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Utility of the Multi-Tiered Instruction Self-Efficacy Scale in Assessing Needs and Short-Term Gains of Preservice Teachers for Multi-tiered Instruction

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ABSTRACT: Researchers demonstrated that the Multi-Tiered Instruction Self-Efficacy Scale works with a population of preservice teachers in assessment of self-efficacy for multi-tiered instruction. The scale demonstrated strong internal consistency (.94). With 148 participants, all juniors in a teacher preparation program, areas of greatest need for professional development included data-driven decision making and meeting the needs of English language learners. Significant short-term gains were made in overall self-efficacy for multi-tiered instruction as well as in the six subcomponents of finding and evaluating evidence-based solutions, collaboration, monitoring interventions, data-driven decision making, engaging learners, and meeting the needs of English language learners.

In an environment of accountability for high-quality instruction, how can we know if newly certified teachers are ready to teach all the students in their classrooms? Teacher preparation programs must prepare preservice teachers with knowledge and skills across numerous domains of practice to meet the needs of a very diverse population of students.

Background

Responsive instruction, required by the No Child Left Behind Act (2002), necessitates multi-tiered instruction, structuring levels of ever-increasing support for students who struggle with learning. Such a system emphasizes such actions as teaching with high-quality practices, teaming creatively, gathering meaningful data on the progress of students, and problem solving to meet needs of struggling small groups and individuals.

In order to assess the professional development needs of in-service teachers, researchers developed the Multi-Tiered Instruction Self- Efficacy Scale (MTISES). That scale worked to measure overall self- efficacy of teachers for implementing multi-tiered teaching. The MTISES also worked to assess professional development needs for the specific constructs of multi-tiered instruction (Barnes & Burchard, 2010, 2011). No such tool has been investigated for use with preservice teachers.

As teacher education programs prepare future teachers with high-quality skills, program instructors should model responsive instruction, adjusting to meet the unique needs of preservice teachers. Modeling good assessment practices includes assessment of needs and, importantly, accountability for learning outcomes of these postsecondary learners. Thus far, no system is established to assess the needs of preservice teachers or their perception of gains in their efficacy for providing multi-tiered instruction after receiving college course instruction and field placement

experiences designed to improve their performance in this kind of differentiated instruction. The purpose of this study was to investigate the utility of the MTISES for use with preservice teachers and to assess gains over one intensive semester of specific course work and preservice field experiences addressing multi-tiered instruction or Response to Intervention approaches.

Research Questions

The questions addressed here are the following:

1. Does the MTISES work similarly in measuring self-efficacy using multi-tiered instructional approaches for preservice teachers as it does for in-service teachers?
2. What are the professional development needs of preservice teachers in using multi-tiered instructional approaches?
3. Are there gains in self-efficacy for multi-tiered instructional practices from the beginning to the end of the semester for preservice teachers?

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

Procedures

Participants

This study took place in the teacher preparation program of a small private mid-Atlantic college. Undergraduate enrollment is approximately 2,800 annually with approximately 10% underrepresented populations and approximately 60% females (Messiah College Offices of Institutional Research and Marketing and Communications, 2011–2012, 2013–2014). Participants were recruited from junior preservice teachers enrolled in concurrent courses in inclusion practices, an introductory course about teaching English language learners, and a course in instructional design and assessment. All were participants in pre–student teaching field placements, requiring application of skills learned in the classroom. Recruitment occurred during the fall of 2011 and again in the fall of 2013.

Instrumentation

During both pre- and posttest sessions, participants completed the MTISES (Appendix A). Using 28 Likert scale items, this instrument asks teachers to indicate how much professional development they need for various teaching actions of multi-tiered instruction. In measuring self-efficacy for teachers' use of multi-tiered instructional practices, researchers demonstrated that the MTISES worked. Examination of internal consistency for the overall scale as a measure of self-efficacy resulted in a Cronbach's alpha of .952. In other words, the MTISES items work together well as a measure of one construct: self-efficacy for multi-tiered instruction (Barnes & Burchard, 2011). Furthermore the instrument

worked to measure professional development needs for six more specific constructs: collaborating with teams to use universal design for teaching and assessing learners, collaborating with other professionals, using evidence-based strategies, using data for decision making, implementing interventions, and meeting the needs of English language learners (Barnes & Burchard, 2011). This 28-item questionnaire takes approximately 10 minutes to complete. It is free and easy to use and can be helpful to those providing in-service to teachers and to those planning instruction in teacher preparation programs.

Results

Participants

Preservice teachers completed paper versions of the pre- and postassessment questionnaires during class time. Scores were not tied to course grades, and codes names were used to match the pre- and postassessment data only. Participants were pursuing teacher certification in elementary grades (27), elementary grades with dual certification in special education (48), middle school grades (13), secondary grades (15), or K–12 certification in fine arts education, family and consumer science, or world languages (45). In 2011, 82 preservice teachers participated. In order to increase sample size to support conclusions, the study was repeated with 66 participating in the fall of 2013, bringing the total sample size to 148.

