Connecting Developmental Education to College Level Programs of Instruction

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Teachers College, Columbia University

Developmental Mathematics: For whom? Mathematical Sciences Research Institute
Community College Research Center

Teachers College, Columbia University.
Founded in 1996

- High school to college transitions
- **Developmental Education**
- Student services and financial aid
- Online learning and instructional technology
- College completion and transfer
- College to career and workforce education

- [http://ccrc.tc.columbia.edu/our-research.html](http://ccrc.tc.columbia.edu/our-research.html)
Organization of the Center for the Analysis of Postsecondary Readiness

CCRC

- Descriptive Study of Developmental Education

MDRC

- Evaluation of New Assessment Practices (RCT in NY)
- Evaluation of The New Mathways Project (RCT in TX)

Supplemental Studies
DE Basics

The high school/community college connection is weak

The assessment and placement system needs reform

- We cannot effectively separate students into developmental and college ready categories
- Many students are underplaced

DE does a poor job of improving student outcomes

- Most DE students do not complete a relevant college level course
- DE tends to divert students rather than solidifying them in a college level program
DE Reform Basics

**Assessment—**
- Early assessment
- Multiple measures

**Instruction—**
- Learning facilitation
- Productive persistence
- College success skills
DE Reform—Connection to College Level

Intensity, Compression, Acceleration

- Technology assisted
- Modularized instruction
- Acceleration/compression—CCD
- Intensity—CUNY Start

Comprehensive Reform

- Curricular Alignment—NMP
- ASAP
- On-ramps to college level programs
Assessment Reform
Can We Effectively Divide Students into Dev Ed and College Ready Categories?

- No consensus on definition of “college ready”
  - No consensus on cutoff scores
  - Significant underplacement

- Differs by grade standards

- No obvious cutoff point (continuous not discontinuous relationship)

- Required skills differ by student goals

- Assessments do not measure non-cognitive skills
Intensity, Compression, and Acceleration
The Developmental Education Reform at the Virginia Community College System

Driven by three broad goals:

- To reduce the need for developmental education—more success in college level courses
- To reduce the time students spend in developmental education
- To increase the number of developmental education students graduating or transferring
Modularized Developmental Math

• Redesigned developmental math curricula into one-credit modules

- Arithmetic/Pre-algebra (3-5 credits)
  - Whole numbers (1 credit)
  - Fractions Decimals (1 credit)
  - Ratios Percents (1 credit)
  - Factoring Equations (1 credit)
- Beginning Algebra (3-5 credits)
  - Linear Equations (1 credit)
  - Rational Equations (1 credit)
  - Radicals (1 credit)
- Intermediate Algebra (3-5 credits)
  - 2-variable Equations (1 credit)
  - Quadratic Equations (1 credit)

• Introduced a customized diagnostic assessment to place students into individual modules
Acceleration: FastStart

- Two levels of developmental math and a student success course completed concurrently in a single semester
- Dedicated case manager
- Courses meet in long instructional blocks
- Professional development for FastStart instructors considered essential to program success
CCBC ALP (1 year follow-up)

- Enroll 101
- Pass 101 (if enroll)
- Enroll & Pass 101

Legend:
- Reg Dev Ed
- ALP
Low Scoring Students: CUNY Start

- Instructional design uses student-centered active learning strategies focused on conceptual understanding
- Twelve hours of instruction per week in each subject
- Integrated student supports
- Intensive semester-long apprenticeship for new instructors
## Math Gains

**Table 3.2M** Math Proficiency Gains

<table>
<thead>
<tr>
<th>Proficiency Gains in Math</th>
<th>CUNY Start Students</th>
<th>Matched Comparison Group</th>
<th>% Achieving proficiency after One Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>% Achieving proficiency</td>
<td>N</td>
</tr>
<tr>
<td>All Students Needing Remediation in Math</td>
<td>1,354</td>
<td>53.0</td>
<td>1,354</td>
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<tr>
<td>Initial Need in Math Only</td>
<td>166</td>
<td>62.0</td>
<td>166</td>
</tr>
<tr>
<td>Initial Need in Math + Reading Only</td>
<td>99</td>
<td>50.5</td>
<td>99</td>
</tr>
<tr>
<td>Initial Need in Math + Writing Only</td>
<td>421</td>
<td>61.3</td>
<td>421</td>
</tr>
<tr>
<td>Initial Need in Math + Reading + Writing</td>
<td>668</td>
<td>45.8</td>
<td>668</td>
</tr>
</tbody>
</table>

