assistance

Activities should be entered under the *Technical Assistance* category whenever you provide help to individuals on PS/RtI related knowledge, skills, and/or procedures. In other words, whenever you take on the role of a coach during an activity and help individuals with knowledge/skills they have been trained on, you would enter an activity under this category. Examples of common activities that should be logged under this category include:

- Coaching individuals through completing the steps of the PS/RtI process.
- Providing coaching on implementing PS/RtI in a building to administrators, Building Leadership Teams, District Leadership Teams, etc.
- Providing coaching to individuals on PS/RtI related activities (e.g., data collection procedures, data collection tools, implementing interventions, building consensus)

The following information will be requested when entering data under the *Technical Assistance* category:

- **Date**: For each activity click on the field after date and wait for the calendar to appear. Select the date for which the activity corresponds to by clicking on it.
- **Attendees**: Select who attended the technical assistance session by clicking on one or more of the groups provided (i.e., District Leadership Team, Building Leadership Team, Administrators, School Staff). An x will appear in the check box next to any group that you select.
- **Location**: If Building Leadership Team, Administrators, or School staff are included in the attendees for the activity, select the school at which they work by clicking on one or more of the schools provided. An x will appear in the check

box next to any school that you select. Do not select anything under this category if technical assistance was provided only to District Leadership Team personnel.

- **Topic**: Select <u>as many content areas</u> from the topic domain as were covered during the technical assistance session. For each potential content area, both general (e.g., Problem Solving/RtI – General) and specific (e.g., Problem Identification) topics are provided. An x will appear in the check box next to any topic you select.
- **Time**: Select the amount of time spent on the technical assistance session. When you click on the field for time, a pop-up will appear with times ranging from .5 to 10 hours in .5 hour intervals. Select the interval that was closest to the amount of time spent on the activity.
- **Comments**: For each activity, you will be provided the option to provide some additional comments. Additional information that you believe would be useful to the Project when interpreting the information provided can be typed here. Comments are not required unless “Other: specify in comments” is selected under **Topic**. If “Other: specify in comments” is selected, provide a few word description of the topic(s) on which you provided technical assistance.

Project Data Collection

Activities should be entered under the *Project Data Collection* category when you are engaged in data collection for the Project. Examples of common activities that would be entered under this activity include:

- Facilitating the administration of surveys and/or skill assessments to school staff at pilot or comparison schools. Any time spent on activities like explaining the administration of the instruments, addressing questions, and collecting instruments should be logged under this category.
- Completing any of the Project’s implementation integrity checklists (i.e., the Tiers I & II Critical Components Checklist, Tier III Critical Components Checklist, Problem-Solving Team Meeting Checklists – Initial and Follow-Up Versions). Any time spent on activities such as gathering permanent products to score, scheduling meetings to attend, completing the instruments, and conducting inter-rater agreement checks should be logged under this category.
- Any other data collection activity you have been asked to complete in your district (e.g., collecting data on the number of referrals to the Problem-Solving Team equivalent in your district)

The following information will be requested when entering data under the *Training* category:

- **Date**: For each activity click on the field after date and wait for the calendar to appear. Select the date for which the activity corresponds to by clicking on it.
- **Type**: Select the type of data collection activity you completed (i.e., surveys, integrity checklists, other). An x will appear in the check box next to any type that you select.
- **Location**: Select the school(s) for which the data collection activity was completed by clicking on one or more of the schools provided. An x will appear in the check box next to any school that you select.
- **Time**: Select the amount of time spent on the data collection activity. When you click on the field for time, a pop-up will appear with times ranging from .5 to 10 hours in .5 hour intervals. Select the interval that was closest to the amount of time spent on the activity.
- **Comments**: For each activity, you will be provided the option to provide some additional comments. Additional information that you believe would be useful to the Project when interpreting the information provided can be typed here. Comments are not required unless "Other: specify in comments" is selected under **Topic**. If "Other: specify in comments" is selected, provide a few word description of the topic(s) covered during the data collection activity.