Scale Quality for Preservice Teachers

The overall scale worked essentially the same with preservice teachers as it did with in-service teachers with slight variations in the way some subscales functioned.

Overall Scale Quality

Results provide validation of the previously evaluated scale. Over half the variance is explained by only three components: finding and evaluating evidence-based solutions, collaboration, and monitoring interventions (Table 1). When used with preservice teachers, the MTISES worked with a very strong internal consistency. The Cronbach's alpha of .942 provides evidence that the MTISES is still measuring the construct of self-efficacy in multi-tiered instruction.

Components

Table 2 provides the component matrix showing how items loaded on the six components. The bold text indicates items with the highest loading on the component. These items rarely cross load on other components and have values over 0.5. Values in italic cross load on more than one component. Given the interrelatedness of the components of instructional planning and implementation, having some items related to more than one component is not surprising.

Item-Total Statistics

Table 3 provides the Cronbach's alpha achieved if any one item is deleted from the scale and the item-total correlations. Cronbach's alpha values range from .939 to .942. The goal of the scale developers was to have an alpha score above .90 for this measure of internal consistency. Homogeneity of the items is strong, with corrected item-total correlations from .410 to .711.

Important to a comparison of how the MTISES worked with the two populations of educators—in-service and preservice teachers—is the pattern of how individual items loaded in groups of like items as subscale constructs, or components. One item drifted to a different component, showing that the MTISES is functioning about the same in use with these two populations. Response patterns by preservice teachers show that they perceive question 1, about differentiating presentation of information for various learning styles, to fit more with the construct of engaging learners as opposed to the in-service teacher perception that that item fit more with the construct of differentiation for teaching and assessing learners. Three constructs perceived similarly by both

Table 1. MTISES Component Variance Explained

Initial Eigenvalues

Construct	*Total*	*% of Variance*	*Cumulative %*
Finding and evaluating evidence-based solutions	11.130	39.752	39.752
Collaboration	2.383	8.511	48.262
Monitoring interventions	1.936	6.915	55.177
Data-driven decision making	1.663	5.941	61.118
Engaging learners	1.437	5.132	66.250
Meeting needs of English language learners	1.044	3.729	69.978

Table 2. MTISES Rotated Component Matrix

Component

Item	1 *Evidence-Based Practice*	2 *Collaboration*	3 *Monitor Interventions*	4 *Data-Driven Decision Making*	5 *Engage*	6 *English Language Learners*
1	.248	.226	.006	.162	**.699**	.030
2	.192	.112	.165	.038	**.667**	.261
3	.107	−.003	.081	.006	.280	**.865**
4	−.006	−.038	.277	.111	**.806**	.048
5	.062	.135	.139	.041	**.628**	.426
6	.154	.206	.069	.252	.090	**.834**
7	.252	.240	−.054	*.566*	*.470*	.059
8	.241	.230	.136	*.461*	*.459*	.164
9	.361	.182	.106	.238	.145	**.654**
10	**.729**	.044	−.034	.126	.299	.072
11	**.752**	.104	.109	.197	.231	.062
12	**.763**	.149	.243	.200	.035	.207
13	**.755**	.240	.240	.096	.032	.221
14	***.545***	.285	.233	*.409*	.138	.124
15	.252	**.741**	.080	.234	.160	.072
16	.255	**.846**	.111	.133	.133	.078
17	−.004	**.807**	.321	.041	.130	.159
18	.138	**.790**	.368	.051	.065	.074
19	.163	.236	**.755**	.112	.190	.108
20	.168	.093	**.728**	.266	.280	.005
21	.113	.012	.153	**.661**	.149	.286
22	.352	.094	.382	**.606**	−.048	.127
23	.264	.143	.347	**.734**	.079	.001
24	.151	.200	.449	**.673**	.161	.092
25	*.496*	.178	***.545***	.292	−.032	.077
26	.157	*.475*	***.514***	.376	.059	.122
27	.232	.334	**.694**	.203	.188	.043
28	−.048	.343	**.551**	.309	.072	.222

Note. Extraction method: principal component analysis. Rotation method: varimax with Kaiser normalization. (a) Rotation converged in eight iterations.

