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Training Pre-Service Teachers in Response to Intervention: A Survey of Teacher Candidates

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ABSTRACT

Training Pre-Service Teachers in Response to Intervention: A Survey of Teacher Candidates

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Addressing training in Response to Intervention at the pre-service level has potential to reach educators during their formative years; preparing them to implement research-based practices upon entering the field and building the capacity to do so with more fidelity and less support. While the knowledge levels and perceptions of pre-service teachers are critical to the future success of RTI implementation, the level of training among pre-service educators is less understood relative to their colleagues in the field. This exploratory study was designed to examine pre-service general and special education teachers' perceptions of RTI, and self-efficacy in implementation. A survey, created and distributed to measure teacher candidates' (TCs) opinions and self-efficacy in RTI, found that TCs have positive opinions of RTI. They believe it to be effective for students, but have less ability to implement specific components in the classroom. The outcomes from this study suggest that special education majors had significantly higher ratings of their self-efficacy than elementary education majors. This has implications for curriculum changes in teacher training programs to better prepare educators to implement RTI in the classroom.

Keywords: Response to Intervention, pre-service teacher training, professional development

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DESCRIPTION OF THESIS STRUCTURE

This thesis is prepared in a "submission ready" journal format. Following the introductory pages (title page, acknowledgments, abstract, table of contents, and list of tables), this thesis is segmented into two major sections: the article ready for submission to a journal (p. 1–44), and a review of the literature (p. 45-60). A more extensive literature review is included in Appendix A. The survey created for this study is included in Appendix B. Appendix C contains the coding and decision matrix for the open-ended survey item.

Introduction

Education reform is widely discussed and debated in the field of education as well as in state and federal policy. The science behind instruction and intervention design is in the forefront of discussion in public education, professional organizations including the National Association of School Psychologists and the National Council on Student Development, and among school mental health professionals. The 2004 reauthorization of The Individuals with Disabilities Education Improvement Act added language to the eligibility criteria for specific learning disabilities which initiated the call for alternative, empirically-based means to special education identification, specifically including student responsiveness to intervention as a consideration for evaluation and placement in special education (Grogg, 2010; Nelson & Machek, 2007).

From IDEIA emerged Response to Intervention (RTI), a multi-tiered system of support favored as a model of prevention-focused instruction and intervention which provides an alternative route for identifying students for special education (Nelson & Machek, 2007). While specific systems differ in detail and terminology, the overall multi-tiered approach to research-based instruction and intervention, coupled with continuous monitoring of student progress as a preventative model (Grogg, 2010), will be referred to as RTI for the purposes of this paper.

RTI and other multi-tiered systems of intervention are credited as an effective means for providing timely and meaningful intervention for all students who struggle academically and behaviorally, not only for those students who qualify for special education services. These systems take a comprehensive approach to addressing academic and behavioral concerns for all students in a robust and systemic way (Kratochwill, Volpiansky, Clemments, & Ball, 2007). In addition, these models address several criticisms relevant to special education, particularly the lack of fluidity between special education and general education and the over-identification of

minority students (Skiba et al., 2006). Over the past decade, RTI has emerged as a promising model of service delivery, with reading and behavior receiving systematic attention from researchers and practitioners (Fuchs & Fuchs, 2006).

As with other systematic school improvement efforts, implementing RTI requires change on many levels, from individual classroom practices, to school, district, and state systems, and the most significant changes occurring in the practice and methods of teachers and other school service-delivery professionals. For RTI to be successful, education professionals require appropriate training. RTI requires a level of technical competency in implementing intervention services that have not typically been expected in school practice (Hawkins, Kroeger, Musti-Rao, Barnett, & Ward, 2008). Efforts to provide professional development in RTI for teachers have produced mixed results, and the difficulty of changing outdated teaching practices is currently cited as a significant roadblock to implementation of RTI (Hawkins, 2008). At the pre-service level, educators can be reached in the foundational, formative years of their training. Reaching new professionals pre-service is be the optimal time to influence the teaching practices and build research-based practices into the ideologies of teachers (Begeny & Martens, 2008), giving pre-service professionals a foundation in RTI and other multi-tiered systems of intervention that will inevitably facilitate further progress into a new educational era focused on educational practices guided by research.

Pre-service teachers' levels of knowledge and perceptions of RTI are critical to the future success of its implementation. Currently, RTI literature is limited in regards to pre-service teacher training (Hawkins, 2008). While the importance of pre-service and in-service training in providing multi-tiered intervention services has been emphasized in the literature, the level of training among pre-service educators is unknown. The rationale for studying pre-service

teachers' levels of training and perceptions of RTI includes the potential for understanding the current state of pre-service training, understanding the competency of teachers just entering the field, and implications for change in training practices.

Review of the Literature

RTI presents a promising alternative model to the traditional IQ-achievement discrepancy model for identifying students with learning disabilities given the renewed emphasis of early identification and intervention for students with learning disabilities (Ofiesh, 2006; Sugai & Horner, 2009). While the historical context of RTI is relevant, understanding the specific features of RTI is critical to the discussion of preparing competent practitioners. A review of the RTI literature summarizes current best-practice in the mechanics of implementing RTI as well as effective professional and pre-professional development.

Defining Features of RTI

RTI outlines a multitier service delivery model that increases instructional intensity at each of three tiers, attempting to systematically identify struggling students early in the school year and provide adequate intervention prior to referral for special education. Sugai & Horner (2009) outline six core defining features of RTI:

1. The interventions selected are supported by scientific research.
2. Interventions are organized along a continuum and are divided into tiers that increase in intensity.
3. A standardized protocol is followed for problem-solving, assessment, and making instructional decisions.
4. Explicit data-based decision rules are in place for making adjustments to instruction and interventions.

5. Emphasis is placed on assessing and ensuring intervention integrity.
6. Regular and systematic screening identifies students early who are not responsive to typical instruction and/or behavioral supports.

In addition, RTI also employs a behavioral approach to problem solving as a core feature and should be differentiated from simple prevention measures (Hawkins et al., 2008). It aligns approaches to prevention into a decision-making model, emphasizing the use of data from universal screening and progress monitoring to make decisions about student needs. It is the combination of systematic implementation of intervention *and* the use of data for making decisions that distinguishes RTI from previous prevention efforts (Kratochwill et al., 2007).

The first tier in an RTI model focuses on primary prevention, typically conceptualized as a strong, research-based general education curriculum administered school-wide to all students. Key components of Tier 1 include research-based instruction, high quality teaching practices, and universal screening. Research-based instruction refers to the practice of implementing curriculum that has been validated through scientific study as having a positive impact on student academic outcomes. Using effective programs which have a demonstrated positive effect on student learning is not only good practice, it eliminates one of the many variables in the question of why a student is not thriving – effective curriculum and instruction. With robust curriculum delivered by high quality teachers in the classroom, it is assumed that most students will respond positively, making adequate academic gains (VanDerHeyden, Witt, & Gilbertson, 2007).

Students who fail to respond to this universally-administered core curriculum receive a secondary prevention measure, or Tier 2 intervention. This tier involves intensive small-group instruction, generally standardized and protocol based, using research-validated intervention programs, for as many as 20 weeks (Batsche et al., 2010). Small groups are typically highly

structured, and the evidence-based programs used are often scripted or have a standard protocol in order to be easy to administer consistently and with fidelity. Student progress is monitored frequently in order to fine-tune instruction based on student response (Batsche et al., 2010).

The remaining students who fail to respond to this second tier of intervention (approximately 5%) receive even more intensive intervention at the tertiary level, which typically involves an individualized program to meet the student's needs (Fuchs & Fuchs, 2006). In the third tier, interventions will likely encompass longer-term interventions and more frequent progress monitoring, possibly 1-2 times per week (Batsche et al., 2010). Tier 3 interventions may or may not include special education resources, and depending on the school's particular working definition of RTI, Tier 3 may be synonymous with special education (Batsche et al., 2010).

Overall, the RTI process answers an essential question: Does effective instruction result in acceptable progress and increased learning? Willis and Dumont (2006) stated, "…a child's eligibility to receive special education services always has been predicated on the belief that the child had received proper instruction and interventions within the general education classroom. What the new IDEA language seems to do is reinforce with dicta what always had been presumed in the past" (p. 902). Despite the many challenges inherent in systems change and effective implementation, RTI accomplishes both the goal of identifying students with potential learning difficulties early on, as well as the objective to improve education for all students. Students are able to receive help when they need it, regardless of special education classification. The focus shifts from special education eligibility to providing effective instruction and targeted interventions early on (Kavale, Kauffman, Bachmeier, & LeFever, 2008). RTI provides hope for students, schools, and professional who struggle with the current wait-to-fail models available.

Preparing Teachers and Teacher Candidates in RTI

Professional development is a central concern in implementation of RTI. RTI, like other large-scale school improvement efforts, requires significant change on many levels, particularly in teaching practices (Nunn & Jantz, 2009). The RTI model proposes a fundamental "paradigm shift" in the way in which schools serve students who struggle within the general education classroom. The nature and level of support provided to students requires a set of skills and a level of collaboration that have previously not been seen in traditional educational practice. This paradigm shift has implications for both pre-service teacher preparation and also ongoing professional development for teachers working in the field (Richards, Pavri, Golez, & Canges, 2007). While specific methods of effective professional development are an interesting and relevant question (e.g. one-time training sessions v. ongoing coaching), they fall outside the scope of this study and will not be discussed here. However, the aims and barriers present for training working teachers in RTI systems exist for pre-service training, and provide important insight into pre-service training.

Kratochwill and colleagues (2007) identified barriers in professional development:

> Successful implementation of RTI is multifaceted and involves knowledge of evidence-based interventions, multi-tiered intervention models, screening, assessment and progress monitoring, administering interventions with a high degree of integrity, support and coordinated efforts across all levels of staff and leadership within the school, and sustaining systems of prevention grounded in an RTI framework. (p. 632)

Each of these components requires training and support in a specific set of teacher skills, which may not be part of traditional teaching practices. The results of research are not useful if educators are not adequately trained in their use (Danielson, Doolittle, & Bradley, 2007).

The challenges in RTI implementation that exist for schools, by natural extension exist, for teacher preparation programs. RTI is based on the premise that educators will deliver evidence-based practices in the classroom setting (Danielson et al., 2007), and the training of pre-service teachers in current practices helps build capacity for implementation in the classroom. Danielson et al. (2007) stated, "at this point, there has not been sufficient attention paid to the implications of RTI for the pre-service preparation of personnel who will play critical roles in implementation (i.e. principals, general education teachers, [school] psychologists, and special educators)" (p. 633). RTI is reliant on the premise that educators will deliver evidence-based interventions in the classroom setting with robust teaching methods (Danielson et al., 2007), and the training of pre-service teachers in these practices helps build capacity for responding to student needs when they enter the classroom by bolstering the schemata from which they have to draw from (Grogg, 2010). If teachers receive exposure and training in RTI at the pre-service level, they may implement interventions in the classroom with more integrity and less coaching (Begeny & Martens, 2006).

