The Relation Between Professional Development Training in the Problem-Solving Steps and Teachers’ Self-Perceived Competence

DISSERTATION

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By

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Abstract

Although the tenets of the problem-solving model have been around for decades, they were not written into federal legislation until 2004. With the discrepancy model out and a problem-solving approach in, educators around the United States found themselves in need of training in this approach. This dissertation provides a history of the problem-solving model, Response to Intervention (RTI), and training techniques used to prepare educators on a wide-scale basis. The researcher conducted an exploratory study in which teachers in two suburban, Ohio school districts were surveyed. Respondents indicated his or her personal training background in the problem-solving steps and current self-perceived competence to implement each step. Regression models were examined in an effort to predict one’s self-perceived competence based upon a given set of variables.

Results indicated that teachers generally felt most competent brainstorming interventions and implementing interventions with integrity, while they felt least competent generating hypotheses and accurately identifying when a student should move between tiers. Multiple regression analyses indicated the strongest predictors of an individual’s self-perceived competence to implement the problem-solving steps were teaching level (elementary teachers) and extent of training in each individual step.
Dedication

This document is dedicated to my husband, Patrick Fletcher, for encouraging me to succeed, for keeping me focused on my goals, and for being my best friend.
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I would like to thank my advisor, Dr. Kisha Radliff, for her constant encouragement, her dedication to my personal and professional growth, and her belief in me. To my committee member, Dr. Joe Wheaton, thank you for the countless hours you spent fine tuning our questionnaire and helping me to make sense of the data. Your patience and expertise are traits I will never forget. I wish to thank my committee member, Dr. Antoinette Miranda, for teaching me to examine all angles of a problem before drawing any conclusions from the data.

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Field of Study

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## Table of Contents

Abstract..........................................................................................................................ii
Dedication.........................................................................................................................iii
Acknowledgements..........................................................................................................iv
Vita....................................................................................................................................v
List of Tables.....................................................................................................................xii

Chapters:

1. Introduction...................................................................................................................1
2. Review of Literature......................................................................................................8
3. Methods.......................................................................................................................58
4. Results.........................................................................................................................77
5. Discussion...................................................................................................................107

References.........................................................................................................................124

Appendix A: Self-Perceived Competence in Problem Solving Steps, Teacher Rating Scale (SPCPSS)......................................................................................................................139
List of Tables

Table 1. Teacher Role and Current Grade Level Taught.................................74
Table 2. Descriptive Statistics for Impact of Technique’s Used in Past Training(s)..................................................................................................................76
Table 3. Spearman’s Rho Correlation Table for Self-Perceived Competence……78
Table 4. Descriptive Statistics for the Dependent Variable Self-Perceived Competence to Implement the Problem-Solving Steps, Individual Steps.................................................................89
Table 5. Frequency for the Independent Variable Self-Perceived Competence to Implement the Problem-Solving Steps, Summed Scores.......................80
Table 6. Zero-Order Correlations for the Independent Variables and the Dependent Variable in Regression Model One.........................................................85
Table 7. Standardized and Unstandardized Coefficients of Regression Model One.........................................................................................................................87
Table 8. Standardized and Unstandardized Coefficients of Regression Model Two.........................................................................................................................89
Table 9. Descriptive Statistics for Extent of Training in Problem-Solving Steps by Setting.............................................................................................................90
Table 10. Descriptive Statistics for Extent of Training in Each Problem-Solving Step.................................................................................................................91
Table 11. Correlation Coefficients for Extent of Training in Each Step Versus Self-Perceived Competence to Implement Each Step...........................................92
Table 12. Descriptive Statistics for Opportunities to Practice Each of the Problem-Solving Steps..............................................................................................93
Table 13.  Correlation Coefficients for Opportunities to Practice Each Step Versus Self-Perceived Competence to Implement Each Step

Table 14.  Zero-Order Correlations for Independent Variables and the Dependent Variable in Regression Model Two

Table 15.  Standardized and Unstandardized Coefficients for Regression Model Three

Table 16.  Zero-Order Correlations for Independent Variables and the Dependent Variable in Regression Model Four

Table 17.  Standardized and Unstandardized Coefficients for Regression Model Four
Chapter 1: Introduction

When the Individuals with Disabilities Education Improvement Act (IDEIA) was reauthorized in 2004, the use of a discrepancy model (ability-achievement split) alone to identify learning disabilities (LD) was replaced with a provision for schools to use data from a student’s response to scientific, evidence-based interventions. This data can be utilized in place of, or along with, data from a psychoeducational evaluation. One of the most prominent criticisms of the discrepancy model comes from the finding that a discrepancy large enough to warrant special education services generally does not appear until the fifth grade for a majority of students (Fuchs & Fuchs, 2007). Another quandary with the discrepancy model is that students of ethnic and racial minority background are being classified into the mild (or high-incidence) disability category at a much higher rate than would be expected. This is despite that fact that the general society is mirrored in the school-age population with Caucasian, non-Hispanic citizens occupying the majority (Bynoe, 1998). These findings (delay of services and overrepresentation) are two of the major factors that spurred federal recognition of Response to Intervention (RTI), which is the name of a multitiered intervention model used in school districts throughout the United States.

The individuals who typically implement the interventions within RTI are general education teachers, intervention specialists, and, in some cases, well-trained
paraprofessionals/teaching assistants (Fuchs & Fuchs, 2007). However, these professionals frequently consult with other professionals, such as school psychologists, for help in developing, implementing, and evaluating interventions for children experiencing academic and/or behavioral difficulties. Thus, professional development training in the area of implementing interventions, taking data, and making data-based decisions is vital to a teacher’s ability to implement the intervention process with fidelity (Gilbertson, Witt, Singletary, & VanDerHeyden, 2007). Although several school districts and states have documented professional development training in RTI, as well as the Problem-Solving Model (PSM), offered to school personnel on a large-scale basis (Bergstrom, 2008; Heartland, 2004; Ikeda, Tilly, Stumme, Volmer, & Allison, 1996; Kovaleski, 2007; Kovaleski & Glew, 2006; Kovaleski, Tucker, & Stevens, 1996; Minneapolis Public Schools, 2001; Telzrow, McNamara, & Hollinger, 2000), there is currently no research examining the relation between professional development trainings and teachers’ self-perceived competence to implement the steps of the intervention process.

**Purpose of the Study**

Just as an education curriculum is rigorously evaluated to ensure that students are receiving evidence-based instructional methods that are effective for a majority of individuals, so should professional development trainings that prepare teachers to take part in the RTI process. It is important that these trainings are effectively increasing the skill set of a majority of school personnel who receive them. Otherwise, time and money directed toward these trainings are for naught because the desired outcome of competent
personnel may not be attained. One way to measure the impact of the professional development training on one’s ability to implement the problem-solving steps of the RTI process is to examine teachers’ self-perceived competence. It is likely that an effective training will yield teachers, as well as other school personnel, who feel confident in their ability to take part in the RTI process (as opposed to feeling nervous or unprepared at the idea of implementing a new intervention or taking data on a student’s performance).

**Significance of the Study**

An extensive search of the literature through Academic Search Complete, Education Research Complete, ERIC (EBSCO version), and Psychology and Behavioral Sciences Collection databases over the past two decades revealed no literature on the relation between pre-service and/or professional development training in the problem-solving model and/or RTI and teachers’ self-perceived competence to implement the steps in the RTI process. Danielson, Doolittle, and Bradley (2007) recognize that an emerging knowledge base is present regarding RTI professional development training and building capacity within schools for sustaining an RTI model, but this research base needs to expand vastly if educators are to be effective in improving the achievement of all students. The researcher of the current study aimed to demonstrate a positive relation between professional development training in the problem-solving steps that are inherent in all RTI models and teachers’ self-perceived competence. The seven independent variables in this study include: the (a) extent of training by type, (b) extent of training in each step, (c) quality of past training(s), (d) opportunities to practice each step, (e) number of years implementing steps since initial training, (f) frequency seeking IAT, and
(g) helpfulness of IAT. By analyzing the contribution that each independent variable makes to teachers’ self-perceived competence in their own ability to implement the steps of the problem-solving process, it is hoped that more precise professional development trainings in RTI can be created and implemented in school districts and/or to states on a large-scale basis.

**Research Questions**

The purpose of the current study is to conduct exploratory research to evaluate the relation between teachers’ previous pre-service and/or professional development training in the problem-solving steps, teachers’ self-perceived competence to implement the steps of the RTI process, and various other variables.

- **Research Question One:** What are the demographic characteristics of this sample?
- **Research Question Two:** How confident do teachers feel in their ability to implement each problem-solving step?
  - **Hypothesis:**
    - There will be an equal distribution of responses for which particular problem-solving step teachers feel most and least competent implementing, indicating that there is no particular step in the problem-solving process that is fundamentally easy or difficult to implement.
- **Research Question Three:** What is the relation between frequency seeking IAT, helpfulness of IAT, years teaching, teaching level, experience on IAT, years
implementing, and teachers’ self-perceived competence in their own ability to implement these steps?

- **Hypotheses:**
  - Individuals who seek team assistance less frequently, feel their school’s IAT is very helpful, have more years teaching experience, teach at the elementary school level, have served on their school’s IAT, and have more years implementing the problem-solving steps since their initial training will have higher levels of self-perceived competence.

- **Research Question Four:** What is the relation between quality of past training, the extent of training by type, extent of training in each step, opportunities to practice, and teachers’ self-perceived competence to implement these steps?

  - **Hypothesis:**
    - Individuals who view his or her past training in the problem-solving steps as high quality (or superior), have had more extensive training in various settings (in-service, conference workshop, etc.), have had more extensive training in the problem-solving steps in each individual step or in general, and have had more opportunities to practice implementing each individual problem-solving step will have higher levels of self-perceived competence to implement that particular step.
Limitations

There are several limitations inherent in this study. The correlational nature of this study is a limitation in that no experimental manipulation was implemented. Despite this, a correlational study provides useful information because it allows one to answer broader questions during exploratory research and provide information for the direction of future research (Crano & Brewer, 2002). Future researchers in this area may seek to control the professional development training that is delivered to multiple sites through manipulation and random assignment of subjects to treatment and control groups. A second limitation is that having participants rate their own competence to implement the steps of the problem-solving process may demonstrate social desirability bias in which respondents answer items on the questionnaire the way they believe the researcher wants them to answer (Neuman, 2003). The anonymity of the participants’ responses helps reduce the likelihood of this (Dillman, Smyth, & Christian, 2003).

A third limitation is that there was a low response rate to the survey. Data collection entailed a link to an online questionnaire that was sent to participants through e-mail. The following steps were taken to increase response rates: (a) sending out the initial email plus two reminder emails to complete the questionnaire, (b) the questionnaires were anonymous and no identifying information was collected, (c) confidentiality of responses was stressed, and (d) incentives were awarded to several participants who responded within the first week the survey was open. A low response rate not only limits the generalizability of results to all teachers within school district A and school district B, but also to all teachers within the United States.
Definition of Terms

**Competence**- group of abilities that are necessary for performing an action as well as the result of the action

**Pre-service training and/or professional development training in problem-solving steps**- any previous training the teacher may have had in which he or she learned about the history, purpose, components, and techniques of problem-solving steps and/or

**Response to Intervention**

**Teachers in Sample**- respondents who teach a core curriculum subject
Chapter 2: Literature Review

Professionals’ dissatisfaction with the definition of learning disability (LD) appears to stem more from the self-perceived shortcomings in assessment of the disability than in the validity of the construct itself (McKenzie, 2009). This is evident in the numerous changes in identification procedures seen over the years. The most recent of these changes involves the discrepancy model, which looks for a significant discrepancy (or split) between a student’s cognitive abilities and his or her academic achievement. One of the biggest criticisms of this model for LD identification stems from the fact that a discrepancy large enough to warrant special education services generally does not appear until the fifth grade for a majority of students. This is why the discrepancy model is often referred to as a “wait to fail” model (Fuchs & Fuchs, 2007).

In addition to students having to wait until their ability-achievement discrepancy is great enough to warrant special education services, there has been an ongoing demographic imbalance within the realm of special education that is affected by the use of the discrepancy model alone to identify LD. Higher percentages of ethnic minority students are classified in the mild disability categories than their same-aged peers within the ethnic majority, despite the fact that the general society is mirrored in the school-age population with Caucasian, non-Hispanic citizens occupying the majority (Bynoe, 1998). As of 2000, the National Center for Educational Statistics (2003) documented that the
percentage of Black, non-Hispanic students served under IDEA was 14.9%, American Indian/Alaska Native students was 14.9%, and Hispanic students was 11.3% versus Caucasian, non-Hispanic students at 10.9%. Wagner (1995) posits that poverty, not ethnicity or cultural differences, is the most important factor influencing the disproportionate representation of minority groups in special education programs. The National Association of State Directors of Special Education (NASDSE) Response to Intervention (RTI) Blueprints for Intervention Implementation (2008) states that student outcome data obtained through RTI practices is crucial in preventing unnecessary and excessive identification of students with disabilities. Additionally, the Individuals with Disabilities Education Improvement Act (IDEIA, 2004) documents that all states must have effective policies and procedures designed to prevent the inappropriate overidentification or disproportionate representation (by race and/or ethnicity) of children with disabilities. These two occurrences (waiting for students to fail and overidentification of minority students) prompted IDEIA (2004) to include an alternative method for identifying LD, which is to determine how students respond to scientifically-based interventions.

**Historical Overview**

In an effort to provide academic and behavioral help to struggling students at an earlier age, as well as to provide culturally sensitive interventions to minority students, school districts across the United States began implementing collaborative problem solving teams in the 1970s (Kruger & Struzziero, 1995). Examples of these teams include the teacher assistance team (TAT), which was first documented in 1979 by
Chalfant, Pysh, and Moultrie, and the instructional consultation team (Rosenfield, 1987). These teams were intended to provide problem-solving assistance to general education teachers with respect to students who were struggling academically and/or behaviorally. The state of Pennsylvania provides an example of how this type of team was instituted on a statewide basis. Pennsylvania institutionalized instructional support teams (ISTs) at the elementary level between 1990 and 1997. The IST model was based upon precursor initiatives that were operated in Pennsylvania on a trial basis, including instructional consultation teams and TATs (Kovaleski & Glew, 2006). State regulations mandated that at least one elementary school in each of the 500 Pennsylvanian school districts have an IST. Regulations stated that students had to receive intervention through the IST process to target their specific instructional, behavioral, emotional, and communication needs prior to referral for a multidisciplinary evaluation for special education consideration.

A study conducted to evaluate the effects of Pennsylvania’s ISTs demonstrated a decrease in the number of students referred for a multidisciplinary evaluation for special education consideration due to the students’ needs being met in the general education classroom (Hartman & Fay, 1996). Bickel, Zigmond, and McCall (1998) found that the rate of identification of students in the LD category, as well as the emotionally disturbed category, slowed in Pennsylvania after the implementation of ISTs. According to Bickel et al., the success of ISTs can be attributed in part to the extensive training the teachers received. This training covered the procedures and strategies in a comprehensive manner, and it occurred on a frequent basis. Trainers visited IST sites biweekly to follow up the previous training with demonstrations and peer coaching. A majority of school
districts in Pennsylvania chose to maintain ISTs after the state mandate was removed because the teams provided the schools with a way to target the specific needs of struggling students (Kovaleski & Glew, 2006). This became an especially important asset to schools when the No Child Left Behind Act (NCLB) was passed in 2001. Taking effect in 2002, this piece of legislation required all schools to meet annual yearly progress to demonstrate the academic growth of students (U.S. Department of Education, 2003). With the passing of NCLB and with increased need for accountability within American schools, as well as the documented successes of problem-solving collaborative teams going back several decades, it was inevitable that these teams would eventually be written into federal legislation.

This is precisely what happened when the Individuals with Disabilities Education Improvement Act was reauthorized in 2004 (IDEIA, 2004). This legislation includes a provision for schools to consider a student’s response to scientific, evidence-based interventions when determining a student’s eligibility for special education services. These interventions are also meant to be used as a behavioral management tool in schools. Evidence-based intervention (or instruction) refers to that which has empirical evidence supporting its effectiveness (Brown-Chidsey & Steege, 2005). Response to Intervention is the process that is being used in a majority of the American states and school districts to meet IDEIA requirements.

The RTI process is based upon whether or not a student can respond to either typical classroom instruction or the type of support that is possible in a typical classroom setting (e.g., brief but intensive small-group intervention on key skills; Gersten &
Dimino, 2006). Typical classroom instruction should include high quality instruction and interventions that are matched to students’ needs. This instruction should be documented through scientific research and practice to produce high learning rates for most students (80% or more), which increases the probability of positive student response (NASDSE, 2008). The National Academy of Sciences 1982 report on the overrepresentation of minorities in special education is commonly recognized as the first conceptualization of RTI (Harry & Anderson, 1994). This report described a well-developed logic, methodology, and practice for assessing a student’s response to interventions. The origins of this approach to instruction with data-based decision-making can also be found in theory and practice of applied behavior analysis (Daly, Martens, Barnett, Witt, & Olson, 2007).

The purpose of RTI is to provide culturally sensitive academic and behavioral interventions to students at an earlier age (as opposed to a “wait to fail” model). However, IDEIA (2004) states that schools can use RTI either alone or in conjunction with the discrepancy model to identify LD. RTI enhances ecological validity, allows for efficient progress monitoring, allows data to be easily linked to curricular decisions, and eliminates the over-emphasis on intelligence quotient (IQ) scores (which can lead to an over-identification of minority students in special education; Feifer, 2008). Ecological validity involves taking the whole student into perspective, including his or her family, neighborhood, and community, in order to maximize the results of interventions. Failure to do so can have detrimental effects on future interventions that are tailored from the current results (Sattler & Hoge, 2006).
Through the RTI process, interventions are delivered primarily by general education teachers and intervention specialists. Notably, the focus of RTI has primarily been on implementation in the elementary grades (Ehren, 2007), suggesting that middle and high school teachers may not be as familiar and/or comfortable with the intervention process as elementary school teachers. Team members that often include a school psychologist, school counselor, school social worker, special education teacher, principal, and the student’s parents also contribute to the decisions about problem identification, intervention selection, and data analysis. Every team member has a unique contribution to the process, with the general education teacher (or intervention specialist) generally carrying out implementation of the interventions. As Pennsylvania’s ISTs demonstrated, extensive teacher training is needed to ensure that they can engage in the process of RTI with integrity. Thus, the purpose of this study is to examine the relation between professional development programs in the problem-solving steps inherent in all RTI models and teachers’ self-perceived competence to implement these steps.

**Types of RTI Models**

Not every state or school district takes the same approach to RTI due to there being no federal guidelines as to how to choose or implement an intervention model. Despite this, there are some commonalities across RTI models. All models follow a basic sequence of ten steps that include the following: (a) define the problem, (b) collect baseline data, (c) write the goal(s), (d) generate a hypothesis, (e) brainstorm interventions, (f) select an intervention, (g) implement an intervention, (h) take intervention data, (i) evaluate the effectiveness of the intervention, and (j) identify when
the student should move into Tier II (or III) intervention (or more intensive intervention). Interventions (or instruction) within RTI include components associated with positive academic outcomes, such as high rates of opportunities to respond, immediate corrective feedback, and groups differentiated by skill level (Vaughn et al., 2007; Barnes & Harlacher, 2008). Although the exact nature of instruction may differ between any two settings (e.g., classroom-by-classroom or state-by-state), a focus on the big ideas of the academic subject being taught and the use of an evidence-based program ensures that effective practices are a part of RTI (Barnes & Harlacher, 2008).

Additionally, all models have at least three tiers. Some RTI models view general education as Tier I (Vaughn, Wanzek, Woodruff, & Linan-Thompson, 2007). In this case, all students in a school are in Tier I as they receive high quality instruction. It is only when individual students begin to struggle with their academics and/or behavior that they move into Tier II and receive supplemental intervention. Other models view Tier I as occurring once a student’s performance warrants progress monitoring in the general education classroom (Fuchs & Fuchs, 2006). In this case, this particular student has moved into Tier I. Although the number of tiers differs between these examples, they both fall under the general principles of RTI because they provide increasingly intensive levels of instruction, and the ultimate goal is to promote positive academic outcomes (Barnes & Harlacher, 2008). The second tier of instruction is more intensive than general education, but it is less intensive than special education. For example, a teacher may work with a small group of students on a particular reading skill for 15 minutes, 3 times a week. The third tier is generally characterized by intensive, individual interventions and
may include initiation of special education placement possibilities. This model is the most common one seen in American school systems. In a four-tiered model, Tier III would represent individualized interventions, and Tier IV would entail a multidisciplinary evaluation for special education consideration (Fuchs & Fuchs, 2007).

All RTI models are similar in that they allow students to move in and out of tiers as needed. If a student’s performance improves as a result of the intervention he or she receives, then the student warrants no further intervention. The student may receive progress monitoring for several more weeks in the general education classroom to make sure he or she is able to be successful without the intervention. The goal of special education is to represent a valued tier within RTI models, not a placement to be avoided at all costs. Fuchs and Fuchs (2007) posit that special education should be a flexible service, systematically permitting students to move in and out of this tier, as well as previous tiers, as their needs change in relation to the demands of the general education curriculum.

Within all RTI models, teachers are frequently expected to work with a small group of students during regular class time to provide small-group intervention, and they must also maintain order for the majority of the class not participating in the intervention. The characteristics of increasing the intensity of interventions for small groups and individual students can be found under the section entitled “Approaches to RTI: Instructional Approach.” Of the various RTI models, the two most prominent are the problem-solving model and the standard protocol model. Frequently, states choose to blend these two models together to form a hybridized RTI model.
Problem-Solving Model

The RTI problem-solving model (RTI-PSM) does not use a standard program for all students. Instead, it relies upon a system of increasingly intensive interventions that are planned and implemented by school personnel with increasing levels of knowledge and expertise. This ultimately results in an effective program for a particular student (Deno, 2002; Mellard, Byrd, Johnson, Tollefson, & Boesche, 2004). Designing or tailoring interventions to meet the specific needs of students is the distinctive difference between this model and other RTI models that are discussed later. The four-level RTI-PSM model generally involves (a) identifying the problem, (b) designing and implementing interventions, (c) monitoring the student’s progress and modifying the interventions according to the student’s responsiveness, and (d) planning the next step. Because the use of a single program is not dictated, the level of expertise of each team member involved in the process and the need for collaborative consultation between teachers and other school personnel are much higher for this model (Rollins, Mursky, Shah-Coltrane, & Johnsen, 2009). This type of model is perhaps the most vulnerable to misapplication because the procedures and decision-making criteria are both flexible and not well specified. The outcomes of RTI-PSM depend upon the procedures used (Ikeda & Gustafson, 2002).

