Reimagining Developmental Education

CAPR \ 2019

Strengthening the Transition from High School to College

Presenters:

- John Fink, CCRC
- Kathleen Almy, Northern Illinois University
- Kathi Cook, Charles A. Dana Center

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Reimagining Developmental Education

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Exploring the Potential of Dual Enrollment for Increasing Equity in College Access and Outcomes

John Fink
Senior Research Associate, CCRC

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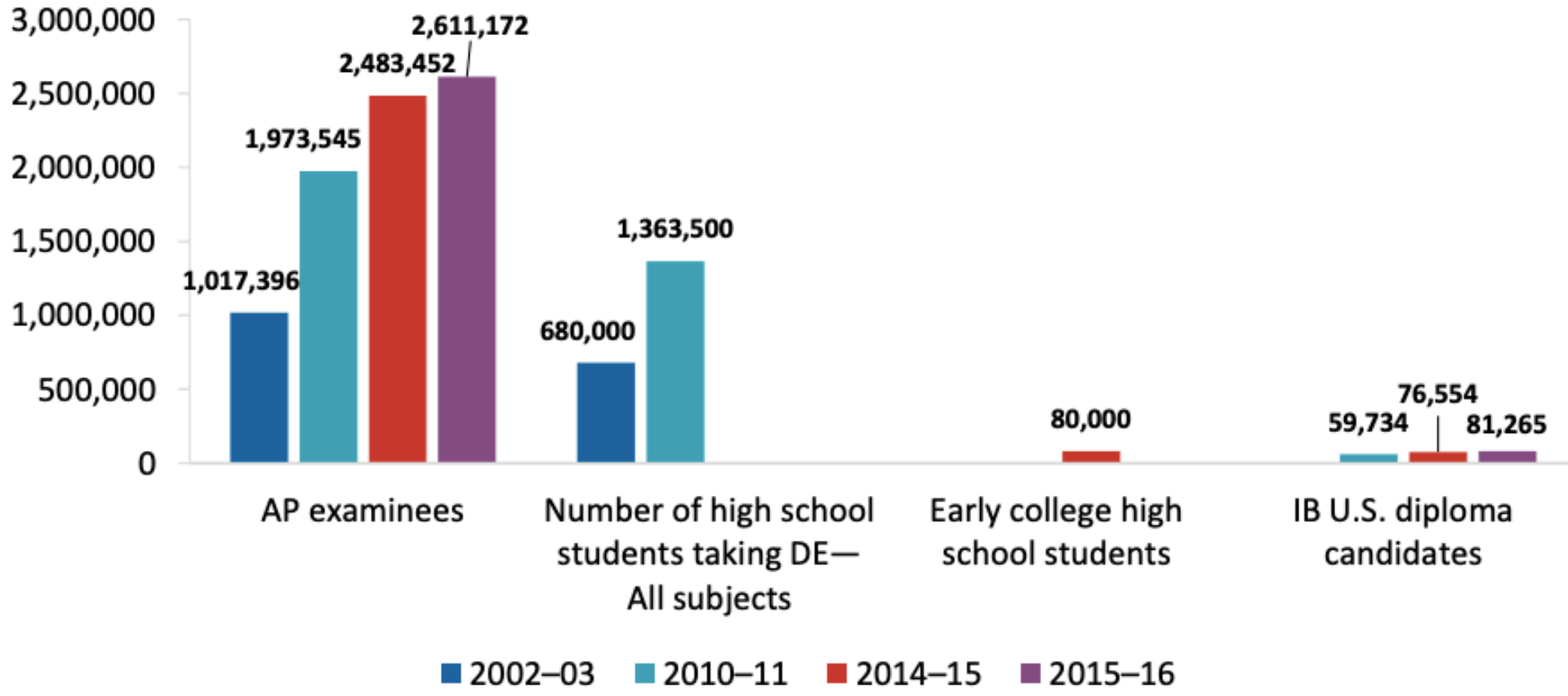
College Acceleration Opportunities: Mostly AP and Dual/Concurrent Enrollment



Note (from original figure): National enrollment data do not exist for DE and CTE beyond 2010–11.

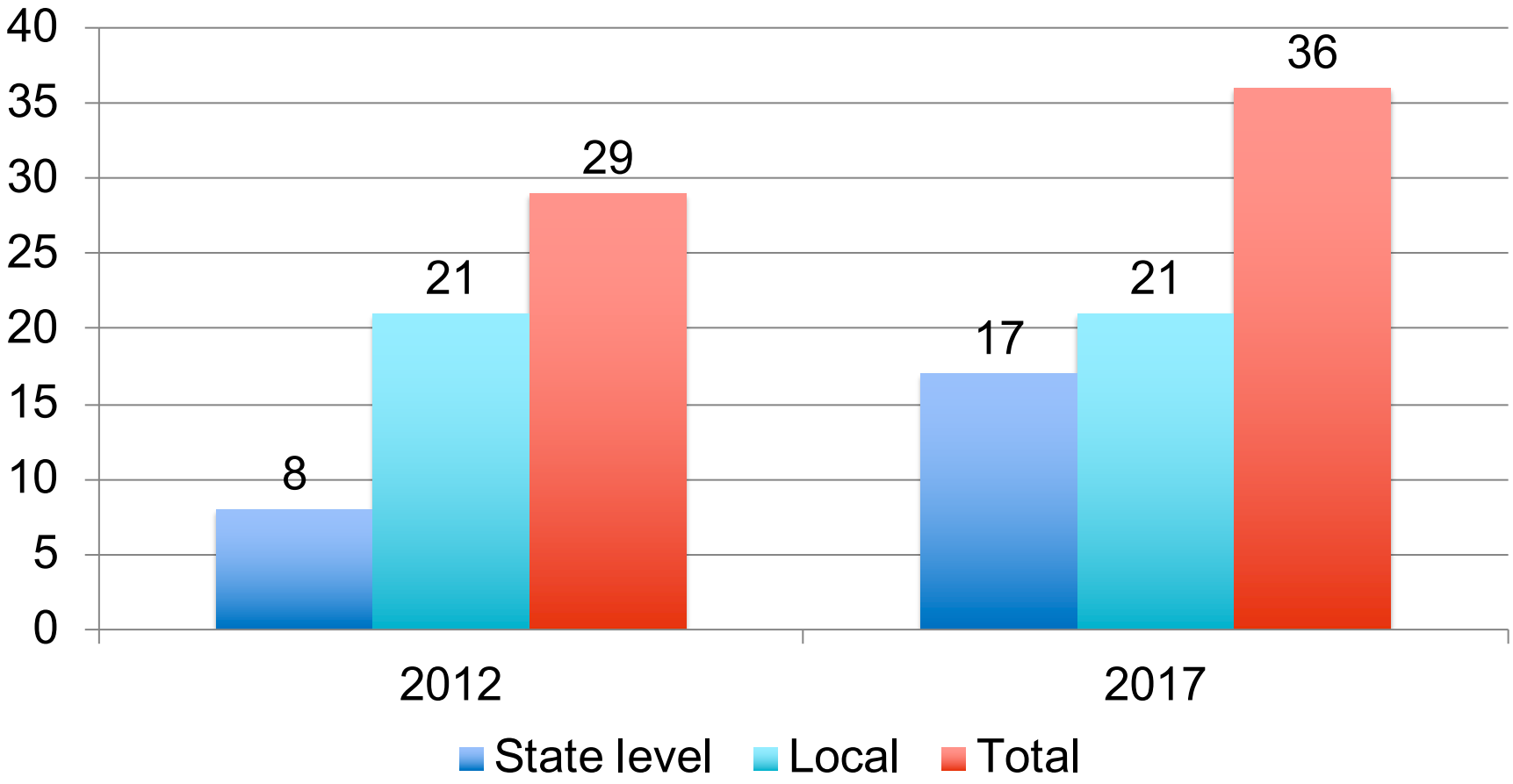
Source: College Board, 2017, p. 9, Figure 1. (Figure A1 reproduces all data from the original figure.)

