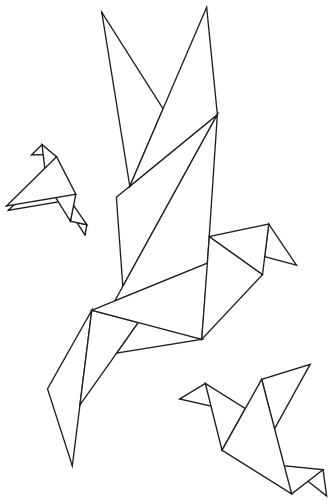

Abstract

Response to Intervention (RTI) is an educational approach that integrates ongoing assessment of individual student progress with targeted instruction. Administrators and teachers in P-12 schools expressed a need for colleagues in higher education to provide training to general education pre-service and in-service teachers in selecting appropriate instruments and conducting accurate assessments, tasks traditionally performed by special education teachers. Researchers developed a scale to measure self-efficacy of educators using these approaches to better identify areas in which educators need additional support. Researchers wanted to know if the scale functioned as expected and if it was appropriate to use the scale for their intended purposes. This paper describes the results of the study of the characteristics of the scale following the administration of the pilot, including indices of score reliability and utility. The researchers used measures of internal consistency and factor analysis to assess scale quality. The results indicate that the scale is useful for measuring teacher perceptions of their self-efficacy using multi-tiered instructional approaches.

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QUALITY AND UTILITY OF THE MULTI-TIERED INSTRUCTION SELF-EFFICACY SCALE

When asked to describe the education system in the United States, one of the first issues that respondents address is that there is not one, unified system. A typical description would start with clarifying that there are separate systems for P-12 schools and postsecondary education.

Some states are working toward integrating these systems, with the goals to reduce resulting disjuncture and improve instruction (Minnesota, 2002). At the heart of improved instruction, at any level, is teacher quality. A key link between the systems of higher education and P-12 is found in teacher education programs, particularly in the area of assessment. Assessment issues in P-12 and post-secondary systems are similar. Practitioners in both systems collect and use performance data to inform accountability systems and to improve instruction. Efficiently planning to meet the instructional needs of in-service teachers, known as professional development, of pre-service teachers in teacher preparation programs, and of P-12 students requires the same thoughtful processes – assessing the learners' needs, planning and implementing the appropriate intervention, evaluating the effectiveness of that intervention, and making revisions in subsequent instruction based on the outcomes. In public schools, that process is known as Response to Intervention (RTI).

RTI is a 2004 federal public education regulation requiring educational practices designed to narrow achievement gaps and meet the needs of all students (Individuals with Disabilities Education Act of 2004). Data concerning a child's response to instruction and interventions can be used to guide instructional and behavioral decisions and even eligibility for special education services. Implementation of RTI practices requires more than "tweaking existing assessment practices" but instead necessitates systems change (Burns & Ysseldyke, 2005).

While the 2004 regulations do not mandate a multi-tiered instructional model, RTI practices do not work without implementation within a multi-tiered instructional model (MTI). In an MTI model, educators design instruction with well-integrated content, goals, evidence-based instructional practices and assessment practices for best benefit to most learners in the general education setting. When students struggle with core instruction, educators reteach content to appeal to varied learning styles or to fill learning gaps. When students do not respond to reteaching, educators intervene with tiered interventions at varied levels of intensity, first providing strategic interventions in small groups and when necessary providing intense interventions in very small groups or individualized to meet the unique needs of learners. MTI is a system involving collaborative partnerships between classroom teachers, specialists and administrators.

Among other practices, MTI stresses evidence-based practices and data-driven decision-making (Barnes & Harlacher, 2008). Some practices are not so new, such as collaboration, though MTI pushes collaboration to new levels. With an emphasis in early interventions to address struggles before gaps reach serious levels, specialists may play proactive roles in core instruction, interventions, or assessment structures. Other MTI principles may feel new to some teachers such as data-driven decision-making, and implementing tiered interventions to meet individual needs.

Public schools requested support in providing professional development for RTI and MTI practices. Those requests were non-specific. In order to design appropriate professional development, the researchers started with a needs assessment. They reviewed literature to determine core content knowledge and skills used in RTI and MTI approaches and to find assessment instruments to measure needs for training in those areas. Various checklists exist to evaluate school or district-level implementation of a multi-tiered intervention methods or RTI practices such as Florida's Self-assessment of Problem-solving Implementation (SAPSI) or Kansas' Innovation Configuration Matrix (Florida Problem-Solving/Response to Intervention Project, 2008; Kansas State Department of Education, 2009). Each of these checklists works as a tool for schools or districts to evaluate systematic levels of progress toward or implementation of various practices such as assessment practices. At the beginning of this project, a review of available scales determined that no one scale or combination of scales effectively assessed self-efficacy in the unique components of MTI practices.

During the time of this study, Florida published the Perception of RTI Skills Survey, a self-rating scale used by teachers to evaluate skills specific to RTI practices such as hypothesizing reasons for gaps and determining appropriate interventions (Florida Problem-Solving/Response to Intervention Project, 2008). Nunn and Jantz (2009) recently demonstrated that the Teacher Efficacy Beliefs and Behavior Scale (TEBBS; 1998) scores have validity for measuring general teacher self-efficacy. Nunn, Jantz and Butikofer (2009) further demonstrated that the TEBBS positively correlated with one measure of student outcomes, the Indicators of RTI Effectiveness Scale (Nunn, 1999).

While the impetus of this study was to assess professional development needs for in-service educators, this study provided valuable applications for teacher education programs. Pre-service educators must be prepared to enter their profession fully equipped to meet the varied demands of MTI practices. Therefore, the research focus on professional development needs of in-service teachers provided important insight for teacher education program development.

The instrument developed and piloted through this study, the Multi-tiered Instruction Self-Efficacy Scale (MTISES), specifically assesses teacher self-efficacy for MTI practices using a survey taking approximately ten minutes to complete. Because the first version, the Response to Intervention Self-efficacy Scale (RTISES), was a new instrument, the researchers wanted to know if the scale functioned as expected and if it was appropriate to use the scale for their intended purposes.

"At the heart of improved instruction, at any level, is teacher quality."

Research Questions

1) Does the scale measure one broad construct or several more specific constructs that can be used to characterize self-efficacy using MTI approaches?
2) What are the meanings of the factors that account for the variation among the set of items?
3) How can the scale be used for planning professional development in using MTI approaches?

This report addresses these questions using several methods, including descriptive and factor analyses.

