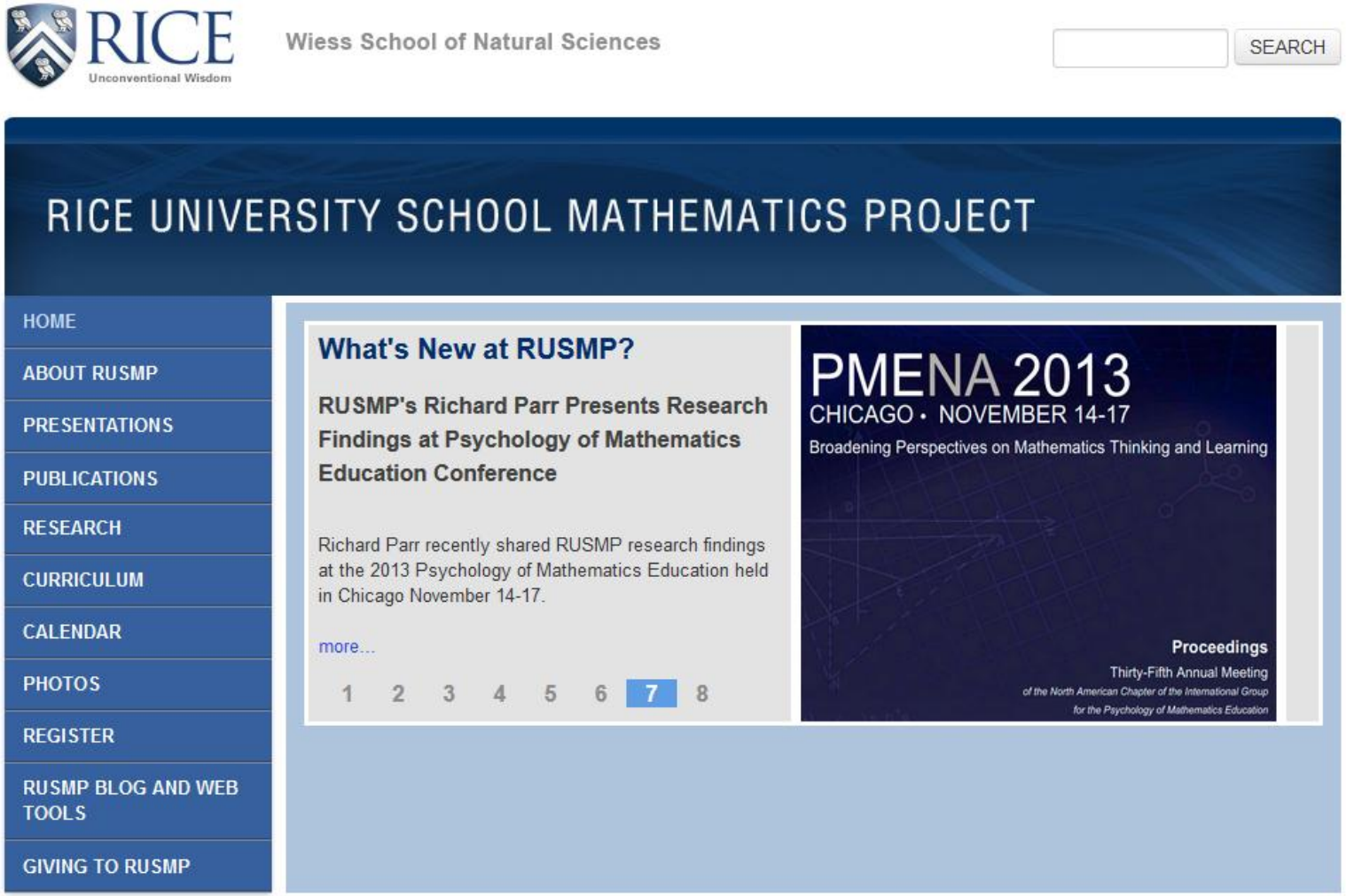
Assessing the Long-Term Impact of Professional Development on Classroom Practices of High School Math Teachers

Yasemin Copur-Gencturk
University of Houston

Outline

- Introduction
- Program Description
- Data Collection
- Results
- Discussion
- Questions & Answers