An important question is the adequacy of pre-service training (Kratochwill et al., 2007). A number of factors must be present to ensure pre-service teacher education programs are adequately training competent professionals. According to Hawkins and colleagues (2008),

> At the broadest levels, given that RTI models will evolve, professional preparation would include how to evaluate scientific evidence for practice, evidence-based instruction and intervention for high incidence school problems, teaming and problem-solving, data-

> based decision making, and cultural appropriateness as criteria for professional roles in instruction and special services. What may be new is the idea of sequencing prevention and tiered (i.e., classwide, group) instructional and intervention efforts using decision rules and outcomes as evaluation data. (p. 747)

In addition, Grogg (2009) asserts that a commitment to the use of evidence-based practices must be in place, as well as an understanding of pre-referral teams and systematic multidisciplinary problem-solving models. Incentives for university faculty in teacher-training programs, such as state and federal grants, and support at the national and state levels through accreditation and certification requirements, can also help support training in RTI-related practices at the pre-service level (Batsche et al., 2010).

Similar to the challenges inherent in training veteran teachers in new methods (Fuchs & Fuchs, 2006; Nunn & Jantz, 2009; Richards et al., 2007), barriers to adequately training pre-service teachers in RTI certainly exist. Batsche et al. (2010) identified factors which impede training at the pre-service level. University faculty may not be invested in RTI due to disagreement for theoretical or epistemological reasons, or RTI conflicts with their own research. Lack of incentive to translate research into practice, such as state or federal research grants, may be limited or unavailable. Certification requirements that do not include RTI skills (Batsche et al., 2010). Begeny & Martens (2006) reported low levels of teacher training in academic assessment strategies, such as curriculum based measurement, with special education majors receiving significantly more training than general education majors. This raised concern for the researchers as to how teachers utilize assessment in their classrooms, particularly with how frequently and how closely student progress is monitored. Teachers who have limited prior experience or training with assessment strategies may be resistant to implementing interventions

based in these strategies (Begeny & Martens, 2006). When considering the prominent role general educators play in the implementation of RTI, this is cause for concern.

Statement of Purpose

While the knowledge levels and perceptions of pre-service teachers are critical to the future success of RTI implementation, Hawkins et al. (2008) stated that "a specific literature review revealed no specific studies related to RTI pre-service training and outcomes" (p. 747). Since Hawkins' statement in 2008, few studies have emerged that specifically examine pre-service teacher training in RTI systems and components (e.g., Meyers et al., 2008; Grogg, 2009; McCombes-Tolis & Spear-Swerling, 2011). Further, while the importance of training pre-service teachers to provide multi-tiered intervention services with fidelity has been emphasized in the literature (Fuchs & Fuchs, 2006; Richards et al., 2007; Kovaleski et al., 2007; Kratochwill et al., 2007), the level of training among pre-service educators is largely unstudied and unknown (Richards et al., 2007; Hawkins et al., 2008).

This exploratory study was designed to contribute to the literature by examining pre-service teachers' preparation and perceptions of RTI intervention delivery in general and special education teacher training programs. Hawkins et al. (2008) called for further research which:

> …investigate(s) the additional supports that teachers require both at the pre-service and in-service levels, allowing collaboration efforts to be expanded and supported in school settings and universities… Disciplinary training for RTI will require the increased and comprehensive participation of teacher education programs and personnel so that the foundations of RTI are understood, integrated, and implemented in teacher preparation course work and in field experiences (p. 760).

Richards et al. (2007) reiterated, "Much research is still needed in how to best prepare our future general and special educators in an RTI model" (p. 63). Rationale for studying pre-service teachers' training levels and perceptions includes the potential for understanding the current state of pre-service training, the competency of teachers just entering the field, and guiding changes in training practices.

Research Questions

This study, exploratory in nature, proposes to study pre-service teacher training within one university using survey research methods. The researchers focused on the following questions:

1. What are teacher candidates' perceptions of RTI?
2. What are teacher candidates' perceptions about their preparation to implement RtI?
3. Are there differences in perceptions or opinions of RTI between regular education and special education teacher candidates?
4. Is there a correlation between teacher candidates' perceptions of RTI and their Self-Efficacy to implement RTI in the classroom?
5. What are the opinions of university faculty regarding RTI as reported by students?

Method

Participants

The potential participants for this study included 390 teacher candidates (TCs) identified through the school of education at a Western states university. Criteria for participation required that participants were majoring in elementary education, special education (mild/moderate or severe), or early childhood education, and the participant had completed all or most of the required coursework for their major. An attempt was made to survey only those TCs who had completed a majority of required coursework in order to obtain responses from those TCs who

had been exposed to the full range of training within their major. This included TCs who were in the final semester of their program, currently completing student teaching or the 1-year internship available to TCs at this particular university, as well as TCs who had graduated from the school of education within the prior three months. More specifically, surveying TCs prior to completing all coursework would not reflect an accurate representation of the school of education's full range of courses and training available.

The sample included 264 elementary education majors, 76 special education majors (specializing in both mild-moderate disabilities severe disabilities), and 50 early childhood education majors. Included in these totals, 70 potential participants were recent graduates who completed student teaching during the previous semester, 99 were current interns, 57 were current student teachers, and 168 were in their final semester of their programs. Those TCs in their final semester of coursework were identified by their application for student teaching or internship for the upcoming fall semester.

A link to the online survey was emailed to a total of 390 potential participants. The completed surveys resulted in a return rate of 32.8% (128 completed surveys). Of these, three participants indicated that they were "not at all" familiar with RTI which disqualified them from completing the survey, resulting in a usable response pool of 125 completed surveys, or a usable response rate of 32%.

In order to describe the participants, the survey requested demographic information including age, gender, ethnicity, major, and progress in their major. Recent graduates were asked to specify if they were currently teaching. The majority of participants were female (97% female, 3% male) and Caucasian (97% white, 2% Hispanic, 2% Native Hawaiian or Pacific Islander). Elementary education majors made up 64% of participants, 13% were majoring in

early childhood education, 13% in special education, severe disabilities, and 10% majoring in special education, mild/moderate disabilities. Nearly half, 45%, of participants were currently enrolled in courses, 23% were current interns, 20% were current student teachers, and 13% identified as recent graduates, of which 8% were not currently teaching and 5% were currently teaching.

Instrument

The survey distributed to participants, approved by the university's Institutional Review Board, was created specifically for this exploratory study. Qualtrics Survey Software was used to create, distribute, and collect responses from participants. The survey was largely modeled after a survey created by Wilcox (2009) intended to measure teacher's understanding of various components of RTI. Questions were added, adapted, or eliminated in order to focus appropriately on pre-service level teachers and the scope of the present study. The 34-question survey was designed in two sections: a brief section addressing informed consent and participant demographic information, and the bulk of the survey addressing the research questions. Throughout the survey definitions for terms were provided, including response to intervention, research-based instruction, benchmark/universal screening, and progress monitoring in order to clarify and orient participants to the intended construct.

Questions measuring TCs' perceptions of RTI fell into three categories: ratings of RTI's effectiveness and importance, self-efficacy in implementing, and questions about the training TCs received (e.g. instructional time and other sources of training). All questions in this section of the survey used Likert-scale item responses with the exception of one open-ended item at the end of the survey eliciting TCs to share any additional insights they wished to include.

Participating TCs rated how important the use of RTI and its various components was to them. Self-efficacy questions required TCs to rate their Self-Efficacy in implementing various components of RTI in the classroom, including interventions in reading, writing, and math, progress monitoring, differentiating instruction, and data-based decision making. Questions focused on TCs' levels of training in RTI interventions included time spent engaged in this type of training, perceived knowledge of the various components of tiered service delivery, field experiences, and information gained from other trainings and personal study. TCs also rated their perceptions of the effectiveness of various components of RTI on student learning. Two questions addressed faculty's emphasis on RTI and faculty opinions.

Finally, an open-ended question eliciting any additional insights TCs wish to share was included. Though identifying information might be relevant, such as linking the responses to the participant's major, participants were assured the open-ended responses would be de-identified prior to analysis to encourage honesty and openness. The open and non-specific nature of the question was also intended to allow TCs to freely express their ideas. It was hypothesized that this open-ended item would reveal relevant constructs not directly measured by the quantitative items.

The survey was piloted with 6 graduate students with background understanding of RTI to ensure instructions were clear, terms were well defined, the online interface was working properly, and to estimate time for completion. An undergraduate research assistant screened the survey to look for terms and definitions not clear to individuals unfamiliar with RTI. Feedback from the pilot survey confirmed that instructions, questions, and definitions were clearly stated, the interface worked properly, and estimated the time for completion between five and ten minutes. The responses from the pilot survey were not included in the data analysis.

Internal consistency for the survey was measured using Chronbach's Alpha, and the overall reliability of the survey was strong (a = .88).

Procedure

The researchers used cross-sectional survey research design (Cone & Foster, 2006) with the intention of describing the current state of pre-service teacher training in RTI at the university. The survey was distributed on March 10, 2013, and was closed to responses on March 20, 2013. The email included a description of the author, purpose of the study, offer for incentive, and the link to the electronic survey. Participants followed the hyperlink from the email and were taken to the Qualtrics online survey. The survey opened with informed consent, followed by demographic questions, and then proceeded through the remaining items addressing the research questions. The survey concluded with the open-ended item, and participants then had the option to include their contact information if they wished to be eligible for the incentive. A brief reminder email was sent on two occasions during this time to TCs who had not completed the survey. Survey data were de-identified prior to data analysis. The contact information collected for incentive purposes was removed from the primary data set and put into a separate database in order to randomly select one TC to receive an iPod Nano.

Quantitative Analysis

The bulk of the survey used four to six point Likert-scale items. Each level was anchored by a descriptor indicating the strength of importance, Self-Efficacy, effectiveness, or agreement depending on the item. Descriptive, summary analyses determined mean and standard deviation in the responses.

A principal components analysis was used to examine relationships between items and the underlying constructs and structure of the variables related to TC's perceptions of RTI. The

survey was designed to measure pre-service teachers' perceptions of RTI's effectiveness, their self-efficacy implementing an RTI model and its various components in the classroom, the amount of training they received in RTI, and TC's perceptions of university faculty opinions of RTI. Examining the factor loadings of the three-factor principal components analysis, clear themes were evident in two of the three factors; the first being perceived effectiveness of RTI, and the second TCs' self-efficacy, or their perceived confidence and ability, to implement RTI in the classroom. These factors were labeled as Effectiveness and Self-Efficacy, and contained eight and nine items respectively. The third factor included items measuring instructional time, perceptions of faculty opinion, ratings of RTI's importance, and additional sources of training. This factor seemed to imply a latent variable measuring the degree to which students and faculty *value* RTI as indicated by TCs' ratings of the importance of RTI's various components, how favorably faculty view RTI, and the amount of instructional time devoted to discussion of RTI. This factor was labeled as Importance, and contained eight items. Descriptive statistics for each subscale were used to describe mean, standard deviation, variance, skewness, and standard error. Reliability for each subscale was calculated using Chronbach's alpha.