Table 3. MTISES Item-Total Statistics

Item-Total Statistics

Item	*Scale Mean if Item Deleted*	*Scale Variance if Item Deleted*	*Corrected Item-Total Correlation*	*Cronbach's Alpha if Item Deleted*
1	61.493243	201.027	.504	.941
2	61.756757	202.063	.498	.941
3	62.169568	203.665	.396	.942
4	61.472973	203.367	.410	.942
5	61.722973	202.896	.472	.941
6	62.074324	200.668	.541	.941
7	61.358108	197.606	.589	.940
8	61.567568	197.975	.644	.940
9	62.067568	198.553	.602	.940
10	61.074324	196.899	.483	.942
11	60.817568	193.007	.591	.940
12	61.256757	193.294	.655	.939
13	61.614865	195.994	.645	.939
14	61.716216	194.300	.711	.939
15	61.500000	195.190	.615	.940
16	61.513514	195.286	.624	.940
17	61.662162	196.402	.560	.940
18	61.702703	195.897	.600	.940
19	61.763514	196.590	.625	.940
20	61.466216	195.842	.621	.940
21	62.391892	198.117	.514	.941
22	62.108108	195.907	.631	.940
23	61.689189	194.610	.656	.939
24	61.662162	193.504	.703	.939
25	61.364865	194.043	.655	.939
26	61.695946	196.213	.696	.939
27	61.506757	195.490	.696	.939
28	61.621622	198.672	.559	.940

in-service and preservice teachers were meeting the needs of English language learners, collaboration, and finding and evaluating evidence-based solutions. While in-service teachers appeared to view differentiation for teaching and assessing learners as a different teaching action than using data for solutions, pre-service teachers appear to perceive those as one teaching behavior: data-driven decision making. Similarly, when used with in-service teachers, item response patterns resulted in two constructs: diagnosing and monitoring progress of students and implementing interventions. With preservice teachers, those two constructs were perceived similarly as monitoring interventions. With preservice teachers, the MTISES works with fewer subscales: six in total (Table 4).

Professional Development Needs of Preservice Teachers

All items of the MTISES used a Likert scale response option scored from 1 to 5. Responses options included (1) "I'll take anything," (2) "I'm starting to get this, but I want lots more," (3) "I do this, but I could benefit from more,"
(4) "I don't feel the need for more," and (5) "I feel ready to help others." For preservice teachers, a response of "I feel ready to help others" would be unexpected, especially at the preassessment of professional development needs. Because the scales have different numbers of items, mean scores were used to compare professional development needs.

Entering the fall junior semester, the preservice teachers' responses resulted in the highest self-efficacy mean scores in the area of finding and judging evidence-based solutions (2.62). Lowest areas of self-efficacy relative to other constructs were data-driven decision making (2.12) and meeting the needs of English language learners (1.82) (Table 5).

Postassessment results at the close of the semester showed higher mean scores in all constructs with somewhat consistent patterns in the constructs with highest and lowest self-efficacy. After completion of the semester, pre- service teachers again indicated highest self-efficacy in finding and evaluating evidence-based solutions (3.67). Lowest reported self-efficacy was reported in data-driven decision making (3.09), with self-efficacy for meeting the needs of English language learners the next lowest (3.13). Although gains were made in mean scores, at the end of the semester, the two constructs with the highest needs for professional development remain data-driven decision making and meeting the needs of English language learners.

Gains in Self-Efficacy by Preservice Teachers

Over the semester, preservice teachers made gains in overall self-efficacy for multi-tiered instruction as well as for all components measured by the subscales. Gains were computed using Cohen's *d*, which is defined as the difference between two means divided by the standard deviation. Using the standards established by Cohen (1988), effect sizes of .40 or greater are

Table 4.

MTISES Subscale Loading

Original Subscale Names and Items	*New Subscale Names and Items*
Differentiation to Engage Learners 4, 5 Differentiation for Teaching and Assessing Learners 1, 7, 8 Using Data for Solutions 21, 22, 23, 24 Meeting Needs of English Language Learners 3, 6, 9 Collaboration 15, 16, 17, 18 Finding and Evaluating Evidence-Based Solutions 10, 11, 12, 13, 14 Diagnosing and Monitoring Progress of Students 19, 20 Implementing Interventions 25, 26, 27, 28	Engaging Learners 2, 1, 2, 4, 5 Data-Driven Decision Making 7, 8, 21, 22, 23, 24 Meeting Needs of English Language Learners 3, 6, 9 Collaboration 15, 16, 17, 18 Finding and Evaluating Evidence-Based Solutions 10, 11, 12, 13, 14 Monitoring Interventions 19, 20, 25, 26, 27, 28

considered significant, while effect sizes of .80 or higher are considered very strong. However, according to the What Works Clearinghouse (2011), re- porting effect sizes as "small, medium, and large" can be misleading because the context is not considered. When reporting effect sizes, it is always good practice to include

context information. Another suggestion is to provide graphic representations to help the reader understand the differences between the means being compared. Figures 1 through 6 provide graphic representations of the gains that preservice teachers made in these areas.