RUSMP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What's New at RUSMP?
RUSMP's Richard Parr Presents Research Findings at Psychology of Mathematics Education Conference
Richard Parr recently shared RUSMP research findings at the 2013 Psychology of Mathematics Education held in Chicago November 14-17.
more...
1 2 3 4 5 6 7 8
PMENA 2013
CHICAGO • NOVEMBER 14-17
Broadening Perspectives on Mathematics Thinking and Learning
Proceedings
Thirty-Fifth Annual Meeting
of the North American Chapter of the International Group
for the Psychology of Mathematics Education

Introduction

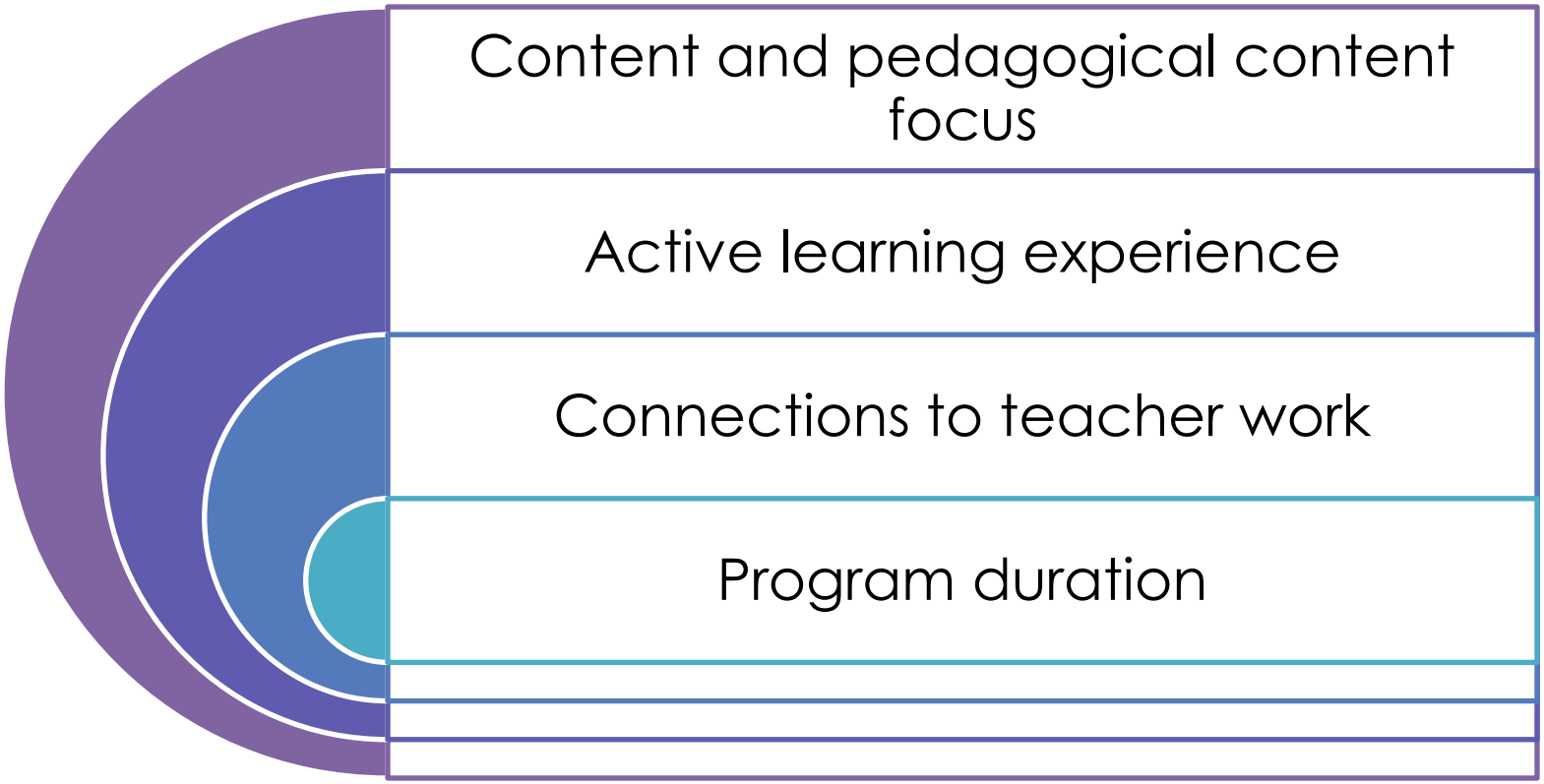
Teachers the key to student success

Effective instruction critical for promoting students' conceptual understanding

Standards-based teaching distributed inequitably across school contexts

- Teachers in low-socioeconomic-status and high-minority schools 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