Independent samples *t*-tests were used to identify significant differences between elementary and special education majors. Early childhood education majors were not included in this portion of the study due to the differences in coursework, less theoretical emphasis of RTI in early childhood education, and to help control for differences in sample size. Significance was determined at $p = .01$ to control for type I error.

Qualitative Analysis

The open-ended item was coded by multiple raters using content analysis methods for qualitative research (Mayring, 2000) in order to identify themes. A total of 60% of TCs elected

to respond to the open-ended item (n=75), and the data was de-identified prior to analysis. All open-ended responses were first reviewed by the primary author to determine general themes in the responses. The response categories and criteria for coding were developed via inductive category development methods (Reid & Gough, 2000) and have been provided for reference in Appendix C, and decision rules were created for responses that might fit multiple categories. Responses were coded at primary and secondary levels in order to capture the main idea expressed in the responses, as well as latent themes implied within the response (Mayring, 2009).

A research assistant was trained as an alternative rater to categorize responses according to the established criteria. A collaborative approach to coding was utilized, where each rater assigned codes to responses independently and then the assigned codes were compared. Differences in coding decisions were discussed until consensus was achieved. This method allowed each rater to identify independently the constructs expressed in the responses without influence of the other rater, and disagreements in coding decisions led to a rich discussion of the content of the response. The response codes were peer-reviewed by a school psychology graduate student. The reviewer agreed with the assigned codes for 88% of responses, and the remaining 22% were re-coded to incorporate feedback from the reviewer.

Results

The exploratory cross-sectional analysis of pre-service teacher training in RTI within one Western states university's school of education aimed to investigate five research questions. The researchers wished to explore (a) the TCs' perceptions of RTI; (b) their perceptions about their preparation to implement RtI; (c) differences in perceptions or opinions of RTI between regular education and special education TCs; (d) correlations between TCs' perceptions of RTI and their Self-Efficacy to implement RTI in the classroom; (e) the opinions of university faculty regarding RTI. The survey examined TC's perceived knowledge and self-efficacy in RTI methods and their

perceptions of the effectiveness of RTI, as well as reported levels of faculty emphasis and opinions of RTI models. The survey data used in the analysis was downloaded from the Qualtrics online survey platform, and Statistical Package for Social Sciences (SPSS) v.21.0 was used for the quantatiative analysis. The data were then subjected to qualititvate analysis to identify common themes in the participants' responses.

Determination of Factors Influencing Teacher Candidates' Perceptions of RTI

A principal components analysis was used to determine the underlying constructs measured by the survey. Initial eigenvalues indicated that the first four factors explained 17%, 13%, 10% and 9% of the variance, respectively. The fifth and sixth factors had eigenvalues just over one, and each explained 6% of the variance. Solutions for two, three, and four factors were each examined using Varimax rotation with Kaiser Normalization. The three-factor solution, which explained 47% of the variance, was preferred because of the 'leveling off' of eigenvalues on the scree plot after three factors, the number of cross-loadings, and difficulty interpreting the second and fourth factors.

Most items contributed to a simple factor structure, meeting an established minimum criterion of having a primary factor loading of .4 or above and no cross-loading of .3 or above, with one exception. The item "How familiar are you with the RTI model" had a primary factor loading of .66 on the Importance factor, and a cross-loading of .37 on the Self-Efficacy factor. For interpretability, the item was included in the Self-Efficacy factor. This decision was preferred because: (a) theoretically the item aligned better with the construct of Self-Efficacy than importance; (b) including the item in the Self-Efficacy factor did not appreciably impact reliability; and (c) the 5-point Likert scale response to the item aligned well with the 5-point response items contained in the Self-Efficacy factor. The item "Importance of progress

monitoring" had a factor loading of .38 on the Importance factor, which was concluded to be within acceptable range of the minimum factor loading criteria of .4. The factor loading table for this solution is presented in Table 1.

Chronbach's alpha was used to calculate internal consistency in each factor, as well as for the survey as a whole. The alphas were strong for Effectiveness (.88; 8 items) and Self-Efficacy (.84; 10 items), and acceptable for Importance (.71; 7 items). Overall internal reliability for the survey was .875, suggesting strong internal consistency for the measure as a whole, as well as within factors.

Composite scores were created for each of the three factors using the mean of the items loaded on each factor. Higher scores indicated more positive ratings of Self-Efficacy, Effectiveness, or Importance. All three factors had negatively skewed distributions, with the Self-Efficacy and Importance skewness within normal limits. The Effectiveness factor had significantly non-normal negative skewness. Mean, standard deviation, and reliability for each of the factors are summarized in Table 2.

Identification of Teacher Candidates' Perceptions Regarding RTI

Measuring TCs' perceptions of RTI is a highly relevant piece of teacher training. Positive perceptions of RTI may indicate TC's willingness to implement RTI in the classroom (Begeny & Martens, 2006). In the present study, TCs ratings of RTI's Effectiveness and Importance are indications of their perceptions of RTI, as they reflect how important RTI is and effective they perceive RTI to be at addressing student needs. Results of this study suggested TCs hold positive opinions of RTI's effectiveness and importance.

Table 1

Principal Components Analysis Factor Loadings

Item	Effectiveness	Self-Efficacy	Importance
Familiar with RTI	.118	.374	**.625**
Ability to implement RTI	.170	**.609**	.252
Selecting research-based interventions	.117	**.697**	.008
Self-Efficacy implementing reading interventions	.027	**.675**	.025
Self-Efficacy implementing math interventions	-.007	**.688**	-.192
Self-Efficacy implementing writing interventions	.036	**.768**	-.158
Imporance of universal screening	.087	.003	**.563**
Self-Efficacy in data-based decision making	-.046	**.716**	.164
Importance of progress monitoring	-.048	.027	.380
Self-Efficacy progress monitoring	.113	**.650**	.039
Instructional time	.258	.348	**.516**
Degree of field-based experiences	.038	**.510**	.218
Information from personal study	.130	**.550**	.243
RTI is beneficial for students	.193	.053	**.711**
Importance of RTI	.241	.011	**.493**
Appropriate instruction	**.700**	-.001	.429
Increasing positive outcomes	**.607**	.121	.331
Increasing academic progress	**.668**	.187	.254
Improving quality of instruction	**.734**	.015	.219
Selecting interventions effectively	**.809**	.037	.040
Monitoring student progress	**.763**	.082	.165
Identifying learning disabilities	**.793**	.148	-.068
Reducing referrals to special education	**.650**	.041	.143
Importance of training students in RTI	.245	-.009	**.535**
Faculty opinion of RTI	.258	.033	**.657**

Note: Factor loadings > .40 are in boldface

**This item was included in the Self-Efficacy subscale.*

Internal consistency for items loading on each factor was examined using Cronbach's

Table 2

Principal Components Analysis Subscales

Subscale	*N*	*M*	*SD*	*a*
Self-Efficacy	10	2.62	.48	0.84
Effectiveness	8	4.91	.66	0.88
Importance	7	4.24	.38	0.714

Note: N = number of item, *M* = mean, *SD* = standard deviation, *a*= Chronbach's alpha

The Effectiveness subscale consisted of eight items rating the effectiveness of RTI in various areas. The items were rated on a six-point likert scale that ranged from "Not at all effective" to "Very Effective." A total of 89.4% of TCs rated RTI's effectiveness as "somewhat effective" or higher. The subscale as a whole obtained a mean response of nearly five out of six, equivalent to a rating of "Effective" (Mean=4.9, SD=.66).

The Importance subscale assessed the degree to which TCs value RTI, as indicated by TCs' ratings of the importance of various components of RTI, reports of how favorably faculty view RTI, and the amount of instructional time devoted to discussion of RTI. The Importance subscale consisted of seven items rated on five-point Likert scales, ranging from low importance (i.e. not important, no instructional time, unfavorable opinion) to high importance (i.e. very important, a lot of instructional time, very favorable opinion). The subscale as a whole obtained a mean response of 4.2 (*SD*=.38).

The results of study suggest that while TCs have generally positive perceptions of RTI in terms of importance and effectiveness, their reported levels of preparation are less substantial. The Self-Efficacy subscale consisted of ten items rating TCs' confidence and ability to

implement RTI and its various components. The items were rated on four-point Likert scales, with responses ranging from not at all confident/limited ability to very confident/proficient. The Self-Efficacy subscale as a whole obtained a mean response of 2.6 (*SD*=.48), which falls between "somewhat confident" and "confident."

As described in the methods section of this paper, the Self-Efficacy subscale included one item rating familiarity with RTI that had a primary factor loading on the Importance factor, but significant cross-loading with the Self-Efficacy factor. Theoretically, TCs' familiarity with RTI aligns well with their confidence implementing RTI. A regression analysis using a Spearman *rho* correlation coefficient indicated a moderate positive correlation between TCs familiarity with RTI and their Self-Efficacy to implement (*rho* (123) = .43, p = <.01).

Comparison of Elementary and Special Education Teacher Candidates' Perceptions

A major focus of this study was to examine the differences in training between elementary education and special education programs at the target university, which are housed in separate departments within the school of education surveyed for this study. TCs were separated into two groups by major; elementary education (*n*=79), and special education (*n*=30) which included both mild/moderate and severe specializations. Independent samples *t*-tests for each subscale (Self-Efficacy, Importance, and Effectiveness) compared the mean scores of the described groups, and significance was determined a p = < .001 to adjust for type I error. The results are summarized in Table 3.

An independent-samples *t*-test comparing the mean scores of special education and elementary education majors on the Self-Efficacy subscale indicated a statistically significant difference between the means of the two groups (t(107) = -3.66, p < .001), with the mean for

special education majors higher (m = 2.9, sd = .43) than the mean for elementary education majors (m= 2.5, sd = .46).

Similarly, an independent-samples t-test comparing the mean scores of the two groups on the Importance subscale also indicated a statistically significant difference ($t(107) = -4.60$ $p <$ .001), with the mean for special education majors higher (m = 4.5, sd = .34) than the mean for elementary education majors (m = .41, sd = .37).

Table 3

Subscale Comparison of Elementary and Special Education Majors

	Elementary (n = 79)		Special Ed. (n = 30)		t
Subscale	*M*	*SD*	*M*	*SD*	(*df* = 107)
Self-Efficacy	2.53	.46	2.89	.43	-3.66*
Effectiveness	4.87	.71	5.12	.54	-1.65
Importance	4.12	.37	4.50	.34	-4.56*
Faculty Perceptions	3.61	.57	4.1	.52	-4.39*

Note: * = $p < .01$

On the Effectiveness subscale, an independent-samples t-test comparing the mean score of both groups did not identify a statistically significant difference ($t(107) = -1.65$, $p > .016$). The mean for special education majors (m = 5.1, sd = .54) was not significantly different from the mean for elementary education majors (m = 4.8, sd = .71).