Participants

Participants in the scale development process included educators from two school districts, teacher education faculty, and university psychometric experts. Psychometric experts included doctoral students in an assessment and measurement program and one university professor in educational psychology assessment. The teacher educators came from departments of special education and of general early and elementary education. Both school districts are rural with farming communities and small towns. One of those districts served as an MTI pilot district, fully engaged in implementation of MTI practices. The second school district was in early stages of RTI planning. Participants in the pilot of the instrument included educators from three school districts, two fully engaged in MTI implementation. The 184 survey respondents included teachers, specialists, and administrators.

Instrument Development

In order to develop a scale with practical and accurate value for educators and professional development trainers, researchers followed the DeVillis scale development process (2003). That process follows eight steps: (1) decide what to measure, (2) generate item pool, (3) format the measurement, (4) have item pool reviewed by experts, (5) consider validation items, (6) administer items to a developmental sample, (7) evaluate items and scale quality, and (8) determine optimal scale length.

Determining Constructs and Items

The growing body of literature on RTI and MTI-related issues guided the content for the first two steps, focusing on five core constructs. These constructs represent emerging MTI practices, the areas in which teachers would most likely need to revise familiar methods used for assessment and instruction within their classrooms. The researchers identified those five constructs as universal design for learning, proficiency in judging evidence-based practices, collaboration, data-driven decision-making, and implementation of interventions. Universal design for learning (UDL) emphasizes proactive instructional design to address needs of all learners in varied presentation of material, multiple ways to engage with learning, and multiple expressions of learning. UDL respects varied learning styles, ability levels and/or language competencies (Strangeman, Hitchcock, Hall, & Meo, 2006). Proficiency in judging evidence-based practices includes the need to find what practices are research-based, to judge appropriateness for populations and purposes, and to evaluate effectiveness based upon the research (Barnes & Harlacher, 2008). MTI may change the degree of collaboration (Burnes & Coolong-Chaffin, 2006; Leaving No Child Behind, 2007). Data-driven decision-making requires educators to find or create appropriate assessment tools, gather meaningful assessment data, and interpret and make decisions based upon data (Barnes & Harlacher, 2008; Frey & Fisher, 2004; Fuchs & Fuchs, 2007). Finally, educators must implement small group or individualized interventions in tiers of increasing intensity to meet the specific needs of individual learners (Fuchs & Deschler, 2007; Mellard, 2008). Though MTI incorporates many practices of good teaching, these five components emerge as areas requiring refinement of practice.

"RTI is a 2004 federal public education regulation requiring educational practices designed to narrow achievement gaps and meet the needs of all students."

Scale refinement. To help maximize item appropriateness, scale developers had all items reviewed by experts for relevance to the area of interest, MTI practices. Three focus groups participated in this part of the scale development process. The first focus group consisted of two university faculty who had researched MTI practices, and one experienced teacher. A second focus group consisted of general and special educators, specialists, and administrators active in MTI leadership. Focus group participants were asked if all relevant issues related to self-efficacy using MTI practices were represented and if there were items that needed to be added or omitted. This item review process was one way the researchers addressed the concern of sampling the content of this new area and confirming their theoretical framework of self-efficacy using MTI practices that they had constructed based upon their review of literature and professional experiences. Participants shared feedback about specific items, the scale as a whole, and the time required to complete the questionnaire.

The third focus group consisted of psychometric experts, two doctoral students in psychology assessment and their professor. In multiple sessions, that focus group mapped items to constructs, evaluated wording of items and response options, critiqued validation items, and required defense of items, allowing for elimination or refinement of items. During this scale refinement phase, one debated issue was the labeling of the anchors on the response scale. Several configurations were discussed including a sliding scale upon which respondents could place a marker indicating their level of agreement to statements regarding perceived competency in a particular area. Other options included language such as, "I do not know how to do this" and "I am an expert at this" to indicate levels of self-efficacy. Each proposed scale generated concerns from either the psychometricians or the teachers. The goal was to use language that would be understood and used consistently among the educators so that the results could be interpreted meaningfully. Interestingly, the focus group participants in this process helped to create a response option very similar to Florida's Perception of RTI Skills Survey (Florida Problem-Solving/Response to Intervention Project, 2008) though that study was published after this stage of this study. Focus group participants in this study justified answers ranging from "I'll take anything" to "I'm ready to help others," motivated by a desire to offer options which would limit defensiveness yet focus on self-efficacy for the specific behaviors. The initial version, the RTISES, is found in Appendix A.

Scale piloting. Finally, the RTISES was piloted using web-based survey software. Participants included three university faculty and 184 educators in three school districts. Most respondents served students in kindergarten through second grades (n=79, 42.2%) and/or third through fifth grades (n=71, 38%) with 31 respondents serving all grades (16.6%) and only three serving middle school or secondary grades (.5%). Survey participants included 87 general educators (46.5%), 38 special educators (20.3%), with 43 (23%) serving all students, and the rest serving specialized target populations.

Scale Quality

Reliability of Scale Scores

Procedure. The reliability of the scores from this new instrument was examined. First, to check the homogeneity of the items, a test of internal consistency was performed. The goal was to achieve a Cronbach's alpha of at least .90. Next, the item-total correlations were calculated. The goal was to have Pearsonian item-total correlations over .3.

Results. Cronbach's alpha based on the 58 standardized items was .976. Appendix C provides the results of the Pearsonian item-total correlation. Of these 58 items, 57 of them had correlation coefficients of over .3, most between .6 and .8. All correlations were statistically significant at the .001 level.

Constructs Characterizing the Item Set

Procedure. The researchers conducted a preliminary check to see if the set of items measured one broad construct, self-efficacy using MTI approaches, or several more specific constructs, such as the five areas explored in the item generation process. First, an 8-item subscale measuring the construct of general self-efficacy was included in the pilot to provide additional understanding of how the new items related to this general measure (Schwarzer & Jerusalem, 1993). The researchers expected that the responses to this subscale would be related positively to the responses on the new RTISES. Next, researchers examined the results of the factor analysis that used principal component analysis to generate initial values.

Results. The correlation between general self-efficacy subscale score and the RTISES total score was positive, but not strong: r(155) = .14, p =.08. While the correlation was not significant relative to the standard alpha level of .05, the p-value was less than .10. These eight items were not included in further scale analysis.

"Implementation of RTI practices requires more than 'tweaking existing assessment practices' but instead necessitates systems change."

The factor analysis extracted 10 factors with initial Eigenvalues greater than one, however, there is one predominate component, initially labeled by the authors as self-efficacy in using MTI approaches, explaining nearly half of the variance. This result provides encouragement for future work continuing to gather evidence to support a claim of unidimensionality of the construct (see Table 1, Figure 1 and Appendix B). Recall that the scale was designed to address the a priori framework of five components comprising self-efficacy using MTI approaches and that each item essentially appears twice – as an item addressing the need for information and as an item addressing the need for training in the instructional method. Therefore, the criteria number for factor extraction was set to five, instead of ten. The Rotated Component Matrix (Appendix D) shows how items loaded on five factors. SPSS output generated the labels Components 1 – 5 on the matrix. Bold type has been used in the matrix to flag strong values and to facilitate defining the substantive meaning of the factors that account for the set of items. Titles were assigned to the groups of items and used in Figures 2 and 3.