Table 5. Needs and Gains of Preservice Teachers in Multi-tiered Instruction

	Pretest	**Protest**	**Gain**	
Subscale	*Mean* (SD)	*Mean* (SD)	*(Change in Mean)*	*Cohen's* d
Overall Self-Efficacy in Multi-Tiered Instruction	2.28 (.52)	3.31 (.61)	.67	1.82
Finding and Evaluating Evidence-Based Solutions	2.62 (.76)	3.67 (.74)	.57	1.39
Collaboration	2.32 (.78)	3.29 (.90)	.50	1.15
Monitoring Interventions	2.35 (.65)	3.25 (.65)	.57	1.39
Data-Driven Decision Making	2.12 (.64)	3.09 (.71)	.58	0.29
Engaging Learners	2.31 (.52)	3.43 (.74)	.6	1.76
Meeting Needs of English Language Learners	1.82 (.62)	3.13 (.80)	.72	1.84

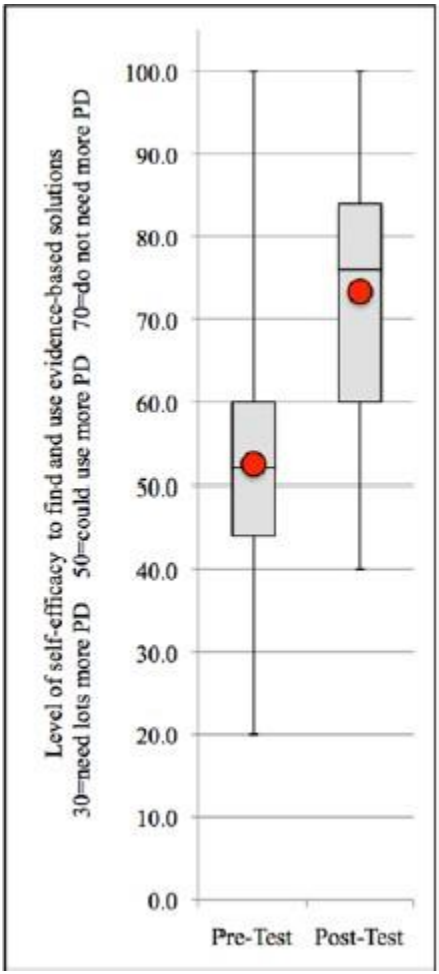


Figure 1. Gains in student self-efficacy from the MTISES, Evidenced-Based Solutions subscale. The difference be- tween the pre- and posttest scores (20.9%) was statistically significant using a two-tailed paired *t* test: *t*(147) = 16.65, $p < 0.001$. The magnitude of this difference has a very large effect size (Cohen's $d = 1.39$). The whiskers rep- resent the range of the upper and lower 25% of all scores. Average scores are indicated with dots. Boxes make up the second and third quartiles. $n = 148$.

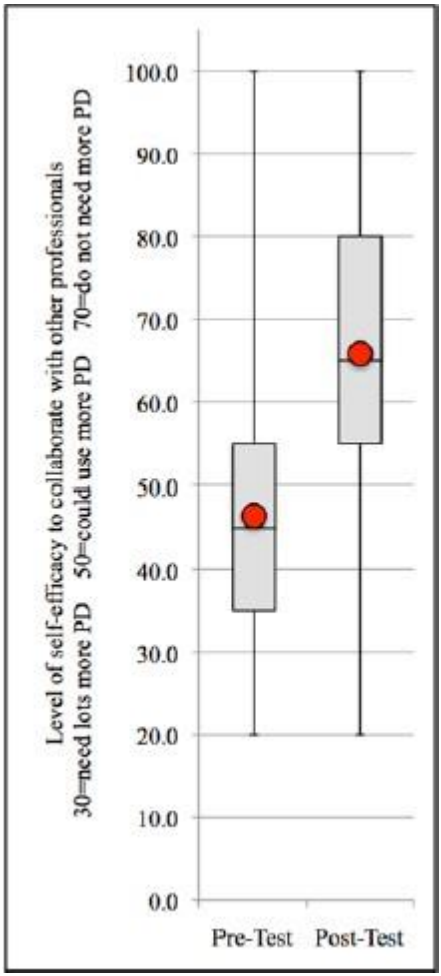


Figure 2. Gains in student self-efficacy from the MTISES, Collaboration subscale. The difference between the pre- and posttest scores (19.4%) was statistically significant using a two-tailed paired t test: $t(147) = 12.48$, $p < 0.001$. The magnitude of this difference has a large effect size (Cohen's $d = 1.15$). The whiskers represent the range of the upper and lower 25% of all scores. Average scores are indicated with dots. Boxes make up the second and third quartiles. $n = 148$.