Improving College Readiness

Dual enrollment programs set the stage for increasing the number of college ready students

- *Early college readiness assessments*: Assessments administered no later than the 11th grade that measure students' readiness to successfully perform entry-level, credit-bearing postsecondary work.
- *Transition curricula*: Courses, learning modules, or online tutorials developed jointly by secondary and postsecondary faculty and offered no later than 12th grade to students at risk of being placed into remedial math or English in college.

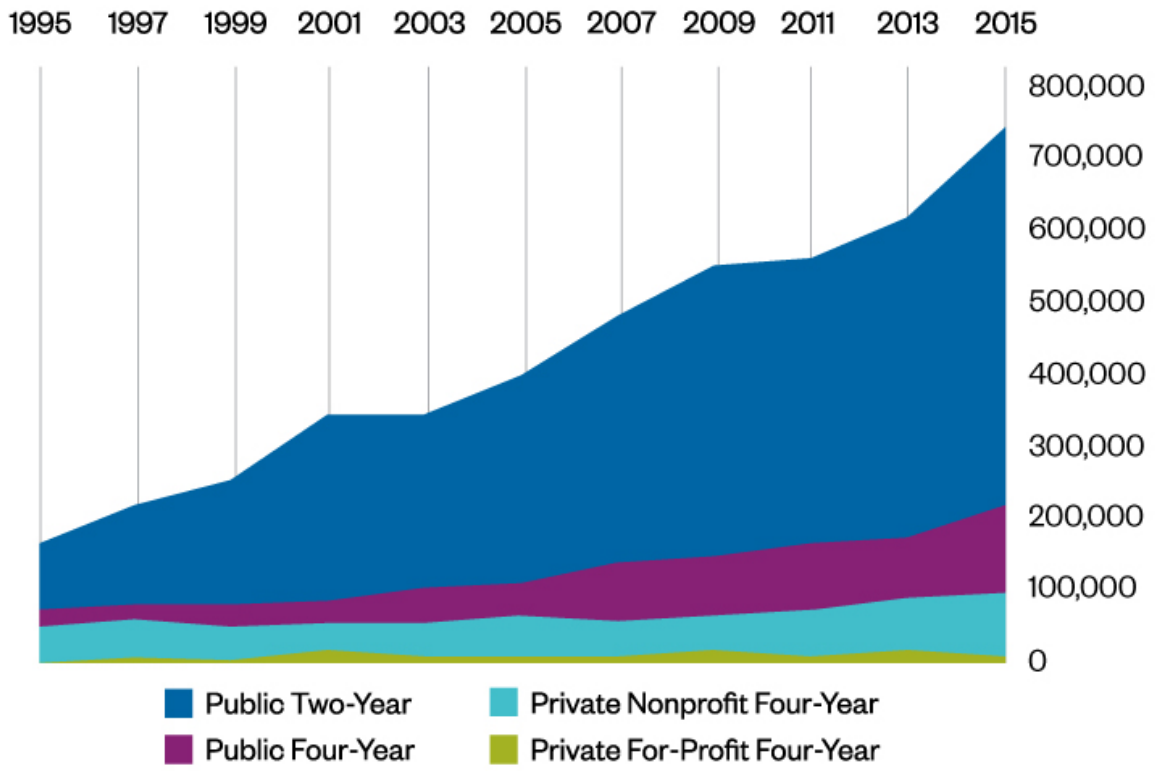
States with Transition Courses (CCRC scan)



Early Postsecondary Opportunities (EPSOs)

