

Reforming Remedial Mathematics An Evidence Based Approach

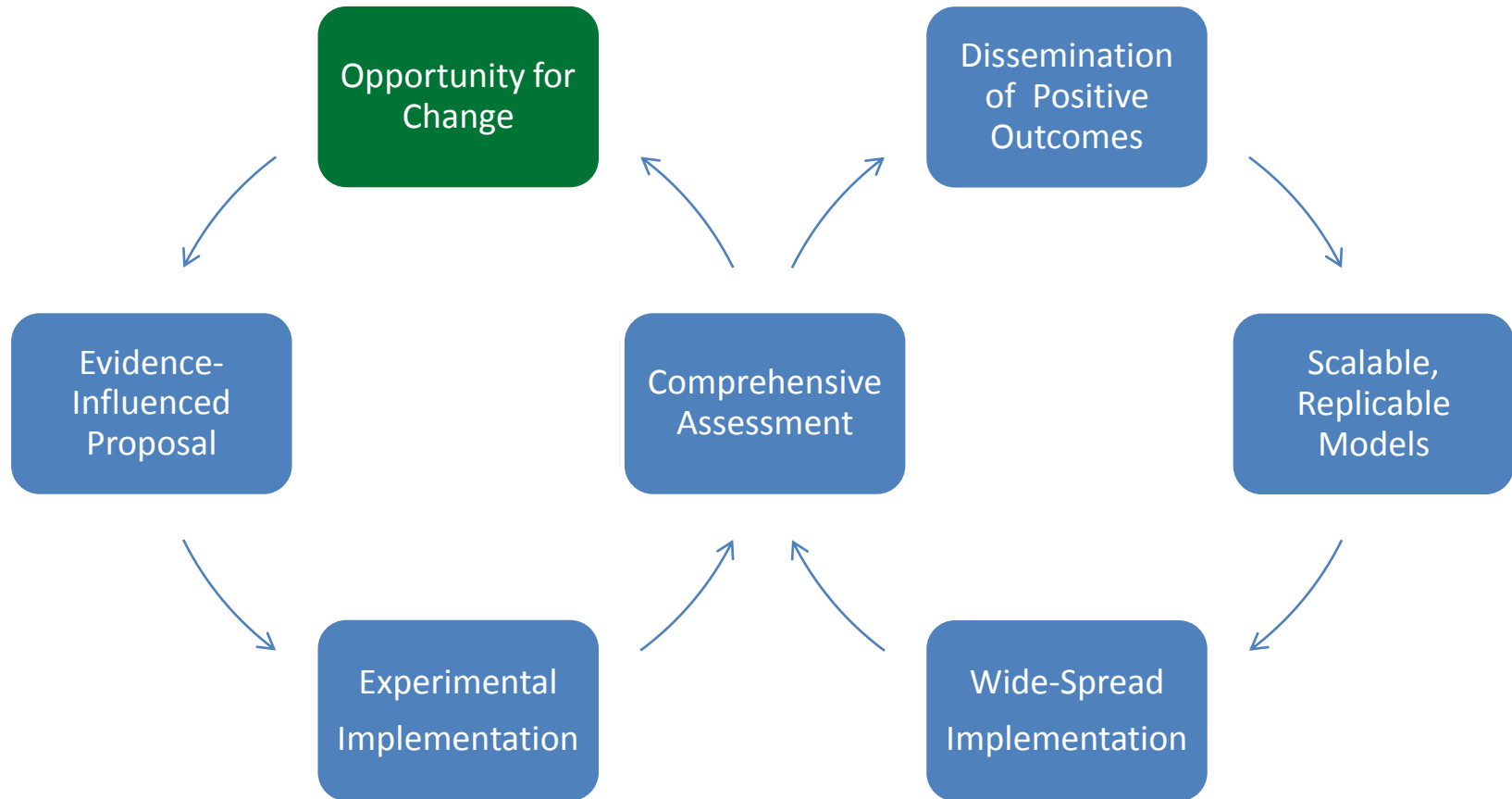
Jonathan Cornick, G. Michael Guy, Robert J. Holt, Andrew S. H. Russell

Department of Mathematics and Computer Science
Queensborough Community College, CUNY

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**2011 Spring Convocation of the College. Queensborough Community College.
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- Passing rates for MA-005 have been around 40% for years
- <10% of students placed in MA-005 ever earn a 2-year degree
- High drop-out rate: >25% get W or WU

A New Format for Arithmetic

- Four-week course; five hours per week
- Maximize time students spend working on problems
- Fully integrated curriculum
- One lab hour per week
- Ample in-class 1-1 instructor-student interaction
- Students who fail take workshop next four-week session
- Three sessions per semester

MA-005M (Debut: Fall 2009) Arithmetic WARM UPS

Workshop
Approach to
Remedial (Relearning, Refreshing, Renewing, Reviewing)
Mathematics
Using
Problem
Solving

- All students take placement exam (COMPASS)
- **Target Group:** Students with similar incoming arithmetic scores (25-29)
- **Control Group:** Students in traditional class
- **Experimental Group:** Students in WARM UPS