Berkeley, Bender, Peaster, and Saunders (2009) conducted a study to examine how all 50 states are progressing with the development and implementation of RTI models. They found that three states (Iowa, Nebraska, and North Carolina) are currently using RTI-PSM as their official model. Each of these three states modified the problem-
solving model to best fit the needs of their school districts. For example, Iowa uses a
four-step problem-solving model that involves defining the problem, developing a plan,
implementing the plan, and evaluating the outcomes. Meanwhile, Nebraska follows a
five-step problem-solving process that adds goal setting as the extra step. North Carolina
follows a seven-step problem-solving process that utilizes the five previously mentioned
steps, as well as describing the student’s performance profile and analyzing the
assessment plan as two additional steps.

**Standard Protocol Model**

The purpose of the standard protocol model is to promote students’ acquisition of
new skills, while incorporating standard methods for addressing behavioral and attention
deficits so that instruction may proceed smoothly (Torgesen, Alexander, Wagner,
Rashotte, Voeller, & Conway, 2001). This model requires the use of scientifically-based
classroom instruction for all students using the same curriculum, the same interventions,
and/or the same behavior management strategies. School districts decide which
interventions to include in their RTI repertoire for each of the core academic subjects
(reading, writing, and mathematics), as well as for behavioral issues. Then, school
personnel use only these interventions when students are struggling in the general
education classroom. Regular administration of curriculum-based assessments and
frequent comparisons of at-risk students to expected or normal growth rates are also a
part of this model (Fuchs & Fuchs, 2007). In contrast to RTI-PSM, the standard protocol
model’s procedures are well specified and open to replication across sites. Because
educators do not have to make any choices as to which interventions are appropriate for a
given academic or behavioral problem, it is relatively easy to train practitioners to use the interventions correctly with large numbers of students. Interventions are frequently scripted to ensure integrity (Fuchs & Fuchs, 2007). The goal of this model is to achieve mastery for the majority of students and to ensure fidelity of the intervention so that the students who meet the criterion for more intensive services actually need those services. Failure to make academic progress due to inadequate classroom instruction can be ruled out as a cause of the student’s difficulties (Rollins et al., 2009). A limitation to this model is that the detailed specifications of its procedures can make the it difficult to replicate if a particular school does not have all of the resources needed to carry out the interventions.

Berkeley et al. (2009) found that two states are currently using the standard protocol model as their official RTI model: Oregon and Pennsylvania. While both states are consistent in that they use RTI as part of an evaluation to determine if a student is eligible for special education, the two states differ in what happens within each tiers. For example, Oregon specifies that students in Tier II receive small-group instruction for a minimum of 30 minutes per day. Pennsylvania, however, leaves it open for specialists to assist with instruction in the general education classroom, using small groups as necessary. Additionally, Oregon has specific checklists for evaluators to rate instructors’ level of fidelity when implementing interventions. Pennsylvania only mentions the issue of instructional fidelity in their RTI guidelines.
Hybrid Model

Kovaleski (2007) states that it is wise to provide a struggling student with an evidence-based intervention (as in the standard protocol model) that has been shown to work with large percentages of students who have similar needs. However, when students fail to respond to typically effective interventions, attempts should be made to customize an intervention (as in the problem-solving model) for the individual student. Merely intensifying an intervention based upon a student’s nonresponsiveness at one tier may not address the root of the problem if the intervention is not matched to the student’s instructional needs (Daly et al., 2007). Thus, hybrid RTI models combine the strengths of the RTI-PSM and the standard protocol model, and they are uniquely tailored to meet the needs of specific schools (VanDerHeyden, 2007). One example of a hybrid RTI model is called the System to Enhance Educational Performance (STEEP), which was created by Witt, Daly, and Noell (2000). This model has similarities to the standard protocol models insofar as it uses a commercially available set of curriculum based assessment/measurement probes in reading and math to obtain data from the student’s classroom. These probes examine the student’s level of performance relative to his or her same-class peers. They also include an instructional standard to proactively identify performance problems, to plan interventions to resolve those problems, and to evaluate the effectiveness (e.g., rate of progress) of the student’s responsiveness to these interventions.

STEEP is similar to the problem-solving model in that it follows sequential steps. The four sequential steps in STEEP are (a) universal screening, (b) class-wide
intervention if a class-wide deficit exists, (c) brief assessment of the effect of incentives upon the student’s performance, and (d) assessment of the student’s response to a short term standardized intervention delivered with integrity in the general classroom setting (VanDerHeyden, Witt, & Gilbertson, 2007). Ardoin, Witt, Connell, and Koenig (2005) describe the brief assessment of the effect of incentives upon student performance as a way to see whether a skill deficit is a function of “can’t do” versus “won’t do.” In other words, this condition helps to determine if a student’s difficulty with reading comprehension is due to a lack of motivation (performance deficit; won’t do) or a lack of necessary reading comprehension skills (skills deficit; can’t do; Jones & Wickstrom, 2002).

Berkeley et al. (2009) found that 22 of the 50 U.S. states are encouraging their school districts to use a hybridized RTI model. Some of these states allow individual schools to choose whether they prefer to use the RTI-PSM or the standard protocol model within a general framework. This results in different models being used within the same state or even within the same school district. States such as Ohio use the problem-solving process to determine which standard protocol interventions should be implemented at Tier II and which individualized interventions should be implemented at Tier III. The remaining 23 states not categorized as using the problem-solving, standard protocol, or hybrid model are in the beginning stages of developing RTI procedures, and they have not yet announced which model they will be using.
Components of RTI Models

RTI is a multi-faceted process that includes various components. Given the lack of federal guidelines specifying what exactly needs to be present in order to call a process “RTI,” a school district must first decide the framework that will constitute their RTI process. This includes determining the following components: (a) approaches to RTI, (b) collaborative teams, (c) methods of identification, (d) universal screeners and progress monitoring, and (e) classifying responsiveness.

Approaches to RTI

There are two different approaches schools can take when implementing RTI in their district: instructional and diagnostic. Both approaches provide interventions to students for behavioral and academic support, but each have a different long term goal in mind when going through the process. However, states and/or schools districts do not have to have either of these approaches in mind when choosing an RTI model (e.g., problem-solving, standard protocol, or hybrid).

Instructional approach. The RTI instructional approach is designed to utilize results gained through interventions and progress monitoring to drive instruction. General education, or Tier I, is an intervention in unto itself that is effective for roughly 80-85% of the school-age population. It is comprised of quality instruction and ongoing progress monitoring (Murawski & Hughes, 2009). Teachers conduct progress monitoring via students’ performances on tests (e.g., chapter tests or math quizzes), class assignments, screening measures, and/or state achievement tests to assess which students are able to keep up with the general curriculum and which students are in need of skill
remediation. When a teacher sees that a student is falling behind, it is then recommended that a different instructional approach be implemented before assuming that the student is inherently unable to do the work (e.g., learning disabled). General education teachers and/or intervention specialists use the instructional methods implemented during Tier I to inform instruction during Tier II of RTI.

RTI Tier II instruction is more intense than Tier I instruction in that there is a smaller ratio of students to teachers by which select skills can be remediated (Klingner & Edwards, 2006). Tier II interventions are considered short-term and are provided through a collaboration between the general education teacher and another professional (oftentimes an intervention specialist); however, there are different opinions as to how many weeks constitute “short-term,” with numbers ranging from 8-30 weeks. Time spent on instruction and group size are functions of intervention intensity. Interventions are generally provided in a small-group setting with two to five group members. Students are grouped based upon similar instructional needs. Small-group instruction time ranges from 20-to-30 minute daily lessons to 45-minute lessons 3 times per week. Ongoing assessment and evaluation is conducted either through curriculum-based measurement (CBM; e.g., chapter test scores) or through intervention data in order to evaluate the intervention’s effectiveness. Students within the intervention group may have differing goals, so intervention effectiveness is considered on an individual basis (Murawski & Hughes, 2009).

If a four-tiered model is being used, then the results of Tier II will do one of the following two steps: the results will inform Tier I instruction as the student joins the
general classroom again and discontinues the intervention, or the results will inform Tier III instruction as the intervention increases in intensity (e.g., smaller ratio of teacher to students, more minutes spent in the intervention per day or per week, and/or more opportunities to respond during the intervention session). The results of all interventions tried for a particular student can also inform instruction via an Individualized Education Program (IEP). An IEP is a document that outlines an instructional curriculum for an individual student in special education or Tier IV (Smith, 1990).

**Diagnostic approach.** The RTI Diagnostic Approach is outlined in IDEIA 2004 as a process that can be used to help determine a student’s eligibility to receive special education services based upon his response to research-based intervention. The success of this model is dependent upon the quality of the RTI instructional model. Students must receive high quality initial instruction (Tier I) and/or reasonable interventions if they are struggling (Tier II/III) to ensure the validity of the diagnostic approach (Torgesen, 2007). RTI proponents theorize that a tiered model will reduce the number of students labeled for special education by offering more intensive, evidence-based instruction prior to a decision on whether or not a student qualifies for special education, and by demonstrating more clearly that all students are, first and foremost, a part of the general education classroom (Snyder, Wixson, Talapatra, & Roach, 2008).

Assuming that a four-tiered model is being used, the general education classroom serves as Tier I, and it provides all students with a scientifically-based instructional program (Murawski & Hughes, 2009). Teachers conduct progress monitoring in this approach as well. Once a student’s scores fall below a predetermined point or a
benchmark, they are referred to the school’s student assistance team where a Tier II intervention is created (RTI-PSM) or chosen (standard protocol model) so that specific instruction can be provided beyond the general education curriculum (Fuchs & Fuchs, 2007). Students who fail to respond and/or make adequate progress during the Tier II intervention are provided with one of a few options: he or she may be given a longer period of time to receive the same intervention (increased intensity), the intervention may be fine-tuned by the student assistance team to better meet the student’s needs (keep what is working and modify or discard what is not working), or he or she may be moved into Tier III of the RTI process in which interventions increase in intensity by becoming fully individualized (Murawski & Hughes, 2009).

If the student’s teacher(s) or parent(s) initiate a special education evaluation prior to the start of the Tier II interventions, then the Tier II interventions will likely be carried out by the classroom teacher (or other professional) while a multidisciplinary evaluation is begun. However, if the referral has not been initiated until after the student fails to respond positively to Tier II interventions, then the multidisciplinary evaluation will commence at this time. It is estimated that five percent of the school-age population will fall into the fourth, long-term tier of special education placement due to failure to positively respond to evidence-based interventions (Fuchs & Fuchs, 2007).

Collaborative Teams

Current federal law mandates the use of multidisciplinary, collaborative teams in special education service planning (IDEIA, 2004), but these teams are also used within the RTI process. Born out of the concept that helped create TATs (Chalfant, Pysh, and
Moultrie, 1979) and instructional consultation teams (Rosenfield, 1987), many school districts that already implement RTI on a daily basis have collaborative teams in place to help facilitate the process. These teams go by a variety of names, such as the Intervention Assistance Team (IAT), the Student Study Team (SST), or the Mainstream Assistance Team (MAT), to name a few (Murawski & Hughes, 2009). Although problem-solving teams and instructional consultation teams of past decades had a focus on problem solving and progress monitoring as core components of their models, they did not include a focus on tiered interventions that can be modified in intensity to meet students’ needs. Collaborative teams within the RTI framework focus on problem solving, progress monitoring, tiered interventions, and data-based decision-making (Kovaleski, 2007).

Teachers discuss concerns about students who are struggling academically and/or behaviorally with the school’s collaborative team to help identify the problem and create interventions that will likely improve the student’s skill deficit. As previously mentioned, RTI interventions are delivered primarily by the general education teacher, as well as by intervention specialists. Thus, collaborative teams are not only made up of the two professionals just mentioned, but also of team members that often include a school psychologist, school counselor, school social worker, special education teacher, principal, and the student’s parents. Furthermore, Fuchs and Fuchs (2006) and Marston (2005) recognize that interventionists may also include special education teachers, reading specialists, student teachers, parent volunteers, graduate students, and paraprofessionals/teaching assistants (TAs). These individuals all take part in the
collaborative problem-solving team when they are involved in the RTI process for a particular student. Each team member brings a unique perspective to the table when discussing problem identification, intervention selection, and data analysis.

Collaboration amongst all school staff ensures that students’ needs are identified early, appropriate instruction/interventions are implemented, and student progress is monitored (Burns, Vanderwood, & Ruby, 2005; Hauerwas & Goessling, 2008). A key function of the multidisciplinary, collaborative team is the facilitation of skill sharing across disciplines in order to create the maximum benefit for the student in question (Phillippo & Stone, 2006). This should reduce future student problems and inappropriate special education evaluation referrals by strengthening teachers’ capacity to effectively intervene with a greater diversity of students (Daly et al., 2007). Although teachers continuously acquire new skills throughout their careers, collaborative teams are particularly beneficial at arming teachers who have fewer years teaching experience with the capacity to effectively teach diverse learners. Teachers who are early in their careers assume responsibilities that are similar to those of experienced teachers, yet they are still learning their job duties with limited experience and/or preparation (Wang, Odell, & Schwille, 2008; Wildman, Niles, Magliaro, & McLaughlin, 1989). A teacher with fewer years teaching experience must focus his or her energy on classroom management and procedures, for example, while teachers with more experience tend to be more comfortable in their teaching role. This allows teachers with more experience to focus their energy on being the most effective teacher he or she can be (Kagan, 1992; Wideen, Mayer-Smith, & Moon, 1998).
The combination of progress monitoring data and a record of the specific interventions tried with the student, along with diagnostic information, gives the RTI team a clear, data-based picture of how well the student is responding to instruction/intervention. In the past, collaborative teams primarily worked from static measures of performance, such as the scores on standardized tests from the previous spring and anecdotal evidence (e.g., qualitative feedback from a teacher stating that he or she does not feel the student knows the material). By using a RTI model, collaborative teams now have a more dynamic picture of a student’s progress. Consequently, team recommendations can be based upon “hard,” quantitative data about how well the student responded to evidence-based intervention, rather than “soft,” and possibly even biased, data sources that continue to play a large role in special education referrals (Gersten & Dimino, 2006).

Methods of Identification

In the context of a RTI prevention model, universal screening is the first step in identifying students who are at risk for developing learning difficulties. Universal screening is an instrument for targeting students who struggle to learn even when provided with scientific, evidence-based general education instruction (Jenkins, Hudson, & Johnson, 2007). Given that errors such as false positives (e.g., low scores despite adequate knowledge) and false negatives (e.g., earning a high score by guessing) will inevitably occur, Jenkins et al. (2007) identify four elements that make up the most effective universal screening measures in an effort to control for these errors: (a) sensitivity, or the ability to produce a true positive, (b) specificity, or the ability to
accurately identify a true negative, (c) *practicality*, which requires that the instrument is brief and simple, and (d) *consequential validity*, which requires that the screening is linked to effective interventions. A screening measure with these four elements will increase the likelihood of true positives and decrease the likelihood of false positives.

VanDerHeyden & Snyder (2006) state that within a RTI framework, a preschool screening system focuses on environmental quality, fidelity of implementation of the core or universal curriculum, and effectiveness and efficiency of instructional strategies used in Tier I. A positive screen in a RTI framework leads to decision-making as to how to design and deliver additional supports or instruction rather than immediate consideration for eligibility for specialized early intervention services. In a universal screening system, all students in a preschool class or program are screened on a regular basis (e.g., weekly, monthly, biannually) with screening measures that might include the following: observations of a student’s performance in authentic contexts (e.g., a home visit), administration of CBM probes, work samples, teacher- or parent-completed rating scales, or standardized norm-referenced measures such as the Bracken Basic Concepts Scale—Third Edition (Snyder et al., 2008).

Screenings for school-age students are typically carried out three times per year (fall, winter, and spring) in the academic and behavioral domains. Students’ performances are compared with established criteria that identify students who are progressing at the expected rate. Examples of screening measures for school-age students include CBM of addition, subtraction, multiplication, and division skills for math, the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) for reading,

**Universal Screeners and Progress Monitoring**

School districts and/or states must establish how they will target students for preventative intervention. Typically, RTI is implemented by screening students three times per year in the academic and behavioral domains with the universal screeners discussed above. Progress monitoring of students’ daily work in the classroom can also be an indication of skill proficiency. Although established rates can be determined by national benchmarks, local norms, or even classroom norms, IDEIA (2004) indicates that a student’s performance should be compared to “state-approved grade-level standards.” Operationally, the measurement tool would be the state achievement test, and the relevant cut score would be the lowest score in the proficient range (Kovaleski, 2007). Students slightly below the criteria may be provided with immediate attention, or they may have their progress monitored over the course of several weeks. Students well below the criteria are considered at risk for academic failure (overall or in a specific subject) or behavioral problems, and they are provided with immediate attention (Gersten & Dimino, 2006). The assumption in this situation is that low performance relative to the cut-point/benchmark constitutes evidence that the student has failed to respond to the instruction in the general education classroom. This is commonly referred to as a direct route model because performance on the universal screener has a direct effect upon whether or not the student receives intervention services (Vellutino, Scanlon, Sipay, Small, Chen, Pratt, & Denckla, 1996).
Progress monitoring (or a progress monitoring model) is used in other RTI models, and this is implemented only for the students who performed below the cut-point during the universal screening. This subset of students’ performances is monitored over a period of five to eight weeks. It is only when no improvement is observed that these students progress on to Tier II preventative intervention (Fuchs & Fuchs, 2007).

Classifying Responsiveness

When considering how to classify a student’s responsiveness to intervention, current research provides four options for school professionals to consider on a state-by-state and, at times, a district-by-district basis. First, if a student’s score is at the 25th percentile or higher at the end of the intervention, then he or she was responsive to the intervention because his or her score is within an average range (Torgensen et al., 2001). This percentile can be obtained either by administering a standardized assessment or by comparing the student’s performance to class, school, or district norms. Second, if a student reaches an established benchmark via CBM at the end of the intervention, then he or she was responsive to the intervention (Good, Simmons, & Kame’enui, 2001). Third, professionals can rank order and assess the slopes of improvement of all students who received the preventative intervention. In this case, the median slope is used as the cut point for responsiveness for all students in the group (Vellutino et al., 1996). Slope of improvement, or learning rate, refers to a student’s individual growth in achievement or behavior competencies over time. Learning rates and levels of performance vary significantly across students and schools (NASDSE, 2008). Fourth, professionals can combine the use of slope of improvement with final performance for classifying
responsiveness. A student whose slope is above the median cut-point and whose performance on the CBM is at or above the benchmark would be considered responsive (Fuchs & Fuchs, 1998).

**Multidisciplinary Evaluation Prior to Special Education Placement**

Berkeley et al. (2009) report that 37 of the 50 U.S. states are currently including a psychoeducational evaluation (ability and academic achievement tests) in addition to their RTI practices to determine students’ eligibility for special education services. Ten states are currently using the discrepancy model without any RTI activities. In regards to implementing RTI practices in these 10 states, 2 have engaged in a pilot implementation, 3 have given their school districts local control of implementation, 3 have a target date set for implementation, and 2 have not specified a date for implementation. There are currently two states (Delaware and Georgia) that use RTI data alone (no discrepancy model) in conjunction with the multidisciplinary evaluation in order to make disability diagnosis decisions. It is unclear if South Carolina uses RTI alone, a psychoeducational evaluation alone, or a combination of the two to make placement decisions as their state department of education did not specify this information on their website.

A psychoeducational evaluation is only warranted if the results provide utility for designing instruction and/or grouping students productively for instruction beyond that which could have been achieved based upon the data collected during interventions (Fuchs & Fuchs, 2007; Kovaleski, 2007). Fuchs and Fuchs (2007) recommend that the instructionally focused multidisciplinary evaluation be designed to answer specific questions that arise during general education instruction and previous rounds of
intervention. The evaluation should also include a process for distinguishing between the high-incidence disabilities (e.g., LD, Speech/Language Disorders, Mild Cognitive Disabilities, Emotional and/or Behavioral Disorders, and Minor Other Health Impairment; Carter, Wehby, Hughes, Johnson, Plank, Barton-Arwood, & Lunsford, 2005; Gresham, Sugai, & Horner, 2001; Murray & Greenberg, 2006). They believe a specifically tailored and instructionally focused evaluation is more efficient than a full-blown, broad evaluation, and that making distinctions among the high incidence disability categories may prove useful to special educators in formulating sensible grouping structures.

Interventions

Interventions make up the backbone of RTI. Merriam-Webster Dictionary (n.d.) defines an intervention as something that comes in or between by way of hindrance or modification, as to prevent harm or improve functioning. Within RTI, interventions serve various purposes, all of which are meant to have positive outcomes for students. The general education teacher or intervention specialist is typically the professional who implements interventions within the RTI process. It is vitally important that these (and other) professionals are able to implement the interventions with integrity in order to ensure internal and external validity of the intervention’s results.

Purposes of Interventions under RTI

VanDerHeyden, Witt, & Barnett (2005) list five purposes of intervention under RTI. First, a goal of RTI is to demonstrate functional competence. The bases of RTI are baseline and intervention conditions implemented with integrity and well-measured
outcomes. These enable a collaborative team to make data-based decisions about responsiveness to the intervention(s). The primary value of data collected in RTI is whether or not short-term growth, under controlled conditions, can predict whether or not a student will be successful when the intervention is removed. Second, RTI can be used to continuously optimize intervention plans. This indicates that interventions can be adjusted to better meet the needs of the student. Both increasing- and decreasing-intensity designs can be applied to components in the intervention(s). The increasing-intensity design of RTI indicates that components can be added as needed to reach desired outcomes (e.g., more supports for the student), whereas decreasing-intensity designs withdraw or fade out intervention components in order to reach goals (e.g., more independence for the student).