Table 1
First 10 Eigenvalues

Component	Total	% of Variance	Cumulative %
1	24.947	43.013	43.013
2	4.808	8.289	51.302
3	4.187	7.220	58.521
4	3.581	6.174	64.696
5	2.420	4.173	68.869
6	2.226	3.838	72.707
7	1.531	2.640	75.347
8	1.295	2.233	77.580
9	1.192	2.055	79.635
10	1.070	1.845	81.480

Examination of the Component Matrix revealed that the items did not load as expected based on the theoretical design of the issues related to self-efficacy in using the MTI approaches. Recall that the instrument was designed with five components in mind – universal design for learning, proficiency in judging evidence-based practices, collaboration, data-driven decision-making, and implementation of interventions. All items loaded positively on the first factor. Items addressing how to adapt learning activities to engage English Language Learners (ELLs) and how to allow ELL students to demonstrate learning loaded on a factor that had not been anticipated in the theoretical framework. Collaboration with grade level team members, items15 and 16, loaded on two different factors.

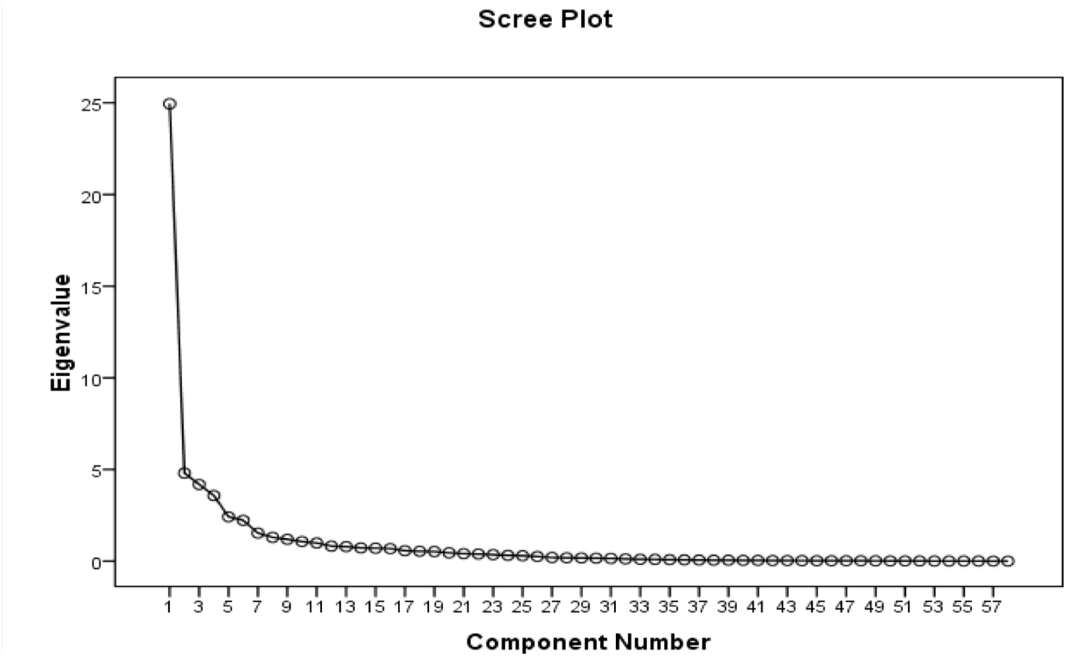

Figure 1. Components extracted by SPSS factor analysis from initial scale.

These items loaded with items addressing collaboration with professionals outside of the grade level teams and with using universal design. This analysis provided some evidence that self-efficacy in using the MTI approaches is not one broad construct, but rather several more specific ones. Using the information from loading patterns, the authors labeled the factors with titles descriptive of the items found there – universal design to teach and engage learners, meeting the needs of English language learners, seeking evidence-based support, collaboration, and using data for progress monitoring and implementing solutions for students. Figures 2 and 3 illustrate the a priori and new frameworks.

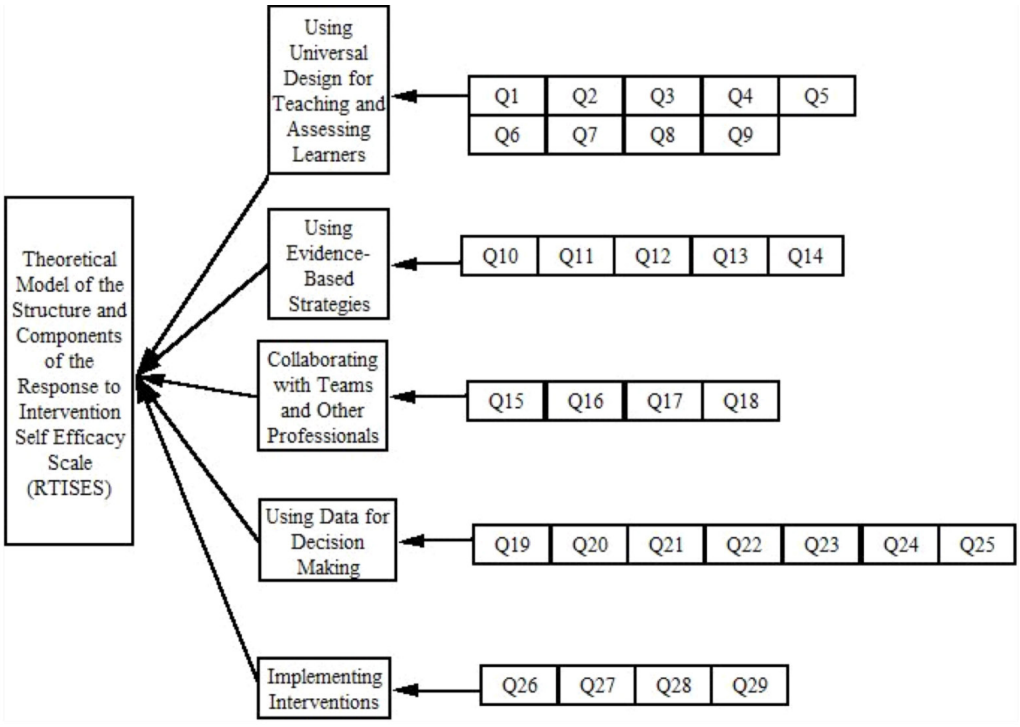

Figure 2. Theoretical model of structure of the RTISES.

