The Problem

- Over 60 percent of entering community college and one-quarter of entering four-year college students are referred to developmental education.

- Students assigned to developmental education are less likely to earn a college credential.

- Developmental education is expensive:
  - Up to $2 billion per year at community colleges and $500 million per year at four-year colleges (Strong American Schools, 2008).
  - State expenditures in the tens of millions of dollars
Assessment and Placement

- Confusion about what it means to be “college ready”—no obvious cutoff point, and a single cutoff point exaggerates the distinction between developmental and college-ready
- Tests may be reasonable predictors of college-level success, but are less effective at identifying who is likely to benefit from dev ed (or alternative interventions).
- Assessments do not provide adequate diagnostic information.
- Students are confused about the process and are not well advised (Venezia, Bracco, & Nodine, 2010).
In-Order Completion and Enrollment: GK

- Sample: 2001-2005 cohorts, tracked for three years

- Percentages in ( ) indicate skipping that level & enrolling in higher level

- Percentages in blue indicate total enroll, including skippers

- 10% total GK completion accounts for skippers who enrolled in a higher level and progressed
• Developmental education is minimally effective, at best.

• Current system neglects the needs of weaker “college ready” students.
Reform of Dev Ed

• Approaches to reform:
  – format/structure (re-packaging or re-organizing)
  – curriculum/content (what content do students really need to know?)
  – pedagogy (change in teaching strategies)

• CCRC Assessment of the Evidence Series also addresses:
  – validity and diagnostic value of placement testing
  – student supports
  – broader college context
Developmental Education Reform Strategies

• Problem is well-defined but solutions are likely to vary
  – Empirical evidence on “what works” is limited

• Experimentation occurring at many colleges, though mostly at a small scale
  – Motivated faculty recruiting like-minded colleagues to try new approaches
  – Relies mostly on “soft” money
  – Lacking resources to rigorously evaluate
Reform Adoption Cycle

- In practice, structural tends to precede curricular and pedagogical but components are not mutually exclusive.
Structural Reforms

• Focus on reorganization of instructional time and content
  – Designed to accelerate, decelerate, or otherwise repackage instructional delivery
  – Facilitates the break down of content into units that can be delivered in non-traditional ways
  – Scheduling and other logistics as well as availability of flexible instructional materials can present challenges

• Examples: acceleration/“stretch” courses, modularization, and mainstreaming
Curricular Reforms

• Focus on rationalizing or refining content
  – Intended to deliver a more relevant and meaningful curriculum
  – Explicitly prepares students for subsequent coursework
  – May require course development processes and significant revisions to instructional materials

• Example: alternative courses (e.g., Statpath)
  – These models frequently straddle structural and curricular reforms
Pedagogical Reforms

• Focus on changes to teaching
  – Encourages use of instructional practices explicitly intended to enhance student learning
  – Requires rigorous, in vivo diagnosis of students’ needs and progress
  – Involves experimentation and continuous improvement approach
  – Hardest reform to enact, mandate, and study

• Examples: student-centered activities, metacognition, and conceptual learning
Accelerating Progress in Mathematics

Statpath: A new, experimental one-semester pathway to college-level Statistics for non-STEM students

In this part of the presentation:
• Rationale for developing Statpath
• Preliminary student achievement data
• A video glimpse into the Statpath classroom
Rationale for Sequence Redesign

Exponential Attrition:
- Enrolled in Elementary Algebra 292
- Passed Elementary Algebra 185 (63% of 292)
- Enrolled in Intermediate Algebra 118 (64% of 185)
- Passed Intermediate Algebra 96 (81% of 118)
- Enrolled in College-level course 55 (57% of 96)
- Passed College-level math 49 (89% of 55)
- Overall gateway course completion rate 17% (49 of 292)
  \[(0.63)(0.64)(0.81)(0.57)(0.89)=0.17\]

Improving success and persistence rates will not significantly improve gateway completion rates. We must shorten the pipeline, reduce exit points.
Rationale for Statpath

Student Pathways:
70-80% of LMC students who complete the developmental math sequence and take a college-level math course take Statistics. They are not STEM students.

Misalignment of Developmental Math with Statistics:
Very little algebra is needed to be successful in Statistics
Rationale for Statpath
Misalignment of Developmental Math with Statistics
Statpath: the course design principles

- Design backwards from Statistics
- College-level thinking and skills: data analysis and statistical literacy
- Just-in-time remediation of relevant algebra and arithmetic skills, no front-loading of remedial work
- High standards, high levels of in-class support
- Struggle and in-depth attention to concepts
- Attention to the affective domain
- Varied pedagogy: cycles of investigation and student presentation (projects, papers); structured group work to develop concepts; use of technology
Student Achievement Data: Proof of Concept

Brief summary of 1st cohort data:

Success in accelerated Pre-Stats course: 76% (22 of 29)
Persistence to college-level Statistics: 82% (18 of 22)
Success in college-level Statistics: 94% (17 of 18)
Overall college-course completion rate: 59% (17 of 29)

Partial summary of 2nd cohort data:
Success in accelerated Pre-Stats course: 89% (49 of 55)
Persistence to college-level Statistics: 98% (48 of 49)
Gateway Completion: Proof of Concept

Completion rates of college-level Statistics by placement level:
Comparison of 1st Statpath cohort with general LMC population

Intermediate Algebra:
Statpath 89% (n=8), Traditional Sequence 29% (n=320)

Elementary Algebra:
Statpath 50% (n=12), Traditional Sequence 17% (n=292)

Arithmetic/Prealgebra:
Statpath 38% (n=9), Traditional Sequence 5% (n=155)
Snapshots of Student Learning

Statpath students grapple with a problem from the national statistics exam, CAOS, during 6th week of pre-Stat course

Video filmed and edited by Jose Reynoso, a student co-inquirer working with Snell through a grant from the Faculty Inquiry Network

http://vimeo.com/9055488 (or go to Vimeo and search for Statpath)

Los Medanos College
Pittsburg CA
Initiating and Scaling a Disruptive Innovation

Getting started:
• Get stakeholders to analyze pipeline data for developmental sequence
• Design an experimental pilot that reduces exit points
• Agree on data collection upfront (gateway completion rates and ??)

Scaling:
• Look for ways to claim purview of the grey policy areas
  --- the issue of mandated prerequisites
For more information:

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Community College Research Center
Institute on Education and the Economy, Teachers College, Columbia University
525 West 120th Street, Box 174, New York, NY 10027
E-mail: ccrc@columbia.edu
Telephone: 212.678.3091

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