Third, RTI can inform eligibility decisions. IDEIA (2004) states that the results (student’s responsiveness) from scientific, research-based interventions must be used alone or in conjunction with either the discrepancy model or an alternative research-based assessment to determine whether or not the student has a specific learning disability (SLD). Fourth, a goal of RTI is to improve achievement in general education. Therefore, interventions are provided at every level, including the general education classroom, so that student achievement improves (versus needing to be moved into small group or individualized instruction). Barnes and Harlacher (2008) state that by providing quality instruction to all students, schools can increase the probability of attaining desirable levels of student achievement, and they can rule out poor instruction as a cause of low achievement. Lastly, RTI can flexibly organize services within and across general and
special education. It provides a framework to deliver interventions across settings and levels (e.g., general and special education; school-wide, class-wide, and individual interventions). These interventions can be modified or adjusted as needed based upon the progress monitoring, or other evaluation processes employed, to create a well-integrated system of instruction/intervention that is guided by student outcome data (NASDSE, 2008).

**Intervention Integrity**

Important decisions affecting student placement are made when using an intervention-based assessment approach. These decisions are based upon an evaluation of the effect of one or more interventions. School professionals must demonstrate that there is a functional relation between student responsiveness (or lack there of) and exposure to a particular intervention in order to make data-based decisions. This demonstration requires intervention (or treatment) integrity (Gresham, Donald, MacMillan, Beebe-Frankenberger, & Bocian, 2000; Duhon, Mesmer, Gregerson, & Witt, 2009). Intervention integrity is present when one administers all steps within an intervention in the manner in which they were meant to be implemented (Gresham, 1991). If left undocumented, Gresham (1991) states that a lack of intervention integrity may result in a misattribution of a student’s failure to respond to the intervention (uninformed decisions). For example, a student may fail to respond positively to an intervention due incorrect administration of the intervention. However, without an integrity check, school personnel may incorrectly view the entire intervention as being inadequate to meet the student’s needs and needlessly implement a new intervention.
Despite the importance of implementation integrity, results from studies that directly assessed treatment integrity of classroom interventions indicate that accurate implementation by teachers is not always the case (Noell, Witt, Gilbertson, Rainer, & Freeland, 1997; Noell, Witt, LaFleur, Mortenson, & Rainer, 2000; Noell, Duhon, Gatti, & Connell, 2002; Noell, Witt, Slider, Connell, Gatti, Williams, Koenig, Resetar, & Duhon, 2005; Witt, Noell, LaFleur, & Mortenson, 1997).

**Increasing Intervention Integrity**

While there are some teachers who follow intervention scripts to the letter, the poor intervention integrity displayed by others may be influenced by various factors. These may include the effort required to implement the intervention, poor classroom management techniques, lack of “buy-in” or motivation of the teacher, a belief that no one will check to see if all steps are followed, lack of support for implementation, and/or failure to have trial periods to adjust interventions (increase/decrease intensity; VanDerHeyden et al., 2005). A logical first step to help teachers increase intervention integrity is to remove any skill barriers to implementation with training prior to asking a teacher to implement an intervention in the classroom. Direct training strategies, simplifying the steps within the intervention, performance feedback, and lean feedback schedules are viable ways to increase integrity (Gilbertson et al., 2007).

Direct training strategies (e.g., classroom rehearsal and feedback; Sterling-Turner, Watson, & Moore, 2002) tend to result in greater gains in integrity compared to indirect training strategies (e.g., verbal instruction) that are typically used in consultation. The type of intervention implemented is also important to consider because interventions that
are complex and take extensive time and effort to carry out are associated with lower levels of integrity (Zins and Erchul, 1995). Bentz, Shinn, and Gleason (1990) suggest that teachers use interventions that utilize peer tutors because this decreases the amount of time and efforts needed by the teacher to achieve academic progress. Fowler (1986) states that peer tutoring has the additional benefit of providing individualized instruction to students and multiple response opportunities with immediate feedback, which can result in increased academic progress for struggling students.

Training alone prior to implementation of interventions in the classroom setting is not sufficient to consistently establish implementation integrity (Noell et al., 2000). Follow-up support strategies (e.g., performance feedback; Duhon et al., 2009; Noell et al., 2002) employed after teachers have had the opportunity to independently use interventions in a busy classroom setting have emerged in the school-based consultation literature. Performance feedback provides direct information regarding the accuracy of performance in the appropriate setting in order to enhance and maintain behavior change. Information provided through performance feedback may include praise for accurate implementation, corrective feedback for errors in implementation, a review of implementation data, and other components regarding questions of implementation that may arise (Codding, Feinberg, Dunn, & Pace, 2005; Duhon et al., 2009). Leaner feedback schedules (weekly instead of daily feedback) moderately improves teachers’ use of academic intervention (80% correct implementation with feedback versus 60% at baseline; Mortenson and Witt, 1998). Consultation follow-up led by a professional familiar with the chosen intervention (e.g., an intervention specialist or school
psychologist) frequently occurs by means of an informal meeting during which time consultants ask teachers how the intervention is working (Gilbertson et al., 2007). Noell et al. (2000) found that changing the format of the follow-up meeting to include detailed feedback about which steps were and were not correctly implemented led to higher implementation integrity with all teachers.

**Professional Development**

Professional development, staff development, and teacher training are interchangeable terms most frequently used to describe learning activities (e.g., continuing education) related to enhancing the skills needed to successfully meet the expectations of one’s occupation (Kratochwill et al., 2007; National Staff Development Council, 2001). There is a provision in NCLB (2001) requiring schools to provide high-quality professional development to school professionals to enable all children in the school to grow both academically and behaviorally.

**Establishing a Need for Professional Development in Schools**

NCLB (2001) lists “significantly evaluating the quality of instruction by providing staff in participating schools with substantial opportunities for professional development” as one of its goals. Additionally, the Act requires schools that receive funding through NCLB Title I to “devote sufficient resources to effectively carry out high-quality and ongoing professional development for teachers, principals, and paraprofessionals... to enable all children in the school to meet the State’s student academic achievement standards.” Many educators may be in need of professional development training in tiered interventions, as well as in the assessments used for
screening and progress monitoring, as a part of RTI. This training should enable the educators to more accurately match interventions with students’ needs. If done effectively, it will result in positive changes in student outcomes (Danielson, Doolittle, & Bradley, 2007; Kratochwill et al., 2007). As of 2008, statewide training efforts were underway in 90% of the states. This training primarily emphasizes an overview of RTI, progress monitoring, and the use of data-driven decision-making. Areas that receive less training emphasis at the present time include culturally responsive RTI and the roles of educators in implementing RTI. The lack of emphasis on culturally responsive RTI may have a long-term impact on the decision making for culturally and linguistically diverse students (Hoover et al., 2008). Kratochwill et al. (2007) recognize that professional development poses challenges that are multifaceted and include training of pre-service and in-service practitioners in the conceptual, methodological, and practical aspects of RTI, as well as the systemic change factors (building and district level) that influence the process of implementing any new innovation. Results from various studies of professional development trainings conducted in the 1990s suggest that training can significantly influence teachers’ classroom practices and lead to improved student achievement (American Educational Research Association, 2005; Danielson et al., 2007).

Critical Components of High-Quality Professional Development

Several critical components of high-quality professional development that are recommended to be included in trainings are professional development structures (e.g., teacher networks and study groups), a way to directly apply what is learned to instructional practices to help improve student performance, and an environment that can
help sustain the learned practices (e.g., teaching materials and staff support; American Educational Research Association, 2005; Danielson et al., 2007; Kratochwill et al., 2007; Kovaleski, 2007). Porter, Garet, Desimone, Yoon, and Bierman (2000) identified two categories of high-quality professional development that encompass six components.

**Structural features.** This category includes structural features that focus on the context in which professional development and implementation activities occur. This category includes three critical components: reform type, duration, and collective participation. Reform type consists of embedded professional development structures such as the teacher networks and study groups listed above. Porter et al. (2000) found these reform types to be more effective in changing teachers’ daily practices than traditional workshop or conference formats, which have little personal interaction between participants. Duration refers to the amount of time spent on professional development activities and the span of time over which these activities occur. This component was also found to produce positive results. Collective participation refers to the powerful effects that training teachers from the same department, grade, or school has upon outcomes, as opposed to training teachers from many different schools.

**Core features.** This category includes core features that focus on the professional development activities that take place. Core features include the other three critical components: active learning, content focus, and coherence. Active learning involves students engaging in higher-order thinking tasks such as analysis, synthesis, and evaluation (Bonwell & Eison, 1991). Porter et al. (2000) found that professional development activities with a strong content area focus (as opposed to a loose focus on
many topics) work as effective change agents. Lastly, coherence refers to the professional developments’ ability to offer activities that are directly aligned with teachers’ goals and states’ standards. These six components of high-quality professional development work together to produce positive change in teachers’ practices.

**Professional Development as it Relates to RTI**

Barnes & Harlacher (2008) cite two factors to consider regarding professional development training in RTI. First, it is critical that training for RTI models is ongoing. As opposed to a “train and hope” approach in which staff receive training at one point in time and no follow-up sessions, RTI requires ongoing professional development so that skills and concepts can be reviewed frequently and consultation can be provided continuously (Bergstrom, 2008; NASDSE, 2006). This continuous level of support ensures that the teaching staff understands the process of RTI, becomes fluent with the skills, and performs their roles accurately. Secondly, even though staff may understand their role and the skills needed to implement RTI, they may need ongoing professional development to understand the reasoning behind it. Understanding the rationale behind RTI is considered just as important to the process as learning how to implement it (Barnes & Harlacher, 2008; NASDSE, 2006). Furthermore, teacher networks within the professional development training, as were described above, are also relevant within RTI training, along with planning for staff turnover (Bergstrom, 2008; Kratochwill et al., 2007).
Brown-Chidsey and Steege (2005) emphasize three essential elements to include in professional development training for RTI: schedule, teacher learning outcomes, and indicators of mastery of RTI methods. Scheduling refers to the frequency of training sessions, and it is consistent with Barnes and Harlacher’s (2008) recommendation for ongoing training. The initial sessions include an overview of RTI methods and ensure that everyone is aware of the plans and expectations regarding RTI. Subsequent sessions teach the detailed components of RTI, such as approaches (diagnostic and instructional), the number of tiers involved, and methods of identification of students in need of preventative intervention. Brown-Chidsey and Steege (2005) recommend that trainers explicitly state learning outcomes at the beginning and end of the training sessions so that participants are well aware of concerning what they should learn from that day’s session. Finally, because it is important to determine whether or not teachers are implementing the RTI methods and interventions as intended, some measurement of implementation integrity should be utilized. Adding this step into the training can help assuage teachers’ anxiety regarding integrity measurement.

Other examples of critical components in high-quality professional development training can be found in Kratochwill et al.’s (2007) examination of the Office of Special Education Programs’ K-3 Reading and Behavior Intervention Models Project. This project implemented multi-tiered intervention models in six research centers across the country. This was done in conjunction with the Coordination, Consultation, and Evaluation Center at the University of Wisconsin—Madison. Each of the six research centers targeted students at risk for developing reading and/or behavior problems. The
following are five of the key summary points collected from the project: (a) utilize participants’ previous training and background knowledge, (b) include role-playing, group discussions, case studies, and reviews and demonstrations of intervention materials, (c) include collaborative problem solving, (d) include co-teaching, mentoring, and coaching on an ongoing basis to provide in-class support, and (e) utilize evaluation strategies such as observations and self-reporting of treatment integrity and data on student outcomes.

**Studies evaluating RTI and problem-solving professional development trainings.** Empirical research evaluating the effectiveness of RTI professional development programs is limited. There are several studies that give an overview of how problem-solving models were implemented in specific states. When being implemented on a large-scale basis, the problem-solving model is frequently referred to as PSM (not to be confused with RTI-PSM). Nunn and Jantz (2008) evaluated RTI professional development training’s effect upon teachers’ self-efficacy. Hauerwas and Goessling (2009) investigated the need to include TAs in RTI professional development training activities. Thus far, there is a need in the research literature to evaluate RTI professional development training’s effect upon teachers’ competency as it relates to taking part in the RTI process.

**Overview of how PSM and/or RTI-PSM were implemented in several states.** Fuchs et al. (2003) and Bergstrom (2008) identified five large-scale RTI models that are exemplars of wide-scale problem solving: the Alliance for School-based Problem-solving and Intervention Resources in Education in Illinois (ASPIRE; Bergstrom, 2008),
the Heartland Agency Model in Iowa (Heartland, 2004; Ikeda, Tilly, Stumme, Volmer, & Allison, 1996; Kovaleski, 2007), Minneapolis Public Schools’ Problem-Solving Model (PSM; Minneapolis Public Schools, 2001), Ohio’s Intervention Based Assessment (IBA; Telzrow, McNamara, & Hollinger, 2000), and Pennsylvania’s Instructional Support Team (IST; Kovaleski, 2007; Kovaleski & Glew, 2006; Kovaleski, Tucker, & Stevens, 1996). Meta-analytic research conducted by Burns, Appleton, and Stehouwer (2005) found that four of the models (Iowa, Minnesota, Ohio, and Pennsylvania) demonstrated large effects upon students placed in special education. These four models have been identified as examples of best practice for large-scale problem solving efforts (Barnett et al., 1999; Kovaleski, 2002; Marston & Magnusson, 1988; Tilly, 2002). Teacher/educator training was an important component of each of these five large-scale models. Each was implemented in phases that involved broad training and included training for general education teachers, as well as other school professionals (Burns & Ysseldyke, 2005). Training and a phased-in process of implementation lasted for three years in Illinois (40 schools districts; Bergstrom, 2008), nearly ten years in Minneapolis (100 schools; Marston et al., 2003), four years in Ohio (329 schools; Telzrow et al., 2000), and five years in Pennsylvania (500 school districts and more than 1,700 elementary schools; Kovaleski et al., 1996). It is unclear how long the process took in Iowa.

ASPIRE, Illinois. ASPIRE South Center at Southern Illinois University (from here on, Center) provided professional development conferences over the course of three years to 40 rural school districts in southern Illinois (Bergstrom, 2008). The first year included six full day sessions, the second year included four full day sessions, and the
third year included two full day sessions. Additionally, the Center provided technical assistance support through local meetings with administrators and team coaches (teams that represented individual school districts). The goals of the professional development training sessions were to increase the capacity of the school districts to build a sustainable structure for implementing early intervention services via a three-tiered RTI model. The Center placed an emphasis on developing materials with built-in time for practicing skills and team planning for application of the content. Attendance at each conference session was made up of special education administrators (n = 35%), building principals (n = 28%), superintendents (n = 10%), general education teachers (n = 8%), special education teachers/intervention specialists (n = 6%), and regional office of education personnel (n = 6%). The teams were expected to lead the professional development training and implementation efforts in their own schools.

All school districts participating in the training had to pledge a commitment to fulfill seven major implementation activities of RTI. The Center added this requirement not only to increase awareness among participants of the key elements of professional development training as it pertains to RTI, but also to ensure that a leadership commitment was made from each district. First, they had to make increasing student achievement through data-based decision-making a top priority. Second, the district team was required to be present at all professional development training sessions offered by the Center. Third, they had to complete a self-assessment to identify expectations and current levels of implementation of RTI. Fourth, the district was required to pledge to build a scientifically-based data system to support decision-making efforts (e.g.,
AIMSweb or DIBELS). Fifth, they had to build a system to support scientifically-based reading instruction. Sixth, the district needed to develop both district and building policies and implementation plans. Seventh, they had to make a commitment to increase parental involvement.

Highly qualified personnel, including university professors who were actively involved with creating the presentation materials and field experts with extensive applied experience with RTI, led the professional development training sessions for the Center. Four special education university faculty members from the University of Southern Illinois also designed and delivered the professional development training content for the Center. Additionally, a reading specialist designed and delivered specialized reading content for the Center. Activities at each session included presentations of guiding principles, sharing of practical examples, targeted team discussions, assessment of the schools’ needs, specific skill development, action planning, and networking opportunities. Data taken at the end of the three-year period indicated that a greater number of students were reaching benchmark scores on screening assessments, which resulted in a reduction in the number of students referred for a special education evaluation.

*Heartland agency model, Iowa.* Ikeda et al. (1996) evaluated the Heartland Area Education Agencies (AEAs), Local Education Agencies (LEAs), and the Iowa Department of Education (IDE) joint-sponsored Renewed Service Delivery System (RSDS) initiative to improve educational services in Iowa schools. Developed in 1988, the RSDS oversight committee was comprised of 22 educators, including principals,
general and special education teachers, school psychologists, university faculty, and IDE personnel (Jankowski, 2003). The foundation principles of RSDS included more integration of services for students diagnosed with or at risk for disabilities, greater inclusion of students with disabilities in the general education classroom, increased use of assessment procedures that inform educational decision-making, and early intervention and prevention of educational problems. These principles were an early form of RTI, and they provided the foundation for Heartland AEA 11 (eleventh agency out of 15 total agencies across Iowa) to develop a comprehensive problem-solving consultation model. This model focuses on identifying resources needed to effectively implement problem-specific interventions. Comprehensive professional development training was provided for school districts to incorporate three priority educational practices into their overall daily practice: collaboration, Building Assistance Teams (BATs), and systematic progress monitoring (Ikeda et al., 1996).

Heartland provided systematic training to both AEA and LEA staff in strategies for working together effectively within RSDS. The training directly taught the skills needed for effective collaboration. BAT training promoted the philosophy that the problem-solving process is continual, that many problems can be treated through interventions in general education settings, and that the roles of AEA and LEA staff do not change once a child is diagnosed with a disability. Specific skills in defining the problem, brainstorming solutions, evaluating outcomes, and group process skills were covered during BAT training. During the progress monitoring portion of training, educators were taught the skills needed to precisely define the problem, identify the
problematic dimension of a behavior, select a measurement strategy, gather information, and use information in an ongoing manner to make instructional/educational decisions. Areas of staff development were continually updated as new and better technologies were empirically validated (Ikeda et al., 1996).

Heartland AEA 11 evaluated the professional development training provided to the school districts by surveying 219 AEA staff members. Eighty-five percent of respondents reported good-to-excellent perceptions that their concerns were given consideration by management. Ten percent felt their concerns were given poor consideration, and roughly five percent felt their concerns were not given consideration. Over 90% of respondents indicated good-to-excellent autonomy, support from management in areas of controversy, and support from management regarding quality performance. Roughly 80% of staff indicated a good-to-excellent level of overall satisfaction with the professional development training Heartland AEA provided. When individual school districts were surveyed, over 1,000 teachers, principals, and superintendents responded. Roughly 75% of respondents indicated satisfactory-to-excellent perceptions of support services provided by AEA in the areas of functional assessment, merging of general and special education services, collaborative instruction, BAT management, and promoting parent involvement (Ikeda et al., 1996). The Heartland PSM was officially written into state law in 1995, which allowed school districts to use this model to help make special education eligibility decisions. New staff members received substantial training about PSM, specifically in using a systematic,
problem-solving process to analyze students’ needs and in using a problem-solving approach to implement interventions of varying levels of intensity (Jankowski, 2003).

*PSM, Minneapolis, MN.* Marston, Muyskens, Lau, and Canter (2003) evaluated the large-scale implementation of the PSM in Minneapolis Public Schools. Formal implementation of the model began in 1992, and included the following problem-solving steps that resemble future RTI models: (a) describing the student’s problem with specificity, (b) generating and implementing strategies for instructional intervention, (c) monitoring student progress and evaluating the effectiveness of instruction, and (d) continuing this cycle as necessary. Various training approaches were utilized for implementation of PSM. The most prominent of which was for a consistent group of PSM Lead Staff members to conduct school-wide training at staff meetings or during school professional development training time. Having a training staff that was made up of consistent members was essential to providing a consistent message on how to implement PSM. Training sessions consisted of 45-60 minutes of introductory presentation with follow-up training and consultations available. Follow-up sessions were usually held with administrators, school lead staff, and school psychologists.

Another approach to training involved a “Training of Trainers” model in which school districts’ school psychologists and lead special education resource specialists were thoroughly trained in the model. This allowed these individuals to conduct further training within their school districts without the aid of PSM staff members. Additional professional development training was provided to general education personnel in effective instructional strategies and progress monitoring procedures. These trainings
were held after school, on weekends, and during the summer, and they were led by staff within the district who had expertise in those areas. This additional training was included to help address the issue of overrepresentation of cultural and linguistic minorities in special education in Minnesota.

Reschly and Starkweather (1997) conducted an evaluation of PSM in Minneapolis, including evaluation of staff perceptions of PSM. Results indicated the attitudes and beliefs of teachers, administrators, social workers, and school psychologists regarding PSM were generally positive. Although information was not available regarding educators’ perceptions of the quality of professional development training they received, additional information gathered from Reschly and Starkweather’s study indicated that pre-referral interventions under the PSM were superior to those implemented using the traditional model. They also found that students received special education services earlier than under the traditional model.