"Proficiency in judging evidence-based practices includes the need to find what practices are research-based, to judge appropriateness for populations and purposes, and to evaluate effectiveness based upon the research."

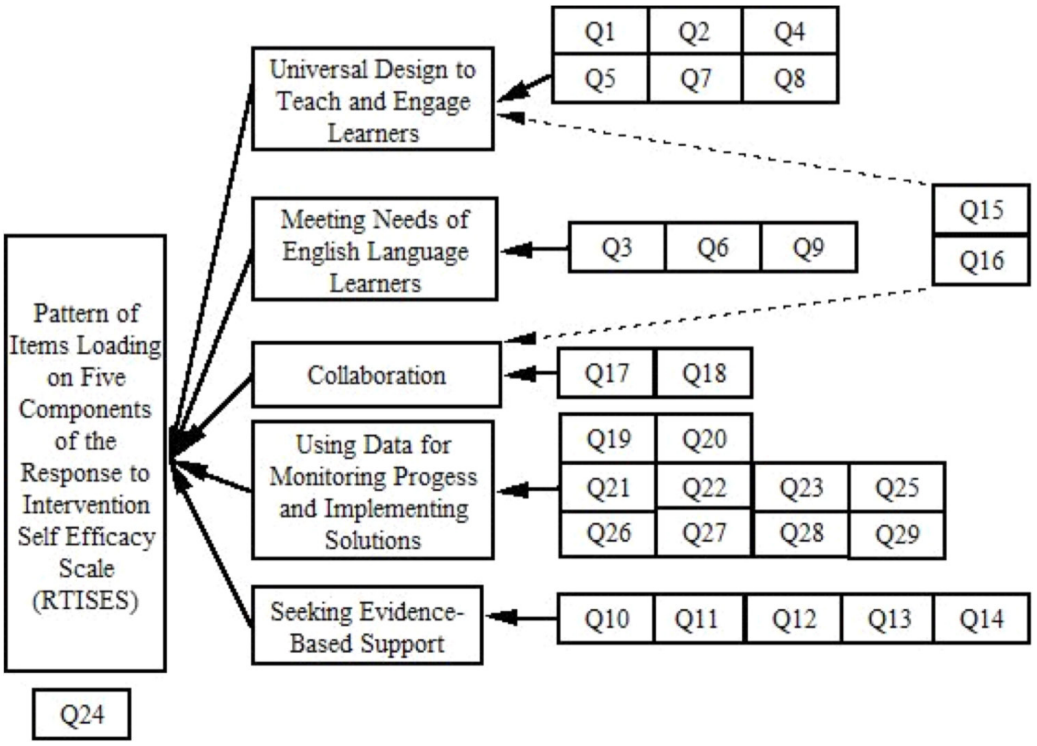

Figure 3. Pattern of items loading on five components of the RTISES.

The authors examined the correlation matrix for additional information to address scale quality. The extremely high correlations between the items looking at educators' perceived needs for more information and their perceived needs for related training (see Appendix E) prompted a closer exploration into scale length and the possibility of removing items without losing important information. The instrument design presented questions as sets of paired items wherein respondents were first asked to address their need for information in a particular area and then asked to address their need for training in that same area. Careful review of the correlations between the two items revealed that the bifurcated questions addressing information and training could be collapsed into a single item, thus reducing the scale by half. Because the purpose of the scale was to inform professional development needs, the items addressing information were eliminated and further analysis used the data from the items measuring the need for training.

One item addressing behavior did not fit with other items. While the other items did not specifically address teaching and learning in a strictly academic or cognitive processes domain, the implication was there. The stand-alone item (Q24) that addressed behavior in the social-emotional domain was dropped from the scale.

The authors analyzed how well the training items function without their companion information items. Reducing the number of items would benefit the survey respondents by reducing time needed to respond to the questions, but longer scales typically have higher reliability estimates. To estimate reliability, researchers calculated Cronbach's alpha for subscales to measure internal consistency and to evaluate how well these new subscales functioned. Cronbach's alpha reliability coefficients range between 0 and 1, with higher values indicating greater internal consistency. The results for this study are found in Table 2. Using the guidelines provided by a SPSS handbook (George & Mallery, 2005) the alpha values for these five new subscales (minimum alpha = 0.789 and maximum alpha = 0.925) are considered to be very good to excellent. The measure of reliability for the total scale, the Cronbach's alpha for 28 items, is .952, a very strong indication of overall internal consistency, but not an absolute indication of unidimensionality.

Factor analysis using just the training items extracted six factors with initial Eigenvalues greater than 1, and one predominate component explaining 45 percent of the variance (See Figure 4). The Rotated Component Matrix (Appendix F) shows how items loaded on six factors. Bold type has been used in the matrix to flag strong values and to

Table 2
Item-Total Correlations for Subscales

Subscale	Number of Items	Items	Cronbach's Alpha
Differentiation to Assess and Engage Learners	6	1, 2, 4, 5, 7, 8	.914
Meeting Needs of English Language Learners	3	3, 6, 9	.789
Seeking Evidence-based Support	5	10, 11,12, 13, 14	.925
Collaboration	4	15, 16, 17, 18	.861
Data-driven Decision Making	10	19, 20, 21, 22, 23, 25, 26, 27, 28, 29	.911
Total Scale	28		.952

User-defined missing values are treated as missing.
Statistics are based on all cases with valid data for all variables in the procedure.

facilitate defining the substantive meaning of the factors that account for this smaller set of items. Examination of the Component Matrix revealed that using this reduced scale, the items loaded nearly as expected based on the theoretical design of the issues related to self-efficacy in using the MTI approaches. The five initial components (universal design for learning, proficiency in judging evidence-based practices, collaboration, data-driven decision-making, and implementation of interventions) and the additional component addressing how to engage and assess English Language Learners are represented here. Collaboration with professionals outside of the grade level teams emerged as a separate component. Titles were assigned to the groups of items and used in Figure 5.

