Classroom Practices of High School Math Teachers: A Longitudinal Analysis

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Outline

- Introduction
- Program Description
- Data Collection
- Results
- Discussion

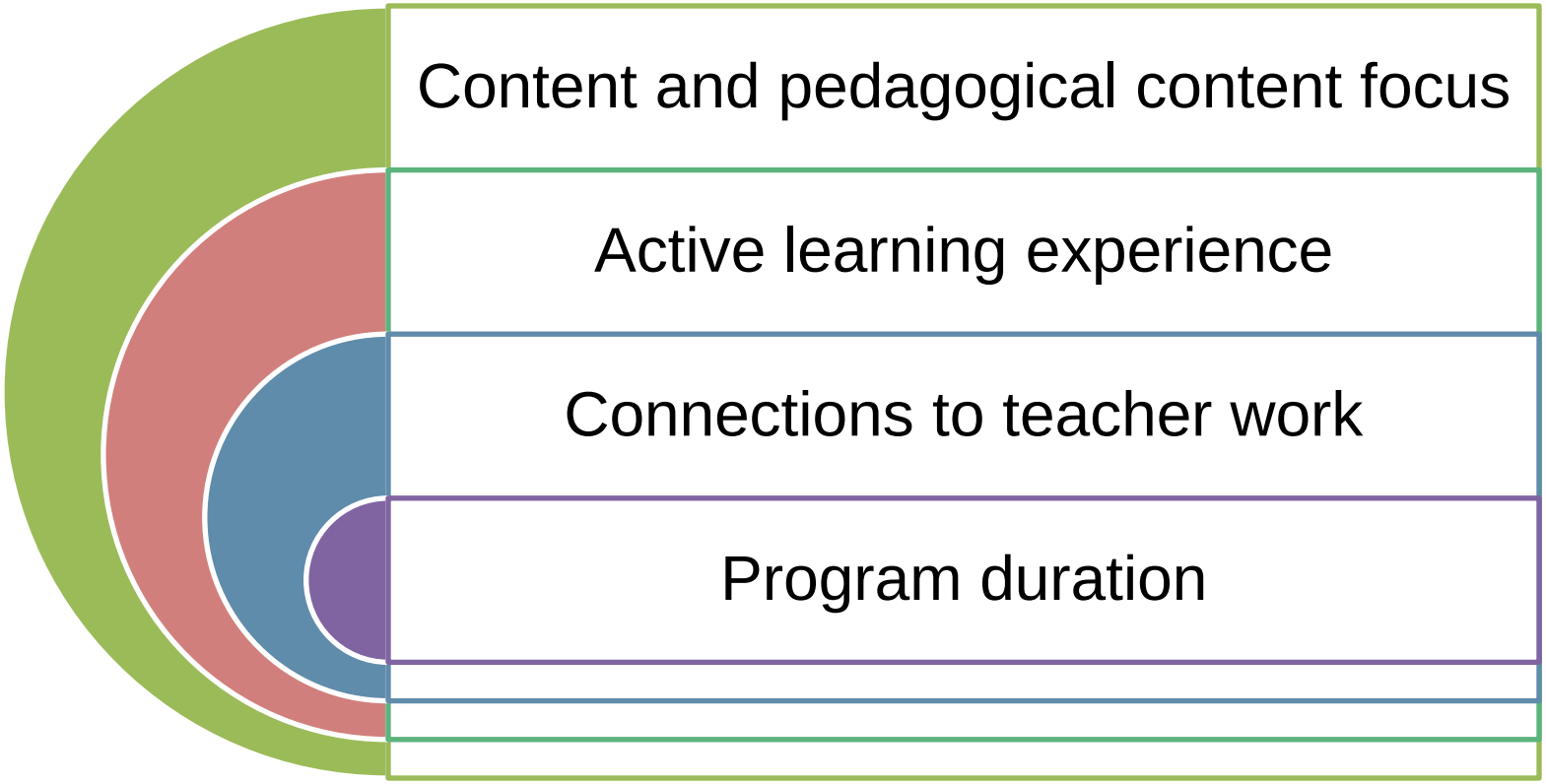
Introduction

Effective instruction critical for promoting students' conceptual understanding

Standards-based teaching distributed inequitably across school contexts

- Teachers in schools that mainly serve low-income or minority students more often relying on rote instructional methods

Key Features of High-Quality PD



What is missing?