Perceptions of self-efficacy. One purpose of this study was to determine if TCs' perceptions of their preparedness to implement RTI, summarized by mean scores on the Self-Efficacy subscale, was correlated with their perceptions of RTI overall. A Pearson correlation coefficient was calculated for the relationships between Self-Efficacy, Importance, and

Effectiveness. A weak positive correlation was found between Self-Efficacy and Importance (r (121) = .325, p = .01), and between Self-Efficacy and Effectiveness (r (121) = .228, p = .05), indicating Self-Efficacy in implementing RTI has a significant linear relationship with beliefs of RTI's Importance and Effectiveness. A moderate positive correlation was found between Importance and Effectiveness (r (121) = .480, p = .01), indicating a significant linear relationship between the two variables. These statistics are summarized in Table 4.

Table 4

Bivariate Correlations Among Self-Efficacy, Effectiveness, and Importance

Subscale	1	2	3
1. Self-Efficacy	--	.228	.325
2. Effectiveness		--	.480
3. Importance			--

Note: *p = < .05, **p = .01

Perceptions of instructional emphasis. An important variable in this study was the TC's perceptions of university faculty's opinions of RTI. While 80% of TCs reported faculty hold favorable or very favorable opinions of RTI, 20% reported faculty hold a neutral opinion. No TCs reported perceiving faculty holding a negative opinion of RTI. Regarding training, 80% reported training TCs in RTI was somewhat important or very important to faculty, and 20% reported training TCs was neutral to not at all important.

The survey examined the amount of instructional time dedicated to discussing RTI, as well as exposure in field experiences and other sources of training. A total of 46% of TCs reported that RTI was sometimes discussed in their university coursework, 25% reported discussing it often, and 2% reported discussing RTI all of the time. Rarely discussing RTI in

coursework was reported by 27% of TCs. In addition to frequency, TCs were asked about additional sources of training. A total of 42% of TCs report receiving "some" or "a lot" of additional exposure to RTI in field-based experiences, however, 58% of TCs reported receiving little to no field-based exposure to RTI. TCs reported learning more about RTI from personal study (47%), through consultation with a mentor teacher (41%), in-service training (20%) and from attending workshops or conferences (12%).

A post-hoc analysis of correlation between faculty opinion and the amount of instructional time was conducted to examine the relationship between the two variables. Composite scores were created using two items measuring faculty opinion and the importance faculty place on instructional time. A moderate positive correlation was found between faculty perceptions of RTI and the amount of instructional time ($r(123) = .473$, $p = .01$).

Composite scores were created using a mean of three items which measured faculty opinion, the importance faculty placed on training, and the frequency of instructional time. An Independent samples *t*-test was used to determine if there was a statistically significant difference between special education and elementary education majors' reports of faculty opinion and the results are summarized in Table 3. A significant difference was found between the means of the two groups ($t(107) = -4.39$, $p < .001$), with the mean for special education majors significantly higher ($m = 4.1$, $sd = .52$) than the mean for elementary education majors ($m = 3.6$, $sd = .57$). Special education majors report that faculty view RTI favorably to very favorably, while elementary education majors report faculty opinions as neutral to favorable.

Identification of Themes in Teacher Candidate Reflections

An open-ended item was included at the end of the survey prompting TCs to share any additional insights they had in regards to RTI or their experiences in their university program.

The narratives shared in the open-ended item contributed a surprising and unexpected depth of understanding to the statistical analysis. Three general themes emerged from the open-ended responses: coursework-related themes, themes related to field-experiences, and statements with affective statement about RTI. Each is explored in this section.

Coursework. The strongest theme apparent in TCs' open-ended responses was related to coursework at the university, comprising 59% of all responses. Responses in this theme included TCs' statements about how often RTI was discussed in their coursework, the scope of those discussions, and where they felt they needed additional support. A third of all responses (33%) mentioned that discussions centered on RTI were limited; it had been discussed infrequently, or was only focused on in one or two classes. As one TC wrote, "If they use it and teach it, which I think they do, they don't really use the term "RTI" to refer to it very much," TCs expressed that while some elements of the RTI model were discussed in courses, such as small-group and differentiated instruction, these elements were not clearly defined as part of the RTI model.

In contrast, a few responses noted that RTI was discussed often in their coursework. As one TC wrote:

> At [my university], RTI was emphasized and taught in many of the courses. Thus, when I entered the school for my internship, I was already a strong believer in RTI. In working in the schools, I have seen even more how important RTI is for academics as well as behavior.

Of the 75 responses, 9 responses mentioned discussing RTI often, while 58 mentioned infrequent or insufficient coverage of RTI topics.

Approximately half of all responses described the need for more training in specific strategies for implementing RTI. As one TC wrote:

> I wish more time/classes were spent describing RTI in detail and more importantly, describing how to implement it. I had one class which talked about it, but I wish I had more classes that demonstrated how it is implemented and carried out in real-life situations. I think it can be extremely beneficial but I do not feel confident when it comes to implementing it myself.

This example identifies a common sub-theme. Of all 75 responses, 21% included statements that their courses emphasized theory over the practical application of RTI or skills training. These TCs report that when RTI was covered it was largely a discussion of the theoretical basis for RTI and the potential outcomes for students, but the practical mechanics of implementation were not covered in sufficient depth for TCs to feel prepared to implement the model when they enter the classroom. One TC wrote, "It was something professors talked about in theory, but the actual application and practical learning of RTI wasn't present in classes." Another TC elaborated:

> I learned about RTI a little bit in [one course] (about pros and cons, and a general idea of what to do), and it was referenced in [other] courses, but mostly to extol the virtues of using RTI, not to teach us how to implement RTI. I feel like our professors told us about RTI in theory but didn't teach us practical use.

As evident in the statistical analysis in this study, the current training taking place at the university is sufficient to create positive opinions of RTI among pre-service teachers, but lacks skills-focused training which makes it possible to implement the model in their future classrooms.

These narratives give evidence that TCs were not only aware of their lack of practical skills, but also revealed another important coursework-related theme: TCs made requests for skills-focused training and exposure to real-life application of the RTI model in schools. As one

TC wrote, “I wish that we had more specific training regarding RTI and how to group students and test them and evaluate results…I really wish my courses had better helped prepare [me] to know how to level students and monitor their progress in this way.”

The request for more training often specified exposure to RTI in authentic settings, such as practicum or student teaching. These responses reiterated that while TCs understand the definition of RTI and its purpose, they did not have sufficient knowledge to implement RTI in the classroom. One TC wrote:

> In my opinion, making sure students have experiences seeing how RTI works in the classroom, or learning "in theory" [sic] how to implement it in the classroom would be helpful … Overall, I think because many schools are using RTI now, students need experiences to feel comfortable using it prior to graduating.

Field experiences. The second most common theme, mentioned in 30% of responses, was related to TCs field experiences. “I learned more and became more comfortable with the idea of RTI in my own classroom during my internship than [in my coursework],” captures the general theme of responses related to field experience. Nearly one quarter of TCs, 23%, noted that they gained greater understanding of RTI once they saw the model implemented in the authentic settings of their field placements. Often, this was accompanied by feelings of frustration or an expression of difficulty learning the process in the field. One TC wrote:

> I felt that I didn't know what I was doing when I got to my internship and have had to figure it out. I am still struggling to make sure that my students are getting the extra help that they need and that has been hard. I have had to do a lot of asking my teammates to help me help me students.

The difficulty TCs experienced learning to use RTI appears to be an important narrative, particularly for those on internship or student teaching. One TC wrote:

> I came to my internship feeling completely overwhelmed and unprepared in regards to RTI. My principal scheduled me for "Tier 2 Math" [sic] each day and I had to ask my mentor teacher what that even meant. I think my professors did teach me about small groups and they did teach me about the RTI model, but they did not teach me how that would actually look in my classroom and how I would effectively implement it.

Another sub-theme described the lack of use of the RTI model in their field experiences. Sixteen of the 75 responses described that their school didn't use an RTI model or didn't use it fully. As with learning to implement RTI, the lack of the model's use in schools appeared to elicit feelings of frustration. One frustrated TC wrote:

> In my short time teaching I have seen many general education teachers not fully understand the RTI process. If a student has a few low test scores or they have changed their seat, they immediately want to refer them to Special Ed. The RTI process makes the general education teachers more responsible for their own instruction to all their students including those that may struggle. As a special education teacher, it is my goal to keep students in their general education class as much as possible. They only come to me if absolutely necessary. I wish my school as a whole understood the RTI process better.

Attitudes toward RTI. Statements of TCs' feelings and beliefs related to RTI were the third most common theme in their responses, and included both positive and negative attitudes toward RTI. As discussed in the previous section, TCs often described their feelings of frustration related to learning to implement RTI in field experiences or frustration with the lack of the model's use at their site. In contrast, 23% of responses included positive attitudes toward

RTI. Often, these were broad, ideological statements of RTI's effectiveness. One TC wrote, "RTI is vital to the education of … students. It is important for us to realize what our students are capable of and discover what specific strategies would be beneficial for their learning." This type of lofty or idealized view of RTI was coded as the primary thought expressed in 15% of responses, and, interestingly, most often did not include any reference to TCs' personal experiences in coursework or in field placements. Another TC wrote, "I think it is a great way to get students the right amount of help they need. Every student is different; some need no extra help, and some need a lot. The tiers make sure it is just right." These examples may be indicative of the kind of rhetoric they are hearing in their coursework.

The majority of responses that discussed field experiences expressed frustration using RTI in their student teaching or internships. Of 17 responses that were coded as containing a supportive or positive attitude toward the RTI model, only three TCs made specific reference to field experiences, compared to the nine TCs who expressed frustration about their field experiences. TCs who reported positive experiences using RTI in their internship also specifically acknowledged the benefits of using RTI to address the wide variety of student needs in their classroom. One TC wrote,

> RTI has helped me identify specific challenges of and appropriate interventions for my students. For most of the students I use RTI with, I see improvement in their performance. However, there are some students that do not make the academic gains that I hope for as their teacher. Because of this, RTI helps me to appropriately differentiate between students who would benefit from special education and students who just need additional in-class support.

As in this example, the three TCs who had positive experiences with RTI in their internships also demonstrated an insightful understanding of the RTI model and how the model supported students and teachers.

Discussion

Training teacher candidates in multi-tiered systems of support holds the potential to prepare pre-service teachers to readily implement RTI in the field. Begeny & Martens (2004) proposed that adequately prepared pre-service teachers may effectively implement RTI practices with fidelity and require less support to do so once they are in the field. While RTI and other models of tiered intervention are somewhat open and likely to evolve (Richards et al., 2007; Hawkins et al., 2008) the literature supports adequate training of pre-service professionals might include critical skills in current interpretations of the RTI model, such as evidence-based practices, multi-disciplinary teaming strategies, differentiated instruction, and data-based decision making (Grogg, 2009; Hawkins et al., 2008; Meyers et al., 2008). While training pre-service teachers is a promising step toward building the capacity for schools to effectively implement RTI, a review of the literature reveals a limited amount of research specifically examining teacher training at the pre-service level (Danielson et al., 2007).

