Quantway®:
Using Quantitative Reasoning to Teach Developmental Math to College Students

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The Quantway® Pathway

QW1

Beginning Algebra

Intermediate Algebra

Semester 1

Semester 2
Quantway’s success rate exceeds the comparison group’s in one half the time.

The pass rate of the comparison group was calculated as successfully fulfilling dev math within two semesters as opposed to one semester for the Quantway group.
Quantway is effective across different gender and race/ethnicity groups – Spring 2012

Note. “Other” also contains data from unknown race/ethnicity status.
Productive Persistence

Ambitious Learning Goals

Networked Improvement Community

Continuous Improvement

Rapid Analytics

Language & Literacy

Advancing Quality Teaching

Productive Persistence
The Curriculum
Algebra through a QR Lense

- Concepts, not procedures
- Evidence of student learning drives the design
- Authentic contexts and real data
- Quantitative reasoning/Statistics is the focus
- Reading and writing is an integral part
- Appropriate technology
- Learning opportunities for instructors AND students

Reading and writing is an integral part
“The curriculum help students get a fundamental understanding in mathematics ... By presenting real world problem and asking them to figure it out ... They work collaboratively to figure out what the problem means, what do I have to do mathematically to solve that problem.”

Jim Wills, Quantway Faculty
Supporting Students with the Curriculum:

Productive Persistence
Students persist through challenges

Believe they can

Social ties

Material important

College skills

Supported
Students with multiple risk factors are less likely to get a passing grade.

Productive Persistence Risk Factors
- Belonging uncertainty
- Math/statistics anxiety
- Fixed mindset
- Stereotype threat
- Grit
New Roles for Faculty
"I felt bad teaching math to my students that I knew they weren't going to use .. I had to go outside my comfort zone .. When you are in a network, you can get better ideas on how to tackle your and your students' struggles."

Rachel Mudge, Foothill College
Changing Faculty Mindsets

Faculty reported that they needed to …

- Move from being a lecturer to a **guide**
- Develop **new skills** such as managing groups, leading discussions, and developing productive persistence routines.
- Learn about new settings and applications along **with** students
- **Trust** a new process of learning
- Become more **flexible** with how material unfolds in the classroom
- **Share** successes and failures within a national community in order to learn from each other.
Network Improvement Communities
A **community** tackling on a high leverage problem

Combining the worlds of **research and practice**

Focused on **continuous improvement**
New Curriculum & Pedagogy
+ Support for Faculty & Students
+ Network Improvement Community

RESULTS
### College Level Math Success Rates in Fall 2012: Quantway vs. Non-Quantway (1 course level below)

<table>
<thead>
<tr>
<th></th>
<th>Spring 2012 (developmental level)</th>
<th>Fall 2012 (college level)</th>
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</thead>
<tbody>
<tr>
<td><strong>Enrollment</strong></td>
<td></td>
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<tr>
<td><strong>Completion</strong></td>
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<tr>
<td><strong>Success</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantway</td>
<td>100%</td>
<td>41%</td>
</tr>
<tr>
<td>1 course level below</td>
<td>100%</td>
<td>37%</td>
</tr>
</tbody>
</table>

**Any Q Class**

<table>
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<tr>
<th></th>
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<th>Completion</th>
<th>Success</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantway</td>
<td>100%</td>
<td>87%</td>
<td>58%</td>
</tr>
<tr>
<td>1 course level below</td>
<td>100%</td>
<td>82%</td>
<td>58%</td>
</tr>
</tbody>
</table>

- 100% completion rate in Spring 2012 (developmental level) for Quantway.
- 87% completion rate in Fall 2012 (college level) for Quantway.
- 58% success rate in Fall 2012 (college level) for Quantway.

- 100% completion rate in Spring 2012 (developmental level) for 1 course level below.
- 82% completion rate in Fall 2012 (college level) for 1 course level below.
- 58% success rate in Fall 2012 (college level) for 1 course level below.
Many students who completed (but not necessarily passed) tested into a higher level math course and passed it.

Students struggled in the beginning with lectures and online platform.

Most formed study groups and utilized campus services.

One wants to be a math major!
Thank You