IBA, Ohio. The Ohio Department of Education (ODE) introduced IBA as a voluntary school-based initiative under a special education waiver plan during the 1992-1993 school year (Telzrow, McNamara, & Hollinger, 2000). Ohio’s network of 16 Special Education Regional Resource Centers (SERRCs) recruited schools to participate in the implementation process. Each SERRC assigned one staff member (SERRC IBA coordinator) to coordinate the recruitment, training, and data collection for schools in the IBA initiative. IBA coordinators were comprised of school psychologists, educational specialists, and speech/language pathologists, who were all experts in assessment. The coordinators met regularly to discuss IBA training, implementation, and statewide data.
The 329 schools taking part in IBA already had a building-level problem-solving team in place. They also had building leadership (e.g., the principal and school psychologist) who promoted collaborative change processes. There was variability both in the content and in the intensity of training delivered at each of the 16 SERRCs due to a lack of a state-sanctioned training model. The design and implementation of training originated in the SERRC regions rather than with the ODE. Training focused on topics such as collaboration, problem solving, intervention design, data collection, and progress monitoring. Workshops focused on small group training, while on-site modeling and coaching were utilized in varying degrees across the 16 regions. Training stressed the importance of the eight components of problem-solving: (a) behavioral description of the problem, (b) baseline data, (c) measurable goal, (d) hypothesized reason for the problem, (e) systematic intervention plan, (f) evidence of treatment integrity, (g) data indicating student response to intervention, and (h) comparison of intervention data with baseline data.

Telzrow et al. (2000) conducted a data analysis of 227 (69%) of the 329 IBA schools by evaluating the work products submitted by multidisciplinary teams (MDTs) to document their student-centered problem solving. The work products included a Problem Solving Worksheet that listed each of the eight problem-solving components, as well as a brief description of common pitfalls and guiding questions for each component. This worksheet was used to train educators and parents in the IBA process, and it was required as part of the case documentation as a means of facilitating scoring of problem-solving integrity. The work products also included an Evaluation Team Report (ETR) form.
ODE prescribed this form to be used by schools implementing IBA in order to document a description and analysis of concerns affecting the student’s learning, a description of the implemented interventions and how these were monitored, and data from progress monitoring. After analyzing the documentation submitted by the 227 IBA sites, results indicated there was no significant correlation between the number of years of participation in IBA training (ranging from one to five years) and implementation integrity.

Telzrow et al. posit that the variability in training across the 16 SERRCs makes years of participating in IBA training an inaccurate index of experience with the problem-solving process. They also recognize that the school principal was a prominent leader in IBA implementation, so schools that experienced a change in administration (principals) during the school year may have experienced a disruption in progress in applying the problem-solving components. Further data analysis indicates that MDTs implemented the eight problem-solving components with varying degrees of integrity. For example, a majority of MDTs identified the target behavior in measureable, observable, and specific terminology, but they tended to provide only indirect baseline measures. Implementation integrity for the eight problem-solving components was below desired standards for a majority of IBA sites. Telzrow et al. recognize that several of the problem-solving components (e.g., generating hypotheses and documenting treatment integrity) may require different and/or more intense training in order to produce higher skill levels in MDTs. Thus, variability of integrity scores amongst the eight components may be attributable to MDTs developmental progress in acquiring these skills.
Pennsylvania institutionalized instructional support teams (ISTs) at the elementary level between 1990-1997. The Pennsylvania Department of Education (PDE) led this effort, and the PDE Director of Special Education formulated the integrated model. State regulations mandated that at least one elementary school in each of the 500 Pennsylvania school districts have an IST. These school districts began using ISTs in a phased-in manner of implementation between 1990-1995: 105 schools districts began in year one, 98 began in year two, 109 began in year three, 84 began in year four, and 104 began in year five. Regulations stated that students had to receive intervention through the IST process to target their specific instructional, behavioral, emotional, and/or communication needs prior to referral for a multidisciplinary evaluation for special education consideration. The IST model was based upon precursor initiatives that were operated in Pennsylvania on a trial basis, including instructional consultation teams and TATs (Kovaleski & Glew, 2006). The traditional four-step process of TATs was extended to include four additional steps in the IST model: (a) express concern for a student’s academic or behavioral progress, (b) conduct a thorough assessment (new addition), (c) identify the problem, (d) establish strategies through trial teaching (new addition), (e) work strategies into class routines (new addition), (f) implement the strategy, (g) evaluate progress, and (h) assess continuously (new addition).

Consultants housed in one of Pennsylvania’s three main instructional support centers or 29 smaller intermediate units provided extensive training to schools in both process and content modules. Although all IST members were invited to attend the training, only support teachers and principals were required to attend. Specialized
training was provided for all principals of participating IST sites. After one year of training, support teachers and principals were involved in frequent follow-up trainings and networking at the intermediate units. The consultants also provided training to teachers and other team members that recently joined the team (staff turnover; Bergstrom, 2008). The training style was based upon a peer coaching model (Joyce & Showers, 1982) in which one participant implements a portion of the IST process while another participant observes and offers constructive criticism. Then, the two individuals reverse roles. Trainers followed up educational workshops by making biweekly school visits for demonstrations and peer coaching.

**RTI professional development training’s effect upon teachers’ self-efficacy.**

Nunn and Jantz (2009) conducted a study in which they administered the Teacher Efficacy Beliefs and Behaviors Scale (TEBBS) to 429 K-12 teachers, administrators, and support professionals trained in a year-long RTI implementation initiative. Participants were from several different small and large school districts within a single, western, U.S. state. Their goal was to measure the impact RTI training programs have upon teachers’ self-efficacy. Self-efficacy, or teacher efficacy, can be an indicator of how teachers perceive their ability to influence positive learning outcomes for students. Nunn and Jantz posit that this concept refers to the belief that there is a substantive link between what the teacher does and what positive outcomes amass as a function of those actions. Self-efficacy was the measured dependent variable of interest. The independent variables were RTI-Implementation (RTI-IMP) and RTI-Involvement (RTI-INV). RTI-IMP was described as the “extent to which a teacher was actively involved in the ongoing work of
their collaborative teams at their school.” RTI-INV was described as the “level of expertise exhibited by the school team in application of RTI practices in the school.” Three components were found to account for 42% of variance: instructional skills efficacy, motivational skills efficacy, and external control efficacy (e.g., family and peers). Results demonstrated that RTI-IMP and RTI-INV were associated with differences in reported teacher efficacy beliefs defined by intervention skills efficacy and motivational skills efficacy, but not external control efficacy. Based upon Nunn and Jantz’s (2009) results, it can be inferred that future RTI trainings may benefit from utilizing program evaluation designs that include teacher efficacy, quality of implementation, and involvement variables.

**TA involvement in professional development training for RTI.** Hauerwas and Goessling (2008) surveyed 166 TAs during regional training sessions in Rhode Island to determine their current roles and responsibilities in schools. Follow-up interviews were conducted with TAs and principals who indicated that they had implemented RTI for at least two years. In Rhode Island, 89% of TAs provide assistance primarily with instructional support of classroom teachers. Historically, TAs were employed to assist with the daily living activities and other care issues individual students with severe and multiple disabilities required. However, as more and more students with disabilities are being included in the general education classroom, TAs are more frequently being assigned to work in general education classrooms with several students with disabilities who need varying levels of support (Hauerwas & Goessling, 2008; Pickett & Gerlach, 2003). Results from the survey indicate that more than 20% of the TAs were involved in
the RTI process for at least two years. Involvement included more than 35% with reading instruction, more than 20% with math instruction, more than 13% with reading assessment, more than 9% with math assessment, and more than 13% with progress monitoring activities. Implications of this study point to the need to include TAs in RTI professional development trainings so they can better participate in the process.

**Rationale for the Current Study**

Previous literature has demonstrated links between professional development training in PSM and a decrease in the number of students referred for special education evaluations. This points to a need for teachers and related school personnel to be trained in RTI and problem-solving models before school teams can make a positive impact on the performance of struggling students. However, there is currently a gap in the research literature evaluating the effectiveness of PSM and/or RTI professional development training during state-wide and district-wide implementation. Specifically, it is necessary to evaluate whether or not these trainings are increasing teachers’ self-perceived competence to take part in the RTI process. Thus, the following research questions are proposed:

- **Research Question One:** What are the demographic characteristics of this sample?

- **Research Question Two:** How confident do teachers feel in their ability to implement each problem-solving step?

  - **Hypothesis:**
- There will be an equal distribution of responses for which particular problem-solving step teachers feel most and least competent implementing, indicating that there is no particular step in the problem-solving process that is fundamentally easy or difficult to implement.

- **Research Question Three:** What is the relation between frequency seeking IAT, helpfulness of IAT, years teaching, teaching level, experience on IAT, years implementing, and teachers’ self-perceived competence in their own ability to implement these steps?
  
  - **Hypotheses:**
    - Individuals who seek team assistance less frequently, feel their school’s IAT is very helpful, have more years teaching experience, teach at the elementary school level, have served on their school’s IAT, and have more years implementing the problem-solving steps since their initial training will have higher levels of self-perceived competence.

- **Research Question Four:** What is the relation between quality of past training, the extent of training by type, extent of training in each step, opportunities to practice, and teachers’ self-perceived competence to implement these steps?
  
  - **Hypothesis:**
    - Individuals who view his or her past training in the problem-solving steps as high quality (or superior), have had more
extensive training in various settings (in-service, conference workshop, etc.), have had more extensive training in the problem-solving steps in each individual step or in general, and have had more opportunities to practice implementing each individual problem-solving step will have higher levels of self-perceived competence to implement that particular step.
Chapter 3: Methods

• **Research Question One:** What are the demographic characteristics of this sample?

• **Research Question Two:** How confident do teachers feel in their ability to implement each problem-solving step?
  
  o **Hypothesis:** There will be an equal distribution of responses for which particular problem-solving step teachers feel most and least competent implementing, indicating that there is no particular step in the problem-solving process that is fundamentally easy or difficult to implement.

• **Research Question Three:** What is the relation between frequency seeking intervention assistance team (IAT), helpfulness of IAT, years teaching, teaching level, experience on IAT, years implementing, and teachers’ self-perceived competence in their own ability to implement these steps?
  
  o **Hypothesis:** Individuals who seek team assistance less frequently, feel their school’s IAT is very helpful, have more years teaching experience, teach at the elementary school level, have served on their school’s IAT, and have more years implementing the problem-solving steps since their initial training will have higher levels of self-perceived competence.
• **Research Question Four:** What is the relation between quality of past training, the extent of training by type, extent of training in each step, opportunities to practice, and teachers’ self-perceived competence to implement these steps?

  - **Hypothesis:** Individuals who view his or her past training in the problem-solving steps as high quality (or superior), have had more extensive training in various settings (in-service, conference workshop, etc.), have had more extensive training in each individual problem-solving step, and have had more opportunities to practice implementing each individual problem-solving step will have higher levels of self-perceived competence to implement that particular step.

**Research Design**

The researcher used a non-experimental design to conduct exploratory research (Vogt, 2005). A non-experimental design is the most appropriate for this study because no treatments or interventions were used, and because there was no manipulation of variables. This study measured the associations of the variables and focused on a predictive model, characteristic of a correlational design (Spata, 2003). Correlational designs are used when variables cannot be investigated experimentally. This design was most appropriate for this study because the variables in this study could not be manipulated as they were past occurrences that could not be changed by the researcher. A correlational design allows the variables to vary freely and the researcher to investigate how a change in one variable is related to a change in another variable (Crano & Brewer,
Survey research utilizing a self-administered Internet questionnaire was used to collect data. This method of data collection is advantageous because of reduced costs (no printing or mailing fees), increased data integrity through the elimination of keypunch errors, and the rapid turnaround in data collection (Creswell, 2003; Dillman et al., 2003).

Sample

The population under study was teachers in suburban school districts in Ohio. The teaching profession can be broadly defined. For the purposes of this study, teaching includes all individuals who work with children to provide academic support across curriculum areas (e.g., general education teachers, special education teachers or intervention specialists, and teaching assistants [TAs]). The participants in this study work at the following levels: pre-k, elementary, middle, and high school.

School district A is located in a suburban community in central Ohio and includes 22 schools: 14 elementary schools, 2 sixth grade schools, 3 middle schools (grades 7 & 8), and 3 high schools. A total of 1,182 teaching staff were employed in school district A, and 15,230 students were served as of September, 2009. The teacher-to-student ratio for school district A is 1:21 (grades K-3), 1:25 (grades 4-5), 1:28 (grades 6-8), and 1:28 to 1:30 (high school). The percentage of students receiving free/reduced price lunches is 21.1%.

School district B is also located in a suburban community in central Ohio, and it has 19 schools: 11 elementary schools, 5 middle schools (grades 6-8), and 3 high schools. School district B had 921 teaching staff and served 9,598 students as of September, 2008. The teacher-to-student ratio for school district B is 1:22 (grades K-3),
1:24 (grades 4-5), 1:26 (grades 6-8), and 1:25 to 1:28 (high school). The percentage of students receiving free/reduced price lunches in this district was 24%. The total pool of teachers for school district A and school district B was 2,103.

A total of 189 individuals responded to the survey (166 female; 22 male). Out of these, 123 questionnaires were deemed usable due to 66 individuals completing demographic information only and/or indicating his or her role in the school to be other than that of one who teaches the core curriculum (e.g., principal, occupational therapist, or school counselor). Respondents were not required to answer every question on the questionnaire in hopes that this would increase the number of individuals who would complete a majority of the questions asked. Thus, some variables have \( n \)'s equaling less than 123. The 123 usable questionnaires were comprised of 91.1% females (\( n = 112 \)) and 8.9% males (\( n = 11 \)). Given that a majority of the teaching staff in both school districts is comprised of females, these gender statistics help to make the results of this study generalizable to the rest of the teaching staff in both school districts. The sample was comprised of 95.9% White/Caucasian (\( n = 118 \)), 0.8% Asian/Pacific Islander (\( n = 1 \)), 0.8% Black/African American (\( n = 1 \)), and 0.8% Hispanic/Latino (a; \( n = 1 \)) individuals. When looking at respondents’ teaching level, 65.8% work at the pre-k or elementary level (\( n = 81 \)), 29.3% work at the middle school level (\( n = 36 \)), and 4.9% work at the high school level (\( n = 6 \)). Respondents had an average of 13.58 years teaching experience (SD = 9.8).
Sampling Procedure

The sample used for this study was a non-random, convenience sample. Although a convenience sample limits the generalizability of the results, this method is ideal in light of the exploratory nature of the current study because it provided access to a large sample of teachers ($n > 2,000$) who are diverse in their educational and previous training backgrounds. This diversity includes the years of teaching experience, teaching level, and years of professional development training in the problem-solving steps. The researcher gained access to school districts A and B by contacting Antoinette Miranda, Ph.D., who led professional development trainings in the problem-solving steps in each school district from 2006-2009.

Variables

Demographic Variables

The 11 demographic variables collected in this study include (a) gender, (b) race, (c) role, (d) teaching level, (e) years on IAT, (f) years of employment in current school district, (g) years teaching at each level, (h) total years experience, (i) training by types, (j) trainings within the past year, and (k) technique’s impact. Gender is a nominal variable that is dichotomous; it was dummy coded as female (0) or male (1). Race is a nominal variable with six levels that was dummy coded as Asian or Pacific Islander (0), Black or African American (1), Hispanic (2), White/Caucasian (3). There were no respondents who indicated his or her race to be biracial/multiracial, Native American, Alaskan Indian, or “other”. Role is a nominal variable that is multichotomous. The seven levels were dummy coded as general education teacher (0), special education
teacher (1), intervention specialist (2), Title 1 interventionist (3), English Language Learner (ELL) teacher (4), art/music specialist (5), and tutor (6).

Teaching level is a nominal variable that is multichotomous. The four levels were dummy coded as pre-K (0), elementary (1; grades K-5), middle school (2; grades 6-8), and high school (3; grades 9-12). Years on IAT is a ratio variable and was collected using an open-ended question. This variable reflects the number of years a teacher served on his or her school’s IAT. Years of employment in current school district is a ratio variable and was collected using an open-ended question and it measures the number of years a respondent has worked in his or her current school district, regardless of the total number of years he or she has been teaching. Years teaching at each level is a continuous, ratio variable and was collected using an open-ended question. This variable reflects the number of years respondents have taught at each level throughout his or her career, regardless of one’s current teaching level. Total years experience is a ratio variable, and this refers to the number of years of teaching experience of each participant. This information was collected summing the responses to years of experience teaching at each grade level.

Training by Type is a nominal variable and was measured by asking participants yes (coded as 1) and no (coded as 0) questions of whether he or she received training at the undergraduate pre-service level, graduate pre-service level, graduate continuing education level, in-service training, conference presentation, and/or conference workshop. Trainings within the past year is a nominal variable as well, and was measured by asking participants the same yes or no questions as in the variable training.
by type. *Technique’s impact* is an ordinal variable that examined the following training activities: role playing, lecture, case studies, small group discussion, class discussion, demonstration of intervention implementation, demonstration of data-taking, demonstration of data analysis, and opportunities to practice each step of the problem-solving process. Respondents rated each activity, and ratings are coded as follows: no opportunity (0), not effective (1), effective (2), and very effective (3).

**Independent Variables**

The seven independent variables in this study include the (a) extent of training by type, (b) extent of training in each step, (c) quality of past training(s), (d) opportunities to practice each step, (e) number of years implementing steps since initial training, (f) frequency seeking IAT, and (g) helpfulness of IAT.

*Extent of training by type* is an ordinal variable used to describe how extensively the problem-solving steps were covered in each training setting (see those listed above under *Training by Type*). This variable has four levels: not covered (0), briefly (1), moderately (2), and extensively (3). *Extent of training in each step* is an ordinal variable as well, and it was used to describe how extensively each individual problem-solving step was covered during past trainings. This variable has four levels: not covered (0), briefly (1), moderately (2), and extensively (3). *Quality of past training(s)* is an ordinal variable with four levels: not applicable (0), poor (1), good (2), and superior (3). This reflects one’s perception of the quality of a training received in the past, regardless of type (graduate courses, conference lecture, etc.). *Opportunities to practice each step* is a ratio variable in which respondents indicated the number of opportunities he or she had to
practice each of the problem-solving steps during their training. Responses included not applicable (0), briefly (1), moderately (2), and extensively (3).

*Years implementing* represented the number of years each teacher has implemented the problem-solving steps since his or her initial training. It is a continuous, ratio variable and was collected using an open-ended question. *Frequency seeking IAT* is an ordinal variable and measures how often respondents sought out assistance from IAT. Respondents answers were coded as follows: no opportunity (0), rarely (1; seek team 1-2 times a year), occasionally (2; seek team 3-4 times a year), frequently (3; seek team 1 time a month), or very frequently (4; seek team more than one time a month).

*Helpfulness of IAT* is an ordinal variable with four levels: not helpful (0), somewhat helpful (1), mostly helpful (2), and very helpful (3). Responses to this independent variable reflect one’s perception of the helpfulness of the IAT when he or she consulted with the team.

**Dependent Variable**

The dependent variable in this study is teachers’ self-perceived competence. This is an ordinal variable. Isaeva (2007) conceptualizes professional competency as having the skills needed to engage in effective professional activities. Gudzuka (2009) further states that competency is both the group of abilities that are necessary for performing an action as well as the result of the action. This variable was measured within one question on the instrument described below, and it had a subset of 12 areas in which a respondent could indicate how true various statements were about the one’s perceived ability to implement the problem-solving steps. Responses were coded as no opportunity (9), not
true about me (1), somewhat true about me (2) and very true about me (3). Responses to these 12 areas were examined individually, and they were also combined into an overall summed score for each respondent for further analysis.

**Instrumentation**

Participants were asked to complete the Self-Perceived Competence in Problem-Solving Steps—Teaching Rating Scale (SPCPSS; Appendix A). The SPCPSS was developed for this study and includes several parts. In the demographic section, participants were asked to provide information on the variables listed above. Second, participants were asked to indicate where they received training in the problem-solving steps (if ever) and if they received training in any setting within the past year. The next sections asked how extensively one was trained in each type of setting and how extensively this training covered each individual problem-solving step. It also asked respondents to rate the overall quality of all previous trainings and to list activities used during the trainings (e.g., role playing and case studies). The SPCPSS asked teachers to state how frequently they were able to practice each individual problem-solving step during training (as opposed to listening to a lecture). Teachers were asked to rate the impact various teaching techniques (e.g., lecture or role playing) had upon their understanding of the problem-solving steps. The SPCPSS asked participants to indicate how true each statement is about his or her ability to implement each step of the problem-solving process (e.g., I clearly and concisely define the problem, I collect accurate baseline data). As previously stated, responses to this scale were analyzed individually, and they were summed to create an overall self-perceived competence score. The final
section of the SPCPSS asked teachers how many years have passed since their first training in the problem-solving steps, how frequently they seek the assistance of IAT, and how helpful the team is during these encounters.

Several sections of the SPCPSS pertain to the following ten problem-solving steps: (a) defining the problem, (b) collecting baseline data, (c) writing the goal, (d) generating a hypothesis, (e) brainstorming interventions, (f) selecting an intervention, (g) implementing an intervention, (h) taking intervention data, (i) evaluating the effectiveness of the intervention, and (j) identifying when a student should move into Tier II (or III) intervention. These items were not only a part of the professional development training provided to Intervention Based Assessment (IBA), which was instituted in Ohio in the 1990s. Thus, these ten items are applicable all participants. The SPCPSS will be available on the Internet through Survey Monkey (www.surveymonkey.com).

**Data Collection Procedures**

The researcher e-mailed a link to the SPCPSS to the principal of each school within school district A and school district B. Each principal then e-mailed the link to the Internet questionnaire to all teachers within his or her school. The estimated time of completion for the SPCPSS was 15 to 20 minutes. The teachers were asked to complete the questionnaire within one week. Because the questionnaire was in electronic format, participants only had to complete the survey on the Internet. There were no materials that needed to be sent via postal mail. The researcher’s initial e-mail indicated that a limited number of incentives would be randomly awarded (e.g., by means of a drawing) to participants who responded to the questionnaire within the first week. After completing
the survey, respondents had the opportunity to e-mail their name and school to the researcher to be entered in the drawing. This information was not linked to any specific data set from a respondent. Incentives included $5 gift cards to Starbucks and $10 gift cards to Barnes & Noble.