We hypothesize that the first step in improving training in RTI for pre-service teachers is to examine the current state of pre-service teacher training in an effort to determine which topics are sufficiently covered and which are in need of more attention. In the present study, we have attempted to contribute to the RTI literature, specifically in better understanding the training of pre-service teachers. Understanding which RTI topics are sufficiently covered in university coursework and which require more attention provides a greater understanding of pre-service teachers' skill, may inform program development, and may lead to improved training for pre-service teachers. The present study surveyed TCs' opinions of RTI, and their self-efficacy to

implement its various components in order to inform the discussion about the adequacy of pre-service teacher training within one Western states university.

The results of a survey completed by TCs in elementary and special education programs indicated that TCs hold positive perceptions of RTI. Both elementary and special education majors reported they felt that RTI was effective at identifying struggling students, addressing students' academic needs, and monitoring their progress. A statistically significant difference was found between special education and elementary education majors in the degree of faculty emphasis (e.g., instructional time discussing RTI) of RTI topics, but overall TCs perceived the model to be valuable. The greatest, and possibly most useful, difference was evident in their self-efficacy: their perceptions of their own ability to implement RTI in the classroom. TCs majoring in elementary education reported less knowledge and skills for implementing RTI, with special education majors reporting significantly more confident to implement RTI than elementary education majors.

An interesting piece of this study developed from analyzing the narrative responses TCs provided in the survey. The most common theme in the narratives was the request for more specific training in RTI. Many TCs reiterated that their training was not sufficient enough for them to know how to implement RTI with students. TCs reported limited exposure to RTI in field experiences prior to the student teaching phase of their program, and TCs in student teaching or internship placements experienced frustration trying to implement RTI once they were in the field. Practical application of RTI processes (e.g. collecting and using data to make decisions, selecting interventions, monitoring the progress of those interventions) and exposure to RTI in field experiences were common requests from TCs who participated in this study.

Implications for Practice

As described in the introduction, challenges to training teachers in tiered service delivery models such as RTI by natural extension exist for pre-service teacher training programs (Danielson et al., 2007; Richards et al., 2007). These challenges include creating teacher buy-in, adequate skills-focused training with ongoing support, and implementing the process with fidelity (Fuchs & Fuchs, 2006; Kratochwill et al., 2007, VanDerHeyden, 2007). The results of the present study have potential implications for addressing each of these challenges at the pre-service level.

Buy-in at the pre-service level. Efforts to train educators in RTI have historically been focused on veteran teachers currently in the field (Hawkins et al., 2008). The benefits of providing training at the pre-service level are perhaps obvious. First, pre-service teachers can be reached in their formative years prior to developing patterns of practice which are difficult to change (Kratochwill et al., 2007). Second, they are prepared to implement current best-practices upon entering the field (Hawkins et al., 2008). Third, with sufficient training they may do so with greater fidelity and require less support (Begeny & Martens, 2004). The results of this study suggest that, currently, pre-service training at the targeted university is sufficiently supporting the first of these three objectives – creating professionals who value multi-tiered approaches to supporting struggling students. TCs reported positive perceptions of the effectiveness of RTI, suggesting that RTI is perhaps being incorporated into their philosophy of teaching as it develops. They reported understanding the value of tiered intervention in having positive outcomes for struggling students, and perceived RTI to be an important model for schools to use. A fair proportion of TCs praised RTI in their narratives. Overall, the results suggest the current

level of training taking place attempts to address the challenging task of generating buy-in from teachers (Kratochwill et al., 2007) at the pre-service level.

Course content of elementary and special educators. An important piece of this study was to determine if the teacher candidates' major, and therefore differences in their training and exposure, influenced TC opinions of RTI or their self-efficacy to implement the critical pieces of the model (e.g. collecting and using data to make decisions, selecting interventions, monitoring the progress of those interventions). Analyses revealed a significant difference between elementary education majors and special education majors in several ways. First, special education majors rate RTI as more important and report higher levels of self-efficacy than elementary education majors. Second, they report more favorable opinions held by faculty and more instructional time spent discussing the RTI model than elementary education majors. These results are similar to Begeny & Martens' report that special education majors received more training in academic interventions and assessment than elementary education majors (2006).

The data are interesting given that RTI is heavily focused on addressing student concerns in the general education setting, pre-referral, and general education teachers are primary implementers of tiered interventions (Begeny & Martens, 2004; Richards et al., 2007). RTI, by its very nature, is a model for *early* intervention, and is intended to address student needs prior to referral for special education. One of the desired outcomes of RTI is reducing the number of referrals for special education by providing intensive intervention in the general education setting (VanDerHeyden et al., 2007). Tier one focuses on highly effective general education curriculum, and tier two interventions are typically implemented in the general education setting (Bricker & Squires, 2001; Kovaleski et al., 2007; VanDerHeyden et al., 2007). Therefore, it seems apparent

and necessary that general education majors receive comparable training to special education majors.

As Richards and colleagues (2007) stated, "It is imperative that we work across general and special education teacher preparation programs to ensure that all teacher candidates acquire and demonstrate the necessary competence" (p. 63). The nature of RTI is such that general education teachers must learn the individualized nature of specialized instruction traditionally reserved for special education, and special education teachers be more involved in the general education classroom than is precedent (Richards et al., 2007). The results of this study support the need for increased training for pre-service general education teachers, and perhaps increased collaboration between general and special education training programs.

Successful implementation of RTI. While creating professionals who hold positive opinions of RTI is a positive step, it raises the question of the importance of buy-in versus equipping TCs with the practical skills required to successfully implement the model. Training pre-service teachers in the critical skills of RTI holds potential for building capacity for them to successfully implement the model in their future classrooms (Danielson et. al, 2007, Grogg, 2009). Without the necessary skills to successfully use the model to positively impact student performance, we ask if positive beliefs about RTI are of much use in actually implementing the practice.

The adequacy of pre-service teacher training is mixed in the literature. According to Daly, Martens, Bamett, Witt & Olson (2007), the process of selecting, organizing, and delivering interventions presents a formidable challenge for pre-service teacher training programs. Similarly, Begeny & Martens (2006) cited assessment strategies, including monitoring academic

progress in order to respond immediately to poor performance, as a deficit in teacher training programs.

Despite positive ratings of RTI's importance and effectiveness in the present study, TCs' reported self-efficacy to implement RTI in the classroom was less reassuring. TCs expressed that RTI was discussed in theory in their classes, but they lacked knowledge in specific and detailed methods for implementing RTI in the classroom. TCs rate their self-efficacy in these critical skills as less than optimum. They specifically requested additional training in the specific mechanics of RTI in their coursework, and shared the frustration they experienced when they were required to implement RTI in student teaching or internship. Most TCs expressed a desire for more training, in specific methods or in field experiences. Often they mentioned RTI was discussed in detail in few of their classes, and they had little exposure in field experiences prior to student teaching and internship. Those TCs who requested more specific information often mentioned it would be helpful to see RTI in practice in schools prior to entering the field. Several TCs who had been required to implement RTI in their internship or student teaching placements expressed frustration or wrote of the difficulty they experienced learning to use RTI in the field, likely as they were trying to learn many other day-to-day tasks of teaching.

In terms of preparing pre-service teachers, a principle finding in this study was the need for more specific training. Lower reported levels of Self-Efficacy implementing RTI suggests that currently, there is a need for increased focus on specific strategies for executing the critical components of RTI in order to build capacity for using the model when they enter the field. Detailed and direct training at the pre-service level in implementing those components of RTI which are crucial to student success, including gathering and analyzing data, utilizing that data to make instructional decisions, selecting and implementing quality interventions, and assessing

student progress (Daly et al., 2007; Kratochwill et al., 2007; Richards et al., 2007), would benefit from increased attention. This is evident in both the statistical and qualitative analysis of the data presented in this study.

Another finding was the need for exposure to RTI in TCs' field experiences. The exposure TCs received through other means, such as conferences, consultation, and workshops, was inconsistent and likely due to chance opportunities. Though systematically providing field-based experiences in schools where RTI is implemented with fidelity has inherent challenges, field exposure holds promise to greatly increase pre-service teachers' depth of understanding, and may be best practice for building pre-service teacher's capacity (Hawkins et al., 2008).

Hawkins and colleagues (2008) present a model for focused field experiences which adequately prepare competent professionals. Hawkins et al. (2008) explored the outcomes of training pre-service professionals in RTI through targeted university coursework and field-based experiences. Following both pre-service school psychology candidates and special education candidates, the study concluded that effective RTI training models should include interdisciplinary training in specific RTI prevention practices, data-based decision making and participation in team problem-solving, selecting effective research-based interventions which are appropriate for specific student needs, and using progress monitoring data collected during implementation to further problem-solve. This study emphasized the importance and difficulty of placing pre-service professionals in field experiences which provide opportunities for exposure to and practice in RTI systems (Hawkins et al., 2008). This study may provide insight into improving opportunities for authentic exposure to RTI, improving the skill set of pre-service professions, and address the frustration expressed by TCs in the present study who experienced difficulty learning to implement RTI on-site.

Limitations and Future Research

There are several limitations within this study that should be noted. First, this study was conducted within one university. Although teacher training programs adhere to similar standards of training (Begeny & Martens, 2006), generalizing these results to other teacher training programs should be done with caution. Second, as inherent in survey research, all data were based on participants' self-reports and are subjective in nature. The relationship to more objective measures of training is unknown. Third, though efforts were taken to prevent bias in responses (e.g. providing definitions, reliability measures of the instrument), participants' inaccurate recall of training remains a potential limitation in this study.

In addition, this study was limited in its exploration of specific course content and programs of study completed by participants. The results were not examined based on specific factors that may have influenced their responses (e.g. specific courses, faculty, site placements). This study did not attempt to survey faculty at the university, and their knowledge, training, and competence related to RTI is unknown. The impact of faculty knowledge of RTI on pre-service teacher training was outside the scope of this study.

Future researchers should consider combining this research design with a comprehensive audit of course syllabi, similar to that described by McCombes-Tolis & Spear-Swerling (2011) to gain an objective measure of the extent and frequency of training. Future replication of this study might include faculty in the research sample. In addition, as suggested by Begeny & Martens (2006), future research should address how much training is necessary to build competent professionals, and what criteria should be set for TCs to demonstrate competence.

Conclusion

The results of the present study suggest that the current state of pre-service teacher training in the university emphasizes theory over practical knowledge, and brings to light the

important difference between valuing RTI and understanding how to put RTI into practice. The pre-service teacher candidates surveyed for this study indicated they value RTI, and believe it to effectively address student needs, but rate their ability to implement RTI as significantly lower. TCs are aware of the benefits of RTI *as well as* their own lack of skill, and this disparity is a source of frustration evident in their narratives. TCs made specific requests for more training in implementing the tasks of RTI in their university coursework, such as progress monitoring and selecting interventions, and requests to observe RTI in field experiences. The results of this study contribute to the growing body of literature where it is evident that pre-service teachers require increased coverage of specific RTI strategies, and practical exposure in schools that use the model with fidelity.