Limited research on the sustainability of the effects of PD

Most studies based on teachers' self-reported data

Limited focus on changes in various aspects of mathematics instruction

Project

- Funded by the NSF MSP program-Grant no: 0412072
- Partnership between Rice University and two urban school districts that mainly serve low-income students or students of color
- Designed to provide PD, support, and leadership experiences for high school teachers
- 79 teachers in 3 cohorts

Program Details

Summer institutes

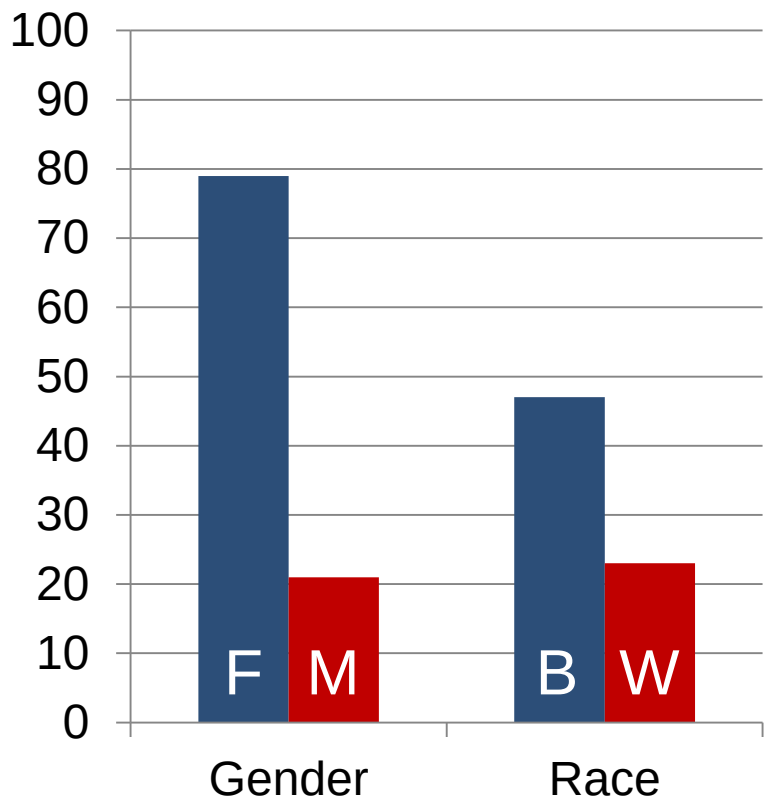
- 4-week long for two consecutive summers
- Mathematics focus: algebra and geometry during the 1st summer & combinatorics and statistics during the 2nd summer

Academic year activities

- Monthly meetings
- Individualized support through site visits and electronic communication

Participants

- 49 high-school mathematics teachers from Cohorts I & II
- All teachers certified
- 36 held master's degrees
- Years of experience ranged from 1 to 49 years (mean = 14.1; median = 12)



Classroom Observation Instrument

Students used a variety of means to represent concepts (e.g., models, drawings, graphs, manipulatives).

thinking among students.

Scale	Reliability Estimate	# of Items
Student Interactions	.87	5
Mathematical Discourse	.75	4
Instructional Clarity	.81	3
Mathematical Habit of Mind	.79	6
Hands-on Materials	.74	4

