SPREADING ACCELERATED REMEDIATION

The California Acceleration Project supports California's 112 community colleges to redesign their English and Math curricula to increase student completion:

- Workshops and presentations to 100+ CA colleges

- Professional development for faculty from 42 colleges to offer new accelerated English & math courses

- Extensive web resources to support colleges at all phases of redesigning remedial curricula

3csn

http://cap.3csn.org

#remedialED

HIGH ATTRITION IN REMEDIATION: CALIFORNIA-WIDE DATA

The lower a student begins in remedial sequences, the lesser their likelihood of completing college-level courses:

- Just 16% of students who begin 3 or more levels below college English complete college English in 3 years.

- Just 6% of students who begin 3 or more levels below college math complete college math in 3 years.

- Students of color are disproportionately placed into these lower levels. More than 50% of Black and Latino community college students are placed 3+ levels below college math.

#remedialED

REMEDIAL ATTRITION: A STRUCTURAL PROBLEM

Students placed 2 levels below college English/Math face 6 "exit points" where they fall away:

- Do they enroll in the first course?
- If they enroll, do they pass the first course?
- If they pass, do they enroll in the next course?
- If they enroll, do they pass the second course?
- If they pass, do they enroll in the college-level course?
- If they enroll, do they pass the college-level course?

Students placed 3 levels down face 8 exit points.

ILLUSTRATION: CHABOT COLLEGE

Students beginning two levels below College English:

- Do they enroll in the first course?   ??%
- If they enroll, do they pass the first course?   66%
- If they pass, do they enroll in the next course?   93%
- If they enroll, do they pass the second course?   75%
- If they pass, do they enroll in the college-level course?   91%
- If they enroll, do they pass the college-level course?   78%

$(0.66)(0.93)(0.75)(0.91)(0.78) = 33\%$

Fall 2006 Cohort. Students tracked from their first developmental English enrollment and followed for all subsequent English enrollments for 3 years. Pass rates include students passing on first or repeated attempts within timeframe. Basic Skills Cohort Tracker, DataMart.

#remedialED

A THOUGHT EXPERIMENT…
IF MORE STUDENTS PASSED THE FIRST COURSE,

How many would complete college level?

$$(0.66)(0.93)(0.75)(0.91)(0.78) = 33\%$$

If 75% passed the first course…

37%

If 80% passed the first course…

40%

If 90% passed the first course…

45%

What if 90% passed and persisted <u>at each point?</u>

59%

BOTTOM LINE

Improving our results *within* the existing multi-level system will never be enough.

We need to fundamentally restructure our approach to under-prepared students and eliminate the exit points where we lose them.

ALTERNATIVES TO MULTI-SEMESTER REMEDIATION IN READING/WRITING

Student completion of college English is significantly higher in accelerated models of remediation:

- Co-requisite models enroll "remedial" students into college-level courses and provide additional time and support to help them succeed.

- One-semester pre-requisite models provide a single well-designed semester of preparation to students with any placement score.

Shortening the remedial pathway by a semester is correlated with 20+ percentage points higher completion of college English in established models.

CO-REQUISITE MODEL

Community College of Baltimore County

Upper-level remedial students enroll in a regular college English course, plus a small support class with the same teacher.

Completion of College English

	Traditional remedial sequence	Accelerated Learning Program
CCBC	40%	75%

Jenkins, D. et al (Sept. 2010). A Model for Accelerating Academic Success of Community College Remedial English Students: Is the Accelerated Learning Program (ALP) Effective and Affordable?(CCRC Working Paper No. 21). New York: Community College Research Center, Teachers College, Columbia University.

ONE-SEMESTER ACCELERATED PRE-REQUISITE TO COLLEGE ENGLISH

Chabot Las Positas Community College District

Integrated reading and writing course open to students with *any* placement score below college-level; alternative to two-semester remedial sequence.

Completion of College English

	2-semester remedial path	Accelerated course
Chabot College	28%-34%	52%-57%
Las Positas College	35%-48%	67%-68%

3-year completion data from the Basic Skills Cohort Tracker. Student cohorts beginning in Fall 2000, 2003, 2006, and 2008. Repeats included.
http://datamart.cccco.edu/Outcomes/BasicSkills_Cohort_Tracker.aspx

COMMON FEATURES

At CCBC, Chabot, & Las Positas, accelerated models…

- Are implemented at large scale, serving majority of students below college level

- Serve students with wide range of placement scores

- Give "remedial" students same tasks as "college-level" students, but with more time and support

ACCELERATED REMEDIATION IN MATH

Paradigm Shift: Math Pathways

Remediation not a repeat of K-12 mathematics through Algebra II. Instead, support tailored to the student's intended program of study or meta-major.