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Appendix A: Review of the Literature

Education reform is currently widely discussed and debated in the field of education as well as in state and federal policy. The science behind instruction and intervention design is in the forefront of discussion in public education, professional organizations (National Association of School Psychologists, National Council on Student Development), and among school mental health professionals. The reauthorization of IDEA in 2004 added language to the eligibility criteria for specific learning disabilities which initiated the call for alternative, empirically-based means to special education identification, specifically including student responsiveness to intervention as a consideration for evaluation and placement in special education (Grogg, 2009). From this emerged Response to Intervention (RTI), a multi-tiered system of support which has been favored as a model of prevention-focused instruction and intervention which provides an alternative route for identifying students for special education. While specific systems differ in detail and terminology, the overall multi-tiered approach to research-based instruction and intervention coupled with continuous monitoring of student progress as a preventative model (Grogg, 2009) will be referred to as RTI for the purposes of this paper.

RTI is credited as an effective means for providing timely and meaningful intervention for all students who struggle academically and not just for those students who are being considered for special education. As a result, RTI and other multi-tiered systems of support are viewed as a comprehensive approach to addressing academic and behavioral concerns for all students in a robust and systematic way. In addition, these models address several criticisms relevant to special education, particularly over-identification of minority students and the lack of fluidity between special education and regular education (Kratochwill, Volpiansky, Clements, & Ball, 2007). Over the past decade, RTI has emerged as a promising model of service delivery at

the elementary level, with reading and behavior receiving systematic attention from researchers and practitioners (Fuchs & Fuchs, 2006).

As with other systematic school improvement efforts, implementing RTI requires change on many levels from individual classroom practices to school, district, and state systems, with the most significant change occurring in the practice and methods of teachers and other school service-delivery professionals. For RTI to be successful, education professionals should have appropriate training. RTI requires a given level of technical competency in implementing intervention services that have not typically been expected in school practice (Hawkins, Kroeger, Musti-Rao, Barnett, & Ward, 2008). Efforts to provide professional development in RTI for teachers has mixed results, and the difficulty of changing outdated teaching practices is currently cited as a significant roadblock to implementation of RTI (Hawkins et al., 2008). At the pre-service level, educators can be reached in the foundational, formative years of their training. Reaching new professionals pre-service could be the optimal time to influence the teaching practices and build research-based practices into the ideologies of teachers, giving pre-service professionals a foundation in RTI and other multi-tiered systems of intervention that will inevitably facilitate further progress into a new educational era focused on research-guided educational practices.

Pre-service teachers' levels of knowledge and perceptions of RTI is critical to the future success of its implementation. Currently, RTI literature is limited in regards to pre-service teacher training (Hawkins et al., 2008). Hawkins et al (2008), in a study attempting to measure the outcomes of pre-service training in RTI for students, cited program isolation as a significant barrier to adequate training of pre-service professionals. While the importance of pre-service and in-service training in providing multi-tiered intervention services has been somewhat emphasized

in the literature, the level of training among pre-service general education and special education teachers, as well as school psychologists, is largely unknown and unstudied (Hawkins et al., 2008). The rationale for studying pre-service teachers' levels of knowledge and perceptions of RTI includes the potential for understanding the current state of pre-service training, understanding the competency of teachers just entering the field, and implications for change in training practices.

Defining Features of Response to Intervention

Given the renewed emphasis on early identification and intervention for students with learning disabilities, RTI presents a promising alternative model to the traditional IQ-achievement discrepancy model for identifying students with learning disabilities(Sugai & Horner, 2009). RTI outlines a multitier service delivery model that increases instructional intensity at each of three tiers. Sugai & Horner (2009) outline six core defining features of RTI:

1. Interventions selected are supported by scientific research.
2. Interventions are organized along a continuum, divided into tiers that increase in intensity.
3. Follows a standardized protocol for problem-solving and assessment and instructional decision making.
4. Explicit data-based decision rules are in place for making instructional and intervention adjustments.
5. Emphasis is placed on assessing and ensuring intervention integrity.
6. Regular and systematic screening which ensures early identification for students who are not responsive to instruction.

In addition, RTI also employs a behavioral approach to problem solving as a core feature (Hawkins et al., 2008), and should be differentiated from simple prevention measures. It extends approaches to prevention into a decision-making model, emphasizing the use of progress monitoring data to make decisions. It is the combination of systematic implementation of intervention *and* progress monitoring for making decisions that distinguishes RTI from previous prevention efforts (Kratochwill et al., 2007).

The first tier in an RTI model focuses on primary prevention, typically conceptualized as a strong, research-based general education curriculum administered school-wide to all students. Key components of Tier 1 include research-based instruction, high quality teaching practices, and universal screening. Research-based instruction refers to the practice of implementing curriculum that has been validated through scientific study as having a positive impact on student academic outcomes. Using effective programs which have a demonstrated positive effect on student learning is not only good practice, it eliminates one of the many variables in the question of why a student is not thriving – effective curriculum. With robust curriculum and high quality teachers in the classroom, it is assumed that 80% of students will respond positively, making adequate academic gains. .

High quality, research-based teaching practices are also critical for Tier 1 success. Where research-based curriculum refers to the content and materials used to teach content, research-based teaching practices are the methods teachers utilize to teach the curriculum (e.g. direct instruction, project-based learning). One example of an effective teaching practice that teachers at this stage might use would be to assess students' prerequisite skills and match curriculum content accordingly to create an appropriate learning experience at the students' instructional level (Batsche et al., 2010). Direct instruction is the most widely studied teaching

practice, but effective teachers make use of multiple, varied, engaging teaching practices. Universal screening is an essential component of Tier 1, as it identifies students' levels of proficiency within each of the major academic areas. Data from universal screening are useful in interpreting both group and individual performance, and provides evidence of the efficacy of the core curriculum and instructional processes (Batsche et al., 2010).

Students who fail to respond to this universally-administered core curriculum receive a secondary prevention measure, or Tier 2 intervention. This tier involves intensive small-group instruction, generally standardized and protocol based, using research-validated intervention programs, for as many as 20 weeks (Batsche et al., 2010). Small groups are typically highly structured, and the evidence-based programs used are often scripted or have a standard protocol in order to be easy to administer consistently and with fidelity. Student progress is monitored frequently in order to fine-tune instruction based on student response (Batsche et al., 2010).

It is estimated that 10-15% of students will require second tier interventions (Fuchs & Fuchs, 2006). These students are considered "at-risk" for school problems in academics or behavior. Intervention services are provided in addition to the core curriculum, and are designed to be delivered regularly and systematically with small groups of students, typically with similar educational needs (e.g., failure to develop basic reading skills). Students who improve in the desired academic skills as a result of intervention at the Tier 2 level are typically reintegrated into tier 1 academic structure, or general education without specialized instruction. Some students who exhibit progress may continue to need supports in addition to the general education curriculum and remain in Tier 2 for as long as needed. It is for these students with whom RTI is particularly helpful, as they are able to receive assistance as soon as they demonstrate a need,

rather than the "wait to fail" process, which special education is often referred to as (Batsche et al., 2010).

Despite systematic, small-group specialized instruction, a percentage of students may not display desired levels of improvement (Batsche et al., 2010). The remaining 5% of students who fail to respond to Tier 2 interventions receive even more intensive intervention at the tertiary level, which typically involves an individualized program to meet the student's needs (Fuchs & Fuchs, 2006). In the third tier, interventions will likely encompass a longer duration and more frequent progress monitoring, possibly 1-2 times per week (Batsche et al., 2010). RTI redefines learning disabilities as failure to respond to systematic intervention. Tier 3 interventions may or may not include special education resources, and depending on the school's particular working definition of RTI, Tier 3 may or may not be synonymous with special education (Batsche, 2010).

A core component of the RTI model is the systematic measurement of students' responsiveness to intervention in order to inform decision making. Collecting data begins with the class-wide administration of a reading and/or math universal screening tool, usually assessing a grade-level skill that students would be expected to have mastered. If the class median falls at or above the instructional standard, the core curriculum is considered effective. Conversely, in cases where the class median falls below the instructional standard, the core curriculum needs to be examined, and class-wide intervention is considered. Individual child scores that fall below the instructional standard are considered for tier 2 intervention. This is the first of many data-driven decisions outlined by the RTI model (Vanderheyden, Witt, & Gilbertson, 2007).

As students receive intervention, their progress is monitored weekly through the use of simple, curriculum based measures to determine if they are responding adequately. The data from progress monitoring is used to determine if the intervention should continue unchanged,

modifications to the intervention should be made, if the student should shift to tier 1 or 3, or if evaluation for special education should be considered. Progress monitoring students as they receive scientific research-based interventions administered with fidelity can help to separate slow learners who simply need extra instruction from the truly learning disabled. The data can also provide for more accurate and early identification of students with SLD (Kavale, Kauffman, Bachmeier, & LeFever, 2008).

Overall, the RTI process answers an essential question: Does effective instruction result in increased learning and acceptable progress? Willis & Dumont (2006) state, "…a child's eligibility to receive special education services always has been predicated on the belief that the child had received proper instruction and interventions within the general education classroom. What the new IDEA language seems to do is reinforce with dicta what always had been presumed in the past" (p. 902). RTI presents a systematic way for students experiencing educational difficulties to receive effective and timely support. Monitoring the fidelity of implementation of interventions, as well as students' responsiveness to those interventions, allows educators to make informed decisions about what a student needs to help him or her to be successful. Implementation is *the* critical factor in RTI. If there is to be an evaluation of RTI, interventions must be implemented correctly and monitored closely (VanDerHeyden et al., 2007).

Praise and Criticism for RTI

RTI has, over the past decade, become a promising multi-tiered system of service delivery. West Ed (2006, p.1) states, "Schools don't wait for formal identification of a learning disability, but instead start providing targeted interventions early on." The School Social Work Association of America (2006) proclaims it to be "a systematic, multi-tiered approach to helping

all students achieve school success." The National Association of School Psychologists endorses the RTI process by noting it to be a "provision of scientific research-based instruction and interventions in general education [which] provide an improved process and structure for school teams in designing, implementing, and evaluating educational interventions [that may be] part of the evaluation process for special education eligibility" (Klotz & Canter, 2006, p. 1-2).

While a favorable opinion is held by many, RTI is also under close scrutiny and its value questioned. The longitudinal ability of RTI to live up to its promises is unknown. A second issue is that most of the research has been conducted by well-funded research centers, where the components are carried out by well-trained researchers. Practical application in real schools with real kids, where it is predicted that fidelity to the process will almost certainly be compromised, is an area where further empirical evidence is necessary (VanDerHeyden et al., 2007). Several issues surround the measurement of responsiveness. Progress monitoring techniques are limited by a lack of screening measures with strong psychometric features, lack of standardization in administration and scoring, and lack of clear-cut criteria for determining adequate responsiveness to an intervention (Kratochwill et al., 2007).

Despite the challenges inherent in systems change and effective implementation, RTI accomplishes both the goal of identifying students with potential learning difficulties early on as well as the objective to improve education for all students. Students are able to receive help when they need it regardless of special education classification. The focus shifts from special education eligibility to providing effective instruction and targeted interventions early on (Kavale et al., 2008). RTI provides hope for students, schools, and professional who struggle with the current models available.