Meetings

Activities should be logged under the *Meeting* category when you participate in any meeting related to PS/RtI implementation or training. The key difference between the *Meeting* and *Technical Assistance* categories is your role. Activities should be logged under the *Meeting* category when you are a participant in the meeting, but are not taking an active coaching (i.e., instructional) role. Activities for which you take an active coaching role should be logged under *Technical Assistance*. Examples of activities that should be logged under the *Meeting* category include:

- Meetings with your Regional Coordinators
- Meetings with District Liaisons for the Project
- Planning or update meetings focusing on PS/RtI implementation at the district- or building-level
- Meetings with other PS/RtI Coaches (e.g., Regional Coaches Meetings)
- Meetings with school staff to discuss Project issues
- Attending state or national conferences
- Attending district training
- Attending PS/RtI Project trainings (e.g., Coaches Training during Summer 2007; integrity measures training)

The following information will be requested when entering data under the *Meeting* category:

- **Date**: For each activity click on the field after date and wait for the calendar to appear. Select the date for which the activity corresponds to by clicking on it.
- **Attendees/Type**: Select who attended the Meeting and/or the type of meeting by clicking on one or more of the options provided (i.e., District Leadership Team, Building Leadership Team, Administrators, School Staff, Attend Conference/Training, Meeting with Other Coaches, Meeting with Regional Coordinators, District Liaison). An x will appear in the check box next to any option that you select.
- **Location**: If Building Leadership Team, Administrators, or School staff are included in the attendees for the activity, select the school at which they work by clicking on one or more of the schools provided. An x will appear in the check box next to any school that you select. Do not select anything under this category if the meeting, training, or conference did not involve any of the Building Leadership Teams, administrators, or school staff in the schools for which you are responsible.
- **Topic**: Select as many content areas from the topic domain as were covered during the meeting. For each potential content area, both general (e.g., Problem-Solving/RtI – General) and specific (e.g., Problem-Identification) topics are provided. An x will appear in the check box next to any topic you select.
- **Time**: Select the amount of time spent on the meeting. When you click on the field for time, a pop-up will appear with times ranging from .5 to 10 hours in .5 hour intervals. Select the interval that was closest to the amount of time spent on the activity.
- **Comments**: For each activity, you will be provided the option to provide some additional comments. Additional information that you believe would be useful to the Project when interpreting the information provided can be typed here. Comments are not required unless "Other: specify in comments" is selected under **Topic**. If "Other: specify in comments" is selected, provide a few word description of the topic(s) covered during the meeting.

Other

Activities should be logged under the *Other* category when they are either not captured by any of the first four categories described above or are not related to the PS/RtI Project. Examples of activities to be logged under this category include:

- Checking email
- Travel to another location
- Any training, technical assistance, meetings, etc. that are not directly related to the Project

The following information will be requested when entering data under the *Training* category:

- **Date**: For each activity click on the field after date and wait for the calendar to appear. Select the date for which the activity corresponds to by clicking on it.
- **Grant-Related**: Select yes or no. An x will appear in the check box next to the option that you select.
- **Time**: Select the amount of time spent on the activity. When you click on the field for time, a pop-up will appear with times ranging from .5 to 10 hours in .5 hour intervals. Select the interval that was closest to the amount of time spent on the activity.
- **Comments**: Provide a few word description of the activity. This comments section should be completed each time you log something under the *Other* category.

Confirming Data Entered Successfully

The PS/RtI Project remote log system is constructed such that data that are entered are uploaded to the central database in real time. Thus, anytime you click on a field and enter data, the data are automatically uploaded. However, the remote system does allow you to check to see what data were successfully uploaded. On the main screen and on each data entry page a button is available that says "View Table of All Sessions." Whenever you want to see a summary of the data you have entered, click on this button and a page will appear that contains a table with several columns. Below is a review of the columns that are available for you to examine and what information is included in those columns.

- **Session ID**: The session ID is the number that is assigned to each session (i.e., activity) you enter into the database. The session ID is automatically derived for you and is located in a box marked "For Office Use Only" on any page on which you are entering data. Keeping track of this session ID will allow you to find the information you most recently entered when you are on the table page.
- **Date**: This column summarizes the date you entered for a given activity.
- **Hours**: This column summarizes the amount of time you entered for a given activity.
- **Location**: This column summarizes any schools that you indicated had personnel participating in an activity you entered. Only one location shows up by default. If you entered more than one location, you can check to see if all the data were received by clicking on the field under **Location** that corresponds with the appropriate session ID. When you click on the appropriate field, all the information you entered for **Location** should appear.