The researcher sent a follow-up e-mail to the principal of each school after one week, and each principal, in turn, e-mailed this follow-up e-mail to his or her teaching staff. The follow-up e-mail not only encouraged non-respondents to complete the questionnaire, but it also denoted the percentage of the sample that completed the questionnaire to date and indicated that non-respondents had two additional weeks to complete the questionnaire. At the end of the second week, another follow-up e-mail was sent to the sample, and it included an updated percentage of the sample that had completed the questionnaire to date. This second reminder indicated that non-respondents had one remaining week to complete the questionnaire prior to the conclusion of the study.

**Recommended Data Analysis**

All data analyses were carried out using Predictive Analytics SoftWare (PASW, 2009).

**Descriptive Statistics Analysis**

Descriptive statistics analyses (e.g., frequency, percentage, mean, and/or range) were computed in order to report demographic information collected in research question one. Demographic variables included gender, race, years of employment in current school district, role, training by type, years on IAT (if applicable), teaching level, and
years teaching at each grade level. Descriptive statistics were also computed for all independent variables prior to comparing independent and dependent variables through correllational and/or regression analyses. Data was graphed to look for patterns between variables, to examine if the proper scaling methods were used, and to aid in interpretation.

**Frequency Distribution**

To answer research question two, a frequency statistics were utilized to view the distribution of teachers’ self-perceived competence (No Opportunity, Not True About Me, Somewhat True About Me, and Very True About Me) across the 12 steps of the problem-solving process. Statements about these steps include: (a) I clearly and *concisely* define the problem, (b) I collect *accurate* baseline data, (c) I write *appropriate* goals, (d) I generate *appropriate* hypotheses, (e) I brainstorm interventions, (f) I select *appropriate, evidence*-based interventions, (g) I implement interventions with *integrity* (e.g., follow all steps), (h) I take intervention data *accurately*, (i) I *effectively* evaluate interventions, (j) I *accurately* identify when a student should move into Tier II (or III) intervention, (k) I work with a small group of students during class time while maintaining order for the majority of the class as needed, and (l) I collaborate with an intervention specialist/school psychologists during the problem-solving process, as needed. The frequency count of the “Not True About Me” and “Very True About Me” categories will be assessed to gain an understanding of which steps teachers generally feel the most and least competent in their abilities to implement.
Correlational Analyses

Pearson product-moment coefficients were produced when examining the association between variables of a ratio level (Lomax, 2007). Spearman rank correlation coefficients were produced when examining the association between variables that were at the ordinal (ranked) level (Lomax, 2007). A 95% confidence interval was used \( (a = .05) \), requiring significance levels for all Pearson and Spearman correlation coefficients to be equal to or less than .05.

Multiple Regression

To address research questions three and four, multiple regression analyses were conducted on the independent variables (extent of training by type, extent of training in each step, opportunities to practice, frequency seeking IAT, years teaching, teaching level, quality of past training, and years implementing) in relation to the dependent variable (self-perceived competence). This was done to determine if the dependent variable could be predicted from one or more independent variables (Hair, Black, Babin, Anderson, & Tatham, 2006). Individual standard, multiple regression analyses will be conducted with respect to the dependent variable (Birman, 1998). Variables found to be significant in the initial analyses were entered as control variables for the refined regression analyses. A zero-order correlation matrix was utilized to look at variables individually. This table shows the intercorrelations among all variables (Hair et al., 2006).

For each multiple regression model, the independent variables were entered simultaneously, which is known as a simultaneous regression model. This method of
entry was chosen because there are no a priori beliefs that indicate entering the variables at different times will affect results (Hair et al., 2006). Furthermore, this method was chosen over other methods, such as hierarchical entry, because this study was exploratory and there was no way to determine a logical hierarchy of entry.

**Assumptions**

Lomax (2007) describes the steps necessary for multiple regression analysis, including tests of assumptions. These assumptions include independence, homogeneity of variance, normality, linearity, independent variables are fixed, and noncollinearity. After all six assumptions were tested and the decision was made that multiple regression was appropriate for the data, all independent variables, as well as significant demographic variables, were entered into the model simultaneously to assess if significant results existed even when controlling for these variables. Variables that were not significant were manually removed from the model.

To test for independence, plots of the residuals versus the predicted dependent variable and of the residuals versus each independent variable were examined. Residuals fell into a random pattern, so the independence assumption was satisfied. The second assumption is **homogeneity of variance**. For multiple regression, this assumption states that the conditional distributions have a constant variance for all values of the independent variables. To examine homogeneity, a plot of the independent variable scores or the residuals versus the dependent variable was made. The conditional residual variance was constant for all values of the independent variables indicating the assumption was met.
The third assumption is normality, which states that the conditional distributions of the scores on the dependent variable, or the prediction errors, are normal in shape. To test this assumption a normal probability plot was developed. This assumption was not violated, as no outliers were viewable on the plot. The fourth assumption tested was linearity, which means there was a linear relationship between the dependent variable and the independent variables. The assumption is that the dependent variable changes at a constant value with the change in the independent variables. This assumption was tested through the examination of residual plots. If the assumption has been met, then no systematic pattern of points would be viewable. The plot resulted in a systematic pattern, indicating there was a non-linear relationship, and the sample partial slopes and intercept were unbiased estimators of the population.

The fifth assumption is that the values of the independent variables are fixed, not random. “This results in the regression model being valid only for those particular values of [the independent variable] that were actually observed and used in the analysis” (p. 402). The use of a prediction model based upon one sample of individuals to predict the dependent variable for another sample of individuals may be suspect and should be interpreted with caution. Generalization of results may cause larger prediction errors and bias in the partial slopes and intercept. The sixth and final assumption is noncollinearity. Two independent variables are said to exhibit complete collinearity if their coefficient equals one, and they exhibit a complete lack of collinearity (or lack of a strong relationship) if their coefficient equals zero (Hair et al., 2006). Violation of this assumption would result in increased standard errors of the regression coefficients,
increased difficulty to achieve statistical significance, and a restriction of the use and
generalizability of the estimated regression model. To test for collinearity, regression
analyses were conducted with each independent variable, where that predictor was
predicted by the remainder of the independent variables. None of the analyses resulted in
an \((R^2_k)\) value close to one, signifying collinearity was not a problem.

**Regression Steps**

First, the partial slopes and intercept were calculated on a univariate level. The
partial slope is the slope of the dependent variable for a particular independent variable in
which the influence of the other independent variables is partialled out. To determine the
partial slopes and intercept, the least squares criterion was calculated. The significance
of each individual partial slope or regression coefficient was examined to see if the
individual regression coefficients are statistically significant from zero. If the individual
partial slope was significantly different from zero, then the null hypothesis would be
rejected.

Second, one needs to determine how well the dependent variable is predicted by
the independent variables using a multivariate model. This was conducted by calculating
the coefficient of multiple determination, which provides the proportion of total variation
in the dependent variable that is predicted from the set of the independent variables:

\[
R^2_{Y,1,...,m} = b_1^* r_{Y1} + b_2^* r_{Y2} + \ldots + b_m^* r_{Ym}
\]

where \(R^2_{Y,1,...,m}\) is the coefficient of determination, \(Y\) is the dependent variable, \(X_1,...,m\) are
the independent variables, \(b\) is the sample partial slope or raw regression coefficient, and
\(r\) is correlation of the dependent and independent variable. The coefficient can vary from
0 to 1, with higher values indicating greater explanatory power of the regression equation and better prediction of the independent variable (Hair et al., 2006). The significance of the overall regression model (the coefficient of multiple determination) was examined, and if one or more of the regression coefficients was statistically significant from zero, then the null hypothesis would be rejected. This test was carried out using the multivariate $F$ statistic:

$$F = \frac{R^2 / m}{(1 - R^2) / (n - m - 1)}$$

where $m$ is the number of predictors, $n$ is the sample size, and $R^2$ is the coefficient of multiple determination. If the $F$ statistic exceeded the critical value, then the null would be rejected and the conclusion would be that none of the regression coefficients were equal to zero at the given level of significance.

**Validity**

**External Validity**

External validity was affected, and the results of this study are only generalizable to the teaching staff of school district A and school district B due to the low response rate (8.9%).

**Social Validity**

It was beneficial to the social validity of this study for participants to work within the same building and/or same school district. When teachers talked to each other in the school, they may have spoken about the questionnaire that everyone recently received via e-mail. Knowing that other people similar to himself or herself completed the e-mail
questionnaire may have influenced other teachers to participate in the study if they had
not yet done so (Dillman et al., 2009). To further increase social validity, the researcher
e-mailed the sample after they had one week to complete the questionnaire. The
researcher reported what percent of the population had responded to the questionnaire as
of that date, thus increasing participants’ knowledge that others similar to himself or
herself had already completed the questionnaire. Incentives were also provided to a
limited number of respondents of the questionnaire. The population was informed that
the only individuals eligible for the incentive gifts are those who completed the
questionnaire within the one-week time frame. It was hoped that the participants of this
study perceived the rewards as more valuable when there were fewer opportunities to
obtain them (Dillman et al., 2009).

**Nonresponse Error**

Increasing the social validity of the study also decreased the likelihood of having
nonresponse error (Dillman et al., 2009). Nonresponse error occurs when many people
selected for participation in a study do not respond. A lower response rate indicates that
there is a higher probability that those who do not respond are different from those who
do respond in a way that is important to the study. By having the principal of each school
e-mail the Internet link to the questionnaire to his or her teaching staff, it was thought that
the teaching staff would view the request with less suspicion than if the request came
from an e-mail address the teacher did not recognize. This also helped to increase the
response rate (Dillman et al., 2009).
**Measurement Error**

In order to avoid measurement error, which occurs when a respondent’s answer is inaccurate or imprecise (Dillman et al., 2009), the questionnaire was comprised of a combination of open and closed ended questions with ranges or a Likert scale for response choices. In a majority of instances, respondents did not have the opportunity to provide a response that was incompatible with data analysis.

**Criterion and Concurrent Validity**

The researcher was unable to address criterion validity (verifying this measure of self-perceived competence by comparing it with another measure of the same construct) and concurrent validity (this measure of self-perceived competence is highly associated with an existing or older measure of self-perceived competence; Neuman, 2003) within this study. This is because there are currently no other measures examining one’s self-perceived competence to implement the problem-solving steps.

**Implications**

It is hoped that the ramifications of this study will demonstrate the relation between teachers’ self-perceived competence and professional development training in problem-solving steps, as well as several other independent variables. By analyzing the contribution each independent variable makes to teachers’ self-perceived competence in their own ability to implement the steps of the problem-solving process, it is hoped that more precise and effective professional development trainings can be created and implemented in school districts and/or to states on a large-scale basis.
Chapter 4: Results

In this chapter, the results of the quantitative data analysis are presented. Nominal, ordinal, and ratio data were gathered through an online survey instrument administered to teachers. Respondents included general education teachers, special education teachers, intervention specialists, and teaching assistants (TAs) who work at the elementary, middle, or high school level in two central Ohio school districts. All of the data were analyzed by using Predictive Analytics SoftWare (PASW, 2009) for Mac. The data collected online were downloaded into PASW from the web server (www.surveymonkey.com). The researcher utilized descriptive statistics within the quantitative data analysis to illustrate the general characteristics of the research subjects. Tables and figures present the results of the analyses based upon the research questions. One hundred and eighty-nine individuals completed part of the survey. Only data for those who completed a majority of the questions, as well as those who teach the core curriculum subjects, were analyzed. This produced 123 usable questionnaires. Given that respondents were not required to answer every portion of each question, there are varying n’s for the data being analyzed.

Research Question One:

What are the demographic characteristics of this sample?
Following is a summary of the demographic characteristics of the respondents. Frequencies are provided, and means and standard deviations are reported where appropriate. Table 1 presents a cross tabulation of teaching level and role. The sample was comprised of 65% teachers in general education ($n = 80$), 8.9% teachers in special education ($n = 11$), 17.8% intervention specialists ($n = 22$), 2.4% Title 1 Interventionists ($n = 3$), 2.4% English Language Learners (ELL) teachers ($n = 3$), 1.6% art/music specialists ($n = 2$), and 0.8% tutors ($n = 1$). Elementary teachers in general education made up the majority of the sample followed by middle school teachers in general education. Individuals at the elementary school level made up the majority of the sample ($n = 76, 61.5\%$) followed by middle school employees ($n = 36, 29.5\%$).

Table 1

<table>
<thead>
<tr>
<th>Teacher Role and Current Grade Level Taught</th>
<th>Pre-K $n(%)$</th>
<th>Elementary $n(%)$</th>
<th>Middle School $n(%)$</th>
<th>High School $n(%)$</th>
<th>Total $n(%)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher, General Education</td>
<td>1(1.3)</td>
<td>46(57.5)</td>
<td>27(33.8)</td>
<td>6(7.5)</td>
<td>80(65.6)</td>
</tr>
<tr>
<td>Teacher, Special Education</td>
<td>3(27.3)</td>
<td>5(45.5)</td>
<td>3(27.3)</td>
<td>0(0.0)</td>
<td>11(9.0)</td>
</tr>
<tr>
<td>Intervention Specialist</td>
<td>1(4.5)</td>
<td>17(77.3)</td>
<td>4(18.2)</td>
<td>0(0.0)</td>
<td>22(18.0)</td>
</tr>
<tr>
<td>Title 1 Interventionist</td>
<td>0(0.0)</td>
<td>2(66.7)</td>
<td>1(33.3)</td>
<td>0(0.0)</td>
<td>3(2.5)</td>
</tr>
<tr>
<td>ELL Teacher</td>
<td>0(0.0)</td>
<td>3(100.0)</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
<td>3(2.5)</td>
</tr>
<tr>
<td>Art/Music Specialist</td>
<td>0(0.0)</td>
<td>2(100.0)</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
<td>2(1.6)</td>
</tr>
<tr>
<td>Tutor</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
<td>1(100.0)</td>
<td>0(0.0)</td>
<td>1(0.8)</td>
</tr>
<tr>
<td>Total</td>
<td>5(4.1)</td>
<td>75(61.5)</td>
<td>36(29.5)</td>
<td>6(4.9)</td>
<td>122(100.0)</td>
</tr>
</tbody>
</table>

Respondents have worked in their current school district for an average of 9.99
years (SD = 8.165, range = 1-35 years). Respondents were able to indicate teaching experience at multiple grade levels throughout one’s career. They have worked at the pre-k level for an average of 4.00 years (SD = 5.11), the elementary level for an average of 10.96 years (SD = 9.5), the middle school level for an average of 7.77 years (SD = 8.11), and the high school level for an average of 6.97 years (SD = 8.00). They have served on their school’s IAT for an average of 2.13 years (SD = 3.697, range = 0-19 years). Respondents have had the opportunity to implement the problem-solving steps for an average of 2.86 years (SD = 2.88) since their initial training on the steps.

**Past Training Experiences**

Respondents were encouraged to select all types of training that applied when indicating types of previous problem-solving training. Therefore, the percentages do not total 100% for all areas. Seventy-two point four percent (n = 89) of respondents had training through in-services provided by one’s school district, 41.5% (n = 51) had training through a conference lecture, and 40.7% (n = 50) had training through a conference workshop. Thirty point one percent (n = 37) of respondents had training through continuing education units, 15.4% (n = 19) had training through graduate studies, and 12.2% (n = 15) had training through undergraduate studies. One individual responded to the open-ended question of past types of training and indicated that an informal staff discussion provided some information/training on the problem-solving steps.

Barnes & Harlacher (2008) stated that it is critical for training in the implementation of RTI models (and the problem-solving steps) to be ongoing. The
problem-solving model and RTI require ongoing professional development so that skills and concepts can be reviewed frequently and consultation can be provided continuously (Bergstrom, 2008; NASDSE, 2006). When examining the number of individuals in the sample who had problem-solving training in the past year alone, responses indicate that no individuals had training through undergraduate studies (113 responses), 41.5% ($n = 51, 117$ responses) had training through an in-service provided by one’s school district, 19.5% ($n = 24, 113$ responses) had training through a conference workshop, 18.7% ($n = 23, 112$ responses) had training through a conference lecture, 13.0% ($n = 16, 111$ responses) had training through continuing education units, and 0.8% ($n = 1, 111$ responses) had training through graduate studies. One individual responded to the open-ended question of training in the past year and indicated that he or she gained experience through a guided discussion of computer modules. Another individual indicated that he or she gained information through hands-on training at IAT meetings.

**Technique’s Impact**

Respondents had varying training backgrounds; therefore, the teaching techniques used for instruction were bound to vary, as well. In an effort to evaluate which techniques had the greatest impact upon acquisition of the problem-solving steps, respondents were asked to rate the techniques listed in Table 1 as follows: no opportunity (0), not effective (1), effective (2), and very effective (3). Means and standard deviations for the following steps are presented in Table 2. The three techniques rated the highest, or most effective, were, small group discussion, lecture, and class discussion. The three techniques rated the lowest, or least effective, were demonstration
of data taking, demonstration of data analysis, and role playing.

Table 2

Descriptive Statistics for Impact of Technique’s Used in Past Training(s)

<table>
<thead>
<tr>
<th>Technique’s Impact…</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small group discussion</td>
<td>121</td>
<td>1.82</td>
<td>0.992</td>
</tr>
<tr>
<td>Lecture</td>
<td>121</td>
<td>1.66</td>
<td>0.737</td>
</tr>
<tr>
<td>Class discussion</td>
<td>122</td>
<td>1.49</td>
<td>1.030</td>
</tr>
<tr>
<td>Case studies</td>
<td>123</td>
<td>1.43</td>
<td>1.146</td>
</tr>
<tr>
<td>Demonstration of intervention implementation</td>
<td>122</td>
<td>1.20</td>
<td>1.224</td>
</tr>
<tr>
<td>Opportunities to practice each step in problem-solving process</td>
<td>123</td>
<td>1.17</td>
<td>1.219</td>
</tr>
<tr>
<td>Demonstration of data taking</td>
<td>123</td>
<td>1.15</td>
<td>1.171</td>
</tr>
<tr>
<td>Demonstration of data analysis</td>
<td>123</td>
<td>1.15</td>
<td>1.128</td>
</tr>
<tr>
<td>Role playing</td>
<td>121</td>
<td>0.94</td>
<td>1.043</td>
</tr>
</tbody>
</table>

Research Question Two:

How Confident Do Teachers Feel in Their Ability to Implement Each Problem-Solving Step?

Table 3 displays a correlation coefficient table for the dependent variable self-perceived competence. Coefficients listed in bold have a moderate, positive association. The reliability statistics for this variable indicate that Cronbach’s Alpha is .92, which signifies that the items on this scale have a high level of internal consistency (Hair et al., 2006). Items with the top seven highest associations include the following: to collect baseline data and to progress monitor ($r = .618$), to collect baseline data and to generate hypotheses ($r = .597$), to generate hypotheses and select interventions ($r = .596$), to
progress monitor and to evaluate interventions \( (r = .584) \), to brainstorm interventions and to select interventions \( (r = .578) \), to collect baseline data and to select interventions \( (r = .577) \), and to define the problem and to write goals \( (r = .574) \).
Table 3

*Spearman’s Rho Correlation Table for Self-Perceived Competence*

<table>
<thead>
<tr>
<th>Self-perceived competence to...</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Define the problem</td>
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<tr>
<td>2. Collect baseline data</td>
<td>.474**</td>
<td></td>
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<td>3. Write goals</td>
<td>.574** .500**</td>
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<tr>
<td>4. Generate hypotheses</td>
<td>.434** .597** .470**</td>
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<tr>
<td>5. Brainstorm interventions</td>
<td>.327** .427** .457** .415**</td>
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<tr>
<td>6. Select interventions</td>
<td>.416** .577** .464** .596** .578**</td>
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<td>7. Implement with integrity</td>
<td>.245* .391** .347** .260** .424** .417**</td>
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<tr>
<td>8. Progress monitor</td>
<td>.338** .618** .410** .388** .404** .521** .487**</td>
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<tr>
<td>9. Evaluate interventions</td>
<td>.384** .503** .242* .478** .401** .470** .366** .584**</td>
<td></td>
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<tr>
<td>10. Identify when a student moves in tiers</td>
<td>.221* .435** .200 .234* .356** .448** .363** .504** .517**</td>
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<tr>
<td>11. Work with small group</td>
<td>.243* .355** .210* .161 .414** .251* .466** .375** .421** .277*</td>
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<tr>
<td>12. Collaborate with others</td>
<td>.260** .369** .251* .357** .419** .407** .212* .326** .395** .303** .526**</td>
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<td></td>
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</tr>
</tbody>
</table>

**Correlation is significant at the 0.01 level (2-tailed)**

*Correlation is significant at the 0.05 level (2-tailed)
Self-Perceived Competence, Individual Steps

Table 4 presents descriptive statistics for self-perceived competence. Respondents indicated how competent they felt to implement the previously described 12 steps. Responses include “not true about me” (1), “somewhat true about me” (2), and “very true about me” (3). Average scores for each individual step within the overall variable range from 1.33-2.31 with a mean of 2.30 (SD = .40, n = 118). Descriptive statistics of this variable indicate that, as a whole, respondents felt most competent to brainstorm interventions, implement interventions with integrity, and collaborate with an intervention specialist/school psychologist. Conversely, respondents felt least competent to work with a small group of students during class time while maintaining class order, generate appropriate hypotheses, and accurately identify when a student should move between tiers.
Table 4

Descriptive Statistics for the Dependent Variable Self-Perceived Competence to Implement the Problem-Solving Steps, Individual Steps

<table>
<thead>
<tr>
<th>Self-perceived competence to…</th>
<th>N</th>
<th>Mean</th>
<th>Std.Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Step 1) Clearly and concisely define the problem</td>
<td>123</td>
<td>2.08</td>
<td>0.785</td>
</tr>
<tr>
<td>(Step 2) Collect accurate baseline data</td>
<td>123</td>
<td>2.11</td>
<td>0.880</td>
</tr>
<tr>
<td>(Step 3) Write appropriate goals</td>
<td>122</td>
<td>2.03</td>
<td>0.995</td>
</tr>
<tr>
<td>(Step 4) Generate appropriate hypotheses</td>
<td>122</td>
<td>1.72</td>
<td>0.929</td>
</tr>
<tr>
<td>(Step 5) Brainstorm interventions</td>
<td>121</td>
<td>2.31</td>
<td>0.845</td>
</tr>
<tr>
<td>(Step 6) Select appropriate, evidence-based interventions</td>
<td>122</td>
<td>2.09</td>
<td>0.881</td>
</tr>
<tr>
<td>(Step 7) Implement interventions with integrity</td>
<td>122</td>
<td>2.25</td>
<td>0.839</td>
</tr>
<tr>
<td>(Step 8) Take intervention data/progress monitor accurately</td>
<td>123</td>
<td>2.15</td>
<td>0.878</td>
</tr>
<tr>
<td>(Step 9) Effectively evaluate interventions</td>
<td>122</td>
<td>1.98</td>
<td>0.881</td>
</tr>
<tr>
<td>(Step 10) Accurately identify when a student should move between tiers</td>
<td>121</td>
<td>1.33</td>
<td>1.052</td>
</tr>
<tr>
<td>(Step 11) Work with a small group of students during class time while maintaining class order</td>
<td>123</td>
<td>1.85</td>
<td>1.116</td>
</tr>
<tr>
<td>(Step 12) Collaborate with an intervention specialist/school psychologist</td>
<td>122</td>
<td>2.20</td>
<td>1.018</td>
</tr>
</tbody>
</table>

Self-Perceived Competence, Summed Scores

Table 5 presents frequency statistics for the summed scores of self-perceived competence. The summed scores range from 2.00-36.00 with a mean of 24.97 (SD = 6.69, n = 118). Respondents rated the problem-solving steps listed above as to how competent he or she feels to implement each step on a scale of (1) not true about me, (2) somewhat true about me, and (3) very true about me. Roughly 5% of respondents’ ratings fell between 2-12 points, and roughly 29% of respondents’ ratings fell between...
13-24 points. Approximately 54% of respondents’ ratings fell between 25-35 points. Only two respondents’ (1.7%) totaled ratings equaled 36 (rating of “very true about me” on every step).