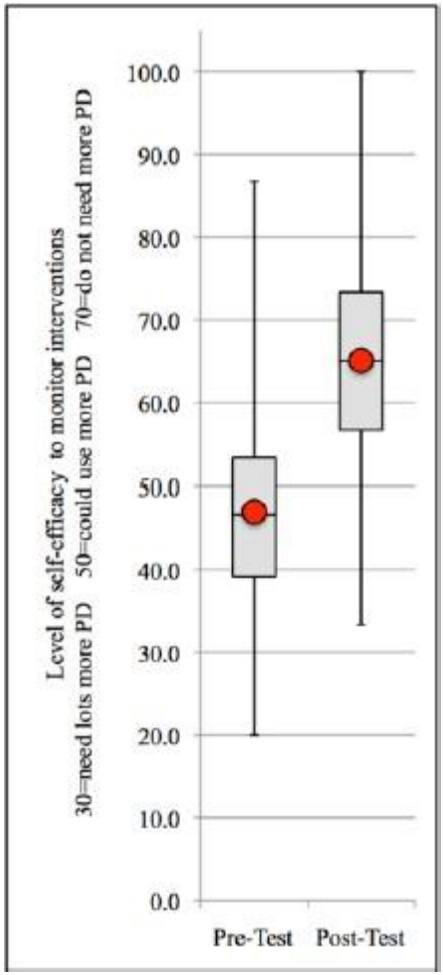


Figure 3. Gains in student self-efficacy from the MTISES, Monitoring Interventions subscale. The difference be-tween the pre- and posttest scores (18.1%) was statistically significant using a two-tailed paired t test: $t(147) = 15.87$, $p < 0.001$. The magnitude of this difference has a very large effect size (Cohen's $d = 1.39$). The whiskers rep-resent the range of the upper and lower 25% of all scores. Average scores are indicated with dots. Boxes make up the second and third quartiles. $n = 148$.

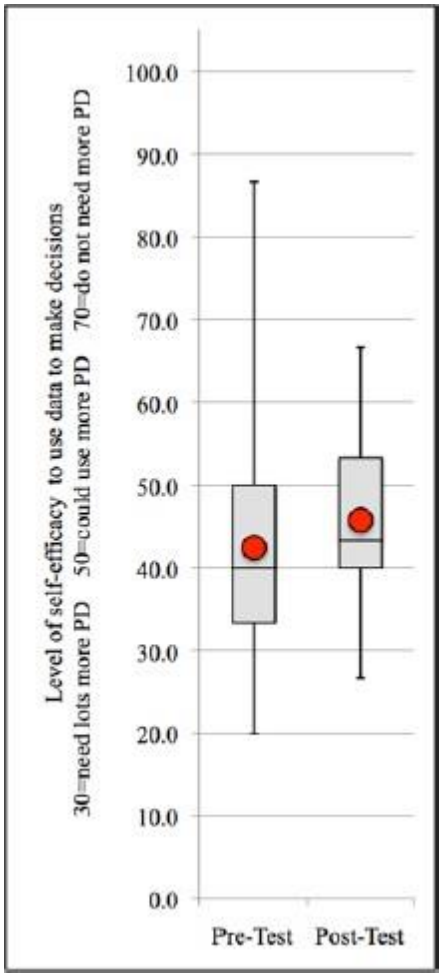


Figure 4. Gains in student self-efficacy from the MTISES, Data-Driven Decision Making subscale. The difference be-tween the pre and posttest scores (3.3%) was statistically significant using a two-tailed paired t test: $t(147) = 2.85$, $p < 0.0005$. The magnitude of this difference has a small effect size (Cohen's $d = 0.29$). The whiskers represent the range of the upper and lower 25% of all scores. Average scores are indicated with dots. Boxes make up the second and third quartiles. $n = 148$.

