Developing Prime Corequisite and Accelerated Math Courses

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Traditional Mathematics Sequence

Term 1: Elementary Algebra
Term 2: Intermediate Algebra
Term 3: College Math

Statway 1 & 2

Quantway 1 & 2

College math credit achieved in two terms.
Quantway 1: Nearly triple the Success in Half the Time

Baseline Success - 1 Year: 21%
Quantway Success - 1 Term: 59%
Statway: Triple the Success in Half the Time

Success Rate

Baseline Success - 2 Years: 15%
Statway Success - 1 Year: 51%
The Problem

Despite success rates, two terms deemed not fast enough.

- Still opportunities to lose students (e.g. between terms)

Policies and pressure to move towards co-requisite and accelerated models.

The Pathways had to adapt to fit these structures. We have or are currently creating accelerated and co-req models for both Quantway and Statway.
Design Principles for Restructuring Pathways

1. Maintaining *pedagogical design principles AND learning outcomes*
   a. When moving from full Pathways sequence to co-req/accelerated
   b. In each component (e.g. in both co-req and college-level course components)

2. *Flexibility* of implementation
   a. Develop resources that can be used in a variety of models
   b. E.g. Variable credit model

3. *Guides* for recommended use of materials
   a. To support known or typical variations of implementation.
Pathways Instructional System

Learning Opportunities
- Productive Struggle
- Explicit Connections
- Deliberate Practice

Statway/Quantway Curricula

Pathways Pedagogy

Productive Persistence

Language & Literacy Supports

Ambitious learning goals & curricular materials designed with authentic and relevant problem situations

Research-based collaborative and student-centered pedagogical practices that support deep and long lasting understanding
Challenges We Are Facing

1. Maintaining *pedagogical design principles AND learning outcomes*

Challenges

Productive Persistence (socio-emotional supports)

- Structure and balance across course components

Time

- Balancing content coverage with effective pedagogy (e.g. productive struggle, deliberate practice) with shorter course structures)
Challenges We Are Facing

2. *Flexibility of implementation*

Challenges

Meeting Everyone’s Needs

- Many different implementation strategies across and even within institutions.

- Instructors need to make decisions about what is best for them, their students, and their college, as well as meet policy demands.
Challenges We Are Facing

3. *Guides* for recommended use of materials

Challenges

Developing Recommendations

• For what material is essential and what is supplementary support for those that have time

• To help faculty to select the materials appropriate for their students
Our Progress and Strategies
These all result in college level credit for Quantway 2.
These all result in college level credit for intro to statistics.
Quantway Co-Req

Description

1-Term

• Quantway 2 (college credit): 3 credit hours
• Co-req material: 1-3 contact hours (may vary)

Purpose

Development Process

• Alignment analysis of QW 1 materials to QW 2, at the lesson AND concept level
• Designing the structure of the co-req materials and restructuring material from QW 1 into co-req structure
• Identifying gaps; finding or developing new material
Structure of Co-Req Materials

Corresponding to each QW2 lesson:

1) Co-req Lesson Documents
2) Practice problems
3) Algebra fundamentals

Initial plan was to have one set of these documents per QW2 lesson.

-Labeling the content by learning outcome.

May create separate documents for each learning outcome for more easily targeting specific concepts.
Guide for using Co-Req materials

Instructors can select among the co-req resources, depending on their course structure and student needs.

The Co-Req Guide will indicate which learning opportunities, practice problems, etc. are vital, for those with less time (e.g. 1 credit hour co-reqs), as well as provide suggestions for structuring co-req class time.
Outstanding Issues / Questions

How best to integrate Productive Persistence into the Co-Req materials.

Finalizing structure of each Co-Req lesson document so we can create the user guide.

How to support algebra learning to enhance and support (not replace) the Quantitative Reasoning material as an option for instructors.
Quantway Accelerated

**Description**

1-Term

- 4 or 5 credit hours

**Purpose**

**Development Process**

- Use QW 2 as the base
- Integrate supporting material from QW 1
- Ensure coherent flow with minimal repetition
Statway Accelerated

Description

1-Term
- 6 credit hours

Purpose

Development Process
- Developed by institutions. The Pathways support institutions that want to run various administrations of high contact hour Statway courses.
Statway College-level

Description
1-Term
- 3 credit hours

Purpose

Development Process
- Identifying learning outcomes of Statway Pathway needed for college-level intro to stats course.
- Removing developmental support and condensing college-level material into a cohesive 3-credit course (E.g. rewriting, reordering, and merging lessons)
Statway Co-Req

Description

1-Term
• Statway College: 3 college credit hours
• Co-req materials: 1-3 credit hours (may vary)

Purpose

Development Process
• Structuring the Co-Req materials (similar to QW co-req)
• Repurposing developmental content from the full Statway Pathway in the Co-Req material
• Identifying gaps and developing/finding new material
Outstanding Issues / Questions

How best to integrate Productive Persistence into the Co-Req materials.

Finalizing content of Statway College to build aligned Co-Req materials.

How to support algebra learning to enhance and support (not replace) the statistics content as an option for instructors.
Networked Approach: Curriculum Committee
Student Success

Students can succeed at high rates if the course is well-structured with effective content, pedagogy, and productive persistence.

Pathways have shown high rates of success with both Statway Accelerated and Quantway Co-Req.

Results will be evaluated as these options continue to expand.
Closing thoughts

There are many ways schools and faculty will want to implement co-req and accelerated designs.

You need to find a way to support the variations while maintaining your pedagogical design principles and without sacrificing key content or learning outcomes.

Course design should support flexible implementation with recommended strategies. User guides (for faculty and administrators) could be helpful.
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