ALIGN DEGREE PROGRAMS WITH MATH PATHWAYS

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Carnegie Math Pathway, WestEd

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Onondaga Community College

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Chippewa Valley Technical College
What is the impact of Carnegie Math pathway
CARNEGIE MATH PATHWAYS

Transforming students’ mathematical learning experiences
Improving course success and college completion, and
Closing the opportunity gap

Karon Klipple
Executive Director
The Challenge

• One quarter of our students who start in the fall, won’t be there in the spring

• Since 2000, tuition has increased 142%, and wages and financial aid haven’t kept up

• Mathematics is one of THE biggest barriers to college completion. Students spend YEARS and $$ trying to complete mathematics and most fail.
The Problem

60-70% of community college students need at least one developmental math course before enrolling in college-credit courses.

80% of those students never get out of the developmental math pathway.

500,000 students in every cohort will never complete the math requirement.

We cannot continue to use the same approach and expect different results.
We need a solution that...

• **Accelerates** mathematics completion
• Significantly **increases outcomes**
• Equips students with **rigorous learning and transferable knowledge**
• **Closes the gap**, works for ALL students
• **Increases college completion**
Carnegie Math Pathways Today

18 states
90+ colleges
30,000 students
State University of New York

• 28 SUNY Institutions part of the network

• Regional/state hub
  • Faculty professional learning
  • Faculty mentorship and coaching
  • Institutional research
Ambitious, relevant, problem-centered curriculum

Comprehensive and sustained professional learning opportunities

Network engagement and improvement

Accelerated Pathway

Language and Literacy Supports

Student-focused, collaborative pedagogy

Productive Persistence interventions/practices
My experience has been positive. You know, I struggled with it..., but I think that’s just a main part of it. You’re supposed to jump in and figure it out!

I enjoy coming to class. I want to think through the problems, not just get the answer.

Having a small group allows you to have more contact with the people around you - not necessarily having to raise your hand or be on the spot in front of the whole class. Your questions can get answered a little quicker, you can come to an understanding with your peers quicker. I think it’s great.
Because I have had such a turn around in the way I feel as someone who is competent at doing math, it has started to translate into the other things that I do in my life. I feel like I am growing a new capacity.

I couldn’t imagine taking another stats class. The people in this class are more like a family than a classroom… Not only will you leave with a higher education, you will leave with friends.
QW Core replaces dev sequence

Result in transfer-level credit
Triple the Success in Half the Time (2011-2017)

**Statway**
- 1 year stretch pathway replaces 3-4 courses (2-3 dev + 1 college)
- Baseline Success - 2 Years: 15%
- Statway Success - 1 Year: 54%

**Quantway**
- 1 semester course replaces 2-3 courses
- Baseline Success - 1 Year: 21%
- Quantway Success - 1 Term: 63%
Triple the Success in Half the Time (2011-2017)

**Statway**
1 year stretch pathway replaces 3-4 courses (2-3 dev + 1 college)

67% Co-Req

**Quantway**
1 semester course replaces 2-3 courses

83% Co-Req

Baseline Success - 2 Years

Statway Success - 1 Year

Baseline Success - 1 Year

Quantway Success - 1 Term
For every 10 traditional students, more than 15 Statway students earn their two-year degree/credential
For every 10 traditional students, more than 22 Statway students earn their four-year degree.
Benefits for Students

• Complete college math, and ultimately, graduate faster, saving time and money.

• Build meaningful math skills relevant to your academic studies and career path.

• Develop lifelong learning skills that build confidence and persistence.

Benefits for Institutions

• Dramatically increase student success and completion rates.

• Retain more students- making every recruitment dollar go further.

• Build capacity for classroom and institutional reform through connection with a nation network.
WHY IT WORKS

TEACHING WITH CARNEGIE MATH PATHWAYS

MARY CRAWFORD MOHAT
MATH PROFESSOR
DESIGN PRINCIPLES

- RESEARCH-BASED INSTRUCTION AND PROFESSIONAL DEVELOPMENT
- PRODUCTIVE PERSISTENCE
- NETWORKED COMMUNITY
- RELEVANT ANALYTICS
- RELEVANT CONTENT
Classroom Productive Persistence
Summary for [4X82Q79Q] MAT 084-309 Fall 2018

Students’ perceptions of themselves as mathematical learners and doers

Students’ sense of belonging in a mathematical environment
<table>
<thead>
<tr>
<th><strong>Interest Rates and Interest Charges</strong></th>
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<tbody>
<tr>
<td><strong>Annual Percentage Rate (APR) for Purchases</strong></td>
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<tr>
<td><strong>APR for Balance Transfers</strong></td>
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<td><strong>APR for Cash Advances</strong></td>
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<tr>
<td><strong>Penalty APRs and When It Applies</strong></td>
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<tr>
<td><strong>How to Avoid Paying Interest on Purchases</strong></td>
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<tr>
<td><strong>Minimum Interest Charge</strong></td>
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</table>
HOW TO MAKE IT HAPPEN

Leading the change
Margo Keys
Vice President Student Services
CHIPPEWA VALLEY TECHNICAL COLLEGE

› 2-year community and technical college
› 4,100 full-time equivalent students (FTEs)
› Steady decline in FTEs 2010-2013
› Performance-based funding
› Strategic initiative to increase access and graduation
› Business and industry demand for more graduates
Some students took the COMPASS placement test but did not enroll.