- **Topic**: This column summarizes any topics that were covered during the activity you entered. Only one topic shows up by default. If you entered more than one topic, you can check to see if all the data were received by clicking on the field under **Topic** that corresponds with the appropriate session ID. When you click on the appropriate field, all the information you entered for **Topic** should appear.
- **Facilitator**: This column is for office use only. It lets the database know who was entering data.
- **Session Type**: This column summarizes the type of activity for which you entered data (e.g., *Training, Technical Assistance).*
- **Attendees**: This column summarizes who participated in the activities you entered. Only one attendee shows up by default. If you entered more than one attendee, you can check to see if all the data were received by clicking on the field under **Attendees** that corresponds with the appropriate session ID. When you click on the appropriate field, all the information you entered for **Attendees** should appear.
- **Created by:** This column summarizes who entered the data into the log system. Your username should always appear in this column once the table is adjusted to show only your data.
- **Comments**: This column summarizes any comments that you typed while entering an activity.

Trouble-Shooting Log System

If any questions or issues arise regarding the log system, please contact Emiliano Cardona (cardona@coedu.usf.edu) or Jose Castillo (castillo@coedu.usf.edu). Issues do occasionally arise with systems such as the remote log system. If at any point something is not working correctly or you realize you entered some data incorrectly, please contact Emiliano and he will assist you as best he can. If you have questions about how an activity should be logged, please contact Jose and he will help you work through the issue.

Appendix M: PS/RtI Project Coaches Training Curriculum

Florida PS/RtI Project 3-Year Coaches Training Curriculum			
Year	***Date***	***Length***	***Training Content***
2007-2008	July 2007	5 Days	• FL PS/RtI Project Overview • Policy & Legislative Issues • Systems-Change Principles • Problem-Solving Process • Research-Based Coaching Practices • Project Data Collection Materials & Procedures
	March 2008	1 & ½ Days	• PS/RtI Concepts & Content Review • Data Collection Tools, Materials, & Procedures Review • New Project Data Collection Tools & Training • Group Sharing & Discussion Sessions • General Technical Assistance & Problem-Solving Sessions
2008-2009	August 2008	3 Days	• PS/RtI Concepts & Content Review • Data Collection Tools, Materials, & Procedures Review • New Project Data Collection Tools & Training • Group Sharing & Discussion Sessions • General Technical Assistance & Problem-Solving Sessions
	March 2009	3 Days	• Project Data Review & Program Planning • Individual & Group Action Planning • Group Sharing & Discussion Sessions • General Technical Assistance & Problem-Solving Sessions
2009-2010	August 2009	3 Days	• Data Collection & Interpretation • Data Collection Tools, Materials, & Procedures Review • Group Sharing & Discussion Sessions • General Technical Assistance & Problem-Solving Sessions
	March 2010	2 & ½ Days	• PS/RtI Project Updates • Project Data Review & Action Planning • Group Sharing & Discussion Sessions • General Technical Assistance & Problem-Solving Sessions

Appendix N: Project Data Collection Timeline

Data Collection, Entry, and Analysis Rubric

Year 1

Measure	Collection Timeline												Collection Method & Responsible Personnel	Data Entry Method & Responsible Personnel	Analysis Frequency
	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul			
Beliefs Survey		SBLT Day 1 & 2 & Staff Pre							SBLT Day 5 & Staff Post (3/30-5/15)				Administered by RCs (SBLTs) & Coaches (Staff)	Entered by Project staff	1 x year
Perceptions of Skills Survey		SBLT Day 1 & 2 & Staff Pre							SBLT Day 5 & Staff Post (3/30-5/15)				Administered by RCs (SBLTs) & Coaches (Staff)	Entered by Project staff	1 x year
Coaches Logs*	X	X	X	X	X	X	X	X	X	X	X	X	Coaches track activities and hours	Coaches enter into remote database (minimum of monthly)	Monthly
Coaching Evaluation Survey**									X				Mailed to principals to be completed by SBLTs	Entered into database by Project staff	1 x year
Tiers I & II Critical Components Checklist*	T1 Window				T2 Window				T3 Window				Coaches complete checklists from permanent products	Project staff enter into database	3 x year
Needs Assessment (SAPSI)*		Pre							Post				SBLT fills out (Coach lead)	Project staff enter	2 x year