Growth of Dual Enrollment 1995-2015

IPEDS Fall Enrollments



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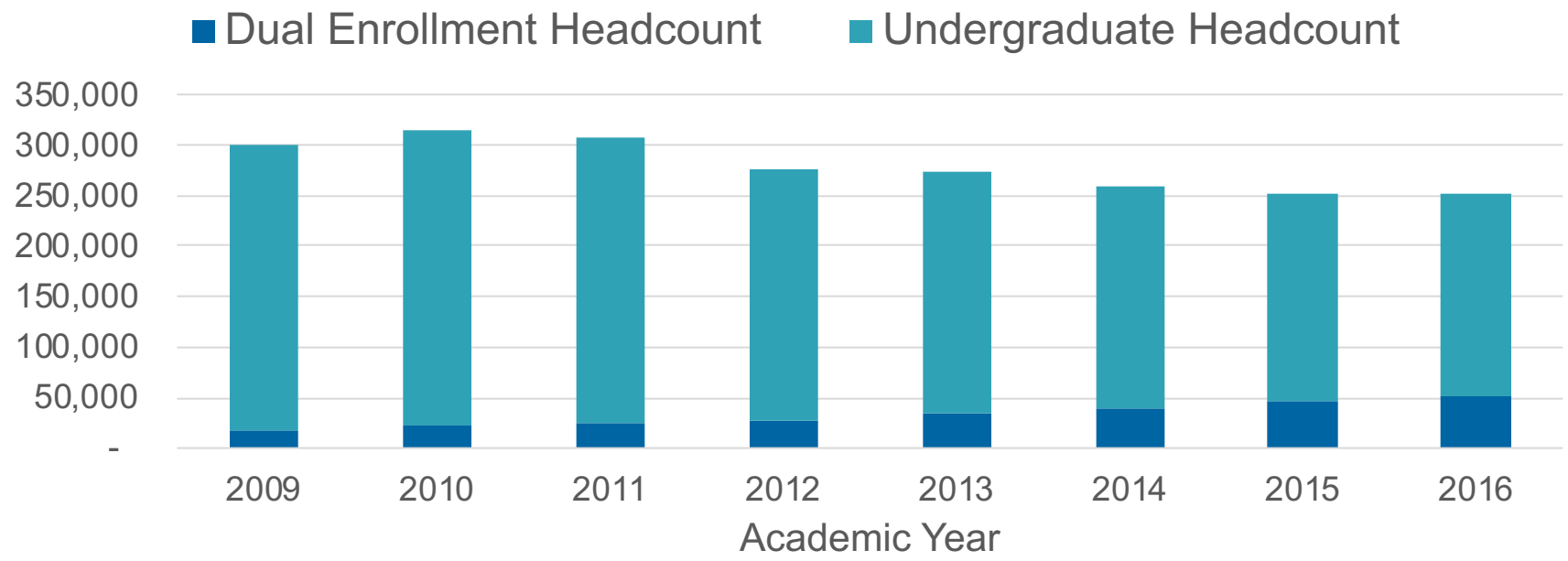
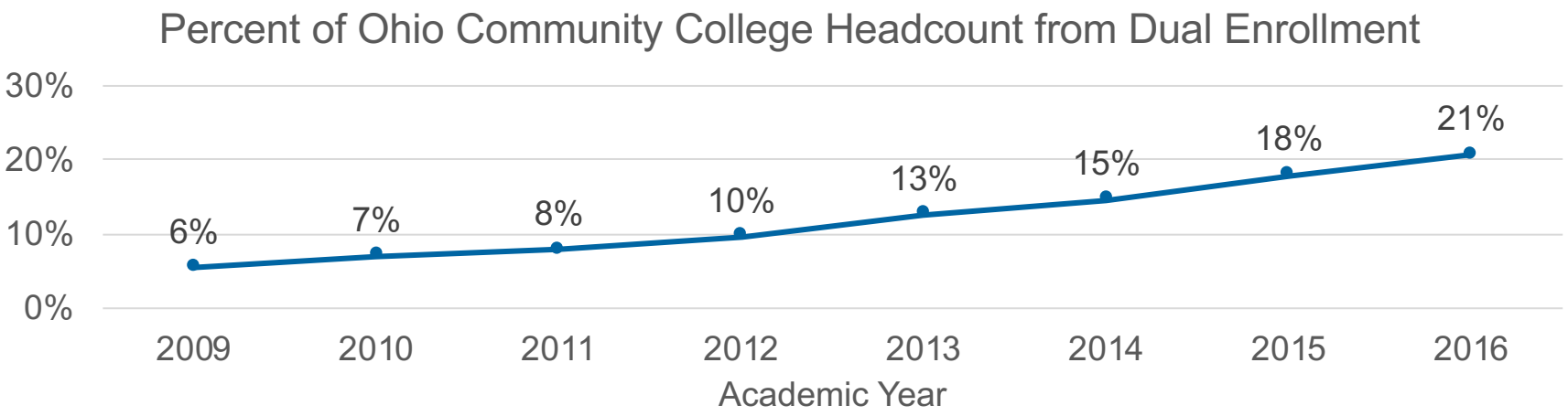
Fall Undergraduate Enrollments Among Students Aged 17 or Younger

Expansion of Dual Enrollment Concentrated at Community Colleges

Ohio: Dual Enrollment Students as a percent of Community College Headcount, 2009-2016

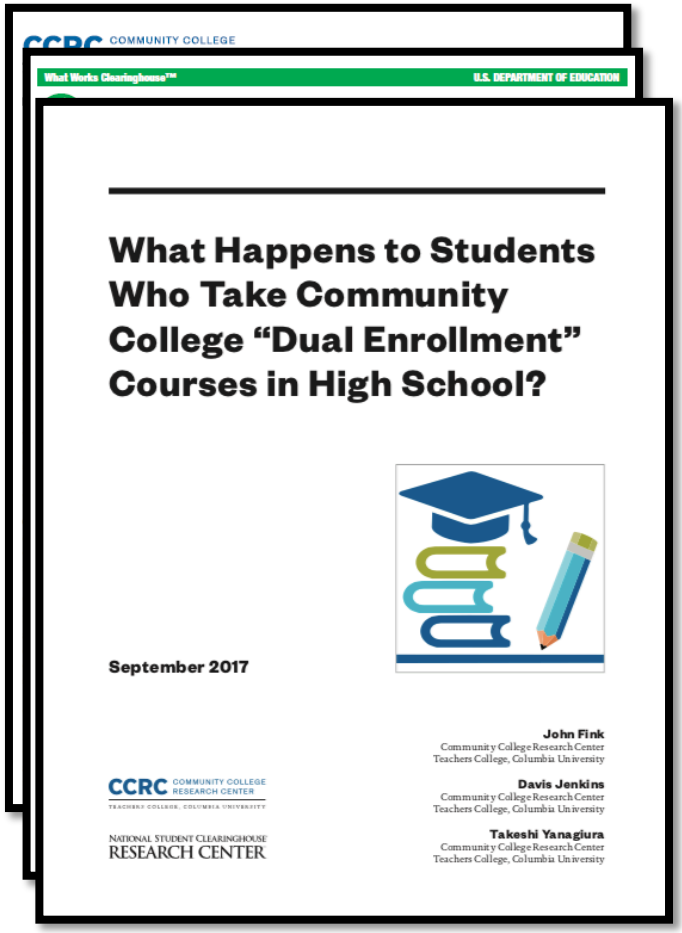




Data source: CN File (counting all students who took at least one course at an Ohio community college during the academic year)

What We Know About Dual Enrollment

- Accumulation of rigorous research on effects of HS dual enrollment
- *WWC* Report: Taking college courses in HS has numerous positive effects, including stronger HS grades, more HS completion, more college enrollment, more credit accumulation, more degree completion.
- Equitable access to and benefits from dual enrollment? Mixed findings.
(An, 2013; Taylor, 2015; AIR, 2018).
- Substantial state and institutional variation in post-HS college outcomes among former DE students
(Fink, Jenkins, & Yanagiura, 2017)