Table 5

<table>
<thead>
<tr>
<th>Score</th>
<th>Frequency</th>
<th>Cumulative Percent</th>
<th>Score</th>
<th>Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>36</td>
<td>2</td>
<td>1.7</td>
<td>22</td>
<td>4</td>
<td>73.7</td>
</tr>
<tr>
<td>35</td>
<td>3</td>
<td>4.2</td>
<td>21</td>
<td>8</td>
<td>80.5</td>
</tr>
<tr>
<td>34</td>
<td>3</td>
<td>6.8</td>
<td>20</td>
<td>6</td>
<td>85.6</td>
</tr>
<tr>
<td>33</td>
<td>5</td>
<td>11.0</td>
<td>19</td>
<td>3</td>
<td>88.1</td>
</tr>
<tr>
<td>32</td>
<td>5</td>
<td>15.3</td>
<td>18</td>
<td>3</td>
<td>90.7</td>
</tr>
<tr>
<td>31</td>
<td>6</td>
<td>20.3</td>
<td>16</td>
<td>1</td>
<td>91.5</td>
</tr>
<tr>
<td>30</td>
<td>8</td>
<td>27.1</td>
<td>14</td>
<td>1</td>
<td>92.4</td>
</tr>
<tr>
<td>29</td>
<td>8</td>
<td>33.9</td>
<td>13</td>
<td>2</td>
<td>94.1</td>
</tr>
<tr>
<td>28</td>
<td>8</td>
<td>40.7</td>
<td>12</td>
<td>1</td>
<td>94.9</td>
</tr>
<tr>
<td>27</td>
<td>2</td>
<td>42.4</td>
<td>10</td>
<td>1</td>
<td>95.8</td>
</tr>
<tr>
<td>26</td>
<td>6</td>
<td>47.5</td>
<td>9</td>
<td>2</td>
<td>97.5</td>
</tr>
<tr>
<td>25</td>
<td>10</td>
<td>55.9</td>
<td>8</td>
<td>1</td>
<td>98.3</td>
</tr>
<tr>
<td>24</td>
<td>12</td>
<td>66.1</td>
<td>4</td>
<td>1</td>
<td>99.2</td>
</tr>
<tr>
<td>23</td>
<td>5</td>
<td>70.3</td>
<td>2</td>
<td>1</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Note: 118 total responses, 5 missing responses. Scores have a possible range of 0-36.

Research Question Three:

What is the Relation Between Frequency Seeking the Intervention Assistance Team, Helpfulness of the Intervention Assistance Team, Years Teaching, Teaching Level, Experience on the Intervention Assistance Team, Years Implementing, and
Teachers’ Self-Perceived Competence in Their Own Ability to Implement These Steps?

Frequency Seeking the Intervention Assistance Team and Helpfulness of the Intervention Assistance Team

Frequency seeking IAT is measured by the following: no opportunity (0), rarely (1; seek team 1-2 times a year), occasionally (2; seek team 3-4 times a year), frequently (3; seek team 1 time a month), or very frequently (4; seek team more than one time a month). The mean of all responses is .78 (SD = .91). Forty-six point three percent \( (n = 57) \) of the sample have had no opportunity to use IAT as a resource, 37.4% \( (n = 46) \) rarely sought IAT for assistance, 8.1% \( (n = 10) \) occasionally sought IAT for assistance, and 8.1% \( (n = 10) \) frequently sought IAT for assistance. No respondents reported using IAT as a resource very frequently.

As individuals seek the assistance of the IAT, they form an opinion as to how helpful the team is to meet his or her needs. Helpfulness of IAT is measured by the following: not applicable (0; for those respondents who have had no opportunity to seek IAT), not helpful (1), somewhat helpful (2), mostly helpful (3), and very helpful (4). The mean of responses is 2.50 (SD = 1.17). Eight point nine percent \( (n = 11) \) found this question to be not applicable. These respondents likely came from the pool of respondents who have had no opportunity to seek IAT. Thirty-two point five percent \( (n = 40) \) of respondents find IAT somewhat helpful, 30.1% \( (n = 37) \) find IAT mostly helpful, and 22% \( (n = 27) \) find IAT very helpful, and 6.5% \( (n = 8) \) find IAT not helpful. When frequency seeking IAT is compared with helpfulness of IAT through a Spearman’s
correlation analysis, there is a positive, weak association (rho = .372, p < .001). When frequency seeking IAT and quality of past training (described under research question four) are compared using the same analysis, there is a positive, weak association, as well (rho = .313, p < .000). This indicates that neither helpfulness of IAT nor quality of past training have a significant association with how frequently one seeks help from the IAT.

**Years Teaching and Teaching Level**

As reported in Chapter Three, the average number of years respondents have been teaching is 13.58 (SD = 9.8). When years teaching is compared with self-perceived competence using a Pearson correlation analysis, a positive, weak association can be seen (r = .104), which is insignificant at the .05 level (p = .261). This signifies that a change in the number of years teaching experience (plus or minus) is weakly associated with the dependent variable. A majority (65.8%) of respondents work at the pre-k or elementary level, 29.3% work at the middle school level, and less than 5% work at the high school level. When teaching level is compared with self-perceived competence using Spearman’s correlation analysis (due to the nominal nature of the independent variable), a negative, weak association is seen (rho = -.167), which is not significant at the .05 level (p = .071). This indicates that a change (lower or higher) in the grade level being taught is weakly associated with a change in the dependent variable self-perceived competence.

**Experience on IAT and Years Implementing**

Descriptive analyses indicate that respondents have served as members of his or her IAT for an average of 2.13 years (SD = 3.7). When comparing this variable with the dependent variable self-perceived competence through a Pearson correlation analysis, a
positive, weak association can be seen ($r = .147$) that is insignificant at the .05 level ($p = .113$). This signifies that a change (plus or minus) in the number of years one has served on IAT is not associated with a change in one’s self-perceived competence to implement the problem-solving steps. On average, respondents have had the opportunity to implement the problem-solving steps for 2.86 years ($SD = 2.88$) since his or her initial training on the steps. A Pearson correlation analysis indicates a positive, weak association ($r = .251$, $p<.01$) between years implementing and self-perceived competence. This indicates that an increase in the number of years respondents have had the opportunity to implement the steps is weakly associated with a change (lower or higher) in the dependent variable.

**Self-Perceived Competence, Summed Scores**

Self-perceived competence was compared to the independent variable total years experience using a Pearson correlation analysis, and a positive, weak association was found ($r = .104$, $p<.261$). This indicates that a change (plus or minus) in the number of years an individual works is not associated with a change in one’s self-perceived competence to implement the problem-solving steps. When the independent variable is compared with number of years implementing the problem-solving steps since initial training with a Pearson correlation analysis, a positive, weak correlation is seen, as well ($r = .251$, $p<.008$), which signifies that a change in the number of years an individual has practiced implementing the problem-solving steps is not associated with a change in the dependent variable.
Regression Model One

The following variables were entered simultaneously into a linear multiple regression model: helpfulness of IAT, total years experience, teaching level, years on IAT, frequency seeking IAT, and years implementing. Table 6 presents the zero-order correlations of each of the independent variables and the dependent variable in Regression Model One. The strongest correlations are present between years implementing and years on IAT, years implementing and total years experience, and helpfulness of IAT and frequency seeking IAT. The dependent variable self-perceived competence demonstrated the next strongest correlations with frequency seeking IAT, years implementing, and teaching level. Means and standard deviations are reported, as well.
Table 6

Zero-Order Correlations for the Independent Variables and the Dependent Variable in Regression Model One

<table>
<thead>
<tr>
<th></th>
<th>Self-Perc.</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Teaching Level</td>
<td>-.224**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Years on IAT</td>
<td>.122</td>
<td>-.111</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Years Implementing</td>
<td>.251**</td>
<td>.089</td>
<td>.414**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Freq. Seek. IAT</td>
<td>.264**</td>
<td>-.087</td>
<td>.289**</td>
<td>.214*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Help. of IAT</td>
<td>.164*</td>
<td>.078</td>
<td>.056</td>
<td>.131</td>
<td>.334**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Years Experience</td>
<td>.079</td>
<td>.137</td>
<td>.277**</td>
<td>.407**</td>
<td>.021</td>
<td>.019</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>25.17</td>
<td>1.32</td>
<td>2.28</td>
<td>2.98</td>
<td>0.82</td>
<td>2.55</td>
<td>14.25</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>6.57</td>
<td>0.62</td>
<td>3.79</td>
<td>2.88</td>
<td>0.93</td>
<td>1.13</td>
<td>9.90</td>
</tr>
</tbody>
</table>

Note: Self-Perc. Comp. is the dependent variable self-perceived competence (summed scores)
*Significant at the .05 level
**Significant at the .01 level

The magnitude of the relation between self-perceived competence and the linear combination of the independent variables in Regression Model One is moderate and positive (R = .416, p < .01). The proportion of variance, or goodness of fit, in self-perceived competence explained by the linear combination of these specific independent variables is 17.3% (R-square = .173); thus, the proportion of variance not explained by the model is 82.7% (1 minus R-square = .827). Standard error, or the standard deviation of the residuals, is 6.15. This model is not the most parsimonious with 82.7% of the variance unaccounted for, so the model was reduced in Regression Model Two.

Table 7 displays the standardized (B) and unstandardized (beta) coefficients for Regression Model One. Beta coefficients will be examined because they represent
variables' values on a common scale. For a one-unit increase in teaching level, there is an expected increase in self-perceived competence of .25 points (beta = -.249, p<.01), when all other independent variables are held constant. For a one-unit increase in years implementing problem-solving steps since initial training, there is an expected increase in self-perceived competence of .24 points (beta = .24, p<.05), when all other independent variables are held constant. Finally, for a one-unit increase in frequency seeking IAT, there is an expected increase in self-perceived competence of .18 points (beta = .178, p<.10), when all other independent variables are held constant. Years on IAT (beta = -.071, p = .494), helpfulness of IAT (beta = .096, p = .313), and total years experience (beta = .029, p = .771) are all insignificant at the .01 and .05 levels despite using a 90% confidence interval for Regression Model One. It is further noticeable that these three variables are insignificant when seeing that their respective confidence intervals include zero as a possibility.
Table 7

*Standardized and Unstandardized Coefficients of Regression Model One*

<table>
<thead>
<tr>
<th>Model</th>
<th>B</th>
<th>Std. Error</th>
<th>Beta</th>
<th>t</th>
<th>Sig.</th>
<th>90.0% Confidence Interval for B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>24.578</td>
<td>1.976</td>
<td>12.439</td>
<td>.000</td>
<td></td>
<td>21.299 - 27.857</td>
</tr>
<tr>
<td>Teaching Level</td>
<td>-2.652</td>
<td>0.976</td>
<td>-0.249</td>
<td>-2.717</td>
<td>.008</td>
<td>-4.271 - 1.032</td>
</tr>
<tr>
<td>Years on IAT</td>
<td>-0.122</td>
<td>0.178</td>
<td>-0.071</td>
<td>-0.686</td>
<td>.494</td>
<td>-0.418 - 0.173</td>
</tr>
<tr>
<td>Years Implementing</td>
<td>0.548</td>
<td>0.241</td>
<td>0.240</td>
<td>2.276</td>
<td>.025</td>
<td>0.149 - 0.948</td>
</tr>
<tr>
<td>Freq. Seek. IAT</td>
<td>1.258</td>
<td>0.702</td>
<td>0.178</td>
<td>1.793</td>
<td>.076</td>
<td>0.094 - 2.422</td>
</tr>
<tr>
<td>Help. of IAT</td>
<td>0.561</td>
<td>0.553</td>
<td>0.096</td>
<td>1.013</td>
<td>.313</td>
<td>-0.357 - 1.479</td>
</tr>
<tr>
<td>Total Years Experience</td>
<td>0.019</td>
<td>0.066</td>
<td>0.029</td>
<td>0.292</td>
<td>.771</td>
<td>-0.090 - 0.129</td>
</tr>
</tbody>
</table>

Note: Dependent variable is self-perceived competence (summed scores)

**Regression Model Two**

In order to find the most parsimonious regression model, years on IAT, helpfulness of IAT, and total years experience were removed due to their insignificance in Regression Model One. Zero-order correlations for teaching level, years implementing, and frequency seeking IAT in Regression Model Two are the same as those listed in Regression Model One. A more stringent 95% confidence interval was utilized for this model. The magnitude of the relation between self-perceived competence and the linear combination of the independent variables listed above for Regression Model Two is moderate and positive ($R = .400$, $p < .01$), which is slightly
lower than that found in Regression Model One (R = .416). The proportion of variance, or goodness of fit, in self-perceived competence explained by the linear combination of these three independent variables is 16% (R-square = .16); thus, the proportion of variance not explained by the model is 84% (1 minus R-square = .84). Standard error, or the standard deviation of the residuals, is 6.11. This model is not the most parsimonious with 84% of the variance unaccounted for, so the model will be revised in Regression Model Three. This will be addressed under research question four.

Table 8 displays the standardized (B) and unstandardized (beta) coefficients for Regression Model Two. Again, beta coefficients will be examined. For a one-unit increase in teaching level, there is an expected increase in self-perceived competence of .23 points (beta = -.228, p < .05), when all other independent variables are held constant. For a one-unit increase in years implementing problem-solving steps since initial training, there is an expected increase in self-perceived competence of .23 points (beta = .230, p < .05), when all other independent variables are held constant. Finally, for a one-unit increase in frequency seeking IAT, there is an expected increase in self-perceived competence of .20 points (beta = .195, p < .05), when all other independent variables are held constant.
Table 8

*Standardized and Unstandardized Coefficients of Regression Model Two*

<table>
<thead>
<tr>
<th>Model</th>
<th>B</th>
<th>Std. Error</th>
<th>Beta</th>
<th>Sig.</th>
<th>95.0% Confidence Interval for B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower Bound</td>
</tr>
<tr>
<td>2</td>
<td>(Constant)</td>
<td>25.675</td>
<td>1.544</td>
<td>.000</td>
<td>22.614</td>
</tr>
<tr>
<td></td>
<td>Teaching Level</td>
<td>-2.421</td>
<td>0.947</td>
<td>-.228</td>
<td>.012</td>
</tr>
<tr>
<td></td>
<td>Years Implementing</td>
<td>0.525</td>
<td>0.208</td>
<td>.230</td>
<td>.013</td>
</tr>
<tr>
<td></td>
<td>Freq. Seek. IAT</td>
<td>1.374</td>
<td>0.640</td>
<td>.195</td>
<td>.034</td>
</tr>
</tbody>
</table>

Note: Dependent variable is self-perceived competence (summed scores)

**Research Question Four:**

*What is the Relation Between Quality of Past Training, the Extent of Training by type, Extent of Training in Each Step, Opportunities to Practice, and Teachers’ Self-Perceived Competence to Implement These Steps?*

Individuals’ responses indicated that, on average, the quality of past trainings in the problem-solving steps was a 1.21 (SD = .842), when 1 equals poor, 2 equals good, and 3 equals superior. Spearman’s correlation analysis indicates that the quality of past trainings has a positive, moderate association (rho = .359, p<.001) with the dependent variable self-perceived competence. This indicates that a change (plus or minus) in one’s perception of the quality of training is moderately associated with a change in the dependent variable. Descriptive statistics for extent of types of training are presented in Table 9, and the variable is measured by the following: not applicable (0), briefly (1),
moderately (2), and extensively (3). Overall, respondents received the most extensive training in the problem-solving steps during in-service training provided by their respective school district and the least extensive training during their undergraduate studies.

Table 9

<table>
<thead>
<tr>
<th>Extent of Training…</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-service</td>
<td>120</td>
<td>1.57</td>
<td>.967</td>
</tr>
<tr>
<td>Conference workshop</td>
<td>117</td>
<td>.87</td>
<td>1.095</td>
</tr>
<tr>
<td>Conference lecture</td>
<td>114</td>
<td>.76</td>
<td>.953</td>
</tr>
<tr>
<td>Continuing education units</td>
<td>115</td>
<td>.66</td>
<td>.972</td>
</tr>
<tr>
<td>Graduate studies</td>
<td>117</td>
<td>.38</td>
<td>.763</td>
</tr>
<tr>
<td>Undergraduate studies</td>
<td>119</td>
<td>.34</td>
<td>.692</td>
</tr>
</tbody>
</table>

Extent of training in each step is measured by the following: not applicable (0), briefly (1), moderately (2), and extensively (3). Means and standard deviations for the problem-solving steps are presented in Table 10. Overall, respondents have had the most extensive training in how to define the problem, brainstorm interventions, and collect baseline data. Respondents have had the least extensive training in how to identify when the student should move within tiers, work with a small group of students during class time, and maintain order for students not in the small group intervention.
Table 10

Descriptive Statistics for Extent of Training in Each Problem-Solving Step

<table>
<thead>
<tr>
<th>Extent of Training in…</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Step 1) Defining the problem</td>
<td>123</td>
<td>1.75</td>
<td>0.920</td>
</tr>
<tr>
<td>(Step 2) Collecting baseline data</td>
<td>122</td>
<td>1.68</td>
<td>0.956</td>
</tr>
<tr>
<td>(Step 3) Writing the goal</td>
<td>121</td>
<td>1.55</td>
<td>0.957</td>
</tr>
<tr>
<td>(Step 4) Generating a hypothesis</td>
<td>123</td>
<td>1.28</td>
<td>0.935</td>
</tr>
<tr>
<td>(Step 5) Brainstorming interventions</td>
<td>123</td>
<td>1.74</td>
<td>0.948</td>
</tr>
<tr>
<td>(Step 6) Selecting an intervention</td>
<td>123</td>
<td>1.55</td>
<td>0.934</td>
</tr>
<tr>
<td>(Step 7) Implementing an intervention</td>
<td>123</td>
<td>1.52</td>
<td>0.961</td>
</tr>
<tr>
<td>(Step 8) Taking intervention data/progress monitoring</td>
<td>122</td>
<td>1.48</td>
<td>1.006</td>
</tr>
<tr>
<td>(Step 9) Evaluating effectiveness of the intervention</td>
<td>122</td>
<td>1.35</td>
<td>0.953</td>
</tr>
<tr>
<td>(Step 10) Identifying when the student should move within tiers</td>
<td>123</td>
<td>1.09</td>
<td>0.887</td>
</tr>
<tr>
<td>(Step 11) Working with a small group of students during class time</td>
<td>123</td>
<td>1.07</td>
<td>0.964</td>
</tr>
<tr>
<td>(Step 12) Maintaining order for students not in the small group intervention</td>
<td>123</td>
<td>0.72</td>
<td>0.843</td>
</tr>
</tbody>
</table>

Table 11 presents the correlation coefficients, r-square values, and significance levels for each level of the independent variable extent of training in each step versus each corresponding level of the dependent variable self-perceived competence. Extent of training in each step and self-perceived competence to generate hypotheses had the strongest correlation among all others that explains 18.4% of the variance in the model. The next three strongest correlations were seen between extent of training in each step and self-perceived competence to brainstorm interventions (18.2% variance explained), select interventions (17.5% variance explained), and identifying when a student should...
move between tiers (16.5% variance explained). These four variables were all significantly correlated with the dependent variable (\(p < .01\)). All other associations listed in the table were positive and weak.

