Professional Development and RtI: Does PD improve implementation?

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Prevalence of RtI/MTSS

Respondents to the most recent national Response to Intervention implementation survey indicated that:

- 94% are at some stage of RtI implementation
- 24% report being at full RtI implementation, and
- 80% of elementary schools are at full RtI Implementation in one or more domains (reading, writing, math, behavior, science)

(Spectrum K12, 2011)
Multi-Tiered Systems of Support (MTSS) Defined

“A Multi-Tiered Systems of Supports (MTSS) is a term used to describe an evidence-based model of schooling that uses data-based problem-solving to integrate academic and behavioral instruction and intervention. The integrated instruction and intervention is delivered to students in varying intensities (multiple tiers) based on student need. “Need-driven” decision-making seeks to ensure that district resources reach the appropriate students (schools) at the appropriate levels to accelerate the performance of ALL students to achieve and/or exceed proficiency.”

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Fidelity & Student Outcomes
Common Elements

- Evidence-based model
- Data-based problem-solving
- in varying intensities (multiple tiers)
- District resource allocation
- ALL students achievement
MTSS Implementation Issues

- Most likely reasons why systems change efforts like MTSS implementation fail
  - Failure to achieve consensus
  - School culture is ignored
  - Lack of training and support
  - Lack of feedback to implementers to support continued implementation
  - Unrealistic expectations of initial success
  - Failure to measure and analyze progress
  - Participants not involved in planning
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  - Failure to achieve consensus
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Some Important Professional Development Components to Consider

- Learning Design
  - Why new practices are implemented
  - Expert modeling
  - Practice and collaborative reflection (Joyce & Showers, 2002)

- Job-embedded Support
  - Technical support in real situations/coaching

- Data Use
  - Identify needs
  - Formative assessments and adjustments as needed
What We Know About Professional Development and MTSS

- Literature on Professional Development for MTSS implementation provides suggestions for content and training processes primarily based on conceptual models and anecdotal experiences.
- Direct, intensive training on MTSS critical components is related to increases in:
  - Educators’ positive beliefs regarding data-based decision-making (Castillo, March, Tan, Stockslager, & Brundage, 2016).
  - Educators’ skills in applying MTSS concepts to academic issues (Albritton & Truscott, 2014; Bergstrom, 2008; Castillo, March, Tan, Stockslager, Brundage, McCullough, & Sabnis, 2016).
- Preliminary evidence suggests that educators’ beliefs and perceived skills relate to implementation levels (Castillo et al., 2015; Castillo, March, Stockslager, & Hines, 2016).
- Little empirical information exists regarding relationship between PD for MTSS and implementation, especially for larger-scale studies.
Purpose of this Study

- MTSS is becoming more prevalent and appropriate training and support is seen as an important driver of implementation.
- There is a need for an empirical, large scale studies to analyze the relationship between professional development that is based on effective professional learning designs and MTSS implementation.
- We hypothesized that there would be a positive and significant relationship between
  - Participating in ongoing, intensive professional development and increases in MTSS implementation.
  - School-level beliefs regarding data-based decision-making and MTSS implementation levels.
  - School-level perceived skills applying RtI concepts to academic issues and MTSS implementation levels.
Method
Participants

- 12 out of 67 school districts in the state in which the study took place applied to participate in the project, they were requested to:
  - Nominate pilot schools within their district.
  - Match comparison schools that had similar student population, size, and past achievement.

- A standard evaluation rubric was used to score each application:
  - Overall commitment to the project
  - Commitment of resources and personnel
  - Inclusion of district and school-level data requested
  - Previous experience with other programs or initiatives

- Decisions were made based on:
  - How well the application met the criteria
  - How representative the district was in terms of other districts in the state (e.g., district size, geographical location, student demographic profiles)
Participants: Educator Characteristics