City University of New York, 2013
Comprehensive Reform-On-Ramps to College Level Programs
Widespread Reform without Institutional Level Improvements in Student Outcomes

**Failure of horizontal scaling**

- “Initiatives” outside of the core functioning of the college

**Failure of vertical scaling**

- Addresses problems in a limited segment of the student experience
Three Pathways To-and-Through College Transferable Courses

The New Mathways Project

STATISTICS PATHWAY is designed for students seeking a college-level statistics course as part of their general education requirement for majors in fields including:
- Nursing
- Social Work
- Criminal Justice

QUANTITATIVE REASONING PATHWAY is designed for students pursuing a field of study in which general education math is a requirement. These fields include majors in:
- Communications
- Graphic Design
- Paralegal

STEM-PREP PATHWAY is designed for students seeking a STEM or mathematics-intensive major in fields including:
- Petroleum Engineering
- Computer Science
- Chemistry

- Degree Plan Courses
- Statistics Pathway Course
- Quantitative Literacy Pathway Course
- STEM Pathway Course

- Degree
- Certificate
- License
- 4-Year Transfer
Differences in Enrollment and Completion of College-Level Math

Students in Fast Start vs. Non-Accelerated Students

<table>
<thead>
<tr>
<th>Percentage Point Difference in Outcomes</th>
<th>One Year</th>
<th>Three Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gatekeeper Math Completion (Ever Enrolled &amp; Passed)</td>
<td>15★</td>
<td>11★</td>
</tr>
<tr>
<td>Gatekeeper Enrollment (Ever Enrolled)</td>
<td>20★</td>
<td>14★</td>
</tr>
<tr>
<td>Gatekeeper Pass Rate (If Enrolled, Whether Passed)</td>
<td>13</td>
<td>4 ★</td>
</tr>
</tbody>
</table>

★ Difference is statistically significant
Kommentari der Wissen, was sind deine Berufsmögliche und Lebensziele?

A graduate or certificate from CCC is your ticket to a rewarding career, either right after graduation, or after a successful transfer to a four-year university. We have the resources to get you there, but you have to make some choices about your path.

The City Colleges of Chicago offers over 200 degree and certificate programs. That’s a lot of choices! To narrow down your options, 1) choose one of our ten Focus Areas. Your College Advisor can give you tools and ask you the right questions to help you make your decision. Once you have chosen a focus area, you should consult with your College Advisor to 2) decide if you plan to transfer to a four-year school. With this information, you and your advisor can determine the degree or certificate program that works best for you.

Consider that in 2018, 80% of jobs in Illinois will fall under College to Careers focus areas. The College to Careers (C2C) initiative makes sure that we are training people to fill these positions. C2C also partners with potential employers and transfer institutions to ensure students make smooth transitions to meet their goals.

Set an appointment with your College Advisor!

Your College Advisor is your biggest ally in choosing your path at City Colleges. It is important that you meet with them frequently. Use the program GradesFirst to set an appointment:

1. Go to ccc.gradesfirst.com and log in with your CCC username and password.
2. Click on the Calendar tab, and then on “Get Advising” on the right side of the page.
3. Your advisor’s calendar will pop up; choose an appointment date and time.
Pathways to Academic, Career and Transfer Success (PACTS)

Tier 1 - Foundational Competencies for Success in College and Careers (Trade Tech Experience)
- Academic Readiness (Math and English)
- Career Readiness (Unique to Program of Study(s))
- Computing, Information, and Digital Literacy
- Self-Efficacy for College and Career Success
- Awareness of Academic/Career Options and Readiness
- Academic and Career Goal Setting and Planning
- Navigating and Accessing Community and College Resources

Tier 2 - Academic and Career Readiness Competencies (Competency-Based, Required Until Competencies Met)
- Program of Study Core Competencies (Unique to Each Program of Study)
- Career Readiness (Unique to Program of Study(s))