RTI and Teacher Training

Professional development is a central concern in implementation of RTI. RTI, like other large-scale school improvement efforts, requires significant change on many levels, particularly in teaching practices. While some of the components of RTI have been part of educational practice and discussion for decades, the system as a whole has emerged as a prominent practice largely in response to IDEA 2004, which is fairly recent in the educational landscape. Many of the ideas and components are new and may feel unfamiliar to teachers who have been out of college and in the field. While specific methods of effective professional development are an interesting and relevant question (e.g. one-time training presentations v. ongoing coaching), they fall outside the scope of this study and will not be discussed here. However, the aims and barriers present for training working teachers in RTI systems exist for pre-service training, and provide important insight into pre-service training.

RTI involves strong collaboration among school staff and training in specific teaching and assessment practices (Richards, Pavri, Golez, & Canges, 2007). Successful implementation requires professional development in multiple areas and a shared, school-wide commitment. Administrators must encourage a shared value system with appropriate resources and supports in order for RTI to become firmly established in the school academic structure (Richards et al., 2007). The RTI model proposes a fundamental "paradigm shift" in the way in which schools serve students who struggle within the general education classroom. The nature and level of support provided to students requires a set of skills and a level of collaboration that have previously not been seen in traditional educational practice. This paradigm shift has implications for both pre-service teacher preparation and also for ongoing professional development for teachers working in the field (Richards et al., 2007).

Kratochwill and colleagues (2007) described the potential barriers facing RTI as: "Successful implementation of RTI is multifaceted and involves knowledge of evidence-based interventions, multi-tiered intervention models, screening, assessment and progress monitoring, administering interventions with a high degree of integrity, support and coordinated efforts across all levels of staff and leadership within the school, and sustaining systems of prevention grounded in an RTI framework (p. 632)." Each of these components requires training and support in a specific set of skills which may not be part of traditional teaching practices. The results of research are not useful if educators are not adequately trained in their use (Danielson Doolittle, & Bradley, 2007).

Resistance to change is somewhat notorious in the teaching profession. Kratochwill et al. (2007) identified as problematic "the antitesting, antimeasurement, antibehavioral, or even antiscientific stand of many educators, both those in general and special education (p. 66)." Overcoming barriers to teacher buy-in is critical to successful implementation of RTI. Kratochwill also noted that teachers who lack prior exposure or training may be resistant to learning and implementing the specific set of practices in RTI, and those who agree to implement interventions will need considerable coaching and support to do so with fidelity. Addressing them at the pre-service and early-service level may be the optimal opportunity to help teachers become committed to evidence-based practices.

Teacher and administrator buy-in is imperative to support systemic change and, research suggests, proves a significant challenge (Kratochwill et al., 2007). Successful implementation of RTI in schools requires teachers and others, including school psychologists, technicians, speech pathologists, etc., to have an understanding of the direct relationship between teaching practices and student outcomes. Teachers must understand the use of assessment data to problem-solve

and make instructional decisions for individual students (Batsche et al., 2010). A major implication for professional development is the need to train professionals to conduct new assessments that they may not be familiar with (e.g. curriculum-based measurement such as DIBELS Next), and plan and conduct evidence-based intervention activities (Kratochwill et al., 2007). Administrative support is critical to creating sustained changes in practice, as administrators have the important role of changing the culture of a school through the systemic support of RTI efforts, frequent sharing of outcome data with staff, and providing adequate, ongoing professional development opportunities for staff to develop the skills necessary (Batsche et al., 2010). Essentially, staff buy-in increases with adequate training and support, and in turn increases the likelihood of longstanding systemic changes in practice.

Pre-Service Training

The challenges in RTI implementation that exist for schools, by natural extension, exist for teacher preparation programs at the university level. Danielson et al. (2007) stated, "at this point, there has not been sufficient attention paid to the implications of RTI for the pre-service preparation of personnel who will play critical roles in implementation (i.e. principals, general education teachers, [school] psychologists, and special educators)" (p. 633). RTI is based on the premise that educators will deliver evidence-based practices in the classroom setting (Danielson et al., 2007), and the training of pre-service teachers in these kinds of practices may help build capacity for implementation in the classroom. With prior exposure at the pre-service level, teachers who attempt to implement interventions in the classroom will do so with more integrity and less coaching (Begeny & Martens, 2006).

An important question is the adequacy of pre-service training (Kratochwill et al., 2007). Brickers & Squire (2001) outlined criteria for training pre-service professionals in early

intervention at the University of Oregon as early as 2001, prior to IDEA 2004 and the shift toward tiered service delivery. Their report outlines a model consisting of robust curriculum and coursework, experience in multiple practica, and supervision in practicum placements as a comprehensive approach to training pre-service professionals in early intervention. This comprehensive, longitudinal approach to training supports students from learning theories, through skill acquisition, to monitoring their ability to implement interventions through supervision serves as a model for effectively training pre-service professionals.

Current research indicates a number of factors must be present to ensure pre-service professional development programs are adequately training competent education professionals. A commitment to the use of evidence-based and empirically validated practices, both teaching practices and curriculum, must be in place, as well as an understanding of problem-solving models. Incentives for university faculty in teacher-training programs, such as state and federal grants, and support at the national and state levels through accreditation and certification requirements can also help support training in RTI-related practices at the pre-service level (Batsche et al., 2010).

Barriers to adequate training in RTI processes certainly exist at the pre-service level. Important considerations are a) faculty who disagree with the RTI approach for theoretical or epistemological reasons, or those who are invested in instructional and assessment practices that are not evidence based because of their own research or contribution to development of those practices, b) lack of incentives to translate research into practice (e.g. state or federal research grants), or c) certification requirements that do not include RTI skills (Batsche et al., 2010). McCombes-Tolis & Spear-Swerling (2011) conducted a review of course syllabi for elementary education majors within one state to determine the extent of training in RTI models for reading

interventions, and found that elementary education teacher candidates are not routinely receiving explicit instruction in key terms, concepts and practices of RTI and reading interventions. Begeny & Martens (2006) report low levels of teacher training in academic assessment strategies, such as curriculum based measurement, with special education majors receiving significantly more training than general education majors. This raises concern as to how teachers utilize assessment in their classrooms, particularly how frequently and how closely student progress is monitored. Teachers who have limited prior experience or training with assessment strategies may be resistant to implementing interventions based on these strategies (Begeny & Martens, 2006). When considering the prominent role general educators play in the implementation of RTI, this is cause for concern.

Research in Pre-service Teacher Training and RTI Practices

While researchers often discuss the importance of pre-service training, many of which have been discussed here, few studies specifically investigate pre-service teacher training and RTI practices. Hawkins et al. (2008) stated that "a specific literature review revealed no specific studies related to RTI pre-service training and outcomes" (p. 747), suggesting that any research in this area is very recent. A review of the literature revealed 3 studies, including Hawkins and colleagues' 2008 study, which specifically investigate pre-service teacher training and RTI practices. These three studies are discussed here.

Hawkins et al. (2008) explored the outcomes of training pre-service professionals in RTI through targeted university coursework and field-based experiences. Following both pre-service school psychology candidates and special education candidates, the study concluded that effective RTI training models should include a) interdisciplinary training in specific RTI prevention practices, b) data-based decision making and participation in team problem-solving c)

selecting effective research-based interventions which are appropriate for specific student needs, and d) using progress monitoring data collected during implementation to further problem-solve. This study emphasized the importance and difficulty of placing pre-service professionals in field experiences which provide opportunities for exposure to and practice in RTI systems. The differences in RTI implementation across settings and finding adequate school settings and supervisors creates quite a challenge for universities wishing to provide effective experiences for their candidates.

Meyers, Graybill, & Grogg (2008) studied the outcomes of training pre-service and in-service teachers in becoming effect members of student support teams. In this study, pre-service teachers were placed in simulated student support teams and utilized team problem-solving and data to create interventions for specific students. Pre-service teachers reported gains in understanding data collection techniques, prereferral processes, data-based decision making, and generating appropriate interventions, all of which are critical components of RTI models. In addition, they reported gains in working collaboratively and valuing the perspective of others.

Branching from this research, Grogg (2009) studied the relationship between training in prereferral intervention teams and pre-service teachers knowledge and perceptions of these practices. Pre-service teachers who participated in training in student support teams reported significant changes in knowledge and perceptions about prereferral interventions, specifically positive changes in perceptions of data collection, data-based decision making, and responding to individual student needs. Grogg suggests that these increases in knowledge about prereferral interventions build capacity for responding to student needs. It is suggested that experience and focused training in prereferral activities increases the pre-service teachers' ability to generalize

this knowledge to their future classrooms by bolstering the schemata of experience upon which they have to draw from.

Summary

Response to Intervention is a promising multi-tiered system of support for students who fall behind. It provides a systematic approach to addressing multiple factors in education which have direct impact on student growth, with instruction increasing in intensity at each of 3 tiers. The model emphasizes the use of research-based curriculum, teaching methods, assessment, and monitoring student progress prior to referral for special education. Research shows that RTI effectively reduces the number of referrals for special education and accurately identifies students who need special education services. A significant barrier to the success of RTI implementation is the professional development required to train teachers and other service providers in educational practices which are a significant divergence from traditional teaching methods.

Efforts to provide professional development in RTI for teachers has mixed results, and the difficulty of changing outdated teaching practices is currently cited as a significant roadblock to implementation of RTI (Hawkins et al., 2008). At the pre-service level, educators can be reached in the foundational, formative years of their training. Reaching new professionals pre-service could be the optimal time to influence the teaching practices and build research-based practices into the ideologies of teachers, giving pre-service professionals a foundation in RTI and other multi-tiered systems of intervention that will inevitably facilitate further progress into a new educational era focused on educational practices guided by research. The importance of pre-service and in-service training in providing multi-tiered intervention services has been emphasized in the literature, but little is known regarding the level of training among pre-service

educators (Begeny & Martens, 2006). Therefore, this exploratory study was designed to examine pre-service teachers', preparation and perceptions of RTI and multi-tiered intervention delivery in general and special education teacher training programs.

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Appendix B: Survey

This survey was developed to measure perceptions of Response to Intervention and levels of training for teacher candidates at Brigham Young University. Thank you for contributing to this important research. Your participation contributes significantly to the McKay School of Education.

Demographic Information

1) Gender
   - ☐ Male
   - ☐ Female

2) Ethnicity
   - ☐ Black or African American
   - ☐ American Indian or Alaska Native
   - ☐ Asian
   - ☐ Hispanic
   - ☐ Native Hawaiian or Pacific Islander
   - ☐ White
   - ☐ Other: _____

3) Major at BYU:
   - ☐ Early Childhood Education
   - ☐ Elementary Education
   - ☐ Secondary Education
   - ☐ Special Education – mild/moderate
   - ☐ Special Education – severe
   - ☐ Other:_____

4) How far along are you in your major at BYU?
   - ☐ First, second, or third semester
   - ☐ Fourth semester or more
   - ☐ Student teaching
   - ☐ Internship
   - ☐ Recent graduate, not currently teaching
   - ☐ Recent graduate, currently teaching

Directions: Please read each statement about Response to Intervention (RTI), and then evaluate your response using the Likert scale.