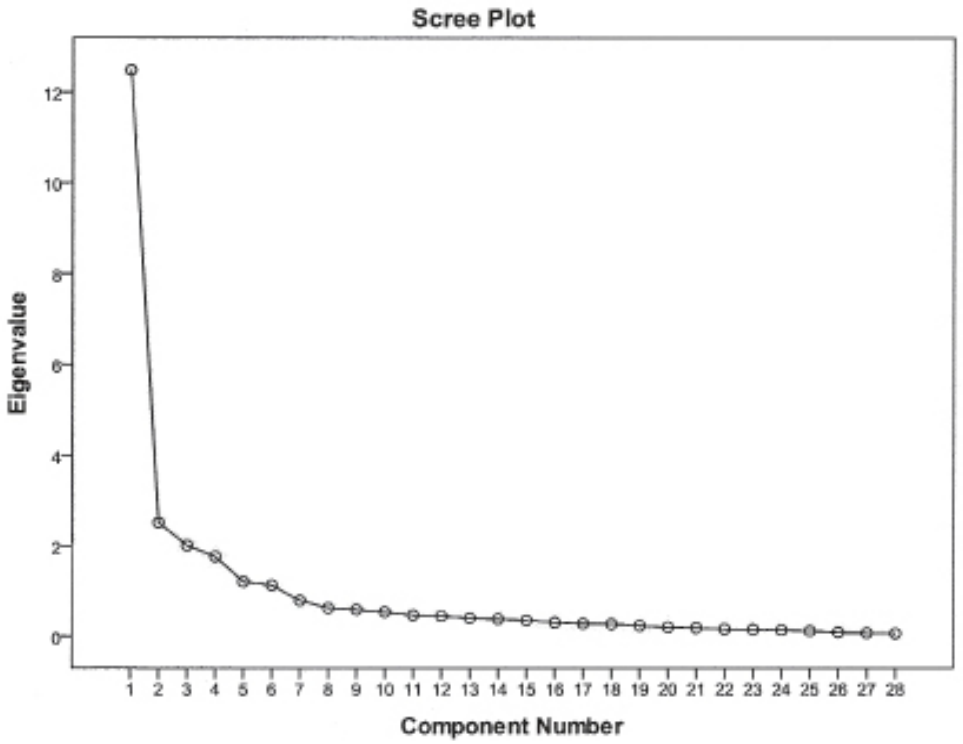

Figure 4. Components extracted by SPSS factor analysis from revised scale.

"Respondents seemed to feel that meeting the needs of English language learners is different from meeting the needs of other learners and that behavior is a different concern than academic purposes."

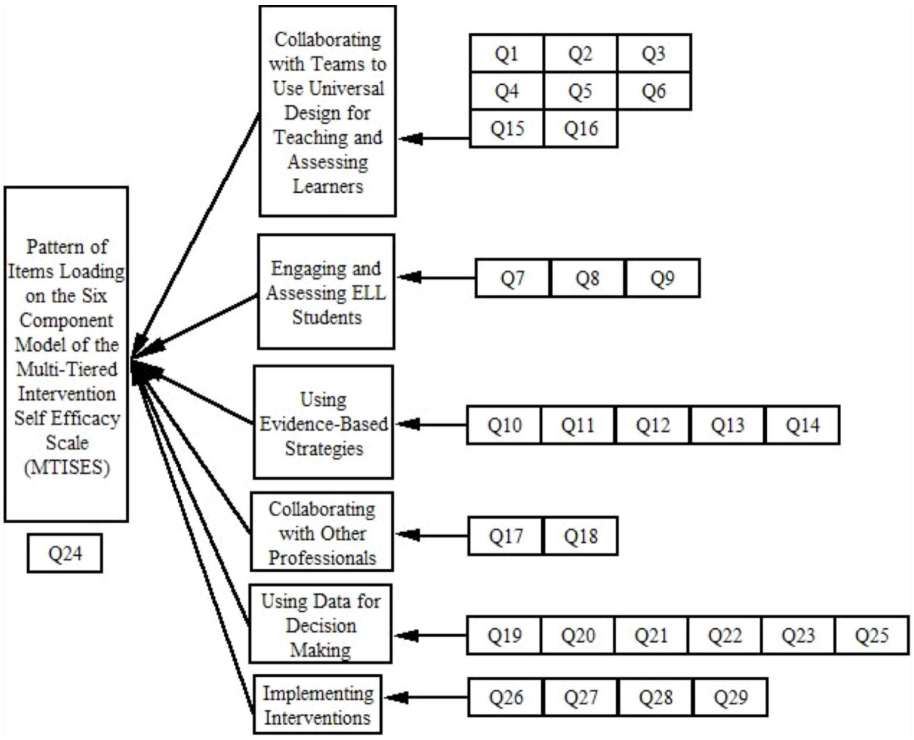

Figure 5. Pattern of items loading on six components of revised MTISES.

Utility. In this small scale study, the researchers demonstrated the value of the RTISES as a measure of teacher self-efficacy specific to MTI practices, especially for the purpose of professional development needs analysis. The resulting MTISES worked to measure teacher self-efficacy for MTI practices in five specific areas of MTI practices. One next step is to determine the utility of this scale for similar purposes in a larger scale study. A second future step is to determine the utility of subscales of the MTISES for pre-post measures of gains made in response to professional development in those areas. Professional development modules and courses are currently under development for components measured by the MTISES. Therefore, the researchers intend to study the utility of pre-post assessments connected to professional development modules and courses on each separate subscale of the MTISES.

Discussion and Practical Applications

The initial results of the instrument quality review provided some evidence that the resulting MTISES (Appendix G) measures teacher self-efficacy in using MTI approaches. Careful scale construction processes were used to maximize item appropriateness. The direction of the relationship between this scale and another scale of general self-efficacy were the same, but not highly correlated, indicating self-efficacy in these practices is different from general self-efficacy. Internal consistency was strong for the subscales and for the overall scale. It appeared that the areas in which the teachers saw the need for professional development did not align precisely with the conceptual map envisioned by the investigators. Specifically, respondents seemed to feel that meeting the needs of English Language Learners is different from meeting the needs of other learners and that behavior is a different concern than academic purposes. Using data from this developmental sample to investigate optimal scale length, the researchers found evidence that the scale works well with half of the RTISES items removed. The subscale responses indicated areas in which teachers felt they needed additional professional development.

"Improving teacher quality through better teacher preparation and development is one of many ways that the P-12 and postsecondary education systems can collaborate."

The MTISES has practical applications for teacher education programs gathering data for accreditation purposes. Such accreditation is earned through meeting requirements of such organizations as the National Council for Accreditation of Teacher Education (NCATE) or the Teacher Education Accreditation Council (TEAC). Each accrediting agency requires data demonstrating that pre-service teachers have obtained quality

levels of knowledge and skills relevant to teaching practices and evidence of value added through program participation (National Council for Accreditation of Teacher Education, 2011; Teacher Education Accreditation Council, 2011). One northeastern college's teacher education program is currently using the MTISES to assess student gains in components of multi-tiered instructional practices through participation in a course and paired field-based experience.

Professional development on specific components of RTI and MTI is essential to successful implementation of RTI and MTI practices. Various experts have proposed models for such professional development (Brown-Chidsey & Steege, 2005; Kratochwill, Clements & Kalymon, 2007; Kratochwill, Volpiansky, Clements, & Ball, 2007). To respond to the practical needs, the researchers are collaborating with experts in higher education institutions to post on-line professional development modules offering continuing education credits for educators and meeting introductory-level needs of both pre-service and in-service educators. These settings will provide opportunities for researchers to gather objective measures of the teachers' competencies implementing MTI approaches. For example, teachers could demonstrate their ability to interpret student assessment data before and after receiving data analysis training and then their scores on these assessments could be compared to the self-reported, self-perceived ability to do the same task. Objective measures will give researchers insight into the relationship between actual and perceived skill levels.