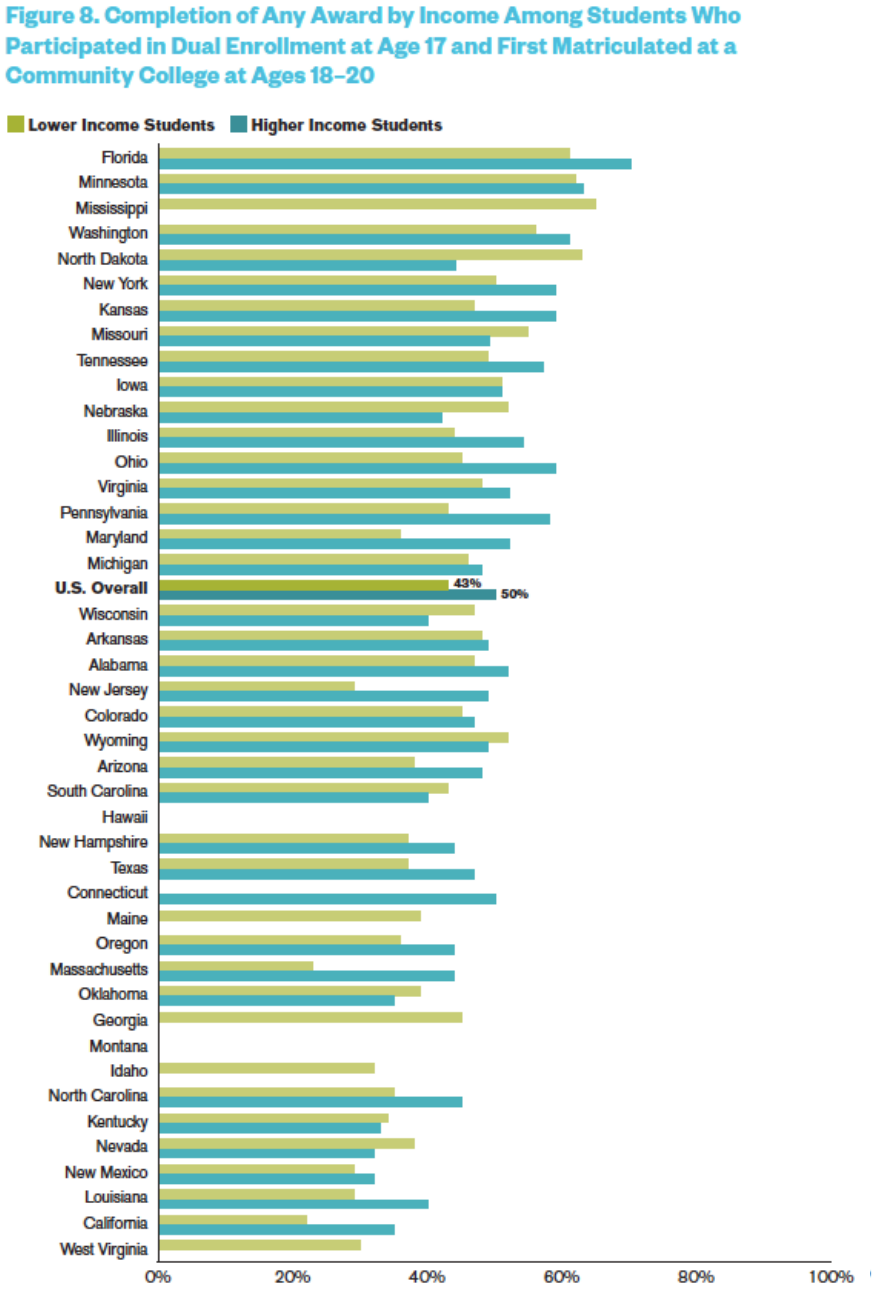


Variation in post-HS college *outcomes* among former community college dual enrollment Students

Where and if students attend college,

Whether and what type of credential they complete,

and the magnitude of equity gaps in completion rates.



John Fink, Davis Jenkins, & Takeshi Yanagiura, (2017). *What happens to students who take community college "dual enrollment" courses in high school?* |

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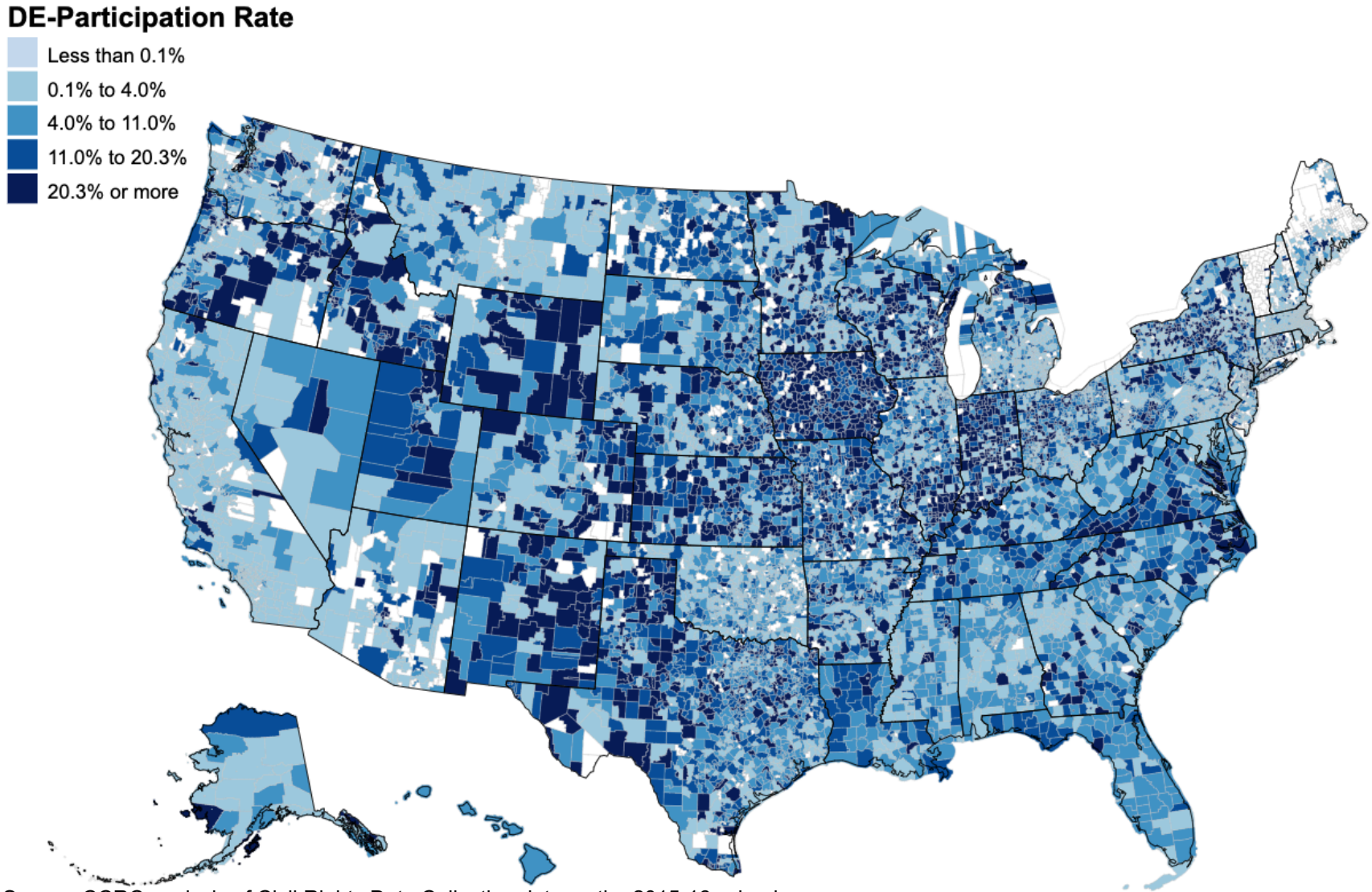
New Federal Data on Dual/Concurrent Enrollment Participation

2015-16 CRDC: First ever census of all US public school DE participation by race/ethnicity and gender

High school student participation in DE and AP coursework:
Variation by school district within and across states



Source: CCRC analysis of Civil Rights Data Collection data on the 2015-16 school year.