- Intensive algebra preparation for students pursuing STEM, other calculus-based majors

- Students in other majors enroll in college-level Statistics or Liberal Arts Math, with co-requisite or accelerated pre-requisite support

#remedialED

WHY PATHWAY REDESIGN:
MISALIGNMENT BETWEEN ALGEBRA & STATISTICS

Algebra Skills needed for Statistics

Table of Contents from a traditional Elementary & Intermediate Algebra text

- **Chapter 1: Some Basic Concepts of Arithmetic and Algebra**
  - 1.1: Numerical and Algebraic Expressions (23)
  - 1.2: Prime and Composite Numbers (20)
  - 1.3: Integers: Addition and Subtraction (25)
  - 1.4: Integers: Multiplication and Division (21)
  - 1.5: Use of Properties (21)

- **Chapter 2: The Real Numbers**
  - 2.1: Rational Numbers: Multiplication and Division (20)
  - 2.2: Rational Numbers: Addition and Subtraction (21)
  - 2.3: Real Numbers and Algebraic Expressions (21)
  - 2.4: Exponents (22)
  - 2.5: Translating from English to Algebra (22)

- **Chapter 3: Equations, Inequalities, and Problem Solving**
  - 3.1: Solving First-Degree Equations (20)
  - 3.2: Equations and Problem Solving (21)
  - 3.3: More on Solving Equations and Problem Solving (23)
  - 3.4: Equations Involving Parentheses and Fractional Forms (2
  - 3.5: Inequalities (21)
  - 3.6: Inequalities, Compound Inequalities, and Problem Solving

- **Chapter 4: Formulas and Problem Solving**
  - 4.1: Ratio, Proportion, and Percent (21)
  - 4.2: More on Percents and Problem Solving (20)
  - 4.3: Formulas: Geometric and Others (21)
  - 4.4: Problem Solving (20)
  - 4.5: More About Problem Solving (23)

- **Chapter 5: Coordinate Geometry and Linear Systems**
  - 5.1: Cartesian Coordinate System (22)
  - 5.2: Graphing Linear Equations (20)
  - 5.3: Slope of a Line (22)
  - 5.4: Writing Equations of Lines (21)
  - 5.5: Systems of Two Linear Equations (25)
  - 5.6: Elimination-by-Addition Method (20)
  - 5.7: Graphing Linear Inequalities (19)

- **Chapter 6: Exponents and Polynomials**
  - 6.1: Addition and Subtraction of Polynomials (20)
  - 6.2: Multiplying Monomials (22)
  - 6.3: Multiplying Polynomials (22)
  - 6.4: Dividing by Monomials (20)
  - 6.5: Dividing by Binomials (20)
  - 6.6: Zero and Negative Integers as Exponents (21)

- **Chapter 7: Factoring, Solving Equations, and Problem Solving**
  - 7.1: Factoring by Using the Distributive Property (21)
  - 7.2: Factoring the Difference of Two Squares (22)
  - 7.3: Factoring Trinomials fo the Form x (to the 2nd) $+ bx + c$
  - 7.4: Factoring Trinomials of the Form ax (to the 2nd) $+ bx +$
  - 7.5: Factoring, Solving Equations, and Problem Solving (20)

- **Chapter 8: A Transition from Elementary Algebra to Intermedia**
  - 8.1: Equations: A Brief Review (20)
  - 8.2: Inequalities: A Brief Review (36)
  - 8.3: Equations and Inequalities Involving Absolute Value (34
  - 8.4: Polynomials: A Brief Review and Binomial Expansions i
  - 8.5: Dividing Polynomials: Synthetic Division (20)
  - 8.6: Factoring: A Vrief Review and a Step Further (20)

- **Chapter 9: Rational Expressions**
  - 9.1: Simplifying Rational Expressions (21)
  - 9.2: Multiplying and Dividing Rational Expressions (21)
  - 9.3: Adding and Subtracting Rational Expressions (20)
  - 9.4: More on Rational Expressions and Complex Fractions (
  - 9.5: Equations Containing Rational Expressions (21)
  - 9.6: More on Rational Equations and Applications (20)