- Educators from 34 pilot schools (N = 1,205) and 27 comparison schools (N = 806) within 7 school districts participated.
- Staff who worked at participating schools at any time during the 3-year study were included. Turnover in staff occurs frequently in education (Ingersoll, 2001), but we wanted to investigate our hypothesis under this reality.
- Pilot vs Comparison School Demographics:
  - General education teachers: 71% (Pilot), 74% (Comparison)
  - Special education teachers: 9% (Pilot), 9% (Comparison)
  - Highest degree earned (Bachelor’s): 59% (Pilot), 57% (Comparison)
- School-Based Leadership Team (SBLT) Demographics:
  - 28% general education teachers, 13% administrators, 21% student services personnel, 22% other positions
  - 62% earned advanced degrees.
  - Participants’ experience: 1 to 20+ years

* Ns based on 3rd year of study, additional data available from first author
<table>
<thead>
<tr>
<th></th>
<th>Pilot School</th>
<th>Comparison School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Number of Students</td>
<td>680 (SD = 236)</td>
<td>781 (SD = 192)</td>
</tr>
<tr>
<td>White Students</td>
<td>68% (SD = 17)</td>
<td>59% (SD = 18)</td>
</tr>
<tr>
<td>Black Students</td>
<td>12% (SD = 12)</td>
<td>14% (SD = 11)</td>
</tr>
<tr>
<td>Hispanic Students</td>
<td>11% (SD = 9)</td>
<td>13% (SD = 10)</td>
</tr>
<tr>
<td>Free and Reduced Lunch</td>
<td>44% (SD = 23)</td>
<td>48% (SD = 23)</td>
</tr>
<tr>
<td>English Language Learners (ELLs)</td>
<td>7% (SD = 8)</td>
<td>7% (SD = 7)</td>
</tr>
<tr>
<td>Students with Disability</td>
<td>13% (SD = 5)</td>
<td>12% (SD = 5)</td>
</tr>
</tbody>
</table>

* Data based on first year of project. Additional data available from first author.
Study Variables and Measures: Independent and Dependent Variables

- **Independent Variable**
  - Professional Development (Pilot vs. Comparison School)

- **Dependent Variable**
  - Implementation of RTI (*Tier I & II Critical Components Checklist*)
    - Coaches looked for the degree to which critical components of the problem-solving process were present in paperwork (i.e., permanent products) derived from data meetings focused on Tier I and II instruction.
    - Scale from 0 to 2 (0 = Absent, 1 = Partially Present, 2 = Present, N/A = Not Applicable)
    - Four Components
      - Problem Identification
      - Problem Analysis
      - Intervention Development and Implementation
      - Program Evaluation/RTI
Study Variables and Measures: Covariates

1. Educators’ beliefs regarding data-based decision-making (DBDM)
   - Measure: *RtI Beliefs Scale DBDM Factor*
     - 10 items; Response scale ranged from 1 (Strongly Disagree) to 5 (Strongly Agree)
     - Internal consistency reliability estimates: School level = .73

2. Educators’ Perceived skill applying the problem solving process to academic issues
   - Measure: *Perceptions of RtI Skills Survey (RtI Skills Applied to Academic Content factor)*
     - 22 items; Response scale ranged from 1 (I do not have this skill at all) to 5 (I am highly skilled in this area and could teach others this skill)
     - Internal consistency reliability estimates: Educator level = .97

3. Proportion of students who receive free or reduced lunch

4. Time
Procedures: Professional Development

Who and When:

• 13 full days across 3 years
  • direct, intensive training for SBLT members
  • ongoing job-embedded coaching for SBLT members and the remaining pilot school instructional staff

How:

• **Project Staff** -> SBLT members; **RtI coaches** -> SBLT members and other instructional staff:
  • Presented the rationale for RtI related skill(s)
  • Demonstrated the use of the skill(s)
  • Provided opportunities to practice with feedback
  • Provided opportunities for collaborative reflection

What:

• Historical, legislative, and research-based rationale for RtI
• Systems change principles to apply when facilitating implementation
• Critical components of RtI
• Application of problem-solving steps across tiers
Procedures: Collection of the Tier I & II Critical Components Checklist

**Who:**
- Completed by RtI Coaches

**When:**
- End of each year

**How:**
- Gathered available products from data meetings focused on Tier 1 and 2 issues
- Reviewed products for evidence of critical components of the problem-solving process
- Used a standard rubric to rate the extent to which each component was present
Procedure: Administration and Collection of the *Rti Beliefs Scale* and *Perceptions of Rti Skills Survey*