* Demonstration sites only
** School-Based Leadership Teams Only

Data Collection, Entry, and Analysis Rubric

Year 2

Measure	Collection Timeline												Collection Method & Responsible Personnel	Data Entry Method & Responsible Personnel	Analysis Frequency
	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul			
Beliefs Survey									SBLT Day 4 & Staff Post (3/30-5/15)				Administered by RCs (SBLTs) & Coaches (Staff)	Entered by Project staff	1 x year
Perceptions of Skills Survey									SBLT Day 4 & Staff Post (3/30-5/15)				Administered by RCs (SBLTs) & Coaches (Staff)	Entered by Project staff	1 x year
Coaches Logs*	X	X	X	X	X	X	X	X	X	X	X	X	Coaches track activities and hours	Coaches enter into remote database (minimum of monthly)	Monthly
Coaching Evaluation Survey**									X				Mailed to principals to be completed by SBLTs	Entered into database by Project staff	1 x year
Tiers I & II Critical Components Checklist*	T1 Window				T2 Window				T3 Window				Coaches complete checklists from permanent products	Project staff enter into database	3 x year
Needs Assessment (SAPSI)*					T1 (12/1-1/31)						T2 (5/1-6/15)		SBLT fills out (Coach lead)	Project staff enter	2 x year

* Demonstration sites only
** School-Based Leadership Teams Only

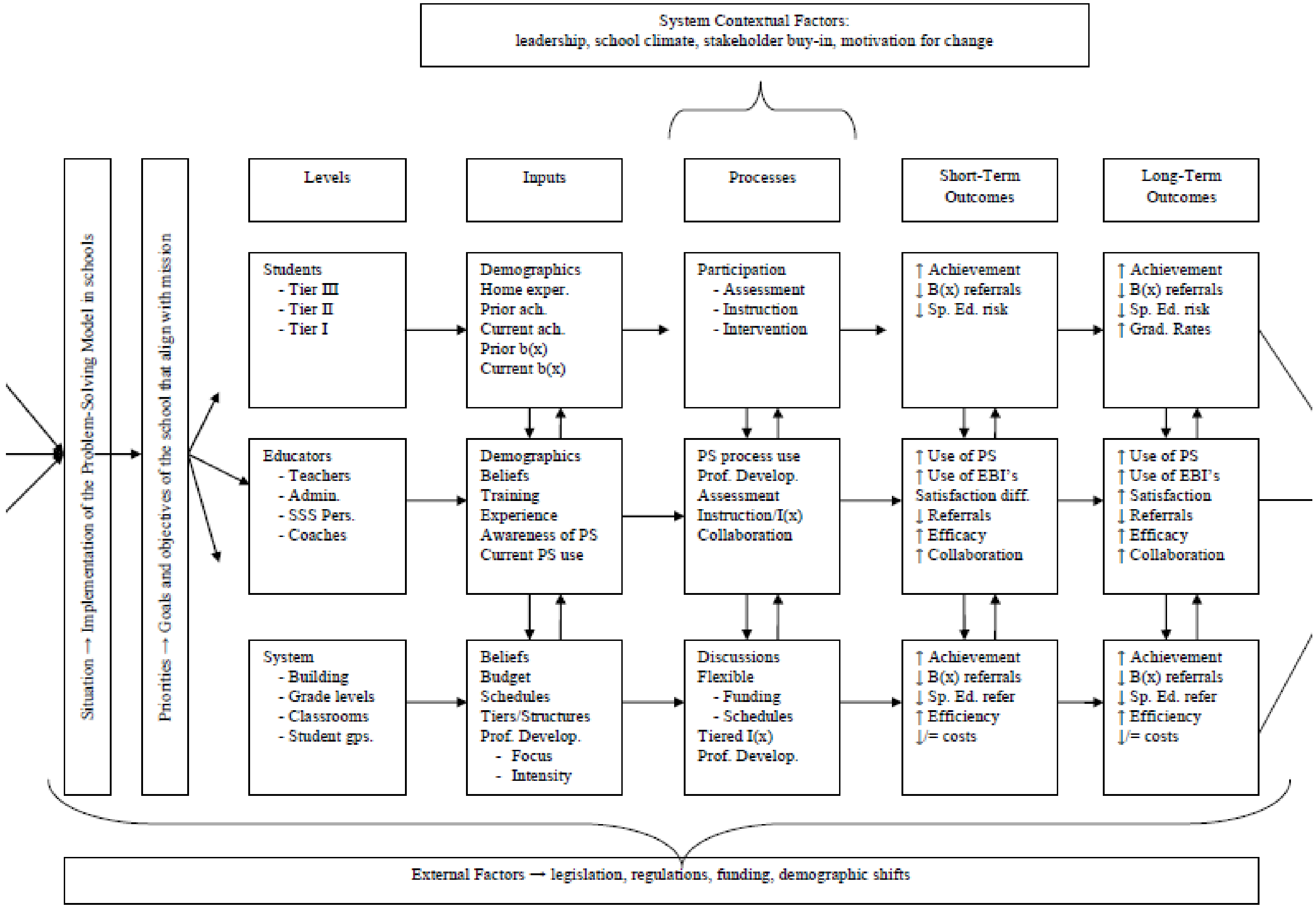
Data Collection, Entry, and Analysis Rubric