High school student participation in DE and AP coursework:
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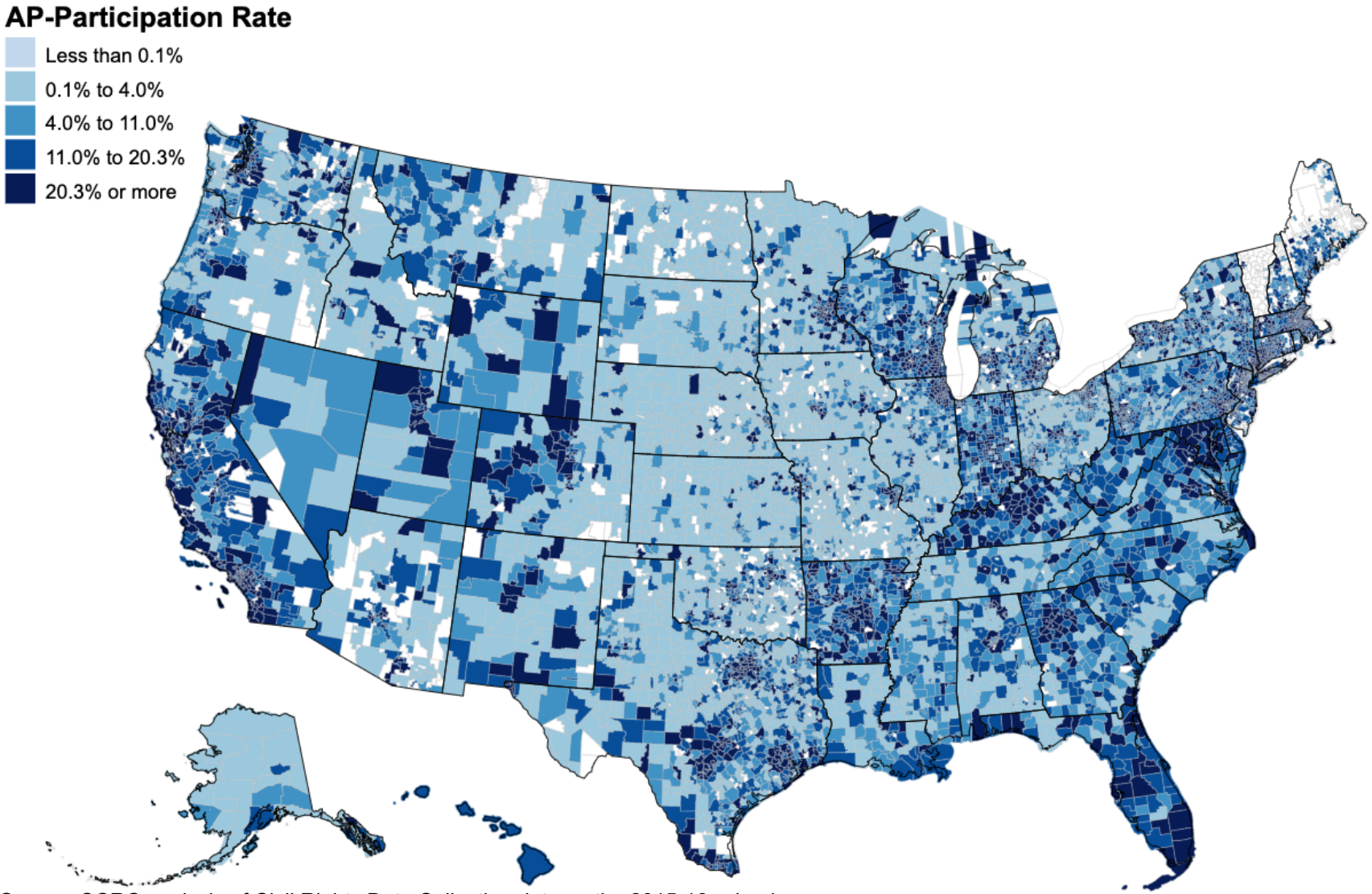
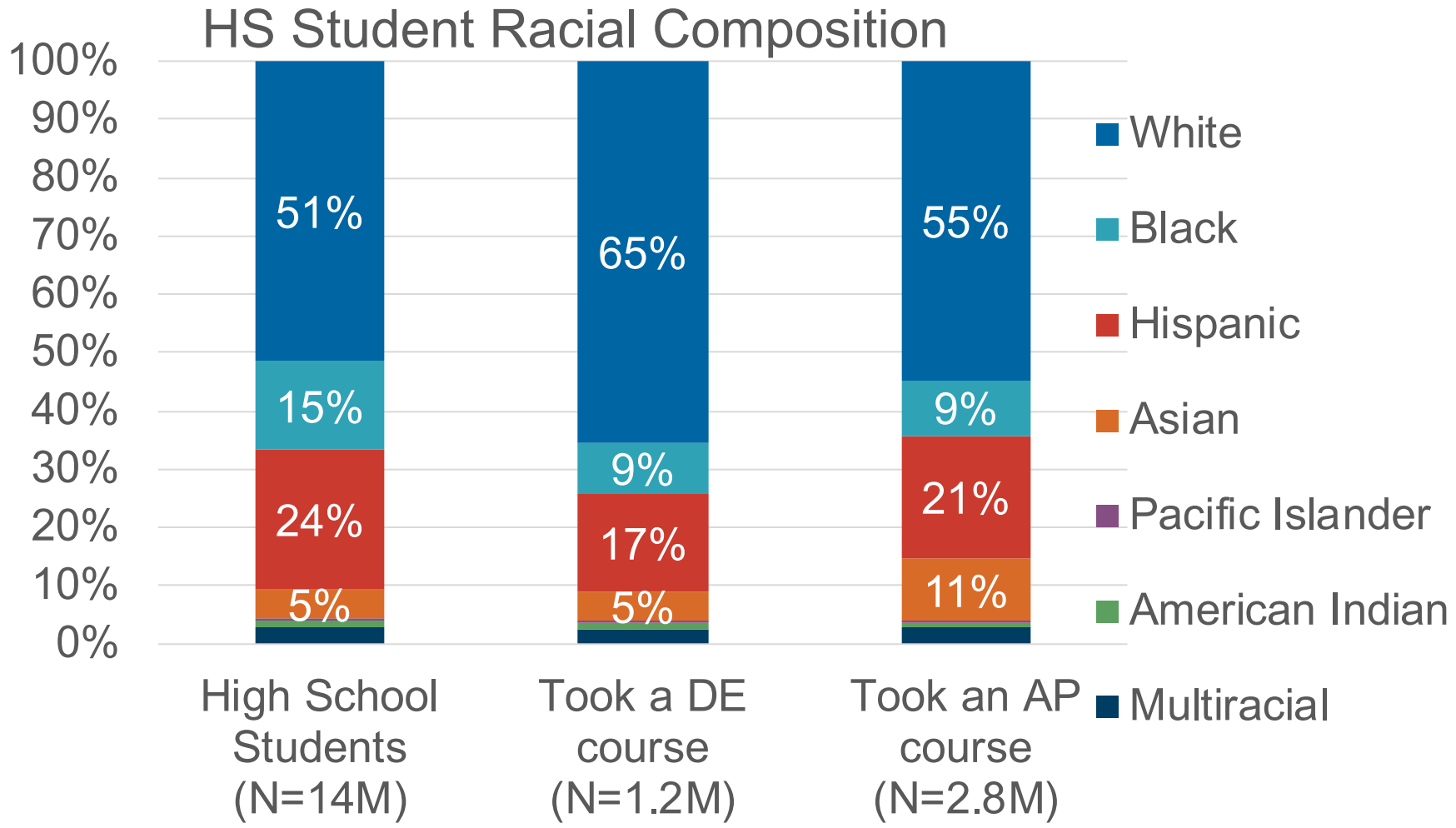


Source: CCRC analysis of Civil Rights Data Collection data on the 2015-16 school year.