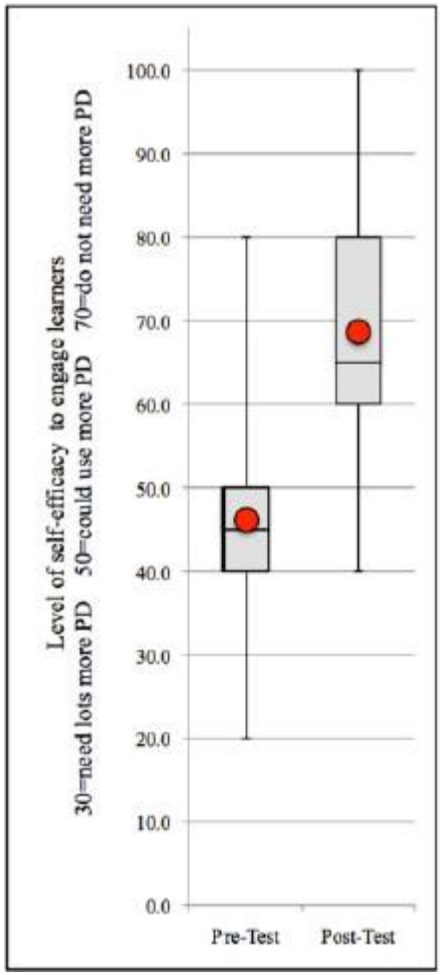


Figure 5. Gains in student self-efficacy from the MTISES, Engaging Learners subscale. The difference between the pre- and posttest scores (22.5%) was statistically significant using a two-tailed paired t test: $t(147) = 18.28$, $p < 0.0001$. The magnitude of this difference has a very large effect size (Cohen's $d = 1.76$). The whiskers represent the range of the upper and lower 25% of all scores. Average scores are indicated with dots. Boxes make up the second and third quartiles. $n = 148$.

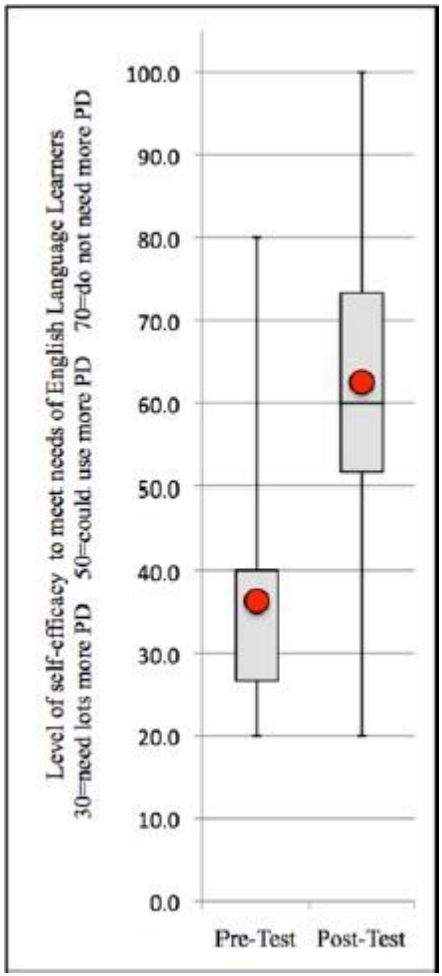


Figure 6. Gains in student self-efficacy from the MTISES, Meeting Needs of English Language Learners subscale. The difference between the pre- and posttest scores (26.2%) was statistically significant using a two-tailed paired t test: $t(147) = 18.6$, $p < 0.001$. The magnitude of this difference has a very large effect size (Cohen's $d = 1.84$). The whiskers represent the range of the upper and lower 25% of all scores. Average scores are indicated with dots. Boxes make up the second and third quartiles. $n = 148$.

Two-tailed paired t tests were used to compare the pre- and posttest scores. Over one semester of teacher preparation instruction and field experiences, the preservice teachers showed growth in self-efficacy for multi-tiered instruction. As illustrated in Figure 7, the difference between the pre- and posttest scores (20.5%) was statistically significant using a two-tailed paired t test: $t(147) = 22.66$, $p < 0.001$. The magnitude of this difference has a very large effect size (Cohen's $d = 1.82$). Differences in subscale scores were significant as well. All the differences could be interpreted as large, except for the Data-Driven Decision Making subscale, where the effect size was significant but small.

On the Evidence-Based Practices subscale, the difference between the pre- and posttest scores (20.9%) was statistically significant using a two-tailed paired t test: $t(147) = 16.65$, $p < 0.001$ (Cohen's $d = 1.39$).

On the Collaboration subscale, the difference between the pre- and post- test scores (19.4%) was statistically significant using a two-tailed paired t test: $t(147)= 12.48$, $p < 0.001$ (Cohen's $d = 1.15$).

On the Monitoring Interventions subscale, the difference between the pre- and posttest scores (18.1%) was statistically significant using a two-tailed paired t test: $t(147) = 15.87$, $p < 0.001$ (Cohen's $d = 1.39$).

On the Data-Driven Decision Making subscale, the difference between the pre- and posttest scores (3.3%) was statistically significant using a two-tailed paired t test: $t(147) = 2.85$, $p < 0.0005$. The magnitude of this difference has a small effect size (Cohen's $d = 0.29$).

On the Engaging Learners subscale, the difference between the pre- and posttest scores (22.5%) was statistically significant using a two-tailed paired t test: $t(147) = 18.28$, $p < 0.0001$ (Cohen's $d = 1.76$).

On the Meeting Needs of English Language Learners subscale, the difference between the pre- and posttest scores (26.2%) was statistically significant using a two-tailed paired t test: $t(147) = 18.6$, $p < 0.001$ (Cohen's $d = 1.84$).