Table 11

**Correlation Coefficients for Extent of Training in Each Step Versus Self-Perceived Competence to Implement Each Step**

<table>
<thead>
<tr>
<th>Extent of Training in... / Self-Perceived Competence to...</th>
<th>Spearman’s Rho</th>
<th>R-squared</th>
<th>Significance (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Step 1) Define the problem</td>
<td>.380</td>
<td>.144</td>
<td>.000</td>
</tr>
<tr>
<td>(Step 2) Collect baseline data</td>
<td>.396</td>
<td>.157</td>
<td>.000</td>
</tr>
<tr>
<td>(Step 3) Write Goals</td>
<td>.387</td>
<td>.150</td>
<td>.000</td>
</tr>
<tr>
<td>(Step 4) Generate hypotheses</td>
<td>.429</td>
<td>.184</td>
<td>.000</td>
</tr>
<tr>
<td>(Step 5) Brainstorm interventions</td>
<td>.427</td>
<td>.182</td>
<td>.000</td>
</tr>
<tr>
<td>(Step 6) Select Interventions</td>
<td>.418</td>
<td>.175</td>
<td>.000</td>
</tr>
<tr>
<td>(Step 7) Implement interventions</td>
<td>.384</td>
<td>.147</td>
<td>.000</td>
</tr>
<tr>
<td>(Step 8) Progress monitor</td>
<td>.306</td>
<td>.094</td>
<td>.001</td>
</tr>
<tr>
<td>(Step 9) Evaluate interventions</td>
<td>.227</td>
<td>.052</td>
<td>.018</td>
</tr>
<tr>
<td>(Step 10) Identify when a student should move between tiers</td>
<td>.406</td>
<td>.165</td>
<td>.000</td>
</tr>
<tr>
<td>(Step 11) Work with a small group of students during class time</td>
<td>.144</td>
<td>.021</td>
<td>.159</td>
</tr>
<tr>
<td>(Step 12) Maintaining order for students not in the small group intervention</td>
<td>.132</td>
<td>.017</td>
<td>.075</td>
</tr>
</tbody>
</table>

Opportunities to practice each step is measured by the following: not applicable (0), briefly (1), moderately (2), and extensively (3). Means and standard deviations are presented in Table 12 for the problem-solving steps. As a whole, respondents had the greatest number of opportunities to practice brainstorming interventions, selecting an intervention, defining the problem, and writing goals during previous training(s).
Respondents had the least amount of opportunities to practice evaluating the effectiveness of an intervention, identifying when the student should move within tiers, working with a small group of students during class time, and maintaining order for students not in the small group intervention during previous training(s).

Table 12

Descriptive Statistics for Opportunities to Practice Each of the Problem-Solving Steps

<table>
<thead>
<tr>
<th>Opportunities to Practice…</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Step 1) Defining the problem</td>
<td>123</td>
<td>1.19</td>
<td>0.970</td>
</tr>
<tr>
<td>(Step 2) Collecting baseline data</td>
<td>123</td>
<td>1.12</td>
<td>0.963</td>
</tr>
<tr>
<td>(Step 3) Writing the goal</td>
<td>123</td>
<td>1.16</td>
<td>0.995</td>
</tr>
<tr>
<td>(Step 4) Generating a hypothesis</td>
<td>123</td>
<td>1.07</td>
<td>0.981</td>
</tr>
<tr>
<td>(Step 5) Brainstorming interventions</td>
<td>123</td>
<td>1.29</td>
<td>0.981</td>
</tr>
<tr>
<td>(Step 6) Selecting an intervention</td>
<td>123</td>
<td>1.20</td>
<td>0.989</td>
</tr>
<tr>
<td>(Step 7) Implementing an intervention</td>
<td>123</td>
<td>1.09</td>
<td>1.000</td>
</tr>
<tr>
<td>(Step 8) Taking intervention data/progress monitoring</td>
<td>123</td>
<td>1.06</td>
<td>0.978</td>
</tr>
<tr>
<td>(Step 9) Evaluating the effectiveness of the intervention</td>
<td>123</td>
<td>1.02</td>
<td>0.954</td>
</tr>
<tr>
<td>(Step 10) Identifying when the student should move within tiers</td>
<td>123</td>
<td>0.83</td>
<td>0.866</td>
</tr>
<tr>
<td>(Step 11) Working with a small group of students during class time</td>
<td>122</td>
<td>0.81</td>
<td>0.948</td>
</tr>
<tr>
<td>(Step 12) Maintaining order for students not in the small group intervention</td>
<td>117</td>
<td>0.61</td>
<td>0.840</td>
</tr>
</tbody>
</table>

Table 13 presents the correlation coefficients, r-square values, and significance levels for each level of the independent variable opportunities to practice versus each corresponding level of the dependent variable self-perceived competence. Opportunities
to practice and self-perceived competence to generate hypotheses had the strongest correlation among all others that explains 20.7% of the variance in the model. Opportunities to practice and self-perceived competence to write goals demonstrated the next strongest association that explains 17.7% of the variation in the model. All other associations listed in the table were weak.

Table 13

*Correlation Coefficients for Opportunities to Practice Each Step Versus Self-Perceived Competence to Implement Each Step*

<table>
<thead>
<tr>
<th>Opportunity to Practice… / Self-Perceived Competence to…</th>
<th>Spearman’s Rho</th>
<th>R-squared</th>
<th>Significance (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Step 1) Define the problem</td>
<td>.231</td>
<td>.053</td>
<td>.014</td>
</tr>
<tr>
<td>(Step 2) Collect baseline data</td>
<td>.315</td>
<td>.099</td>
<td>.001</td>
</tr>
<tr>
<td>(Step 3) Write Goals</td>
<td>.421</td>
<td>.177</td>
<td>.000</td>
</tr>
<tr>
<td>(Step 4) Generate hypotheses</td>
<td>.455</td>
<td>.207</td>
<td>.000</td>
</tr>
<tr>
<td>(Step 5) Brainstorm interventions</td>
<td>.335</td>
<td>.112</td>
<td>.000</td>
</tr>
<tr>
<td>(Step 6) Select Interventions</td>
<td>.390</td>
<td>.152</td>
<td>.000</td>
</tr>
<tr>
<td>(Step 7) Implement interventions</td>
<td>.235</td>
<td>.055</td>
<td>.012</td>
</tr>
<tr>
<td>(Step 8) Progress monitor</td>
<td>.243</td>
<td>.059</td>
<td>.010</td>
</tr>
<tr>
<td>(Step 9) Evaluate interventions</td>
<td>.255</td>
<td>.065</td>
<td>.007</td>
</tr>
<tr>
<td>(Step 10) Identify when a student should move between tiers</td>
<td>.286</td>
<td>.082</td>
<td>.008</td>
</tr>
<tr>
<td>(Step 11) Work with a small group of students during class time</td>
<td>.032</td>
<td>.001</td>
<td>.758</td>
</tr>
<tr>
<td>(Step 12) Maintaining order for students not in the small group intervention</td>
<td>.075</td>
<td>.006</td>
<td>.216</td>
</tr>
</tbody>
</table>

**Regression Model Three**

The following variables were entered simultaneously into the regression model: extent of training by type, extent of training in each step, opportunities to practice, and quality of
past training. The three independent variables, teaching level, years implementing, and
can be seen in Table 14 and are between extent of training in steps and the following
frequency seeking IAT, were entered as control variables in Regression Model Three due
variables: opportunities to practice each step, self-perceived competence, quality of past
to their significance in Regression Model Two. The strongest, significant correlations
training, and extent of training by type. These four variables were all significantly
can be seen in Table 14 and are between extent of training in steps and the following
correlated with the dependent variable (p < .01). Extent of training by type was
variables: opportunities to practice each step, self-perceived competence, quality of past
moderately, positively associated with quality of past training and opportunities to
training, and extent of training by type. These four variables were all significantly
practice each step. Opportunities to practice was moderately, positively associated with
weak (r = <.400) and/or insignificant at the .05 level.
Table 14

*Zero-Order Correlations for Independent Variables and the Dependent Variable in Regression Model Two*

<table>
<thead>
<tr>
<th></th>
<th>Self-Perceived Comp.</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
<th>7.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Teaching Level</td>
<td>-0.224**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Years Implementing</td>
<td>0.251**</td>
<td>0.089</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Freq. Seek. IAT</td>
<td>0.264**</td>
<td>-0.087</td>
<td>0.214*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Quality of Past Training</td>
<td>0.323**</td>
<td>-0.047</td>
<td>0.280**</td>
<td>0.308**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Opportunities to Practice Each Step</td>
<td>0.488**</td>
<td>0.016</td>
<td>0.348**</td>
<td>0.284**</td>
<td>0.473**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Extent of Training by Type</td>
<td>0.346**</td>
<td>0.017</td>
<td>0.357**</td>
<td>0.312**</td>
<td>0.517**</td>
<td>0.454**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Extent of Training in Steps</td>
<td>0.547**</td>
<td>0.032</td>
<td>0.328**</td>
<td>0.200*</td>
<td>0.535**</td>
<td>0.778**</td>
<td>0.525**</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>25.17</td>
<td>1.32</td>
<td>2.98</td>
<td>0.82</td>
<td>1.29</td>
<td>13.37</td>
<td>4.68</td>
<td>17.98</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>6.57</td>
<td>0.62</td>
<td>2.88</td>
<td>0.93</td>
<td>0.81</td>
<td>9.83</td>
<td>3.08</td>
<td>8.50</td>
</tr>
</tbody>
</table>

*Significant at the .05 level
**Significant at the .01 level
As was seen in Regression Model Two, the regression coefficient for the control variables is positive and moderate ($R = .400, p < .01$). When controlling for teaching level, years implementing, and frequency seeking IAT, the magnitude of the relation between self-perceived competence and the linear combination of quality of past training, opportunities to practice each step (summed scores), extent of training by type (summed scores), and extent of training in steps (summed scores) is moderate and positive ($R = .622, p < .01$). The proportion of variance, or goodness of fit, in self-perceived competence explained by the linear combination of these specific independent variables is 38.7% ($R$-square = .387); thus, the proportion of variance not explained by the model is 61.3% (1 minus $R$-square = .613). Standard error, or the standard deviation of the residuals, is 5.32 for Regression Model Three.

Table 15 displays data indicating that for a one-unit decrease in teaching level, there is an expected increase in self-perceived competence of .23 points ($\beta = -.228, p < .01$). For a one-unit increase in extent of training in steps (summed scores) there is an expected increase in self-perceived competence of .43 points ($\beta = .432, p < .001$), when controlling for teaching level, years implementing, and frequency seeking IAT. Years implementing, frequency seeking IAT, quality of past training, opportunities to practice each step (summed scores), and extent of training by type (summed scores) are insignificant at the .05 level. The insignificance of these variables is further evident when noting that zero is within each independent variable’s confidence interval. Based upon the results of Regression Model Three, one final regression model was run using only the two variables, teaching level and extent of training in steps (summed scores), that are significant at the .01 level in order to find the most parsimonious model that is
able to predict teachers’ levels of self-perceived competence to implement the problem-solving steps.

Table 15

<table>
<thead>
<tr>
<th>Model</th>
<th>B</th>
<th>Std. Error</th>
<th>Beta</th>
<th>Sig.</th>
<th>Lower Bound</th>
<th>Upper Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>25.675</td>
<td>1.544</td>
<td>.000</td>
<td>22.614</td>
<td>28.736</td>
<td></td>
</tr>
<tr>
<td>Teaching Level</td>
<td>-2.421</td>
<td>0.947</td>
<td>-.228</td>
<td>.012</td>
<td>-4.297</td>
<td>-0.544</td>
</tr>
<tr>
<td>Years Implementing</td>
<td>0.525</td>
<td>0.208</td>
<td>.230</td>
<td>.013</td>
<td>0.113</td>
<td>0.936</td>
</tr>
<tr>
<td>Freq. Seek. IAT</td>
<td>1.374</td>
<td>0.640</td>
<td>.195</td>
<td>.034</td>
<td>0.105</td>
<td>2.644</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>20.530</td>
<td>1.668</td>
<td>.000</td>
<td>17.222</td>
<td>23.839</td>
<td></td>
</tr>
<tr>
<td>Teaching Level</td>
<td>-2.534</td>
<td>0.827</td>
<td>-.238</td>
<td>.003</td>
<td>-4.174</td>
<td>-0.895</td>
</tr>
<tr>
<td>Years Implementing</td>
<td>0.157</td>
<td>0.195</td>
<td>.069</td>
<td>.423</td>
<td>-0.229</td>
<td>0.543</td>
</tr>
<tr>
<td>Freq. Seek. IAT</td>
<td>0.805</td>
<td>0.594</td>
<td>.114</td>
<td>.178</td>
<td>-0.373</td>
<td>1.983</td>
</tr>
<tr>
<td>Quality of Past Training</td>
<td>-0.338</td>
<td>0.794</td>
<td>-.042</td>
<td>.672</td>
<td>-1.913</td>
<td>1.237</td>
</tr>
<tr>
<td>Opportunities to Practice</td>
<td>0.068</td>
<td>0.084</td>
<td>.102</td>
<td>.422</td>
<td>-0.099</td>
<td>0.235</td>
</tr>
<tr>
<td>Extent of Training by type</td>
<td>0.081</td>
<td>0.211</td>
<td>.038</td>
<td>.701</td>
<td>-0.337</td>
<td>0.499</td>
</tr>
<tr>
<td>Extent of Training in Steps</td>
<td>0.334</td>
<td>0.103</td>
<td>.432</td>
<td>.002</td>
<td>0.131</td>
<td>0.538</td>
</tr>
</tbody>
</table>

Note: Dependent variable is self-perceived competence (summed scores)

Regression Model Four

Teaching level and extent of training in steps (summed scores) were entered simultaneously into the regression model. Both independent variables were significantly
and positively correlated with the dependent variable self-perceived competence, as seen in Table 16.

Table 16

Zero-Order Correlations for Independent Variables and the Dependent Variable in Regression Model Four

<table>
<thead>
<tr>
<th></th>
<th>Self-Perceived Competence</th>
<th>Teaching Level</th>
<th>Extent of Training in Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Level</td>
<td>-.226**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extent of Training in Steps</td>
<td>.560**</td>
<td>.029</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>24.97</td>
<td>1.32</td>
<td>17.37</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>6.69</td>
<td>0.625</td>
<td>8.90</td>
</tr>
</tbody>
</table>

**Significant at the .01 level

The magnitude of the relation between self-perceived competence and the linear combination of teaching level and extent of training in steps (summed scores) is moderate and positive (R = .610, p < .01). The proportion of variance, or goodness of fit, in self-perceived competence explained by the linear combination of these specific independent variables is 37.2% (R-square = .372); thus, the proportion of variance not explained by the model is 62.8% (1 minus R-square = .628). Standard error, or the standard deviation of the residuals, is 5.35 for Regression Model Four.

Table 17 displays data indicating that for a one-unit decrease in teaching level, there is an expected increase in self-perceived competence of .24 points (beta = -.242, p < .001). For a one-unit increase in extent of training in steps (summed scores) there is an expected increase in self-perceived competence of .57 points (beta = .567, p < .001). Zero is not within either variable’s confidence interval, which further establishes their respective significance.
Table 17

*Standardized and Unstandardized Coefficients for Regression Model Four*

<table>
<thead>
<tr>
<th>Model</th>
<th>B</th>
<th>Std. Error</th>
<th>Beta</th>
<th>Sig.</th>
<th>95.0% Confidence Interval for B</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (Constant)</td>
<td>20.993</td>
<td>1.486</td>
<td></td>
<td>.000</td>
<td>18.050</td>
</tr>
<tr>
<td>Teaching Level</td>
<td>-2.595</td>
<td>.791</td>
<td>-.243</td>
<td>.001</td>
<td>-4.161</td>
</tr>
<tr>
<td>Extent of Training in Steps</td>
<td>.426</td>
<td>.056</td>
<td>.567</td>
<td>.000</td>
<td>.316</td>
</tr>
</tbody>
</table>

Note: Dependent Variable is self-perceived competence (summed scores)
Chapter 5: Discussion

The purpose of this research was to examine predictors of teachers’ self-perceived competence to implement the problem-solving steps within two central Ohio school districts. A link to a questionnaire was e-mailed to contact liaisons in each school district, who then e-mailed the link to the questionnaire to his or her principal LISTSERV. Each school principal e-mailed the link to the questionnaire to his or her staff LISTSERV. Participation in this study was voluntary, and there were 123 usable questionnaires for analysis.

Research Question One:

What are the Demographic Characteristics of This Sample?

Personal Characteristics

A majority of the sample was comprised of females (91.1%). This is likely due to females making up a majority of teachers in school districts A and B. Due to having unequal numbers of males and females in the sample, comparisons could not be made between male and female respondents. The sample was comprised of 95.9% White/Caucasian, 0.8% Asian/Pacific Islander, 0.8% Black/African American, and 0.8% Hispanic/Latino individuals; therefore, comparisons between racial/ethnic groups could not be made either. Two individuals did not reply to this question. A majority of the sample was also comprised of individuals working as teachers in the general education setting (65.6%) and by individuals working at the elementary level (61.5%). Again,
comparisons could not be made amongst these demographic groups due to having unequal groups. Respondents have an average 10 years teaching experience, with the majority of respondents having more than 10 years experience.

**Past Training**

A majority of respondents (72.4%) received training in the problem-solving steps through in-services provided by his or her school district. In-services provided by one’s school district also appears to be the setting in which respondents received their most in-depth coverage of the problem-solving steps. The next most common setting for respondents to receive training on the problem-solving steps was through conference lectures and workshops (40% and 41% respectively). Few respondents indicated that they received training on the problem-solving steps during undergraduate or graduate studies (12.2% and 15.4% respectively). Out of the 72.4% of respondents who received in-service training at some point in their career, only 41.5% received this training in the past year. Furthermore, out of the roughly 40% of respondents who received training in the problem-solving steps through a conference lecture or workshop, only roughly 19% attended one of these in the past year.

As Barnes & Harlacher (2008) stated, it is critical that training in the implementation of RTI models (and the problem-solving steps) is ongoing so that skills and concepts can be reviewed frequently and consultation can be provided continuously (Bergstrom, 2008; NASDSE, 2006). This continuous level of support ensures that the teaching staff understands the process of RTI, becomes fluent with the skills, and performs their roles accurately. Given the above findings, it would be beneficial to teachers for school districts to provide in-service training on a yearly basis. It may also
be advantageous to provide funding for teachers to attend conferences yearly in order to receive training in the problem-solving steps if in-service training is not being provided. Furthermore, individuals leading trainings in the problem-solving steps should consider targeting audiences in conference lectures, conference workshops, and inservices due to a majority of respondents receiving training in these formats. School districts should be hesitant to assume an applicant has training in the problem-solving steps just because he or she is certified to teach a given area and/or level; however, these results should be interpreted with caution. Low percentages for training in PSM and RTI in undergraduate and graduate courses may be representative of respondents who attended college more than a decade ago, which was before RTI was written into federal legislation in 2004 (average number of years teacher = 9.99).

If funding is an issue for school districts, then creativity should be utilized for the manner in which teacher training in the problem-solving steps is encouraged. In-house incentive programs may be created in order to motivate teachers to seek out their own training. For example, teachers who pay their own way to a conference and bring back documentation for the RTI lecture/workshop attended could be entered into a drawing for prizes.

Training Techniques

Average ratings of techniques used during trainings in the problem-solving steps indicate that small group discussion, lectures, class discussion, and case studies were viewed by respondents as being the most effective teaching methods. Demonstration of intervention implementation, opportunities to practice each step in the problem-solving process, demonstration of data taking, demonstration of data analysis, and role playing
were viewed by respondents as being less effective training techniques. These findings may help direct the instructors of future trainings in the problem-solving steps and RTI as to which techniques are most effective for educators currently practicing in the field. The techniques rated as being most effective were likely provided in settings conducive to these methods of instruction (e.g., conference lectures, conference workshops, and inservices) in light of a majority of respondents in this study receiving training in these settings. The techniques viewed as being less effective by respondents in this study may be effective in other settings (e.g., undergraduate and/or graduate courses).

**Research Question Two:**

**How Confident Do Teachers Feel in Their Ability to Implement Each Problem-Solving Step?**

**Self-Perceived Competence to Implement the Problem-Solving Steps, Individually**

Respondents’ ratings of how competent one feels to implement each of the problem-solving steps indicate the following order from most competent to least competent: (step 5) brainstorm interventions, (step 7) implement interventions with integrity, (step 12) collaborate with an intervention specialist/school psychologist, (step 8) take intervention data/progress monitor accurately, (step 2) collect accurate baseline data, (step 6) select appropriate, evidence-based interventions, (step 1) clearly and concisely define the problem, (step 3) write appropriate goals, (step 9) effectively evaluate interventions, (step 11) work with a small group of students during class time while maintaining class order, (step 4) generate appropriate hypotheses, and (step 10) accurately identify when a student should move between tiers.
These results indicate that the individual steps are more or less difficult at different points within the problem-solving process for the respondents in this sample. It is likely that respondents feel most competent to brainstorm interventions, implement interventions within integrity, and collaborate with an intervention specialist/school psychologist because these steps closely align with teachers’ daily duties outside of the RTI process. These results may signify a need for instructors of future trainings in the problem-solving steps to complete a needs assessment for the group receiving the training. This way, the instructors can spend more time covering the steps that trainees are having more difficulty with while spending less time on the steps in which the group feels competent to implement.

Self-Perceived Competence to Implement the Problem-Solving Steps, Overall

Respondents rated their own ability to implement the problem-solving steps using the following scale: (1) not true about me, (2) somewhat true about me, and (3) very true about me. Twelve steps were presented, and respondents’ answers were combined to produce a total score for each individual (score range = 2-36 with the lowest score at 2 due to one respondent not providing a response to one of the 12 steps). The higher one’s total score, the more self-perceived competence one has to implement the problem-solving steps as a whole because each individual step provides an important piece of the puzzle. Roughly 5% of respondents’ ratings fell between 2-12 points, and roughly 29% of respondents’ ratings fell between 13-24 points. Approximately 54% of respondents’ ratings fell between 25-35 points. Only two respondents’ (1.7%) totaled ratings equaled 36 (rating of “very true about me” on every step). While it is promising to see that more than half of the sample’s ratings fall within the (2) somewhat true about me to (3) very
true about me range, it is also important to examine the characteristics those respondents. Correlation analyses discussed under research questions three and four shed light on this area.