Tier 3 - Program of Study Core Competencies
- Degree and/or Transfer (Unique to Each Program of Study)
- Program of Study Core Competencies (Unique to Each Program of Study)
- Career Readiness (Unique to Program of Study(s))

Tier 4 - Degree and/or Transfer Program of Study Competencies
- Reaching the Pinnacle of Potential through Postsecondary Pathway Completion
- Degree Completion
- Transfer Ready/ IGETC Certification
- CTE Certificate of Achievement (Completion(s) that lead to career Readiness for Entry Occupations, Career Advancement, and/or Wage Progression)
- Industry-Recognized Certification/Credential(s)
- 30 Units in Degree Program of Study
- Competency Gains (pre-post assessment)
- Progress Towards PACTS Goal(s)
- HighDiploma or GED Completion
- Noncredit
- Certificate of Competency Completion

STUDENT OUTCOMES (1-2 Years)
- Degree Completion
- Transfer Ready/ IGETC Certification

STUDENT PREPARATION
- Competency Gains (pre-post assessment)
- Progress Towards PACTS Goal(s)
- High Diploma or GED Completion
- Noncredit
- Certificate of Competency Completion

STUDENT ACCESS & ENGAGEMENT
- Completed PACTS Plan
- Increased Self-Efficacy Skills

*Four Additional Pathways Programmed for 2014-2016
Prepare students to choose and enter a college-level program of study

- Upfront career/college exploration, planning
- Undecided students required to choose “meta-major” or “exploratory major”
- Instruction in academic fundamentals and “soft skills” integrated into gatekeeper courses
- Collaborative professional development
Pathway Models Compared

<table>
<thead>
<tr>
<th>Self-Service (Status Quo)</th>
<th>Guided Pathways</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Opt-in” career and college planning</td>
<td>Required plans, exploratory majors</td>
</tr>
<tr>
<td>Program paths unclear</td>
<td>Clear roadmaps to student end goals</td>
</tr>
<tr>
<td>Too many choices</td>
<td>Default, whole-program schedules</td>
</tr>
<tr>
<td>Dev ed narrowly focused on Math &amp; English 101, no “soft skills” prep</td>
<td>Intake system redesigned as “on-ramp” to program of study</td>
</tr>
<tr>
<td>Students’ progress not monitored</td>
<td>Progress tracking, regular feedback &amp; support</td>
</tr>
</tbody>
</table>
Comprehensive Reform: ASAP

- Financial incentives: tuition waiver, free textbooks, monthly transit cards
- Consolidated full-time schedule
- Cohort design
- Regular structured advisement for courses and careers
- Extra academic assistance: mandatory tutoring for students deemed at-risk
### Impact Over Three Years

#### Three Year Summary Table

<table>
<thead>
<tr>
<th></th>
<th>Program Group (451)</th>
<th>Control Group (445)</th>
<th>n = 896</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Sessions enrolled</td>
<td>6.6</td>
<td>5.4</td>
<td></td>
</tr>
<tr>
<td>No. of Credits earned</td>
<td>47.7</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>Degrees earned</td>
<td>40.1%</td>
<td>21.8%</td>
<td></td>
</tr>
</tbody>
</table>
Focus on the Ultimate Goals

- Market program paths
- Build bridges from high school and adult ed. into program streams (e.g., strategic dual enrollment, I-BEST)

- Help students choose program pathway and track entry
- Build prescribed “on-ramps” customized to largest program streams

- Clearly define and prescribe program paths
- Monitor students’ progress and provide feedback and supports JIT

- Align academic program outcomes with requirements for success in further education and (for CTE programs) in the labor market

CONNECTION
From interest to application

ENTRY
From entry to passing program gatekeeper courses

PROGRESS
From program entry to completion of program requirements

COMPLETION
Completion of credential of value for further education and labor market advancement

START HERE
STEP 4
STEP 3
STEP 2
STEP 1

START HERE
Redesigning America’s Community Colleges

A Clearer Path to Student Success

Thomas Bailey, Director, CCRC
Shanna Jaggars, Asst. Director, CCRC
Davis Jenkins, Sr. Research Associate, CCRC
For more information

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http://ccrc.tc.columbia.edu

where you can download presentations, reports, and briefs, and sign-up for news announcements.

We’re also on Facebook and Twitter.

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