Project Goals

- Deepening subject-matter knowledge specific for teaching
- Improving teachers' understanding how students learn and difficulties associated with mastery
- Improving teachers' understanding of equity and how to address better in their teaching.

Program Details

Summer institutes

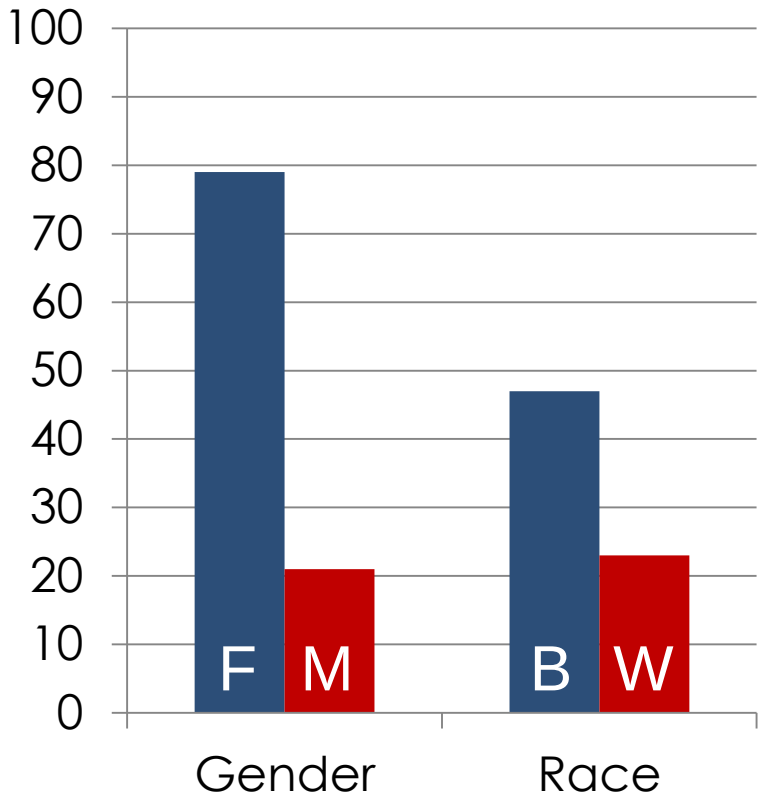
- 4-week long for two consecutive summers
- Mathematics focus: algebra and geometry during the 1st summer & combinatorics and statistics during the 2nd summer

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

- Developed by the research team of RUSMP
- Designed to capture various aspects of and factors related to instruction
- Composed of 20 dichotomous items as well as 25 items on a 6-point frequency
- Items capturing teacher behaviors as well as student behaviors on a 6-point Likert scale
- Items capturing the materials used, the content focus, and the classroom culture dichotomous.

Classroom Observation Instrument

- External evaluators conducted classroom observations beginning in fall 2005 after Cohort I completed the 1st summer program
- Classroom observations continued through spring 2010
- Two separate factor analyses for the items on binary and Likert scales

