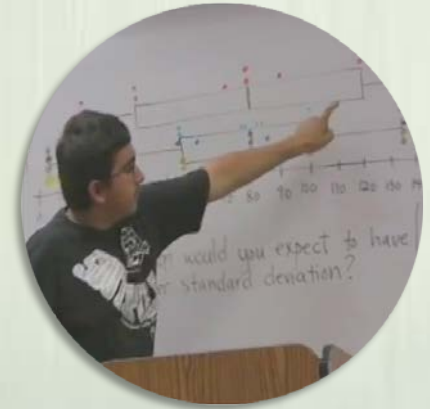




Carnegie Foundation
for the Advancement of Teaching

Quantway™ Pathways for Student Success in Community Colleges



Have you been Quantified?



The Problem: Developmental Math

60%

of community
college students

60% of CC students taking the placement exam need **at least 1 remedial course.** **Cuyahoga 92%**

3-5

additional courses

The remedial college math path can be **3-5 courses** **Cuyahoga 3 courses**

>

More students drop out **between courses** than from an actual class

1

remedial math
pathway

Only **one remedial math pathway**, regardless of major

Solution: New Mathematics Pathways

Two 1-year contextualized pathways for elementary algebra students

1

STATWALYSM

“To-and-through” college-level **statistics**

2

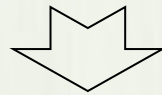
QUANTWALY

“To-and-through” college-level **quantitative reasoning**

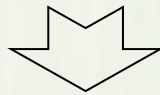
The Quantway Goal

Increase the percentage of students who complete a college-level non-stem, math course in one year:

Students are ready for elementary algebra



Quantway™ I course



Liberal Arts college-level math course

Quantway Learning Outcomes

- **Numerical Skills**
- **Proportional Reasoning**
- **Algebraic Reasoning**
- **Reasoning with Functions**

Solution: More than a curriculum

- Combines **research** and **practice**
- Applies **cognitive and learning theory**
- Supports **pedagogy** and **professional development**
- **Removes barriers** of language and literacy
- Works on **continuous improvement** through community network



Instructional Design Principles

- 1) **Evidence of student learning** drives the design and revision of Quantway™
- 2) Development of **mathematical literacy and quantitative reasoning** is the focus of the lessons
- 3) The focus of Quantway™ instruction is on **concepts**, not procedures
- 4) Instruction in mathematics makes use of **authentic contexts and real data**
- 5) **Struggling** with problems – both large and small – is a core part of the instructional experience

Instructional Design Principles

- 6) Each lesson is designed to help students make progress toward **clearly stated learning goals**
- 7) Specialized terminology, when it supports discussion, is modeled by the instructor
- 8) The Quantway TM students have access to **appropriate technology**
- 9) Lessons **provide learning opportunities** for instructors as well as students
- 10) **Reading and writing** about quantitative information should be an integral part of activities and assessments

The Roadmap to Success

Create a new course that challenges students using real world applications following these guiding principles:

- Student will struggle with important mathematics
- Make explicit connections to mathematical concepts
- Use deliberate practice by applying concepts and procedures in order to solve problems

Classroom Experience



Comparative Concepts

Algebraic Evaluation

Evaluate:

$$3x - 5$$

when

$$x=4$$

Quantway™ Evaluation

The formula for the braking distance of a car is

$$d = \frac{V_0^2}{2g(f + G)}$$

1. Let $f = 0.8$ and $G = 0.05$. Write a simplified form of the formula using these values for the two variables.
2. How can you verify your predictions about the relationship between velocity and braking distance?

Comparative Concepts

Linear Equations

Find the equation of the line passing through the points

$(2,-4)$ and $(-3,7)$.

Write the equation in slope-intercept form.

Quantway™ Linear

You want to have your own phone and need to decide which option costs less. Note that the descriptions of these options are examples of verbal representations of the mathematical relationships.

- **Per-Minute Pricing:** There is a monthly fee of \$15.99 plus \$0.13 per minute.
- **Unlimited Plan:** The plan costs \$39.99 per month. The phone is free and unlimited minutes of talk time are included, but a two-year contract is required.

Find linear models to help you decide.

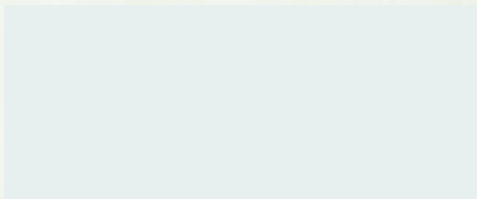
Classroom Experience





Lesson

Lesson 1.1.1: Introduction to Quantitative Reasoning



Lessons

Lesson 4.1.7: Personal Loans

Three Main Questions

1. What are the effects of contextualization overall?

2. For which students and in what kind of institution/ instructional contexts does contextualized curricula work best?

3. How will we know that it's working?

Assessment Criteria

- **Performance in the follow-up college-level liberal arts math course**
- **Completion of student college program**
- **Transfer to 2- and 4-year colleges**

Challenges

➤ Internal

- Communication with students
- Communication within Institutions
- Faculty concerns

➤ External

- Accreditation through OBR
- Transfer Agreements

Discussion

What challenges do you foresee if you tried to implement something like Quantway™?

Discussion

- What experiences have you had at your institution with innovative initiatives?

- What have you learned?

Discussion

What other topics could we look at contextualizing? How could we do this?

Contact Information

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