Year 3

Measure	Collection Timeline												Collection Method & Responsible Personnel	Data Entry Method & Responsible Personnel	Analysis Frequency
	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul			
Beliefs Survey									SBLT Day 4 & Staff Post (4/1-5/31)				Administered by RCs (Day 4) & Coaches (Staff)	Entered by Project staff	1 x year
Perceptions of Skills Survey									SBLT Day 4 & Staff Post (4/1-5/31)				Administered by RCs (SBLTs) & Coaches (Staff)	Entered by Project staff	1 x year
Coaches Logs*	X	X	X	X	X	X	X	X	X	X	X	X	Coaches track activities and hours	Coaches enter into remote database (minimum of monthly)	Monthly
Coaching Evaluation Survey**									X (Due 5/7/10)				Mailed to principals to be completed by SBLTs	Entered into database by Project staff	1 x year
Tiers I & II Critical Components Checklist*	T1 Window (Due 1/15/10)				T2 Window (Due 4/30/10)				T3 Window (Due when contract ends for year or before 7/31/10)				Coaches complete checklists from permanent products	Project staff enter into database	3 x year
Needs Assessment (SAPSI)*					T1 (12/1-1/29)					T2 (4/15-6/15)			SBLT fills out (Coach lead)	Project staff enter	2 x year

* Demonstration sites only
** School-Based Leadership Teams Only

Appendix O: PS/RtI Project Logic Model



Appendix P: PS/RtI Coach Responsibilities, Literature Support, and Survey Items Rubric

PS/RtI Coaching Responsibilities, Literature Support, and Coaching Evaluation Survey Items Rubric

Responsibility 1: Staff Training	
The RtI Coach is responsible for facilitating building-based training for problem-solving and response to intervention skills. The Coach works collaboratively with the school-based problem-solving team to develop and implement the PS/RtI training agenda for the school year. The Project Regional Coordinator will serve as a consultant to the Coach and the building Problem-Solving Team.	
Coaching Activities in the Literature	**Coaching Evaluation Survey Items**
• Successful professional development for RtI must adequately address beliefs & attitudes, knowledge, & skill (Batsche et al., 2006) • Coaches plan and implement a professional development agenda (Killion & Harrison, 1997), and must consider the individual school culture, climate, & context (Fullan, 2010) • Coaches assists schools in examining resources (e.g., time, personnel, money, schedules) and allocate them effectively (Neufeld & Roper, 2003a) • Coaches develop the leadership skills of staff to help build system capacity (Neufeld & Roper, 2003a) • Coaches work collaborative with diverse individuals and groups (Neufeld & Roper, 2003a)	• Works collaboratively with diverse groups (6) • When introducing a new skill or concept: clearly explains the need, indicates sub-skills required, indicates the support to be provided to help implement new skill (9a-c) • Works effectively with administrator to facilitate implementation of PS/RtI model (22)