CRDC 2015-16 Data: Black and Latino HS Students Underrepresented in DE & AP



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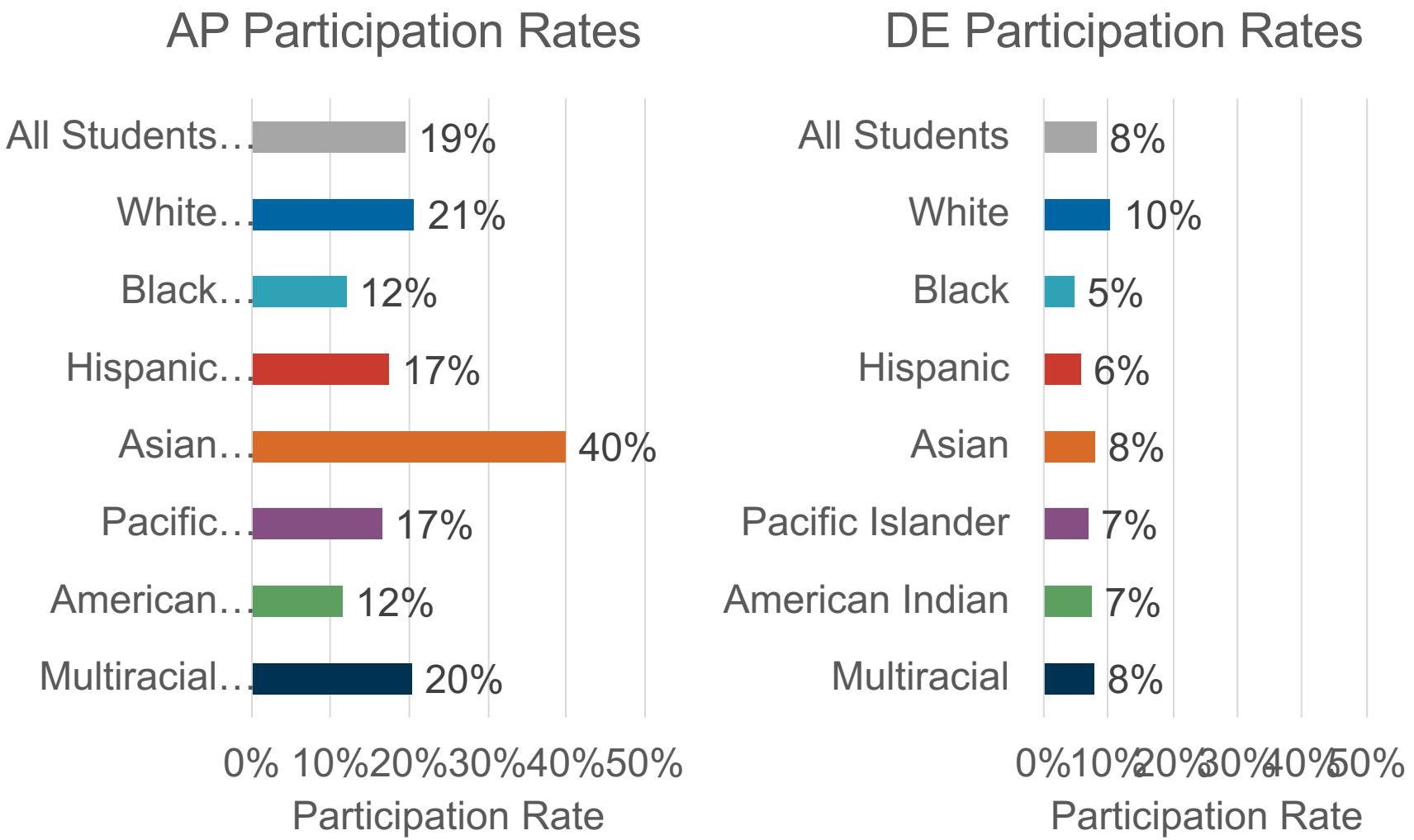
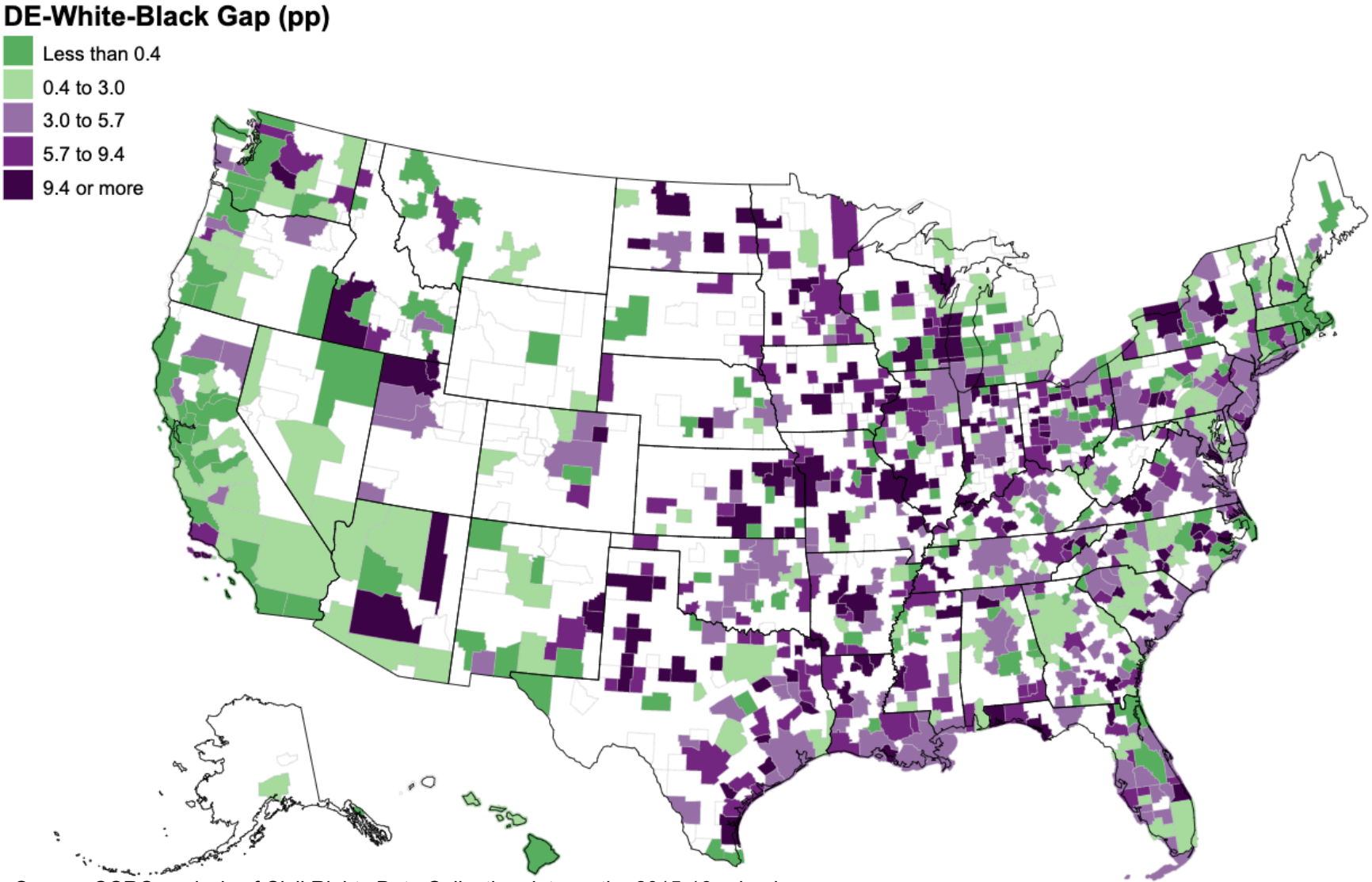
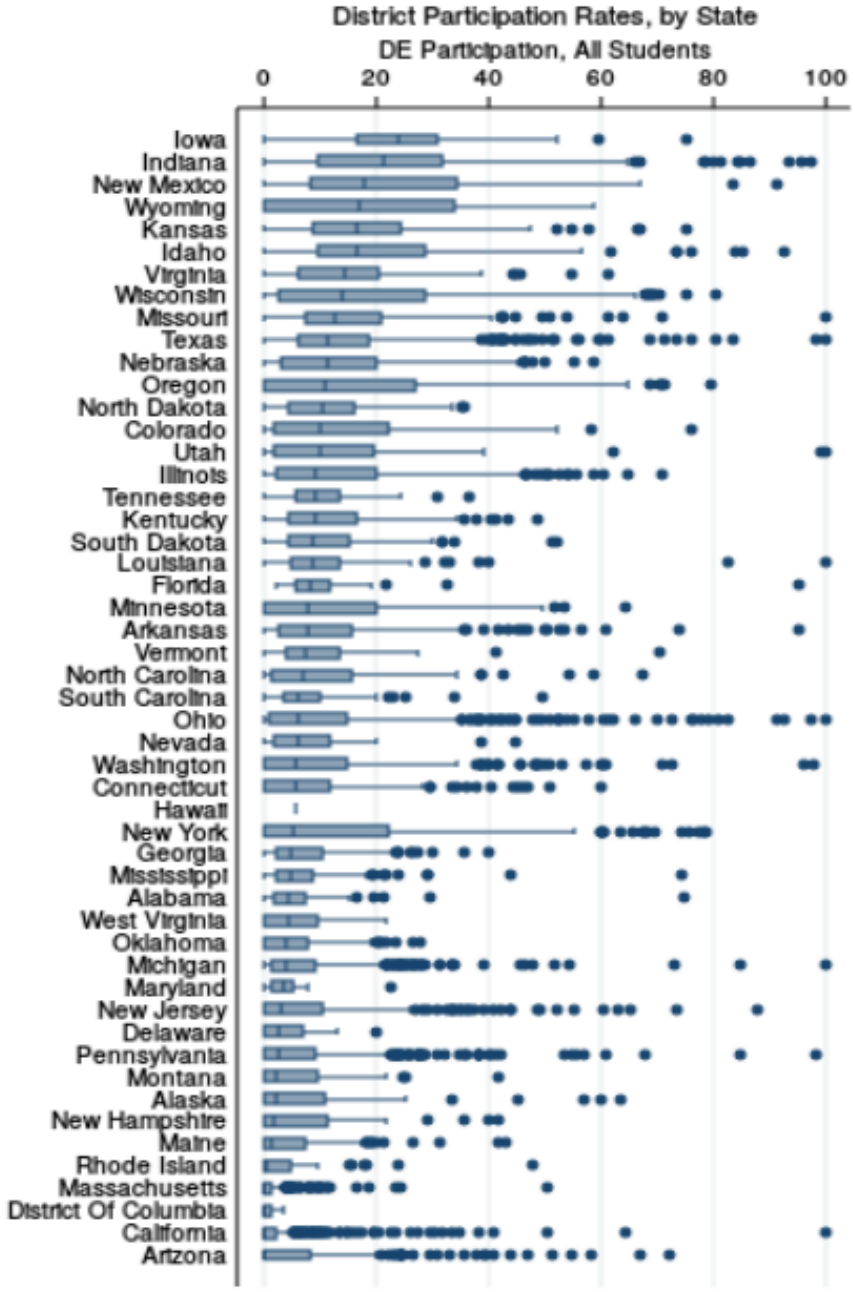
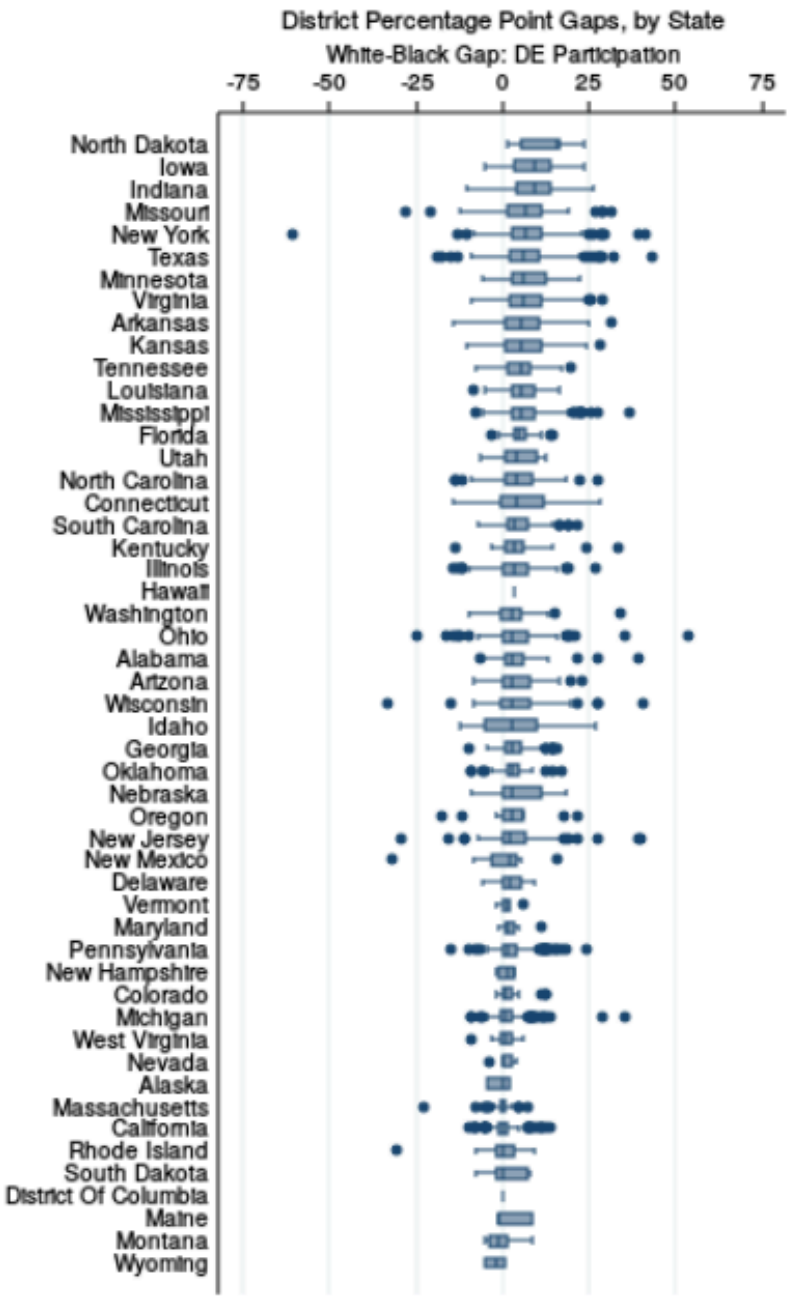