Another way to interpret gain scores is to look at effect size as the difference between the pre- and posttest means. Using this approach, the gain in self-efficacy using multi-tiered instruction has effect size (ES) of .67. Moderate growth occurred in collaboration (ES = .50), finding and evaluating evidence-based solutions (ES = .57), monitoring interventions (ES = .57), data-driven decision making (ES = .58), and engaging learners (ES = .66). The

most growth occurred in meeting the needs of English language learners (ES = .72).

Interpreting the Significance of Gains

For the paired-sample t tests to be considered valid, the differences between the paired values of the pre- and the posttests (gain scores) should be approximately normally distributed. The normal distribution of values of the difference scores can be checked by examining the histogram of the gain scores or by doing a simple one-sample Kolmogorov–Smirnov test on the values of the difference. The histogram of the distribution of the gain scores or the total scale was fairly easy to interpret. The position of the normal distribution curve on the histogram indicates that the gain scores were approximately normally distributed (Figure 8).

Histograms for the six subscale gain scores were less straightforward. Normal distributions of the gain scores of the subscales were then checked by doing one-sample Kolmogorov–Smirnov tests. The results are mixed. Gain scores appear to be normally distributed on four of the five subscales, thus meeting the normality assumptions. It is unlikely that the gain scores for the Engaging Learners subscale and the English Language Learners subscale are normally distributed. This result makes interpretation of the t test of significance of gains on these scales less clear because those t tests have not clearly met the assumption of normal distribution of values. Table 6 provides a summary of the results of the hypothesis tests for each of the subscale gain scores. The null hypothesis is that the distribution of gain scores is normal. The decision is to either to retain or to reject this hypothesis.

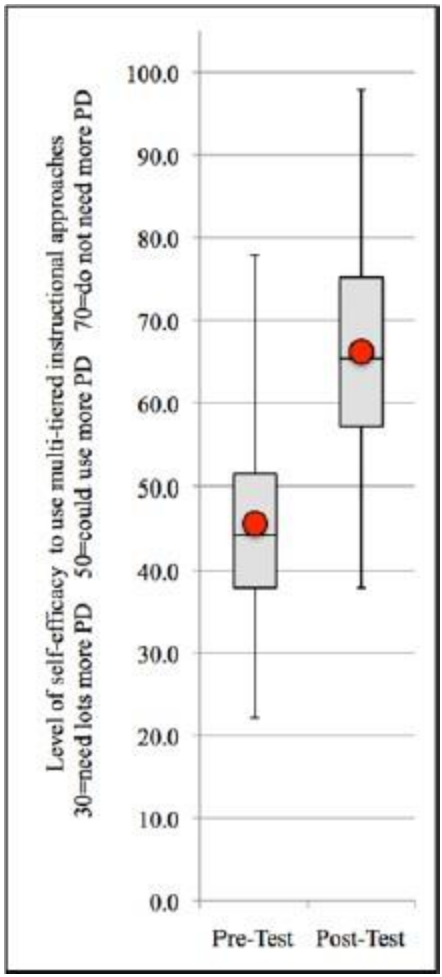


Figure 7. Gains in student self-efficacy from the MTISES. The difference between the pre- and posttest scores (20.5%) was statistically significant using a two-tailed paired t test: $t(147) = 22.66$, $p < 0.001$. The magnitude of this difference has a very large effect size (Cohen's $d = 1.82$). The whiskers represent the range of the upper and lower 25% of all scores. Average scores are indicated with dots. Boxes make up the second and third quartiles. $n = 148$.

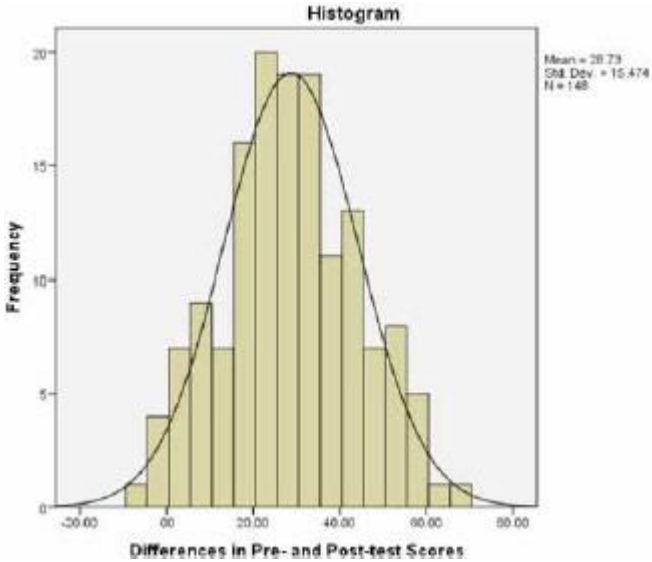


Figure 8. The histogram of differences between pre- and posttest scores (gain scores) with the normal distribution curve. Difference scores are approximately normally distributed.