Ongoing follow-up studies using the instrument to measure a change in the level of self-efficacy before and after professional development will add to the fuller understanding of the utility of the scale to measure change and the effectiveness of training. One large mid-Atlantic urban school district proposed use of the MTISES as one pre/post-assessment of effectiveness of new professional development initiatives. One research study in a southern state is currently using the MTISES as a pre/post- assessment instrument connected with district-wide professional development.

As both in-service training programs and pre-service teacher education programs implement professional development for MTI practices, instruments such as the MTISES are essential for identifying training needs and measuring gains in response to professional development. Results from all of these studies should demonstrate the utility of the MTISES for use in measuring change over time in response to professional development through post-secondary education.

Improving teacher quality through better teacher preparation and development is one of many ways that the P-12 and post-secondary education systems can collaborate. Summaries by the Education Commission of the States (ECS) describe other collaborative efforts, referred to as K-16 initiatives, including programs that focus on aligning standards and policies that develop cross-system structures (ECS Education Policy, 2011). Higher education assessment professionals are key stakeholders in the area of improving student learning by leading efforts to educate teachers, and also by making sure that their teacher preparation programs align with the P-12 curriculum and with licensure processes.

Conclusion

This study addressed key characteristics of the MTISES, specifically score reliability, the question of whether multi-tiered intervention self-efficacy has more than one specific construct, and the potential utility of the instrument. This initial administration and preliminary analysis of the MTISES provides researchers with guidance for further study, especially in the area of measuring change in self-efficacy after training. This work, along with repeated administrations of the test to increase the sample size, will add to the increasing evidence of construct and content validity of the scores.

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Appendix A
Response to Intervention Self-Efficacy Scale
The original version, RTISES

All scale items use the following response option:

	I'll take anything	I'm starting to get it, but I want lots more	I do this, but I could benefit from more	I don't feel the need for more	I feel ready to help others
information	○	○	○	○	○
training	○	○	○	○	○

DIRECTIONS:
For most of the following questions, you will be asked to indicate your needs for information and/or training in various educational practices. For each question, please indicate first how much more information you desire on that topic, and then how much more training you desire on that topic.

For purposes of this survey, information means resources you can process on your own through print or web-based resources.

For purposes of this survey, training includes such supports as mentorship, coaching, workshops, conferences and courses.

1. How much information and/or training do you need about differentiating presentation of information for various learning styles (listening, seeing, manipulating, etc.)?

2. How much information and/or training do you need about differentiating presentation of information for various ability levels (gifted, students with disabilities, etc.)?

3. How much information and/or training do you need about differentiating presentation of information for varied lev els of English language proficiency?

4. How much information and/or training do you need about adapting learning activities to engage students of varied learning styles (listening, seeing, manipulating, etc.)?

5. How much information and/or training do you need about adapting learning activities to engage students of various ability levels (gifted, students with disabilities, etc.)?

6. How much information and/or training do you need about adapting learning activities to engage students of varied levels of English language proficiency?

7. How much information and/or training do you need about allowing students to demonstrate learning in ways that accommodate varied learning styles (seeing, listening, manipulating, etc.)?

8. How much information and/or training do you need about allowing students to demonstrate learning in ways that accommodate varied ability levels (gifted, students with disabilities, etc.)?

9. How much information and/or training do you need about allowing students to demonstrate learning in ways that accommodate varied levels of English language proficiency?

10. How much information and/or training do you need to find research-based articles and/or books on practices relevant to specific educational needs of students?

11. How much information and/or training do you need to judge the trustworthiness of research-based articles or books about effectiveness of educational practices?

12. How much information and/or training do you need to evaluate whether the research-based practices are worthwhile for my specific students and purposes?

13. How much information and/or training do you need to compare effectiveness of research-based educational practices for the best fit for my particular student population?

14. How much information and/or training do you need about changing educational practice to incorporate new instructional practices found in a research-based article or book?

15. How much information and/or training do you need to work with a team(s) of grade-level or content-specific educators to assess specific learning needs?

16. How much information and/or training do you need to work with a team(s) of grade-level or content-specific educators to solve specific learning needs?

17. How much information and/or training do you need to collaborate with professionals outside my own field of specialty to assess specific learning needs (for example, teachers working with school psychologists or guidance counselors)?

18. How much information and/or training do you need to collaborate with professionals outside my own field of specialty to solve specific learning needs (for example, teachers working with school psychologists or guidance counselors)?

19. How much information and/or training do you need to use data from appropriate assessment tools to clarify the specific problem for a struggling student?

20. How much information and/or training do you need to use specific assessments to measure student progress on specific learning objectives?

21. How much information and/or training do you need to use results of universal screening instruments (like PALS, DIAL-R, or DIBELS) to determine which students may be at risk of specific learning needs?

22. How much information and/or training do you need to use results of published curriculum-based assessments for instructional planning (like textbook assessments, PALS quick checks, etc.)?

23. How much information and/or training do you need to make decisions about academic instruction for individual students based upon data?

24. How much information and/or training do you need to make decisions about behavioral instruction for individual students based upon data?

25. How much information and/or training do you need to use data on student progress to improve instructional practice?

26. How much information and/or training do you need to use teaching techniques described in a research-based article or book?

27. How much information and/or training do you need to use interventions to address specific learning objectives of specific students?

28. How much information and/or training do you need to implement plans as designed to solve problems for individual students or small groups of students?