**Research Question Three:**

**What is the Relation Between Frequency Seeking the Intervention Assistant Team, Helpfulness of the Intervention Assistance Team, Years Teaching, Teaching Level, Experience on the Intervention Assistance Team, Years Implementing, and Teachers’ Self-Perceived Competence to Implement These Steps?**

**Frequency Seeking and Helpfulness of IAT**

A majority of respondents (46.3%) indicated they had no opportunity to use IAT for assistance, and 37.4% indicated that they sought IAT assistance for students who are struggling academically and/or behaviorally one-to-two times per school year. Few respondents sought assistance three-to-four times per year or at least once per month (8.1% for each), and no respondents reported seeking IAT assistance more than once per month. Average responses to helpfulness of IAT indicate a mean between mostly helpful and very helpful. On average, respondents are utilizing IAT infrequently as a resource, yet they find IAT to be helpful when they go to them for assistance. This finding is mirrored in the finding that frequency seeking IAT is positively yet weakly associated with the helpfulness of the IAT. School districts may want to examine why teachers do not seek IAT assistance. Possible reasons may be that there are relatively few numbers of academic and/or behavioral concerns within the classroom, or a lack of awareness of what IAT is and/or what the team offers (e.g., belief that IAT is a stepping stone to qualifying a student for special education).
Years Teaching and Teaching Level

A correlation analysis indicated that years teaching had an insignificant, positive association with self-perceived competence. This signifies that increased years of experience teaching is not necessarily connected to higher levels of self-perceived competence to implement the problem-solving steps. The correlation analysis also indicated that teaching level had an insignificant, negative association with self-perceived competence. It was hypothesized that respondents who currently work at the pre-k or elementary level would have higher levels of self-perceived competence due to having more opportunities to implement academic and/or behavioral interventions. Although the negative direction of the correlation supports this hypothesis (teaching level was coded from pre-k to high school as 0-3), the insignificance of the association does not. This result may be due to having a small sample size and may not be representative of all teachers at school district A and B. It may also be due to teachers having experience in multiple grade levels over the course of their career. For example, a respondent who currently teaches at the high school level may have significant experience teaching elementary grades where she would have had numerous opportunities to take part in the problem-solving process.

Experience on IAT and Years Implementing

It was hypothesized that respondents with more years experience serving on their school’s IAT and respondents with a greater number of years implementing the problem-solving steps since their initial training would have greater levels of self-perceived competence. However, correlation analyses indicate a weak association between these
independent variables and the dependent variable. This finding may be due to having a small sample size that included few individuals who are members of IAT.

**Regression Analyses**

A multiple regression analysis was run to measure the impact the independent variables frequency seeking IAT, helpfulness of IAT, years teaching, teaching level, experience on IAT, and years implementing have upon the dependent variable self-perceived competence. These independent variables were grouped together for the first model because they represent information that is separate from respondents’ training background. Variables related to training background were used in the third and fourth regression models. The combination of these variables in Regression Model One resulted in a model with moderate, positive strength that was able to explain 17.3% of the variance in the data. The regression model was reduced to only include the variables that were significant in the first model (teaching level, years implementing, and frequency seeking IAT). These variables maintained their significance and appeared to be valid to use as control variables in Regression Model Three. It is likely that the final three variables maintained significance in the second model due to the contribution of opportunities to implement the problem-solving process frequently (at a lower teacher level/setting), experience in the field (years implementing), and openness to seeking help (frequency seeking IAT). Whether respondents found IAT to be helpful or are presently a member of IAT do not appear to be contributing factors to one’s self-perceived competence to implement the problem-solving steps.

**Research Question Four:**
What is the Relation Between Quality of Past Training, the Extent of Training by type, Extent of Training in Each Step, Opportunities to Practice, and Teachers’ Self-Perceived Competence to Implement These Steps?

Quality of Past Training

Overall, respondents rated the quality of their past training(s) in the problem-solving steps as below average. Although hands on training in IAT meetings provides some measure of training, less effective direct training in the problem-solving steps is a likely contributor to respondents’ lower self-perceived competence to implement each step. Spearman’s correlation analysis indicates that quality of past training has a positive, weak association with self-perceived competence. This signifies that increased quality of training is weakly associated with increased levels of self-perceived competence to implement the problem-solving steps. This finding should be interpreted with caution, however, due to respondents having different forms of training on the problem-solving steps at different points in their career and having different definitions of what constitutes “higher quality” training. One respondent may have interpreted “superior” training to be a training led by a highly credentialed individual renowned in the field of RTI. Another respondent may have judged past trainings to be of higher quality if they provided applicable materials to take back to their schools. There are many interpretations of this variable without more direction being provided by the researcher. Please see Directions for Future Research for further discussion.

Extent of Training by type

Average responses to how extensive one was trained in different settings indicate the following order of overall extensiveness: (1) in-service, (2) conference workshop, (3)
conference lecture, (4) continuing education units, (5) graduate studies, and (6) undergraduate studies. These findings suggest that teachers would benefit from school districts providing in-service training on the problem-solving steps and funding teachers to attend conferences, if possible. However, taking the findings of quality of past training into consideration, it would be advantageous for school districts to survey their teaching staff to see what they feel should be included in a high quality training (e.g., applicable examples or more opportunities to practice a given step). Given that quality of past training finds are cumulative responses to all trainings received over one’s career, school districts should also survey teachers to see which type of training is viewed as the most effective.

**Extent of Training in Each Step**

Average responses to how extensive one was trained on each of the problem-solving steps indicate the following order of overall extensiveness: (step 1) define the problem, (step 5) brainstorm interventions, (step 2) collecting baseline data, (step 3) writing the goal, (step 6) selecting an intervention, (step 7) implementing an intervention, (step 8) taking intervention data/progress monitoring, (step 9) evaluating effectiveness of the intervention, (step 10) identifying when the student should move within tiers, (step 11) working with a small group of students during class time, and (step 12) maintaining order for students not in the small group intervention.

Spearman’s correlation analysis was run for each corresponding part of the independent variable extent of training in each step and the dependent variable self-perceived competence. Results indicate a positive, moderate correlation between extent of training in and self-perceived competence to generate hypotheses, brainstorm
interventions, select interventions, and identify when a student should move between
tiers. All other correlations were weak. These findings signify that more training on
specific steps is positively associated with increased self-perceived competence to
implement those specific steps. However, it appears that extensiveness in training in
each individual step does not increase at consistent rate when compared to self-perceived
competence for respondents in this study. This is apparent when viewing the order of
extensiveness of training in each step listed above compared to the four variables with the
highest correlations with self-perceived competence. One possible explanation for this is
that respondents felt competent to implement one or more steps in which they did not
receive extensive training. Conversely, respondents may have felt less competent to
implement one or more steps in which they received extensive training. This finding also
highlights the need for instructors of future trainings to complete a needs assessment with
those receiving the training in order to pinpoint which steps within the problem-solving
process trainees feel more or less competent to implement.

Opportunities to Practice Each Step

Average responses to how frequently one had the opportunity to practice each of
the problem-solving steps during past trainings indicate the following order of overall
frequency: (step 5) brainstorm interventions, (step 6) selecting an intervention, (step 1)
defining the problem, (step 3) writing the goal, (step 2) collecting baseline data, (step 7)
implementing an intervention, (step 4) generating a hypothesis, (step 8) taking
intervention data/progress monitoring, (step 9) evaluating the effectiveness of the
intervention, (step 10) identifying when the student should move within tiers, and (step
11) working with a small group of students during class time, and (step 12) maintaining order for students not in the small group interventions.

Spearman’s correlation analysis was run for each corresponding part of the independent variable opportunities to practice each step and the dependent variable self-perceived competence. Results indicate a positive, moderate correlation between opportunities to practice and self-perceived competence to generate hypotheses and write goals. All other correlations were weak. These findings signify that more opportunities to practice each of the problem-solving steps is positively associated with increased self-perceived competence to implement those specific steps for respondents in this study.

However, one must keep in mind that the setting of the training limits the number of opportunities one has to implement each step. A conference lecture, for example, is a one time event where attendees cannot monitor a student’s progress over the course of several weeks. A graduate course, on the other hand, would provide one the opportunity to implement this step of the problem-solving process in order to gain this hands-on experience. In this case, pre-service training would be the optimal setting to provide opportunities to practice each step of the process.

**Regression Analyses**

Regression Model Three was run to measure the impact the independent variables extent of training by type (summed scores), extent of training in each step (summed scores), opportunities to practice (summed scores), and quality of past training have upon the dependent variable self-perceived competence (summed scores) when controlling for the significant variables from Regression Model Two (teaching level, years implementing, and frequency seeking IAT). The regression model was reduced to only
include the variables that were significant in the third model (teaching level and extent of training in steps). These variables maintained their significance and appear to represent the most parsimonious model for predicting one’s level of self-perceived competence. The strength of the relation between these variables is moderate and positive, and their combination is able to explain 37.2% of the variance in the data.

Thus, knowledge of one’s teaching level (e.g., elementary, middle or high school) and the extent of training he or she received in each of the problem-solving steps helps predict how competent a random respondent within this study perceives himself or herself to be to implement each of the steps. Principals and IAT leaders of schools within this study can use this information to gauge how competent new team members might feel when joining their school’s IAT. They can also use this information to gauge how competent teachers within this study feel to actively take part in the IAT process and contribute each step of the way.

**Limitations and Directions for Future Research**

There was an 8.9% response rate (189 individuals out of 2,103 total) to the questionnaire. Out of these responses, only 123 questionnaires were usable, which decreased the percentage to 5.8%. Such a low response rate not only limits the generalizability of results to all teachers within school district A and school district B, but also to all teachers within the United States. Females responded to the questionnaire more than males (91.1% and 9.8% respectively), and individuals of White/Caucasian descent (95.9%) responded more than any other racial/ethnic group, which limited the researchers ability to compare the demographic groups.
The current findings are reflective of respondents’ cumulative perception of the quality of all trainings received in one’s career. Future researchers may want to evaluate respondents’ perception of the quality of past trainings in the problem-solving steps according to individual trainings. These perceptions could be compared to self-perceived competence through correlational analysis. Findings from this type of analysis may indicate a stronger association between quality of training and self-perceived competence to implement the problem-solving steps. Moreover, instructors of future trainings in RTI/problem-solving steps may gain valuable information by having trainees complete pre- and post-training questionnaires rating their knowledge of and/or ability to implement the problem-solving steps.

The questionnaire was made available to teachers to complete at the end of May, which is close to the end of the school year. It was hoped that this timing would allow respondents to reflect back upon an entire school year when answering the questions. The low response rate may be due to teachers having other obligations to fulfill at the end of the school year. Future researchers in this area may want to consider making the questionnaire available to teachers in the early spring in order to allow respondents to reflect upon several months of the school year while still allowing them ample time to complete the questionnaire before the end of the school year.

Dillman et al. (2009) state that a fundamental difference between questionnaires sent by postal mail and those sent by e-mail is that with postal mail, one delivers the questionnaire to the respondent. With e-mail, one asks respondents to go and retrieve the questionnaire themselves, frequently through the use of technologies with which they are uncomfortable using. Because this posed a possible limitation for this study, every care
was taken to make the questionnaire easy to access and navigate. A strength inherent in
the populations in this study is that they all had access to computers and the Internet at
the schools where they work. Teachers are provided with a personal e-mail account
through their school district. The principal of each school has an electronic list of all
teachers’ email addresses. In a few short steps, the principal of each school forwarded
the questionnaire to his or her teaching staff through the school’s e-mail LISTSERV. A
LISTSERV is a system that makes it possible to create, manage, and control electronic

Furthermore, the correlational nature of this study is a limitation in that no
experimental manipulation was implemented. Future researchers in this area may seek to
control the professional development training that is delivered to multiple sites through
manipulation and random assignment of subjects to treatment and control groups. A
school district that does not receive any professional development training in problem-
solving steps can be administered the same questionnaire to see if that district’s teachers’
levels of self-perceived competence are significantly lower than that of another district’s
teachers who received the professional development training.

Another limitation of the current study is that having participants rate their own
competence to implement the steps of the problem-solving process may demonstrate
social desirability bias (Neuman, 2003). Respondents may have answered items on the
questionnaire the way they believe the researcher wanted them to answer. For example, a
respondent may rate his or her level of competence higher than it actually is because he
or she believes the researcher wants teachers to have higher competence if they have had
previous training in the problem-solving steps.
Another area of study that future researchers in this area may undertake involves establishing convergent validity (Neuman, 2003). This type of measurement validity applies when multiple indicators converge or are associated with one another.

Convergent validity can be attained by not only having teachers rate their self-perceived competence in their own ability, but also by having an additional person objectively rate the teachers’ competence to implement all steps in the problem-solving process. The additional person could be the individual who leads the professional development training, the school principal, or the head of the school’s IAT, for instance. If the teachers’ personal ratings of competence do not converge with the principal’s ratings, for example, then the measurement tool (questionnaire) would have weak convergent validity. This would indicate that the two separate ratings of competence should not be combined into one overall measure of competence.

Future researchers may want to provide definitions of key terms throughout the course of the questionnaire to alleviate any confusion that should arise. For example, it is unclear whether the respondents in this study fully understood the terms within the phrase “implement interventions with fidelity.” This step was ranked as the second easiest to implement when all responses were averaged. However, past research consistently demonstrates that this step is generally more difficult for teachers to implement. Furthermore, it is unclear whether respondents knew the difference between an accommodation and a modification within the classroom without a definition to reference on the questionnaire. Lastly, it is likely that respondents defined “quality of past training” differently. For this particular key term, it may be helpful to give respondents
choices to select to highlight what makes a training be of higher quality (e.g., good pacing, opportunities to ask questions, or materials handed out to take back to schools).
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Appendix A: Self-Perceived Competence in Problem Solving Steps, Teacher Rating Scale (SPCPSS)

Self-Perceived Competence in Problem-Solving Steps—Teacher Rating Scale
Lindsay Mendelson, M.A.
Kisha Haye Radliff, Ph.D.
Joe Wheaton, Ph.D.
Antoinette Miranda, Ph.D.

Informed Consent
Your participation is VOLUNTARY. Please consider the information carefully. Feel free to e-mail questions to Lindsay Mendelson, M.A., (Mendelson.13@osu.edu) before making your decision whether or not to participate. If you decide to participate, please proceed to the next section of the survey.

DURATION:
It is expected that it will take no more than 15-20 minutes to complete this survey. You may exit the survey at any time. If you decide to stop participating in the study, there will be no penalty to you. Your decision will not affect your future relationship with The Ohio State University.

INCENTIVES:
Participants responding to this survey within the first week will be entered into a drawing in which $5 gift cards to Starbucks and $10 gift cards to Barnes & Noble will be awarded to randomly chosen participants. There are 20 gift cards available to win.

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<th></th>
<th>Male</th>
<th>Female</th>
<th>Prefer not to reply</th>
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<td>1. Gender:</td>
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<th>White/Caucasian</th>
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<td>2. Race:</td>
<td>Asian or Pacific Islander</td>
<td>Hispanic</td>
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<td>Biracial or Multiracial</td>
<td>Native American or Alaskan Indian</td>
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<td>Other: ______________</td>
<td>Prefer not to reply</td>
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<th>Elementary (K-5)</th>
<th>Middle School (6-8)</th>
<th>High School (9-12)</th>
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<td>3. How many years have you taught each level:</td>
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<th>Elementary (K-5)</th>
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<td>4. What level to you currently teach:</td>
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5. Years of employment in this school district: __________

6. Length of time on Intervention Assistance Teams: _________  □ Not applicable

7. I am a(n):
   □ Teacher, general education
   □ Teacher, special education
   □ Intervention specialist
   □ Paraprofessional/Teaching Assistant
   □ Other __________

8. Were you ever trained in the problem-solving steps during:
   a. Undergraduate, pre-service training: □ Yes □ No
   b. Graduate, pre-service training: □ Yes □ No
   c. Graduate coursework, continuing education credits: □ Yes □ No
   d. Through your school district, in-service training: □ Yes □ No
   e. Conference, presentation (typically one hour): □ Yes □ No
   f. Conference, workshop (typically a half day or more): □ Yes □ No
   g. Other (Please Specify):
      __________________________________________________
      __________________________________________________

9. Were you trained in the problem-solving steps through any of the following methods/settings in the past 1 year:
   a. Undergraduate, pre-service training: □ Yes □ No
   b. Graduate, pre-service training: □ Yes □ No
   c. Graduate coursework, continuing education credits: □ Yes □ No
   d. Through your school district, in-service training □ Yes □ No
   e. Conference, presentation (e.g., one hour or less): □ Yes □ No
   f. Conference, workshop (half day or more): □ Yes □ No
   g. Other (Please Specify):
      __________________________________________________
      __________________________________________________
### 10. Approximately how extensively have you had problem-solving training in each of the following settings:

<table>
<thead>
<tr>
<th>Setting</th>
<th>Not Covered</th>
<th>Briefly (e.g., discussed briefly during one lecture, presentation, or part of a reading)</th>
<th>Moderately (e.g., discussed during 2-3 lectures, presentations or readings)</th>
<th>Extensively (e.g., 4 or more lectures, presentations, readings, and assignments)</th>
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<tbody>
<tr>
<td>a. Undergraduate, pre-service training</td>
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<td>b. Graduate, pre-service training</td>
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<td>c. Graduate coursework, continuing education credits</td>
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<td>d. In-service training through school district</td>
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<td>e. Conference, presentation</td>
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<td>f. Conference, workshop</td>
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<td>g. Other (Please Specify):</td>
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11. Please indicate the type of activities used during your training (lecture, small group activities, action plans, role playing, etc.):

12. How would you rate the quality of problem-solving training you received in the past?

- [ ] Not Applicable
- [ ] Poor
- [ ] Good
- [ ] Superior
13. How extensively did your previous problem-solving training (e.g., PSM, IAT, RTI) cover each of the following areas:

<table>
<thead>
<tr>
<th></th>
<th>Not Covered</th>
<th>Briefly (e.g., rarely addressed this step during lectures, assignments, case studies)</th>
<th>Moderately (e.g., occasionally addressed of this step during lectures, assignments, case studies)</th>
<th>Extensively (e.g., almost always addressed of this step during lectures, assignments, case studies)</th>
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<tbody>
<tr>
<td>a. Defining the problem</td>
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<tr>
<td>b. Collecting baseline data</td>
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<tr>
<td>c. Writing the goal</td>
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<tr>
<td>d. Generating a hypothesis</td>
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<tr>
<td>e. Brainstorming interventions</td>
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<td>f. Selecting an intervention</td>
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<td>g. Implementing an intervention</td>
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<tr>
<td>h. Taking intervention data/progress monitoring</td>
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<tr>
<td>i. Evaluating the effectiveness of the intervention</td>
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<td>j. Identifying when the student should move into Tier II (or III) intervention</td>
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<td>k. Working with a small group of students during class time</td>
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<td>l. Maintaining order for the majority of the class not in the small group</td>
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14. How many opportunities did you have to practice each of the following problem-solving steps during your previous training(s) (e.g., role playing, case studies; PSM, IAT, RTI)?

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<th>Step</th>
<th>Not Covered (e.g., rarely had the opportunity to practice)</th>
<th>Briefly (e.g., occasionally had the opportunity to practice)</th>
<th>Moderately (e.g., almost always had the opportunity to practice)</th>
<th>Extensively (e.g., almost always had the opportunity to practice)</th>
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<tr>
<td>a. Defining the problem</td>
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<td>d. Generating a hypothesis</td>
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<tr>
<td>e. Brainstorming interventions</td>
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<tr>
<td>f. Selecting an intervention</td>
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<td>g. Implementing an intervention</td>
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<tr>
<td>h. Taking intervention data</td>
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<tr>
<td>i. Evaluating the effectiveness of the intervention</td>
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<tr>
<td>j. Identifying when the student should move into Tier II (or III) intervention</td>
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<tr>
<td>k. Working with a small group of students during class time</td>
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<tr>
<td>l. Maintaining order for the majority of the class not in the small group</td>
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</table>
15. Please recall the most effective training you received on the problem-solving steps. How would you rate each of the following techniques’ impact on your ability to implement the problem-solving steps?

<table>
<thead>
<tr>
<th>Technique</th>
<th>No opportunity</th>
<th>Not Effective</th>
<th>Effective</th>
<th>Very Effective</th>
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</thead>
<tbody>
<tr>
<td>a. Role playing</td>
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<td>b. Lecture</td>
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<tr>
<td>c. Case studies</td>
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<tr>
<td>d. Small group discussion</td>
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<tr>
<td>e. Class discussion</td>
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<tr>
<td>f. Demonstration of intervention implementation</td>
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<td>g. Demonstration of data-taking</td>
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<tr>
<td>h. Demonstration of data analysis</td>
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<tr>
<td>i. Opportunities to practice each step of the problem-solving process</td>
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</table>

16. How true are the following statements about you?

<table>
<thead>
<tr>
<th>Statement</th>
<th>No opportunity</th>
<th>Not true about me</th>
<th>Somewhat true about me</th>
<th>Very true about me</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. I clearly and concisely define the problem.</td>
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<td>b. I collect accurate baseline data.</td>
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<td>c. I write appropriate goals.</td>
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<td>d. I generate appropriate hypotheses.</td>
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<td>e. I brainstorm interventions.</td>
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<td>f. I select appropriate, evidence-based interventions.</td>
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<td>g. I implement interventions with integrity (e.g., follow all steps).</td>
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</tbody>
</table>
h. I take intervention data/progress monitor accurately.

i. I effectively evaluate interventions.

j. I accurately identify when a student should move into Tier II (or III) intervention.

k. I work with a small group of students during class time while maintaining order for the majority of the class as needed.

l. I collaborate with an intervention specialist/school psychologists during the problem-solving process as needed.

17. Number of years since your initial training you have been able to implement the problem-solving steps:  

18. How frequently do you seek the assistance of your school’s IAT:

☐ no opportunity
☐ rarely (1-2 times a year)
☐ occasionally (3-4 times a year)
☐ frequently (1 time a month)
☐ very frequently (more than 1 time a month)

If you marked “No opportunity,” you have finished the questionnaire.

19. How helpful do you find your IAT when completing the problem-solving steps as team:

☐ not helpful
☐ somewhat helpful
☐ mostly helpful
☐ very helpful

20. Please discuss why you use the team as frequently/infrequently as you do?

____________________________________________________________________________________
____________________________________________________________________________________

Thank you very much for your time!