Table 6. One-Sample Kolmogorov–Smirnov Test of Normal Distribution of Gain Scores on Subscales

Subscale	*Gain Score Mean*	*Gain Score SD*	*Significance*	*Decision*
Finding and Evaluatng Evidence-based Solutions	5.22	3.82	.390	Retain
Collaboration	3.87	3.78	.095	Retain
Monitoring Interventions	5.42	4.16	.523	Retain
Data-Driven Decision Making	5.79	4.59	.319	Retain
Engaging Learners	4.50	3.00	.006	**Reject**
Meeting Needs of English Languge Learners	3.93	4.59	.319	**Reject**

Note. Asymptotic significances are displayed. The significance level is .05.

Discussion

Teaching to meet the needs of all learners within a context of multiple tiers of instruction is a reality for today's teachers. Preparing for the requisite competencies of multi-tiered teaching is important for preservice teachers and thus for teacher preparation programs. This study demonstrated the quality and utility of the MTISES in measuring both the professional development needs of preservice teachers and their short-term gains over time. Furthermore, this study demonstrated that preservice teachers are responsive to programming, combining course instruction in and field experience to practice component skills of multi-tiered instruction.

The way the MTISES works to measure separate constructs of multi-tiered instruction aligns with the theoretical expectations in its initial development (Barnes & Burchard, 2010). Perhaps this alignment is indicative of perspectives of scale designers who teach preservice teachers. The slight difference in the way the scale functions for the two groups may also be explained by differing perspectives of preservice teachers and in-service teachers toward multi-tiered practices. When the study of the MTISES was conducted with in-service teachers a couple of years ago, in-service teachers may have perceived Response to Intervention–mandated practices as "one more thing we have to do," while future teachers may perceive these same practices as "the way we do business." Because over 50% of the variance is explained by the three subscales (Finding and Evaluating Evidence-Based Solutions, Collaboration, and Monitoring Interventions), when using the MTISES to assess needs and gains of preservice teachers, teacher educators should likely view results for those three constructs as important measures of professional development needs and priorities in programming and course content.

Entering their junior year of a teacher preparation program, the participants of this study completed required prerequisite course work, including three writing-intensive courses requiring information literacy skills and one math course including training in standard deviations. That combined background could explain the higher preassessment score in finding and evaluating evidence-based solutions. At the time of this study, the first course about teaching English language learners occurred during this same semester.

Instruction in data-driven decision making typically started near the end of this semester, continuing into the senior year. Prior to this semester of study, the field experience was observation only, with first experiences teaching occurring during this semester. Therefore, the lower preassessment scores in data-driven decision making and meeting the needs of English language learners may be indicative of limited opportunity and exposure at this point.

Measures of gains show that self-efficacy improved for multi-tiered teaching over just one semester, one in which preservice teachers were applying pedagogy learned in the classroom to their field experience requirements. Although meeting the needs of English language learners remains one area of greatest need for professional development at the end of that semester, gains in that construct were most impressive, indicating encouraging response to the instruction and experiences offered through the program. Considering both the gains and the trajectory of growth, opportunities for students to practice data-driven decision making are important for continued development of self-efficacy for these two cohorts of preservice teachers.

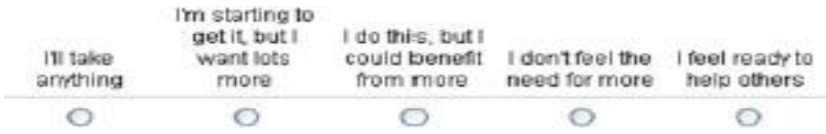
One limitation of this study is that it was conducted with participants of one teacher preparation program. While states do mandate inclusion of specific content, how that content is delivered, emphasized, or practiced can vary from program to program. Therefore, teacher educators cannot assume that all preservice teachers would make such gains over one semester in a teacher preparation program. Another limitation of this study is that gains were assessed over one semester only. Future research should assess gains in self-efficacy for multi-tiered instruction across participation in an entire teacher preparation program.

Appendix

Multi-Tiered Instruction Self-Efficacy Scale (MTISES)

Directions: Please indicate the level of professional development you feel you need for each educational practice.

Each question uses the following response options:



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

2. How much professional development do you need about differentiating presentation of information for various ability 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 accommodate varied learning styles (seeing, listening, manipulating, etc.)?

8. How much professional development do you need about allowing students to demonstrate learning in ways that accommodate 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 accommodate 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 trust-worthiness 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 worthwhile 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 instructional 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 specific problem for a struggling student?

20. How much professional development do you need to use specific assessments to measure student progress on specific 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 instructional planning (like textbook assessments, PALS quick checks, etc.)?

23. How much professional development do you need to make decisions about academic instruction for individual students 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?

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