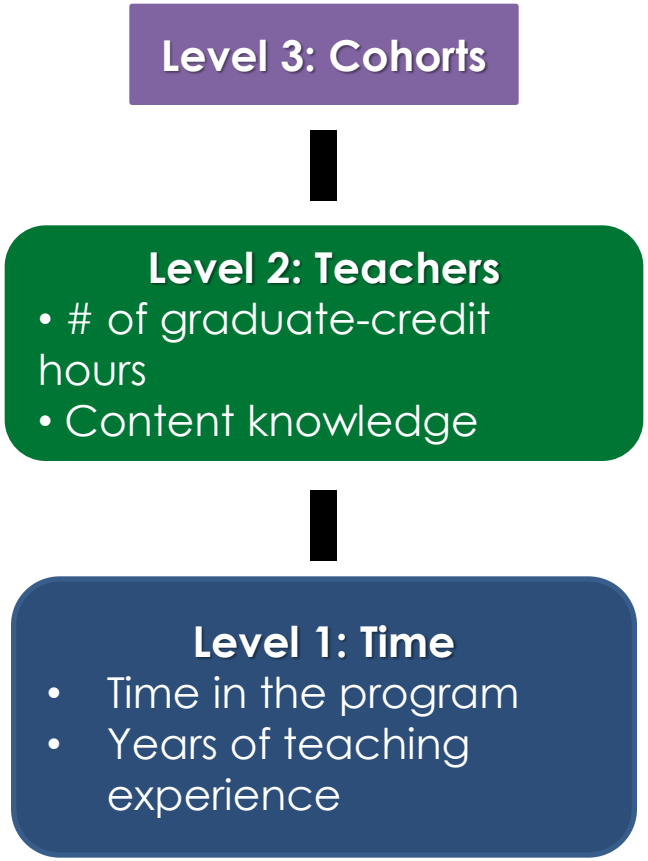
Classroom Observation Instrument

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

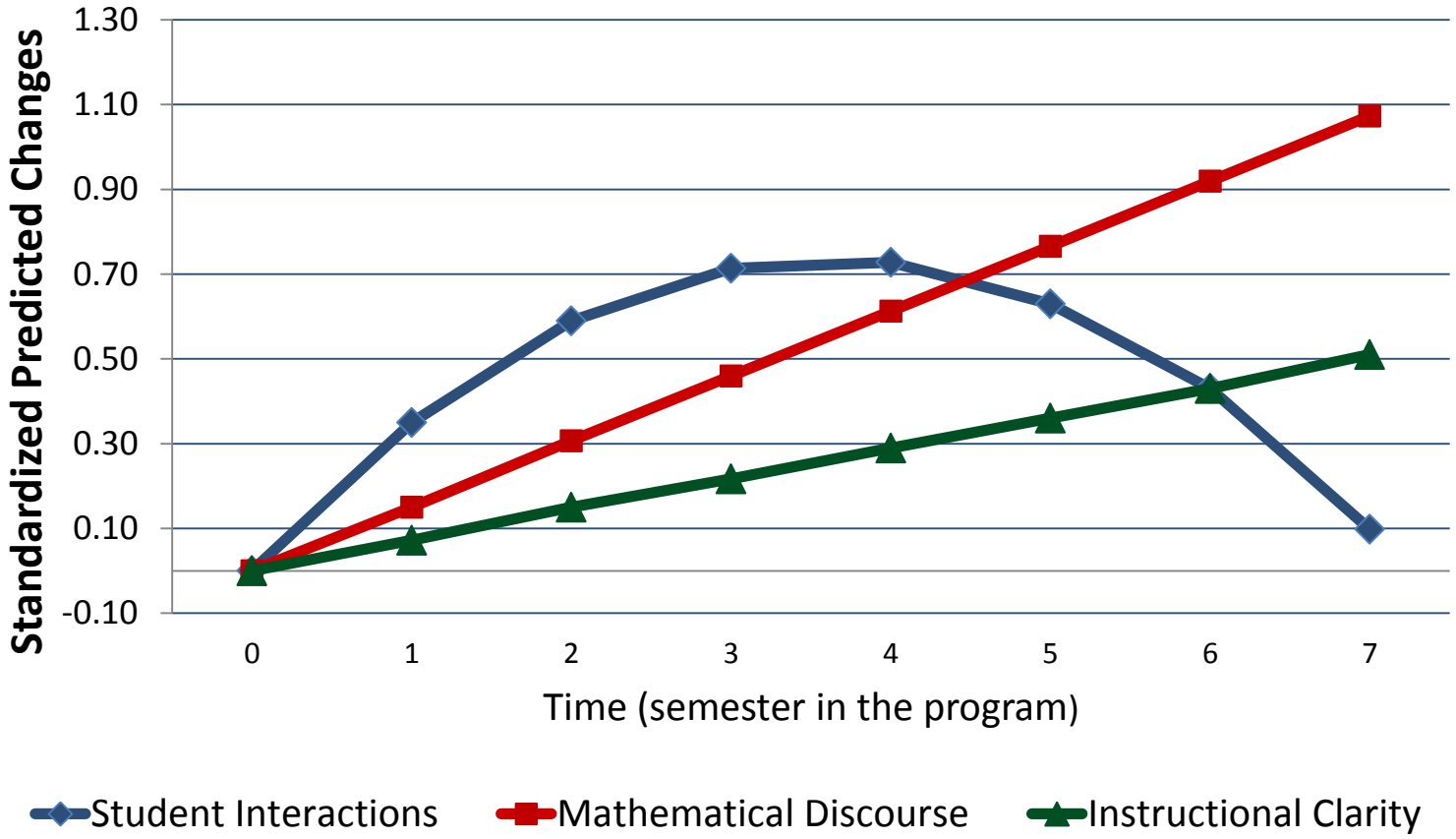
thinking among students.