29. How much information and/or training do you need to respond to a learning need when first evident?

Appendix B
Scale Quality Indicators

Table A1
Total Variance Explained

Initial Eigenvalues from Principal Component Analysis							
Component	Total	% of Variance	Cumulative %	Component	Total	% of Variance	Cumulative %
1	24.947	43.013	43.013	30	.164	.283	97.978
2	4.808	8.289	51.302	31	.150	.259	98.238
3	4.187	7.220	58.521	32	.123	.212	98.450
4	3.581	6.174	64.696	33	.103	.178	98.628
5	2.420	4.173	68.869	34	.100	.173	98.801
6	2.226	3.838	72.707	35	.081	.139	98.940
7	1.531	2.640	75.347	36	.076	.130	99.071
8	1.295	2.233	77.580	37	.065	.112	99.183
9	1.192	2.055	79.635	38	.054	.094	99.276
10	1.070	1.845	81.480	39	.051	.088	99.365
11	.991	1.709	83.189	40	.045	.077	99.441
12	.821	1.416	84.605	41	.040	.069	99.511
13	.793	1.368	85.973	42	.036	.062	99.573
14	.725	1.251	87.223	43	.033	.058	99.631
15	.709	1.223	88.446	44	.027	.047	99.678
16	.686	1.183	89.629	45	.026	.044	99.722
17	.570	.982	90.611	46	.024	.042	99.764
18	.537	.926	91.537	47	.022	.038	99.802
19	.525	.904	92.442	48	.021	.036	99.838
20	.455	.785	93.226	49	.016	.028	99.866
21	.409	.704	93.931	50	.016	.027	99.893
22	.387	.667	94.598	51	.013	.023	99.916
23	.356	.614	95.211	52	.011	.019	99.935
24	.319	.549	95.761	53	.009	.015	99.950
25	.297	.513	96.273	54	.008	.014	99.964
26	.257	.443	96.717	55	.007	.013	99.977
27	.201	.347	97.064	56	.006	.011	99.988
28	.188	.324	97.388	57	.005	.008	99.996
29	.178	.307	97.695	58	.002	.004	100.000

Appendix C

Pearsonian Item-Total Correlations for RTISES

Item Number	Correlation with Total Score	
	Information Question	Training Question
1	.318**	.359**
2	.322**	.311**
3	.272**	.252**
4	.401**	.407**
5	.519**	.538**
6	.365**	.356**
7	.438**	.464**
8	.505**	.516**
9	.377**	.386**
10	.515**	.519**
11	.538**	.580**
12	.616**	.598**
13	.679**	.649**
15	.686**	.669**
16	.642**	.666**
17	.654**	.654**
18	.655**	.676**
19	.633**	.663**
20	.702**	.705**
21	.671**	.675**
22	.577**	.593**
23	.607**	.600**
24	.667**	.655**
25	.570**	.603**
26	.707**	.720**
27	.665**	.672**
28	.712**	.699**
29	.692**	.696**
30	.682**	.707**

** Correlation is significant at the 0.001 level (2-tailed).

Note: Missing data deleted pairwise. Number of respondents range is 155 to 174.

Appendix D
Rotated Component Matrix for Initial Scale

	Component				
Item	1	2	3	4	5
1 information	.158	**.761**	.105	.003	.244
1 training	.208	**.691**	.183	.111	.222
2 information	.150	**.762**	.144	.193	.007
2 training	.206	**.708**	.157	.211	-.008
3 information	.051	.267	.122	**.794**	.045
3 training	.049	.162	.139	**.824**	.014
4 information	.200	**.758**	.196	.017	.161
4 training	.212	**.738**	.238	.098	.071
5 information	.287	**.671**	.245	.240	.098
5 training	.293	**.646**	.283	.270	.110
6 information	.105	.177	.172	**.861**	.149
6 training	.108	.146	.182	**.886**	.116
7 information	.137	**.782**	.129	.171	.121
7 training	.128	**.739**	.201	.194	.124
8 information	.207	**.791**	.109	.267	.066
8 training	.200	**.772**	.209	.255	.126
9 information	.095	.181	.110	**.878**	.128
9 training	.099	.167	.145	**.887**	.122
10 information	.201	.236	**.761**	.019	.139
10 training	.190	.230	**.765**	.019	.162
11 information	.111	.195	**.864**	.112	.111
11 training	.155	.207	**.848**	.149	.138
12 information	.224	.134	**.851**	.137	.122
12 training	.226	.131	**.856**	.135	.142
13 information	.233	.169	**.788**	.239	.084
13 training	.246	.147	**.776**	.250	.097
14 information	.213	.345	**.727**	.158	.151
14 training	.221	.343	**.696**	.157	.132
15 information	.460	.453	.213	-.087	.355
15 training	.497	.426	.273	-.107	.353
16 information	.474	.378	.192	.006	.445
17 training	.494	.314	.237	.001	.460
17 information	.228	.227	.238	.142	**.835**
18 training	.233	.217	.275	.180	**.820**
18 information	.201	.192	.201	.215	**.838**
19 training	.244	.144	.236	.299	**.795**
19 information	.560	.484	.107	.062	.226
20 training	**.582**	.458	.101	.062	.252
20 information	**.633**	.308	.177	-.006	.244
20 training	**.657**	.273	.202	-.008	.243
21 information	**.714**	.183	.085	-.064	.114
21 training	**.726**	.178	.089	-.058	.144
22 information	**.824**	-.037	.202	.087	.086
22 training	**.825**	-.041	.187	.093	.082
23 information	**.826**	.181	.192	.139	-.040
23 training	**.828**	.152	.208	.123	-.043
24 information	.480	.125	.186	.375	.117
24 training	.485	.098	.270	.369	.147
25 information	**.719**	.394	.143	.043	.057
25 training	**.736**	.389	.129	.096	.041
26 information	**.509**	.065	.458	.204	.220
26 training	**.490**	.075	.486	.201	.223
27 information	**.527**	.409	.179	.301	.096
27 training	**.524**	.364	.183	.324	.104
28 information	**.451**	.349	.199	.347	.204
28 training	**.482**	.310	.190	.385	.194
29 information	**.566**	.243	.187	.257	.238
29 training	**.609**	.218	.216	.284	.205

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 7 iterations.

Note: Each item appears twice – addressing the need for information and for training

Appendix E

Correlations between Items Addressing the Need for Information and the Need for Training in the Same Professional Development Content Area

	Item Number and Professional Development Content Area	Corr.
1.	differentiating presentation of information for various *learning styles*	.851
2.	differentiating presentation of information for various *ability levels*	.872
3.	differentiating presentation for varied levels of English language proficiency	.905
4.	adapting learning activities to engage students of varied *learning styles*	.899
5.	adapting learning activities to engage students of various *ability levels*	.933
6.	adapting activities to engage ELL students	.961
7.	allowing students to demonstrate learning in ways that accommodate learning styles	.869
8.	allowing students to demonstrate learning in ways that accommodate *ability levels*	.906
9.	allowing students to demonstrate learning in ways that accommodate ELL	.948
10.	finding research-based articles and/or books on practices	.951
11.	judging the trustworthiness of research-based articles or books	.950
12.	evaluating whether the research-based practices are worthwhile	.959
13.	comparing effectiveness of research-based educational practices for the best fit	.918
14.	changing practice to incorporate new practices found in a research-based article	.945
15.	working with a team(s) of grade-level or content-specific educators to assess needs	.908
16.	working with a team(s) of grade-level or content-specific educators to solve needs	.911
17.	collaborating with professionals outside my field to assess learning needs	.951
18.	collaborating with professionals outside my field to solve specific learning needs	.948
19.	using data from appropriate assessment tools to clarify the specific problem	.916
20.	using specific assessments to measure student progress	.906
21.	using results of universal screening instruments	.988
22.	using results of published curriculum-based assessments for instructional planning	.994
23.	making decisions about academic instruction for individual students based upon data	.963
24.	making decisions about behavioral instruction for students based upon data	.888
25.	using data on student progress to improve instructional practice	.960
26.	using teaching techniques described in a research-based article or book	.950
27.	using interventions to address specific learning objectives of specific students	.927
28.	implementing plans as designed to solve problems for students	.942
29.	responding to a learning need when first evident	.930

Note: All correlations are significant at the 0.01 level (2-tailed).