Two Semesters' Results Fall 2009—Spring 2010

Statistics for students with incoming arithmetic
score of 25-29 (Target Group)

	Passed	Total Students	Percent
WARM UPS	310	433	71.6%
Traditional	138	284	48.6%

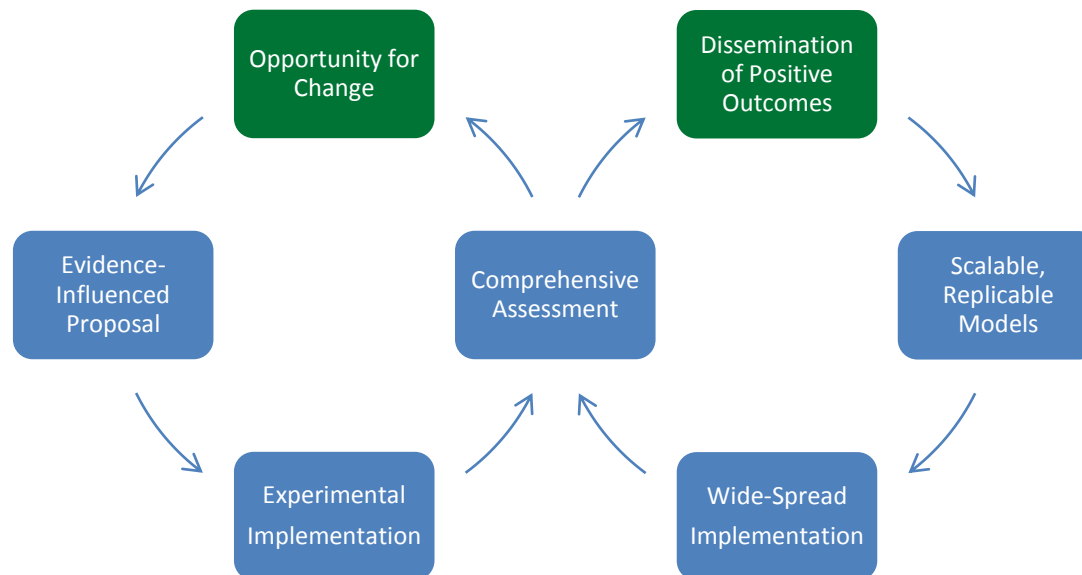
The probability of such a difference occurring by random chance is 4.4×10^{-10} according to Fisher's exact test for a two-by-two contingency table.

MA-005M Key Student Survey Results

≈460 Students Responded (3 semesters)

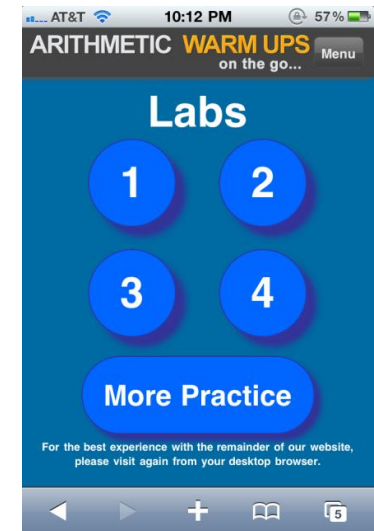
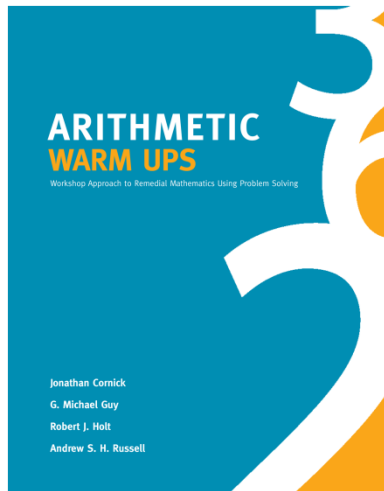
- 88% indicated class time was sufficient
- 94% indicated labs were helpful
(54% of those students wanted more)
- Many indicated in comments that they wanted more courses like this one

- Following students in subsequent courses
- Preliminary data is encouraging, but limited
- Identified additional opportunities for change
- Expanding the scope in size and curriculum



<http://ArithmeticWARMUPS.com>
Workbook

Online Website with Labs



- Inexpensive (\approx \$35 in our bookstore)
- Published by Pearson Learning Solutions

- Free and open to all
- Optimized for desktops and mobile devices

- After arithmetic, students take MA-010
- Last remedial course before credit-bearing course

New Pedagogical Approach MA-010 2010-2011

- Active Learning - One class hour/week for student problem solving
- Early Intervention - Students who fail an exam review it in the MLC or receive 5 point penalty
- Online Homework - Some sections use MathXL

MathXL Key Student Survey Results

- 86% of students have Internet access at home
- 68% said MathXL helped them to prepare for exams
- 73% said MathXL helped their performance in the class
- 71% would recommend taking a class with MathXL

We're not done yet