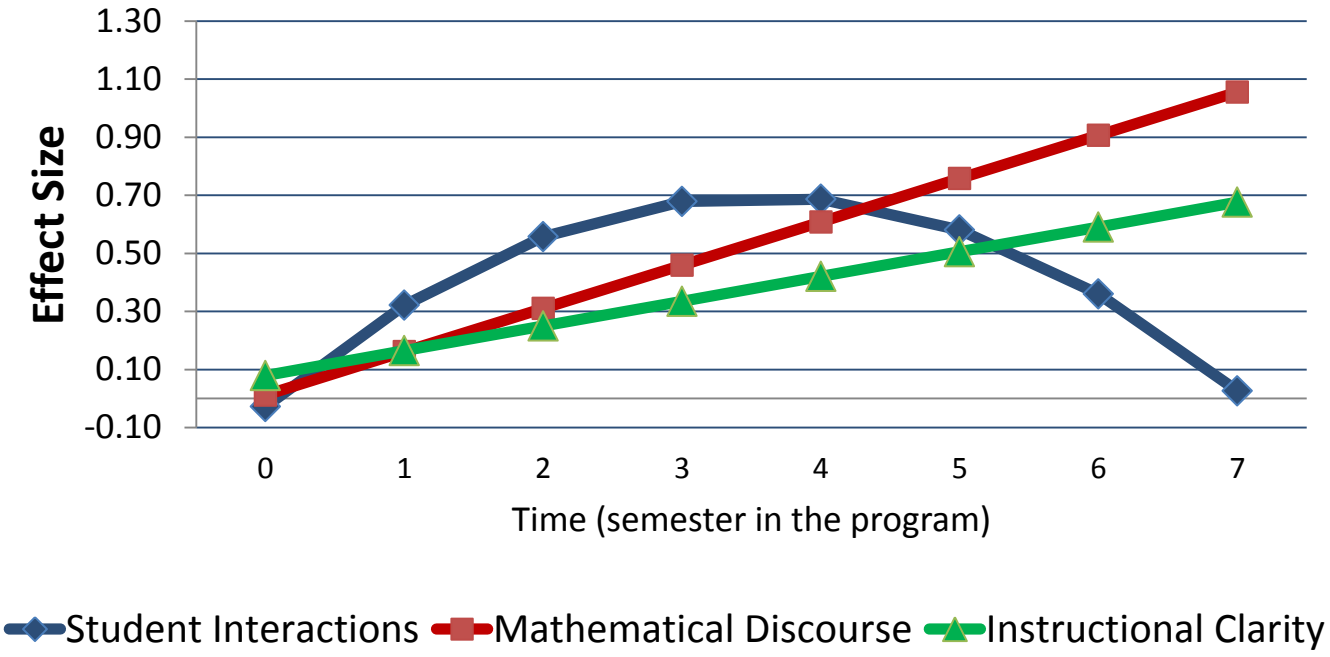
Data Analysis

Level 3: Cohorts

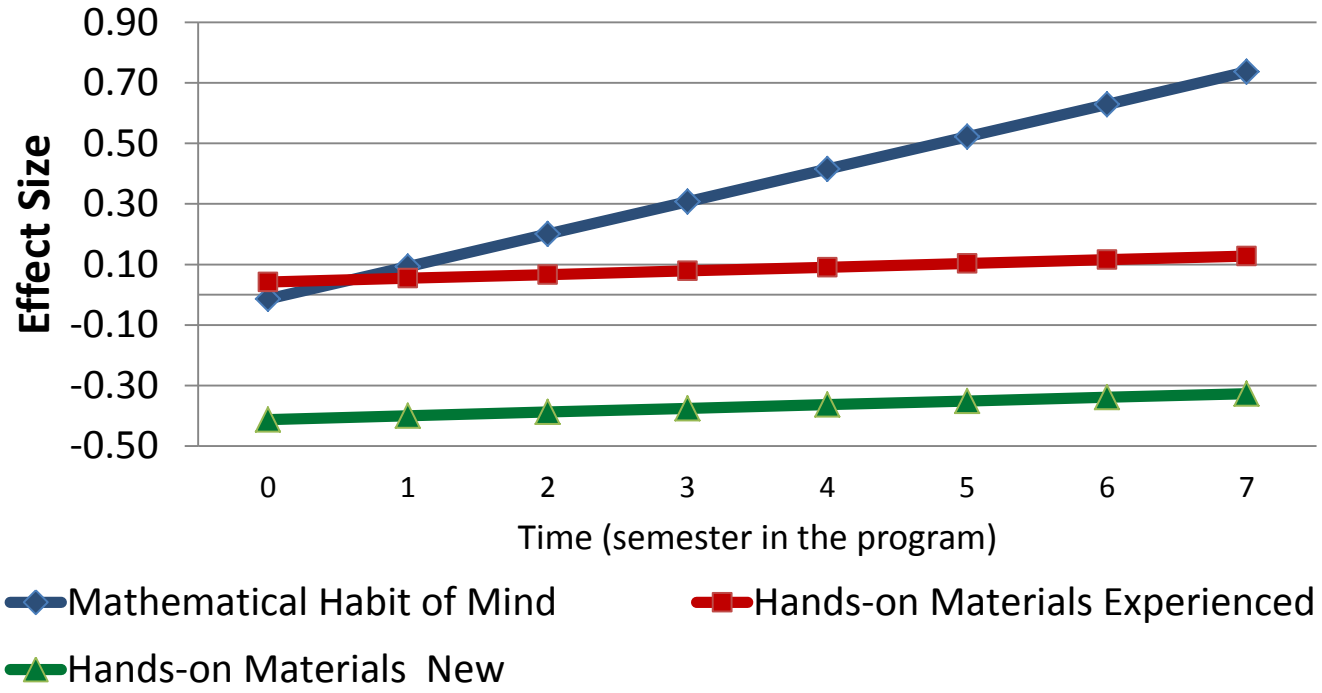
Level 2: Teachers
- # of graduate-credit hours
- Content knowledge