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

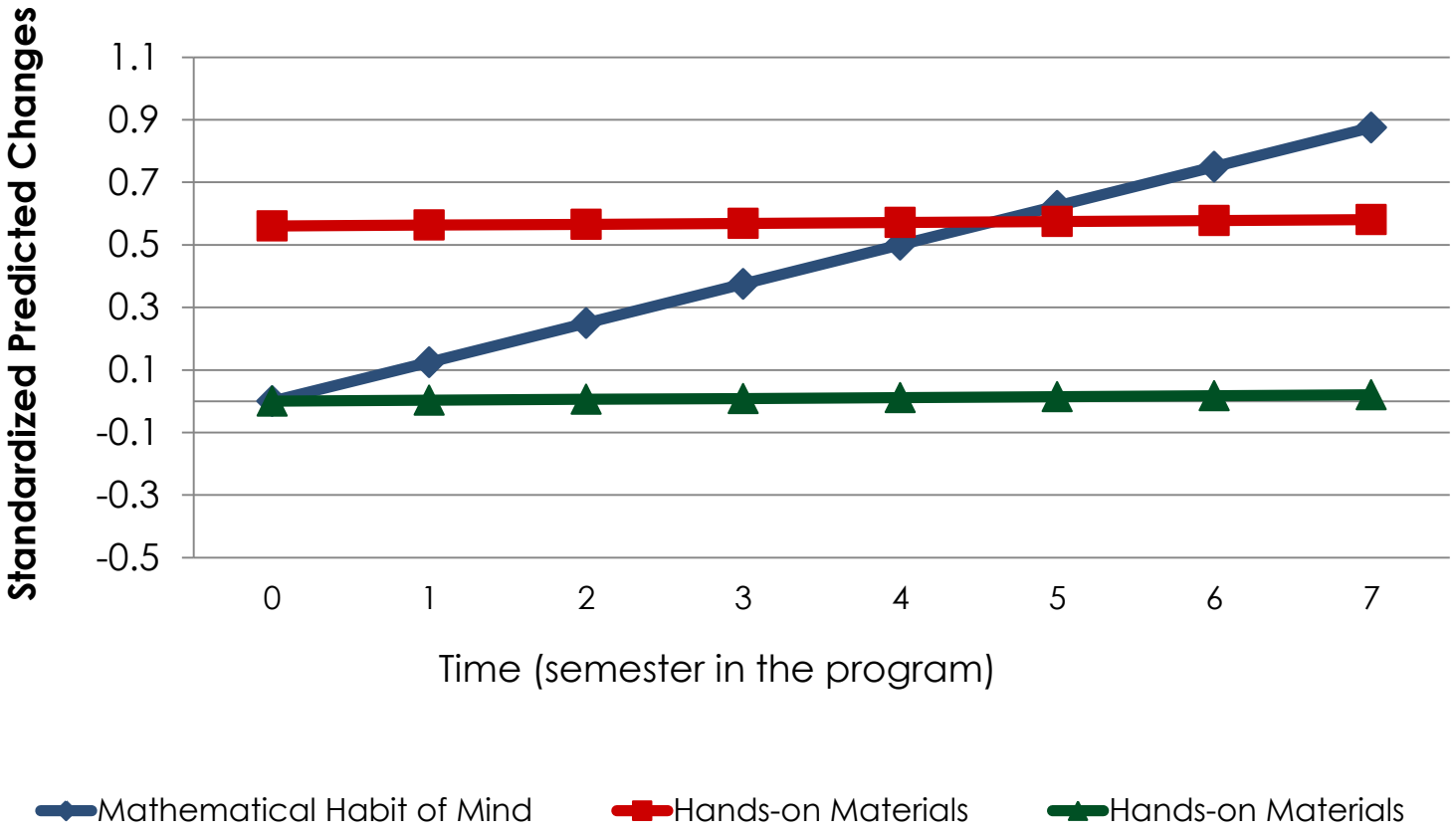
Data Analysis



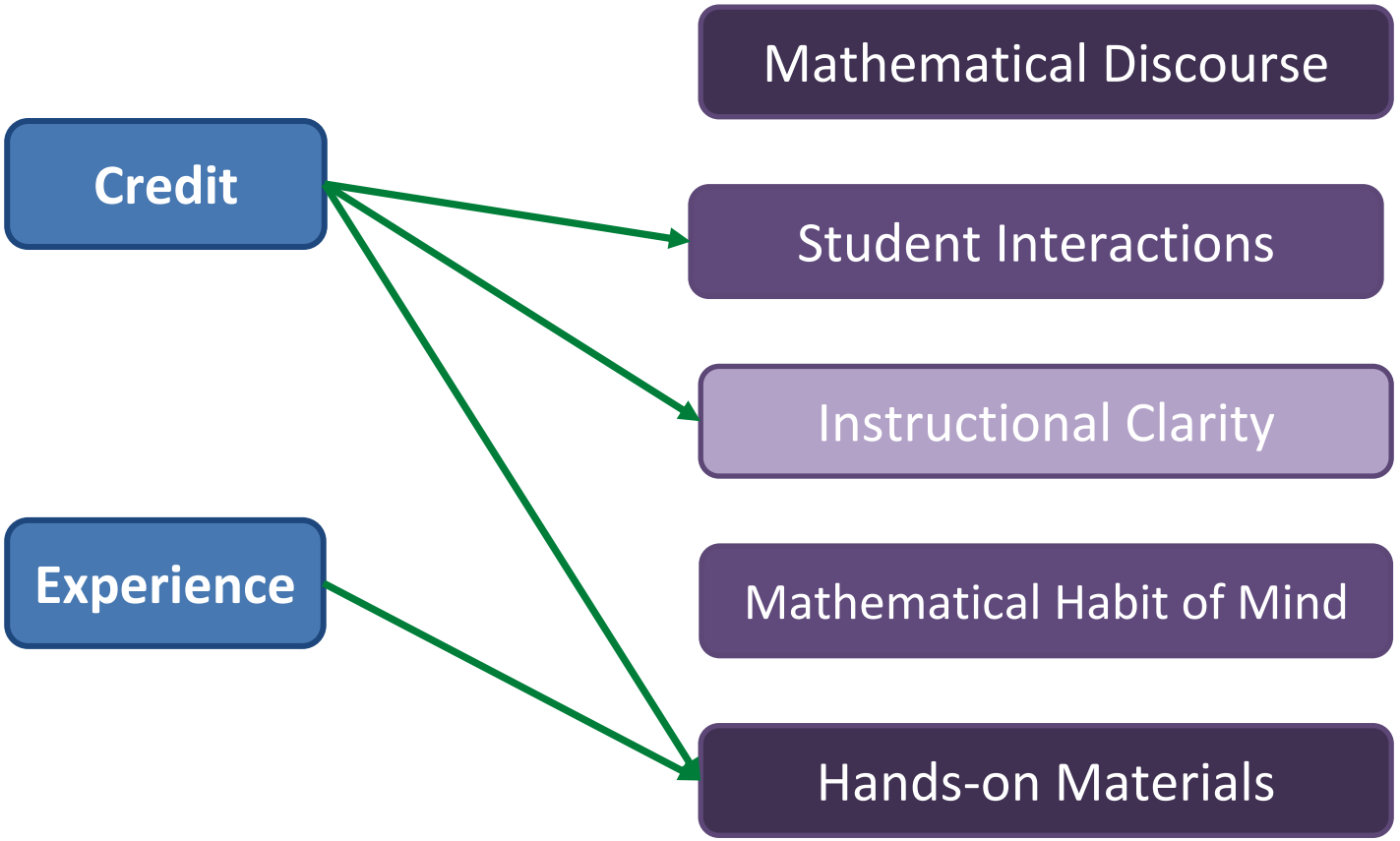
Results


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