Appendix F
Rotated Component Matrix for Revised Scale

	Component					
	1	2	3	4	5	6
UDrepLStrain	.133	**.722**	.161	.030	.294	.220
UDrepAbtrain	.133	**.742**	.120	.136	.300	-.021
UDengLStrain	.193	**.753**	.242	.049	.156	.053
UDengAbtrain	.295	**.643**	.282	.263	.149	.088
UDexnLStrain	.152	**.774**	.182	.198	.014	.166
UDexnAbtrain	.217	**.771**	.193	.256	.057	.171
UDrepELLtrain	.019	.195	.135	**.850**	.124	.010
UDengELLtrain	.078	.158	.171	**.882**	.159	.146
UDexnELLtrain	.089	.181	.146	**.911**	.085	.148
EBlitFINDtrain	.185	.251	**.771**	.013	.057	.164
EBlitTRUSTtrain	.162	.219	**.848**	.170	.064	.127
EBlitPurpPOPtrain	.209	.127	**.855**	.134	.145	.140
EBlitCOMPAREtrain	.200	.145	**.782**	.232	.190	.101
EBlitCHANGEtrain	.151	.340	**.690**	.119	.268	.137
CollabGradeAssesstrain	.622	.383	.275	-.067	-.028	.337
CollabGradeSolvetrain	.536	.260	.229	.010	.120	.480
CollabOutAssesstrain	.224	.202	.270	.148	.177	**.816**
CollabOutSolvetrain	.168	.154	.232	.236	.285	**.783**
DataDiagnostictrain	**.659**	.420	.100	.109	.047	.269
DataProgMontrain	**.707**	.250	.201	.023	.099	.256
DataUnivScreentrain	**.779**	.120	.112	.012	.108	.106
DataPlantrain	**.772**	-.077	.208	.112	.307	.023
DataAcademictrain	**.721**	.133	.206	.115	.417	-.087
DataProgMonImproveInstructtrain	**.698**	.367	.123	.100	.282	.009
InterventionsFidelitytrain	.247	.091	.443	.055	**.646**	.221
InterventionsObjtrain	.294	.389	.131	.174	**.665**	.113
InterventionsIndivtrain	.232	.329	.133	.218	**.702**	.215
InterventionsEarlytrain	.408	.215	.182	.172	**.615**	.198

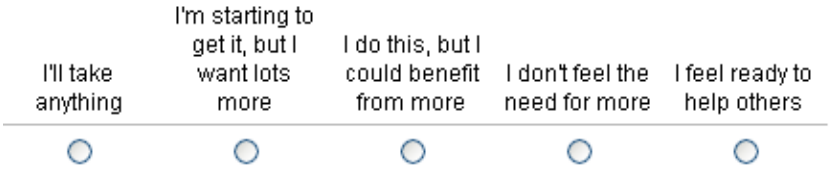
Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 7 iterations.

Appendix G

MTISES, Multi-Tiered Instruction Self-Efficacy Scale
(Also known as the RTISES-II, Response to Intervention Self-Efficacy Scale-II)

All scale items use the following response options:



DIRECTIONS:
For most of the following questions, you will be asked to indicate your needs for professional development in various educational practices. Please indicate the level of professional development you feel you need for each item.

1. How much professional development do you need about differentiating presentation of information for various learn ing styles (listening, seeing, manipulating, etc.)?

2. How much professional development do you need about differentiating presentation of information for various abil ity levels (gifted, students with disabilities, etc.)?

3. How much professional development do you need about differentiating presentation of information for varied levels of English language proficiency?

4. How much professional development do you need about adapting learning activities to engage students of varied learning styles (listening, seeing, manipulating, etc.)?

5. How much professional development do you need about adapting learning activities to engage students of various ability levels (gifted, students with disabilities, etc.)?

6. How much professional development do you need about adapting learning activities to engage students of varied levels of English language proficiency?

7. How much professional development do you need about allowing students to demonstrate learning in ways that ac commodate varied learning styles (seeing, listening, manipulating, etc.)?

8. How much professional development do you need about allowing students to demonstrate learning in ways that ac commodate varied ability levels (gifted, students with disabilities, etc.)?

9. How much professional development do you need about allowing students to demonstrate learning in ways that ac commodate varied levels of English language proficiency?

10. How much professional development do you need to find research-based articles and/or books on practices relevant to specific educational needs of students?

11. How much professional development do you need to judge the trustworthiness of research-based articles or books about effectiveness of educational practices?

12. How much professional development do you need to evaluate whether the research-based practices are worth while for my specific students and purposes?

13. How much professional development do you need to compare effectiveness of research-based educational practices for the best fit for my particular student population?

14. How much professional development do you need about changing educational practice to incorporate new instruc tional practices found in a research-based article or book?

15. How much professional development do you need to work with a team(s) of grade-level or content-specific educators to assess specific learning needs?

16. How much professional development do you need to work with a team(s) of grade-level or content-specific educators to solve specific learning needs?

17. How much professional development do you need to collaborate with professionals outside my own field of specialty to assess specific learning needs (for example, teachers working with school psychologists or guidance counselors)?

18. How much professional development do you need to collaborate with professionals outside my own field of specialty to solve specific learning needs (for example, teachers working with school psychologists or guidance counselors)?

19. How much professional development do you need to use data from appropriate assessment tools to clarify the spe cific problem for a struggling student?

20. How much professional development do you need to use specific assessments to measure student progress on spe cific learning objectives?

21. How much professional development do you need to use results of universal screening instruments (like PALS, DIAL-R, or DIBELS) to determine which students may be at risk of specific learning needs?

22. How much professional development do you need to use results of published curriculum-based assessments for in structional planning (like textbook assessments, PALS quick checks, etc.)?

23. How much professional development do you need to make decisions about academic instruction for individual stu dents based upon data?

24. How much professional development do you need to use data on student progress to improve instructional practice?

25. How much professional development do you need to use teaching techniques described in a research-based article or book?

26. How much professional development do you need to use interventions to address specific learning objectives of specific students?

27. How much professional development do you need to implement plans as designed to solve problems for individual students or small groups of students?

28. How much professional development do you need to respond to a learning need when first evident?