Level 1: Time
- Time in the program
- Years of teaching experience

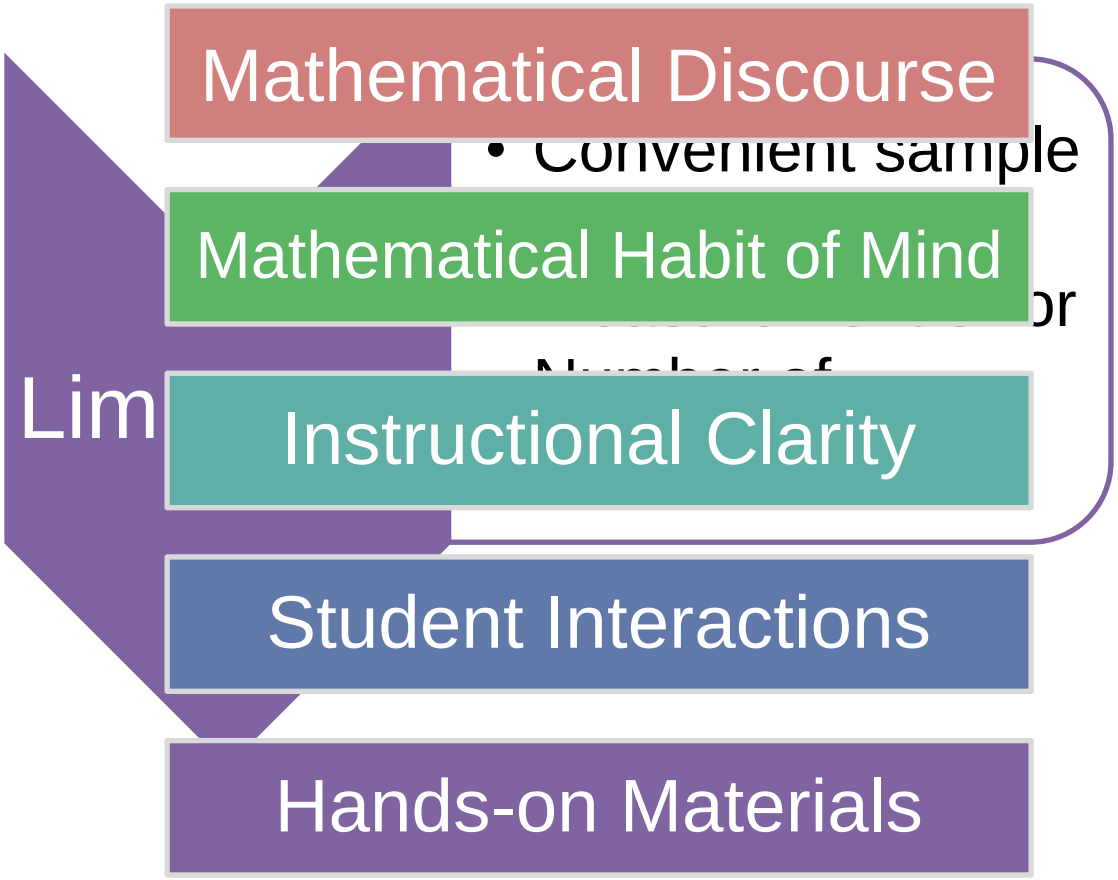
Results


1.30
1.10
0.90
0.70
0.50
0.30
0.10
-0.10
Effect Size
0
1
2
3
4
5
6
7
Time (semester in the program)
Student Interactions
Mathematical Discourse
Instructional Clarity

Results Cont.



Discussion


Mathematical Discourse
Convenient sample
Mathematical Habit of Mind
Lim
Instructional Clarity
Student Interactions
Hands-on Materials

Thanks!
Questions?