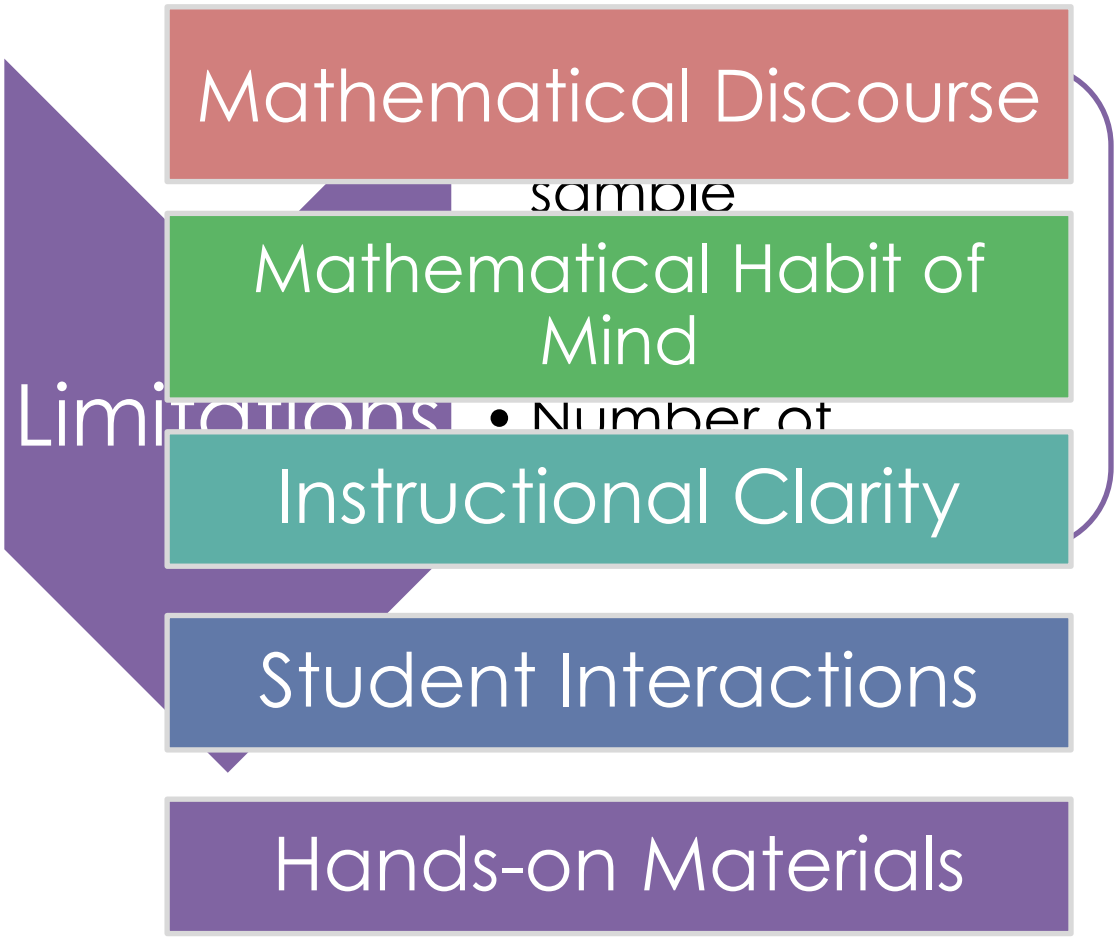
Results Cont.



Results Cont.



Discussion


Mathematical Discourse
sample
Mathematical Habit of Mind
Limitations
• Number of
Instructional Clarity
Student Interactions
Hands-on Materials

Discussion Cont.

- Certain instructional practices apt to change whereas others not
- Teachers continue to grow with appropriate support
- Lack of incorporation of concrete materials into instruction

Thanks!