Definition: Response to Intervention (RTI), also known as multi-tiered systems of support, is a set of procedures that can be used to determine if and how students respond to specific changes in instruction. RTI provides an improved process and structure for school teams in designing, implementing, and evaluating educational interventions. The term RTI will be used throughout this survey.

5) How familiar are you with the Response to Intervention (RTI) model?
   - ☐ Not at all familiar
   - ☐ Somewhat familiar
   - ☐ Familiar
   - ☐ Very Familiar

6) How would you rate your ability to implement RTI in a classroom setting?
   - ☐ Limited
   - ☐ Emerging
   - ☐ Adequate
   - ☐ Proficient

Definition: Scientific, research based instruction refers to specific curricula and educational interventions that have been proven to be effective—that is, the research has been reported in scientific, peer-reviewed journals.*

7) How would you rate your ability to select and implement appropriate research-based academic interventions for struggling students?
   - ☐ No ability
   - ☐ Some ability
   - ☐ Adequate ability
   - ☐ I feel very confident in my ability

8) How confident do you currently feel implementing reading interventions in your classroom?
   - ☐ Not at all confident
   - ☐ Somewhat confident
   - ☐ Confident
   - ☐ Very confident

9) How confident do you currently feel implementing math interventions in your classroom?

- ☐ Not at all confident
- ☐ Somewhat confident
- ☐ Moderately confident
- ☐ Very confident

10) How confident do you currently feel implementing writing interventions in your classroom?
- ☐ Not at all confident
- ☐ Somewhat confident
- ☐ Moderately Confident
- ☐ Very confident

Definition: Benchmark/universal screening is a step taken by school personnel early in the school year to determine which students are "at risk" for not meeting grade level standards or those who have behavioral or emotional problems that may interfere with their learning. Universal screening can be accomplished by reviewing recent results of state tests, or by administering an academic or behavioral screening test to all students in a given grade level. Those students whose test scores or screening results fall below a certain cut-off are identified as needing more specialized academic or behavioral interventions.*

11) To you, how important is it to use benchmark/universal screening data to make education decisions for students?
- ☐ Not at all important
- ☐ Somewhat important
- ☐ Neither important or unimportant
- ☐ Somewhat important
- ☐ Very important

12) How confident do you currently feel using data to make educational decisions for students (e.g. using data to identify struggling students and select appropriate interventions)?
- ☐ Not at all confident
- ☐ Somewhat confident
- ☐ Confident
- ☐ Extremely confident

Definition: Progress monitoring is a scientifically based practice that is used to frequently assess students' academic performance and evaluate the effectiveness of instruction. Progress monitoring procedures can be used with individual students or an entire class.*

13) To you, how important is it to use progress monitoring data to monitor students and make education decisions?
- ☐ Not at all important
- ☐ Somewhat important

- ☐ Neither important or unimportant
- ☐ Somewhat important
- ☐ Very important

14) How confident do you currently feel using progress monitoring tools (e.g. curriculum based measurement) in your classroom to monitor student academic progress?
- ☐ Not at all confident
- ☐ Somewhat confident
- ☐ Confident
- ☐ Very confident

Directions: Please answer the following questions about your experience at BYU.

15) At BYU, how often was instructional time and coursework invested in discussing the RTI process in comparison to other aspects of your training?
- ☐ Never
- ☐ Rarely
- ☐ Sometimes
- ☐ Often
- ☐ All of the time

16) How much RTI training did you receive in field-based experiences (i.e. practicum, student teaching, and internship)?
- ☐ None
- ☐ Little
- ☐ Some
- ☐ A lot

17) How much information about RTI did you gain from personal study/readings?
- ☐ None
- ☐ Little
- ☐ Some
- ☐ A Lot

18) Identify other ways you have received training in RTI (mark all that apply)
- ☐ Workshops I have attended
- ☐ In-service training (i.e. speaker presenting to school or district faculty)
- ☐ Consultation (i.e. school or outside expert)
- ☐ I haven't received any additional training
- ☐ Other (please specify):

Directions: Please share your opinion about RTI.

19) The RTI model is beneficial for students.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Neither agree nor disagree
- ☐ Agree
- ☐ Strongly agree

20) How important is it for a school to use an RTI model?

- ☐ Not at all important
- ☐ Somewhat important
- ☐ Neither important or unimportant
- ☐ Somewhat important
- ☐ Very Important

21) Based on your perception, how effective or ineffective is RTI in the following areas:

	Ineffective	Somewhat ineffective	Neither Effective nor ineffective	Somewhat effective	Effective	Very Effective
24) Ensuring students receive appropriate instruction	○	○	○	○	○	○
25) Increasing positive outcomes for students	○	○	○	○	○	○
26) Increasing the quality of instruction in general education classes	○	○	○	○	○	○
27) Improving the quality of instruction in the general education classroom.	○	○	○	○	○	○
28) Monitoring student progress to interventions	○	○	○	○	○	○
29) Identifying students with a specific learning disability	○	○	○	○	○	○

30) Reducing the number of referrals for special education	○	○	○	○	○	○

32) In your opinion, how important is training students in RTI practices to BYU faculty?

- ☐ Not at all important
- ☐ Somewhat unimportant
- ☐ Neither important or unimportant
- ☐ Somewhat important
- ☐ Very important

33) In your opinion, how favorably do BYU faculty view the RTI model and other multi-tiered systems of support?

- ☐ Very unfavorably
- ☐ Unfavorably
- ☐ Neither favorably or unfavorably
- ☐ Favorably
- ☐ Very favorably

34) Please share any additional insights about RTI in respect to your training at BYU or your practice in school settings (e.g. practicum, student teaching, internship).

Please provide your name, address, and contact phone number so you can receive your incentive. This information will only be used for this purpose, and will not be used to identify you in the study.

Name:	Phone:
Street:	State:
City:	Zip:

**Definitions taken from "Response to Intervention (RTI): A Primer for Parents," National Association of School Psychologists, 2007.*

***Survey adapted from Wilcox, G. (2009). Teachers' understanding of components of response to intervention (RTI) in Pennsylvania (doctoral dissertation). Philadelphia College of Osteopathetic Medicine, Philadelphia, Pennsylvania.*

Appendix C: Open Ended Response Coding Decisions Matrix

Responses were coded at primary and secondary levels:

Primary Code:	Captures the core idea/construct expressed or emphasized most in the response.
Secondary Code(s):	Captures other constructs noted in the response which are in addition to the main idea expressed.

Category	Definition	Example	Coding Rules
1. Content			
1.1 Coursework-Related			
A. THEORY NOT PRACTICE	TCs report learning the theory of RTI, but not strategies for implementation.	”I think my professors did teach me about small groups and they did teach me about the RTI model, but they did not teach me how that would actually look in my classroom and how I would effectively implement it.”	Differentiated from B in that response does not include a request.
B. NEED MORE INFORMATION	TC reports/requests that they need more information, or wish they had learned more. Includes the request for more experiences in practicum settings or seeing RTI in practice.	“I wish I knew more specific interventions I could try in my classroom to help those students who struggle. “	Specific request for training in the university setting. Includes request to see RTI in practice. Differentiated from A in that response includes a request.

C. DON'T KNOW MUCH	TC reports that they don't know very much about the topic.	"I don't know that I have any experience with RTI in practicum settings.""I had no idea what RTI was…"	Response reflects a vagueness or ambiguity about RTI knowledge.
D. NOT CALLED RTI	TC reports learning about various components of RTI, but that it was not explicitly referred to as RTI by faculty or school professionals.	"They don't really use the term "RTI" to refer to it very much."	May be explicit or implied.
1.2 Frequency			
E. ONE CLASS	TC reports discussing RTI in one class, receiving *some* instruction, or not discussing RTI very often.	"RTI was hit in my CPSE course as well as IPT 213. These were the only two classes that really emphasized the RTI model."	Emphasis on limited discussion of RTI topics.
F. OFTEN	TC reports that RTI was discussed often, or that the focus on RTI was adequate.	"Many of my courses have taught about RTI. Some have just mentioned it while others have made it a major course focus."	Emphasis on adequate discussion of RTI topics.
1.3 Faculty			
G. FACULTY ATTITUDE NEGATIVE	TC reports that university faculty have a negative-leaning perception of RTI.	"My professors have mixed feelings about RTI"	Emphasis on negative perception.

H. FACULTY ATTITUDE POSITIVE	TC reports that university faculty have a positive-leaning perception of RTI.	"I do know the faculty really support the system."	Emphasis on positive perception.
2. Practical Experience Related			
2.1 Self Reflection			
I. GAINED KNOWLEDGE IN PRACTICUM SETTINGS	TC reports gaining knowledge in practicum settings, student teaching, or internship	"I learned more and became more comfortable with the idea of RTI in my own classroom during my intnernship."	Emphasis on learning about RTI in real-life application and experiences.
J. STRUGGLED IN PRACTICUM SETTINGS.	TC reports difficulty learning RTI in student teaching or internship.	"I felt like i was very unprepared during student teaching to implement RTI effectively."	Emphasis on the struggle or frustration experienced learning to use the various componenents of RTI on-site.
2.2 Reflection on School Settings			
K. MY SCHOOL KIND OF USES RTI	TC reports limited use in practicum/student teaching/internship placement. The site uses some but not all components of RTI, or is limited in implementation.	"I think rti would be so much more effective if gen Ed teachers had more training and positive perspectives of the model. At least in our school where I student teach, gen Ed teachers do not properly practice rti making it an ineffective approach to implement."	Includes statements about TC's specific practicum placement as well as broad statements about use overall.
3. Other			

L. RTI LOVE	TC makes a broad, lofty, or idealistic statement about RTI.	"I am highly in favor of the RTI Model. I believe, that if implemented correctly, this can be one of the most beneficial systems for a student."	Statement reflects a favorable attitude toward RTI.
M. USED MORE	TC states they wish RTI was used more in school settings.	"I wish more people would use RTI as opposed to the discrepancy model when determining eligibility."	Differentiated from B in that response does not include a specific request to see more RTI in practice during their training.
N. NEGATIVE FEELINGS AND/OR FRUSTRATION	Response reflects an overall feeling of frustration or negative perception of RTI.	"I do not have time or tools to work one-on-one with my [tier] 3 kids as needed. Regular school teachers are now becoming 'special ed teachers' because of the paperwork and difficulty in proving that a student a student needs extra class out of the regular classroom."	Captures the overall tone of the response, as well as specific negative statements.
O.MISCELLANEOUS	Response does not fit into other categories.	"I majored in Severe Disabilities, and an RTI method isn't exactly needed to identify these students."	At the primary level, the response is not captured by other categories. At the secondary level, the response includes an idea that is not captured by other categories.