**Who:**
- Administered by Project personnel and Rti Coaches

**When:**
- Beginning of Year 1
- The ends of Years 1, 2, and 3.
- Return rate: ~ 53% (RTI Beliefs Scale), 46-52% (Perceptions of Rtl Skills Survey)

**How:**
- Prioritized administering during training sessions and staff meetings (direct methods)
- When direct methods were not possible, surveys were placed in staff mailboxes with directions for completing and returning them
Analysis Plan

- Descriptive statistics
  - Multilevel modeling (growth curve modeling)
    - Check assumptions
    - Unconditional models
    - Two-level growth curve model

School 1
- T0
- T1
- T2
- T3

School 2
- T0
- T1
- T2
- T3

School 3
- T0
- T1
- T2
- T3

Level 2: SchType, prop_frl

Cross level interaction: SchType*Time

Level 1: Time, SchDBDM, SchAcld
Two-level growth curve model (CON’T)
- Intercepts and slopes allowed to vary (random effects).
- Centering
  - Time and school type were zero-centered
  - Other variables grand mean centered
- Restricted maximum likelihood estimation
- Alpha set at .05.
Results
Results

- Professional Development
  - 13 days of training for SBLTs, 54% of SBLT members remained.
  - Quality and acceptability of the training was high
    - Administered Training Evaluation Survey to SBLTs
    - Overall mean score: 4.38, 4.23 & 4.27, respectively (Scale of 1-5).

- Job-embedded coaching
  - Quality was high
    - Administered Coaching Evaluation Survey to SBLTs
    - Overall mean score above 4 for each year (Scale of 1-5).
  - Quantity
    - 900, 1,600, & 1,300 sessions for year 1, 2 & 3, respectively
Results/ Descriptive Statistics

Table 1
Means and standard deviation of key variables in pilot and comparison schools across times.

<table>
<thead>
<tr>
<th></th>
<th>Time 0</th>
<th>Time 1</th>
<th>Time 2</th>
<th>Time 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pilot School (N = 27)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RtI Implementation</td>
<td>0.20 (0.24)</td>
<td>0.65 (0.45)</td>
<td>0.83 (0.50)</td>
<td>1.10 (0.54)</td>
</tr>
<tr>
<td>SchDBDM</td>
<td>3.71 (0.14)</td>
<td>3.84 (0.11)</td>
<td>3.85 (0.14)</td>
<td>3.91 (0.16)</td>
</tr>
<tr>
<td>SchAcad</td>
<td>3.44 (0.30)</td>
<td>3.61 (0.19)</td>
<td>3.69 (0.19)</td>
<td>3.81 (0.16)</td>
</tr>
<tr>
<td>Comparison School (N = 34)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RtI Implementation</td>
<td>0.14 (0.16)</td>
<td>0.22 (0.23)</td>
<td>0.31 (0.36)</td>
<td>0.60 (0.58)</td>
</tr>
<tr>
<td>SchDBDM</td>
<td>3.55 (0.11)</td>
<td>3.61 (0.14)</td>
<td>3.70 (0.15)</td>
<td>3.70 (0.15)</td>
</tr>
<tr>
<td>SchAcad</td>
<td>3.59 (0.21)</td>
<td>3.61 (0.28)</td>
<td>3.66 (0.26)</td>
<td>3.66 (0.26)</td>
</tr>
</tbody>
</table>

Independent sample t-test: only SchDBDM showed significant difference at baseline.

RtI implementation increased in both types of schools, but more in pilot.

SchDBDM and SchAcad: slow but steady growth in both types of schools.
## Results/ Descriptive Statistics

Table 2

Correlations among key variables in the overall sample.