Responsibility 2: Technical Assistance	
The RtI Coach provides technical assistance to building administrators, teachers and the school-based team to facilitate implementation of the problem-solving and response-to-intervention activities. Technical assistance activities include observation and feedback, modeling and other supportive assistance necessary to implement the PS/RtI process.	
Coaching Activities in the Literature	**Coaching Evaluation Survey Items**
• Coaching includes ongoing modeling, supportive critiques of practice, and specific observations (Poglico et al., 2003) • Coaching activities have grown out of effective adult learning research, which suggests learners should be allowed opportunities to dialogue and reflect upon new material, observe more experienced peers model new strategies, practice the application of new skills, and receive constructive feedback on performance from experts (Darling-Hammond & McLaughlin, 1995; Lieberman, 1995) • Transfer of training occurs when coaching is delivered in the following steps: theory/description, modeling/demonstration, practice, and feedback (Joyce & Showers, 2002) • The literature suggests the following general characteristics of effective coaching: collaborative planning and demonstration, observation of new practices, reflection and dialogue with educators, and constructive feedback (Rush & Sheldon, 2005)	• Skilled in modeling problem-solving steps: Problem Identification, Data Collection/Interpretation, Problem Analysis, Intervention Development, Intervention Support, Intervention Documentation, RtI Interpretation, & Intervention Modification (10a-h) • Provides opportunities for team to practice problem-solving steps (11) • Gradually increases the team's capacity to function independently (13) • Provides **timely** feedback to team (14) • Provides **useful** feedback to team (15) • Provides technical assistance necessary to implement PS/RtI model (18) • Responds to requests for technical assistance in a timely manner (19)

Responsibility 3: Data Collection and Management	
The RtI Coach serves as the primary source of pilot and comparison school data to support the Project Evaluation Plan. The RtI Coach also serves as the pilot site "data coach" to facilitate the management and interpretation of data necessary to develop, implement and evaluate Tier 1,2 and 3 intervention.	
Coaching Activities in the Literature	**Coaching Evaluation Survey Items**
• Coaches help individual or teams of teachers examine data, understand student strengths and weaknesses, identify instructional strategies and intervention, and assess response to intervention/instruction (Killion & Harrison, 2006) • Coaches must have a comprehensive understanding of the reform efforts of which they are facilitating implementation (Neufield & Roper, 2003a; Poglinco et al., 2003)	• Skilled in interpreting student outcome data (4) • Works with SBLT to implement problem-solving process (12) • Works with team to identify needs at the **school-wide** level (16) • Works with team to identify needs at the **classroom** level (17) • Works with team to monitor student progress (Tier 1) (20) • Works with team to assist in decision-making (21)

Responsibility 4: Consultation and Teaching	
The RtI coach possesses excellent interpersonal communication, listening, facilitation and adult education teaching skills.	
Coaching Activities in the Literature	**Coaching Evaluation Survey Items**
• Consultation & coaching require the development of similar professional & interpersonal skills (e.g., entry & trust building, communication skills, time management) (Denton & Hasbrouck, 2009) • Supportiveness, flexibility, approachability, tactfulness, good relationship building skills (Ertmer et al, 2005; Brown et al, 2006; Polinco et al, 2003;) • Communication Skills (Neufeld & Roper, 2003; Marsh et al, 2008) • Coaches require skills in group facilitation and training (Knight, 2004) • Coaches believe that interpersonal skills were more important than content or pedagogical knowledge (Ertmer et al, 2005) because content knowledge can be learned whereas interpersonal skills cannot • Coaches must have a strong understanding of adult learning processes (Norton, 1999; King et al., 2004)	• Engages team and others in reflecting upon professional practices (3) • Facilitates consensus building (5) • Builds trust among members of SBLT (7) • Facilitates productive working relationships (8)