Students in remediation path were 10 to 15 percent less likely to enroll.

Some students started the remediation path but did not progress through the term or persist to the next term.

Student loan debt increases without a credential (no certification or diploma).

Math Challenge + Writing Challenge = Access Challenge
ANALYSIS REVEALED

› National models emerged with strong results
› State legislatures mandating reform for developmental education
› Complete College America reports on research supported the premise that change is possible
WHY CARNEGIE MATH PATHWAYS?

- Standardized curriculum
  - Statway
  - Quantway (QW)
- Recognized as national leader in math redesign
- Evidence-based student success
- Networked Improvement Community
STRATEGY AND STEPS COMPLETED

› Cross functional **taskforce**: VPs, Deans, Student Services, Faculty
› **Scoped project**. Set goals, measures of success. Action plan
› **Competency** of math courses evaluated. (Existing and CMP)
› Designed four math pathways
STRATEGY AND STEPS COMPLETED

› Math competency table - Program/Degree advisory groups (Industry representatives involved)
› Department Chair/PD selected math pathway
› Updated program/degree requirement master plans
› Communication to faculty, advisors, leaders, college board
› Monitor change. Steering committee monitors metrics each term
## Math Pathway List

<table>
<thead>
<tr>
<th>Quantway</th>
<th>Statway</th>
<th>STEMway</th>
<th>Techway</th>
<th>Student Choice</th>
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</thead>
<tbody>
<tr>
<td>Diagnostic Medical Sonography</td>
<td>Manufacturing Engineering Technologist</td>
<td>Architectural Structural Design</td>
<td>Auto Collision Repair and Refinish Technician (T.D.)</td>
<td>Business Management</td>
</tr>
<tr>
<td>Criminal Justice</td>
<td>Mechanical Design Technology</td>
<td>Manufacturing Quality (T.D.)</td>
<td>Diesel/Heavy Equipment Technician (T.D.)</td>
<td>Culinary Management</td>
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<tr>
<td>Landscape Plant Turf Management</td>
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<td>Mechanical Design Technology</td>
<td>Motorcycle, Marine and Outdoor Power Products Technician (T.D.)</td>
<td>Marketing</td>
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<td>Animal Science Management</td>
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<td>Welding Fabrication (T.D.)</td>
<td>Digital Marketing</td>
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<tr>
<td>Agronomy Management</td>
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<td></td>
<td>Machine Tooling (T.D.)</td>
<td>Human Resources</td>
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<td>Industrial Mechanical Technician</td>
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<td>Organizational Leadership</td>
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<td>Health Info Management and Technology</td>
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<td>Executive Assistant</td>
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<td>Library and Information Services</td>
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<td></td>
<td>Liberal Arts Associate of Science (STEMway or Statway)</td>
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<tr>
<td>Radiography</td>
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<td>Industrial Mechanic (T.D.)</td>
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<td>Professional Communications</td>
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<tr>
<td>Residential Construction (T.D.)</td>
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<td>Foundations of Teacher Education</td>
</tr>
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- **Course Options**
  - Mathematical Reasoning - 5 cr
  - Quantitative Reasoning - 4 cr

- **Course Options**
  - Statistics I - 3 cr
  - Statistics II - 4 cr

- **Course Options**
  - College Tech Math - 5 cr
  - College Algebra - 4 cr

- **Course options**
  - Math for Tech Trades - 2 cr
  - Paired with Math success hour

- **Can take Quantway, Statway, or Principles of Biology**

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*Course Options; The Dean and Department Chair determine the course included in the degree requirements.*

Math Reasoning replaced Beginning Algebra and Intermediate Algebra at CVTC.

09-20-18
RESULTS

› Early results were positive

› FTEs rose four percent for two consecutive years

› When testing barrier was removed, math pathway course success rates remained consistent or increased
COLLABORATION STRATEGIES

› Gather all stakeholders. Strategic change
› Build rationale for the change. Tell the story over and over
› Show impact on students
› Develop project plan. Scope, timeline, measure of success
› Develop vision for project. Listen. Be firm but flexible
› Reward and recognize champions
› Use project management 101
Questions and answers