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. RtI Implementation</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. SchType</td>
<td>.37***</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Time</td>
<td>.48***</td>
<td>.00</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. prop_frl</td>
<td>-.04</td>
<td>.07</td>
<td>.12†</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. SchDBDM</td>
<td>.46***</td>
<td>.50***</td>
<td>.32***</td>
<td>.08</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>6. SchAcad</td>
<td>.42***</td>
<td>.01</td>
<td>.36***</td>
<td>-.13†</td>
<td>.33***</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Note. N = 61. †p < .1, *p < .05, **p < .01, ***p < .001.
## Results/ Assumption Check

### Missing data

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<tr>
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<th>T2</th>
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<td><strong>Comparison</strong></td>
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<td></td>
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</tr>
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<td>(N = 27)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>SchDBDM</td>
<td>16</td>
<td>22</td>
<td>27</td>
<td>26</td>
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<tr>
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<td>16</td>
<td>22</td>
<td>27</td>
<td>26</td>
</tr>
<tr>
<td>Prop_frl</td>
<td>27</td>
<td>27</td>
<td>27</td>
<td>27</td>
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<tr>
<td>CCCavgimp</td>
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<td>27</td>
<td>27</td>
<td>26</td>
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<tr>
<td><strong>Pilot</strong></td>
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<td></td>
</tr>
<tr>
<td>(N = 34)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>SchDBDM</td>
<td>32</td>
<td>34</td>
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</table>

Growth curve models are robust to missing data.

Data were not missing randomly.
Results/ Assumption Check

- Normality
  - No obvious violation (*Skewness & Kurtosis*).
- Residual analysis
Intraclass correlation coefficient is .387 for RtI Implementation.
Results / Growth Curve Modeling

Random effect (variance) estimates

Intercept: non-significant
• Initial levels of MTSS implementation **did NOT vary significantly** across schools

Slope: significant
• Over the time, growth rates of MTSS implementation **varied significantly** across schools

<table>
<thead>
<tr>
<th>Cov Parm</th>
<th>Subject</th>
<th>Estimate</th>
<th>Standard Error</th>
<th>Z Value</th>
<th>Pr &gt; Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>schoolid</td>
<td>0.01652</td>
<td>0.01071</td>
<td>1.54</td>
<td>0.0614</td>
</tr>
<tr>
<td>Time</td>
<td>schoolid</td>
<td>0.02341</td>
<td>0.005925</td>
<td>3.95</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Residual</td>
<td></td>
<td>0.05616</td>
<td>0.006756</td>
<td>8.31</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>
Results / Multilevel Modeling

Fixed effect estimates

All predictors significantly related to RtI implementation.
Discussion
Explanation of Findings

- Pilot schools that participated in ongoing PD focused on RtI associated with increases in problem-solving implementation
  - SBLT trainings followed effective learning design principles (Joyce & Showers, 2002)
  - Job-embedded coaching may have facilitated transfer of training (Learning Forward, 2011)
- School-level beliefs and skills being associated with implementation levels consistent with research indicating beliefs and skills impact educators’ practices (Learning Forward, 2011)
Limitations

- Lack of control necessitates caution regarding causation (can’t directly say implementation increased because of PD), but provides potential for more externally valid findings
- Data not missing at random
- Limits on power associated with number of schools
- Indirect measures of
  - Implementation
  - Skills
  - PD fidelity (SBLT trainings, Coaching processes)
Future Research

- Studies needed to examine how PD relates to implementation of:
  - Instructional and intervention processes in an MTSS
  - Implementation of problem-solving at the individual student level
- Investigations of specific elements of PD that have greatest impact on implementation needed
  - Training content
  - Coaching activities
- Investigations of
  - How to efficiently and effectively implement RtI PD into existing school context
  - How participant stakeholders understand and think about RtI processes
- Studies that examine other potential predictors of implementation needed given significant residual variance
Implications for Practice

- Districts implementing MTSS should consider
  - SBLT training model
  - Job-embedded coaching focused on RtI practices covered during trainings
- Beliefs, skills, and implementation levels could be examined through needs assessment process and monitored to determine capacity for implementation
- Variance in growth rates indicates need to individualize supports to schools based on response to PD
Summary

- Schools and districts proceeding with MTSS implementation
- PD on RtI that incorporates evidence-based PD processes related to increased implementation
- Districts and TA providers should pursue ongoing, intensive PD efforts to facilitate implementation
- Model used in this study provides one option for PD that could be implemented and evaluated
References


Contact Information

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