# Strengthening Mathematics Intervention Classes (SMI)

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## Mathematics Intervention (MI) Classes:

classes that schools offer *in addition* to core math classes to support students with math difficulties. MI classes are *not* homework help clubs, study halls, or separate special ed. classes

## Need:

- Before this project, little was known about US schools' math intervention practices, structures, and challenges at the middle grades
- Teachers need PD that is focused on intervention classes, helping them to provide effective instruction and support for students with math difficulties

## Goals:

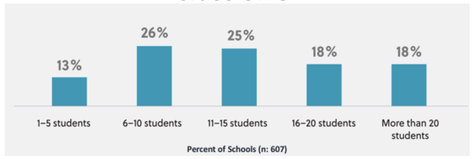
- Study the national landscape of math intervention classes at grades 6-8
- Apply study findings to create a PD course specifically for math intervention teachers and test it

## PHASE 1: LANDSCAPE STUDY

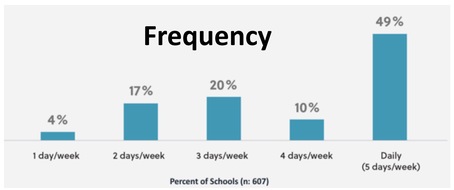
We conducted an observational study and a **national survey** of a random sample of **2,024 public schools** (urban and suburban) with grades 6-8, stratified by U.S. Census region and percent of students with free and reduced-price lunch (FRPL).
876 schools responded (43%). One respondent per school.

**69%** of schools had **mathematics intervention classes** for middle grades students (2016 – 2017)

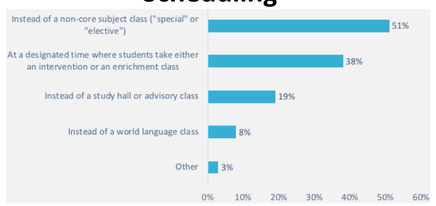
**Class Size**



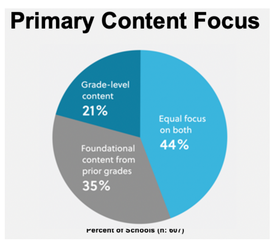

**Frequency**




**Scheduling**




**Primary Content Focus**



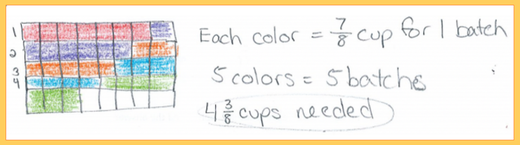

### Common Challenges

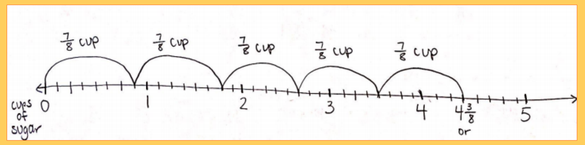
- Students in MI classes have a wide range of learning needs: **93%** of schools
- Some students feel negatively about being in MI classes: **79% of schools**
- Little or no professional development on intervention practices: **66% of schools**

## What do teachers do in the SMI PD Course?

❖ Challenge deficit models of students and build strengths-based approaches

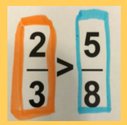
❖ Deepen their own understanding by doing rich math tasks & sharing approaches



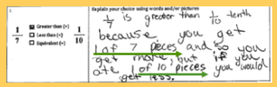

❖ Learn to use recommended instructional practices such as, visual representations, number lines, and Concrete-Semi-Concrete-Abstract (CSA)

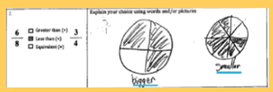


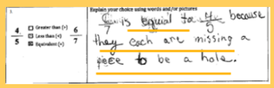



❖ Build strategies to support student communication

❖ Collect, examine, sort, annotate, and discuss student work from probes




❖ Use formative assessment (probes & interviews) to uncover student thinking


❖ Plan and teach lessons that are targeted to students' strengths and needs

❖ Reflect on and share experiences applying course ideas with students

"I thought the interviews were incredibly helpful and allowed me to **understand** my students' thinking much better than I had before. I was surprised by the amount of **thinking/ knowledge my students shared and their excitement to do so.**"

"The interviews really helped me refocus on **slowing down** and really **taking the time to listen** to students as they share their thinking!"

"I am proud of what I created based on my particular student--really **tailoring my lesson to her strengths and learning needs.** It pushed me to critically analyze her work and her thinking and get a whole picture of her."

## PHASE 2: PD COURSE

We created a hybrid PD course for MI teachers

- 5 full-day sessions; 5 online sessions (async); 4 1-hr virtual meetings (sync)
- 70 hours of PD sustained over one school year
- Fractions, Decimals, Integers, Expressions & Equations
- Instructional Practices
- Formative Assessment Approaches

## PILOT STUDY

**Research Question:** After participating in the SMI course, to what extent do teachers show increases in their knowledge, practices and self-efficacy for teaching struggling learners in mathematics intervention classes?

**Sample**

- 28 intervention teachers (grades 5-8)
- 15 urban, suburban, and rural districts in MA & ME
- Participated in pilot of full course (70 hours /9 months)

## MEASURES

- MKT instrument
- MTSES Self-efficacy instrument
- Preparedness for teaching students with math difficulties
- Mathematics Mindset Beliefs items
- Instructional Practices survey
- Classroom observations and interviews
- Course evaluation surveys

## FINDINGS

- MKT: statistically significant increase for rational numbers
- Self-efficacy: statistically significant increase
- Preparedness for teaching students with math difficulties: statistically significant increase
- Instructional practices: increase in reported frequency of using six practices that were emphasized in the PD
- Mindset beliefs: no significant changes
- Evaluation: 89% rated course as *very useful;* 11% as *useful;* 100% would recommend the course to MI teachers (n:28)

## LEARN MORE

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www.edc.org/accessmath

This project is funded by the National Science Foundation, grant #DRL-1621294. Any opinions, findings, and conclusions or recommendations expressed in these materials are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.