Teachers’ Support for Social and Emotional Learning Contributes to Improved Mathematics Teaching and Learning

Erin R. Ottmar, Sara E. Rimm-Kaufman, Ross A. Larsen & Robert Q. Berry

This study looks at how use of a Social and Emotional Learning Program, the Responsive Classroom (RC) approach, alters the relations between mathematics teaching practices and student mathematics achievement. The study found that teachers trained in RC who used more RC practices provided stronger mathematics instruction, which in turn, contributed to greater improvements in math achievement.

Increasing student’s math achievement is a high priority for educators across America, directing attention towards programs that can improve student’s opportunities to learn. Improving children’s mathematics achievement is not straightforward. Boosts in student achievement require a combination of teacher content knowledge, teaching practices that support children’s social and emotional skills, effective classroom management, plus high quality instruction. Integrating social and emotional learning (SEL) strategies into the math classroom may help teachers set up supportive classrooms that improve their instruction through facilitating discussions, encouraging students to share ideas and take risks, and engaging in inquiry based learning.

The Responsive Classroom (RC) approach is one such SEL program that provides teachers with tools and strategies to help create a safe and supportive environment for learning. This study built on prior research that found that RC improves teachers’ ability to use standard-based mathematics teaching by looking at whether stronger mathematical instruction in combination with RC practices contributed to higher achievement.

The Study

The primary goal of this study was to examine the relations between teacher’s mathematical knowledge, math teaching practice, and student achievement. We also wanted to know whether using RC practices changed these relations. Participants were 1,533 3rd grade students from eighty-eight classrooms in twenty-four elementary schools in a mid-Atlantic school district. Forty-three of the teachers received RC training as well as yearlong assistance from a coach.

Data was collected from district student achievement data, online teacher-report questionnaires and three classroom observations. Standards-Based Mathematics teaching practices were assessed using the observational measure, the Mathematics Scan (M-Scan). Teacher’s fidelity of implementation (FOI) to RC was measured using the Classroom Practices Observational Measure (CPOM). Student achievement scores were assessed using end of year state standardized mathematics assessment.

We used separate path analyses to test the relations between teacher knowledge, teacher practice, and student learning in RC and control conditions. Analyses also controlled for students’ prior mathematics achievement, socioeconomic status, ethnicity, gender, and English language learner status.

Social and Emotional Learning:
RC Classroom Practices

1. Morning Meeting
2. Rule Creation
3. Interactive Modeling
4. Positive Teacher Language
5. Logical Consequences
6. Guided Discovery
7. Academic Choice
8. Classroom Organization
9. Working with Families
10. Collaborative Problem Solving

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**Findings**
Results indicate that the greater use of RC practices related to higher quality mathematics instruction (measured as standards-based mathematics teaching practices). Further, higher quality instruction related positively to mathematics achievement. Surprisingly, these relations were not found in classrooms that did not use the RC approach. In essence, teachers trained in a social and emotional learning program were more capable of using standards-based mathematics instruction in a way that produced improved achievement.

**Practical Implications**
These results are important because they show the importance of social and emotional practices in the elementary mathematics classroom. Although social and emotional learning programs are not designed specifically to improve math teaching and learning, this program appears to contribute to such gains. There could be several reasons for this. By enhancing the social, emotional, and organizational dynamics of the classroom, the teacher removes many common barriers and demands that exist in third grade classrooms.

As a result, teachers may be better able to provide higher quality mathematical practice. Social and emotional learning programs may also create teacher and student readiness for using standards-based teaching practices by altering behavioral management approaches, decreasing chaos in the classroom, and emphasizing the need to meet children's social and emotional needs. It may also be that the focus on positive language may improve communications between teachers and students in ways that improve teachers' ability to address more difficult student questions and alter discourse.

As a result of the improved communication, teachers may provide students with more opportunities to collaborate in groups, solve challenging tasks, and justify their mathematical reasoning. This study also highlights the importance of implementation fidelity--attending teacher professional development on its own is not sufficient for altering outcomes. Rather, teachers need to use the strategies as intended to deliver benefits to instruction and student achievement.

Overall, this research suggests that efforts to improve contextual supports in the classroom hold promise to helping improve mathematics teaching and learning.

This research brief is based on the following published study:

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**Components of Standards-Based Mathematics Teaching (The M-Scan):**

(1) Structure of lesson  
(2) Multiple representations  
(3) Students’ use of mathematical tools  
(4) Cognitive depth  
(5) Mathematical discourse community  
(6) Explanation and justification  
(7) Problem solving