- **Chapter 10: Exponents and Radicals**
  - 10.1: Integral Exponents and Scientific Notation Revisited (;
  - 10.2: Roots and Radicals (20)
  - 10.3: Simplifying and Combining Radicals (21)
  - 10.4: Products and Quotients of Radicals (20)
  - 10.5: Radical Equations (19)
  - 10.6: Merging Exponents and Roots (20)

- **Chapter 11: Quadratic Equations and Inequalities**
  - 11.1: Complex Numbers (21)
  - 11.2: Quadratic Equations (20)
  - 11.3: Completing the Square (21)
  - 11.4: Quadratic Formula (22)
  - 11.5: More Quadratic Equations and Applications (22)
  - 11.6: Quadratic and Other Nonlinear Inequalities (40)

- **Chapter 12: Coordinate Geometry: Lines, Parabolas, Circles, Ellipses, and Hyperbolas**
  - 12.1: Distance, Slope, and Graphing Techniques (24)
  - 12.2: Graphing Parabolas (20)
  - 12.3: More Parabolas and Some Circles (20)
  - 12.4: Graphing Ellipses (20)
  - 12.5: Graphing Hyperbolas (17)

- **Chapter 13: Function**
  - 13.1: Relations and Functions (21)
  - 13.2: Functions: Their Graphs and Applications (19)
  - 13.3: Graphing Made Easy Via Transformations (20)
  - 13.4: Composition of Functions (20)
  - 13.5: Direct Variation and Inverse Variation (20)

- **Chapter 14: Exponential and Logarithmic Functions**
  - 14.1: Exponents and Exponential Functions (25)
  - 14.2: Applications of Exponential Functions (26)
  - 14.3: Inverse Functions (22)
  - 14.4: Logarithms (33)
  - 14.5: Logarithmic Functions (26)
  - 14.6: Exponential Equations, Logarithmic Equations, and Problem Solving (30)

- **Chapter 15: Systems of Equations: Matrices and Determinants**
  - 15.1: Systems of Two Linear Equations: A Brief Review (20)
  - 15.2: Systems of Three Linear Equations in Three Variables (23)
  - 15.3: A Matrix Aoproach to Solving Systems (20)
  - 15.4: Determinants (23)
  - 15.5: Cramer's Rule (22)
  - 15.6: Systems Involving Nonlinear Equations (20)

PROMISING EARLY DATA

At CAP colleges piloting accelerated pre-statistics courses, student completion of gateway math courses is 2 to 4 times higher than in the traditional multi-semester algebra sequence.

POLICY CAUTIONS
USING PLACEMENT TESTS TO DENY ACCESS

Policy makers sometimes focus on cutting the lowest curricular levels and setting a "floor" for remediation. Yet, accelerated models show promise even for students who would likely fall below this floor:

- At Chabot and Las Positas, the lowest-scoring 5% of students pass the one-semester accelerated course at a rate of 48%, with better outcomes there than in the longer sequence.

- At Los Medanos, completion of college math among students enrolled in accelerated remediation is 4 times higher than students who follow the traditional 3-4 semester remedial sequence.

POLICY CAUTIONS
ENGLISH LANGUAGE LEARNERS

The accelerated English models discussed here focus on academic literacy development among student populations that are generally fluent in English – native speakers or more advanced ESL students.

An open question in the field:

How can accelerated models be adapted and scaled for English language instruction?

POLICY CAUTIONS

ALGEBRA AS STANDARD OF "COLLEGE READINESS"

There is a danger that efforts like the Common Core could block promising pathway reforms by rigidifying a single algebra-based standard of "readiness."

- High schools must take care not to prematurely track students away from math-intensive fields.

- But at the college level, students *choose* pathways that include different quantitative requirements; remediation should be aligned with *these* requirements not the high school curriculum.

#remedialED

POLICY CAUTIONS
PROFESSIONAL DEVELOPMENT FOR FACULTY

The accelerated English and math curricula described here represent a significant break from more traditional remedial approaches and from many textbook/software products on the market.

To make the shift, teachers need sustained professional support to change what and how they are teaching.

Faculty benefit from collaborative networks for sharing classroom practices and curricula, like 3CSN, funded through California's Basic Skills Initiative.

#remedialED