Substantial national variation in racial equity gaps in DE and AP participation among US metro areas



Source: CCRC analysis of Civil Rights Data Collection data on the 2015-16 school year.

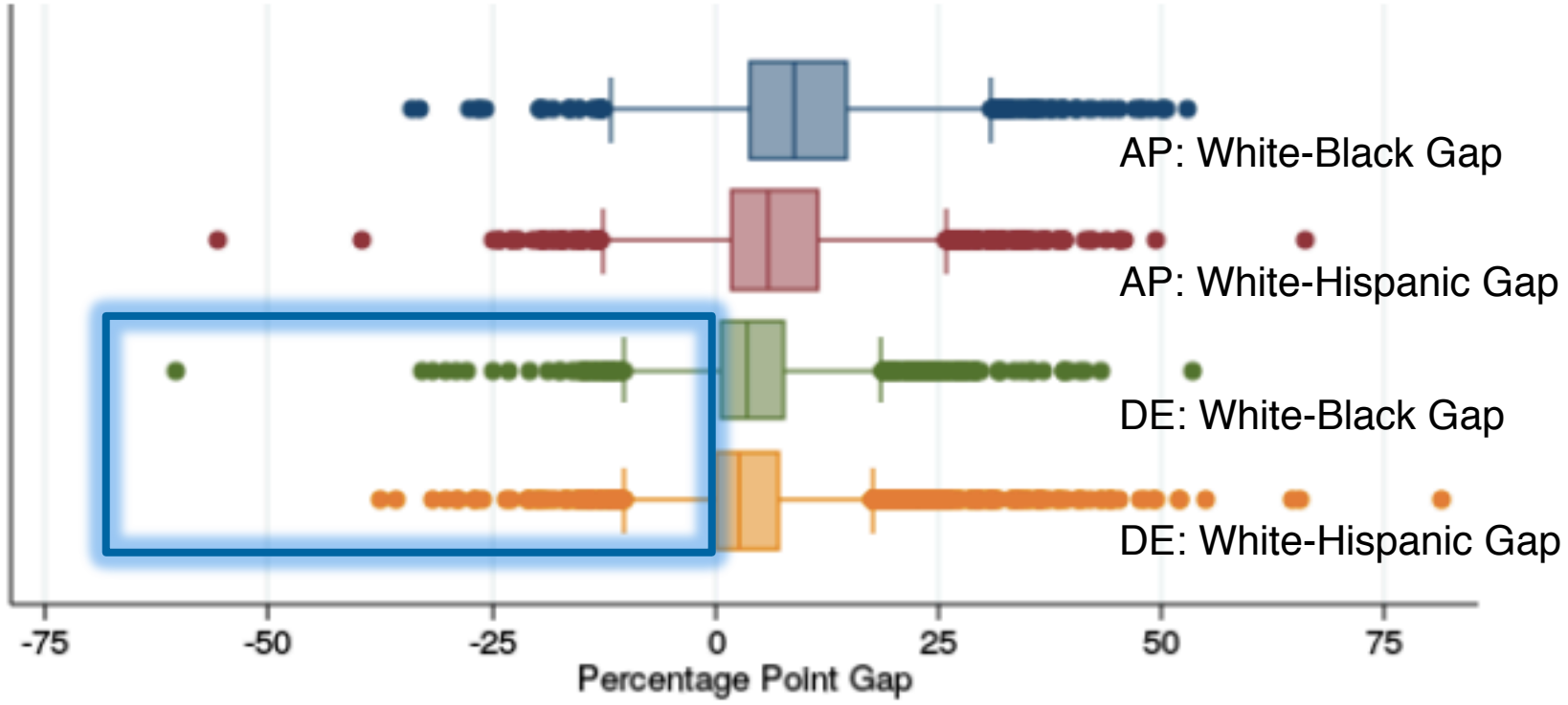

District Participation Rates, by State
DE Participation, All Students
0
20
40
60
80
100
Iowa
Indiana
New Mexico
Wyoming
Kansas
Idaho
Virginia
Wisconsin
Missouri
Texas
Nebraska
Oregon
North Dakota
Colorado
Utah
Illinois
Tennessee
Kentucky
South Dakota
Louisiana
Florida
Minnesota
Arkansas
Vermont
North Carolina
South Carolina
Ohio
Nevada
Washington
Connecticut
Hawaii
New York
Georgia
Mississippi
Alabama
West Virginia
Oklahoma
Michigan
Maryland
New Jersey
Delaware
Pennsylvania
Montana
Alaska
New Hampshire
Maine
Rhode Island
Massachusetts
District Of Columbia
California
Arizona


District Percentage Point Gaps, by State
White-Black Gap: DE Participation
-75
-50
-25
0
25
50
75
North Dakota
Iowa
Indiana
Missouri
New York
Texas
Minnesota
Virginia
Arkansas
Kansas
Tennessee
Louisiana
Mississippi
Florida
Utah
North Carolina
Connecticut
South Carolina
Kentucky
Illinois
Hawaii
Washington
Ohio
Alabama
Arizona
Wisconsin
Idaho
Georgia
Oklahoma
Nebraska
Oregon
New Jersey
New Mexico
Delaware
Vermont
Maryland
Pennsylvania
New Hampshire
Colorado
Michigan
West Virginia
Nevada
Alaska
Massachusetts
California
Rhode Island
South Dakota
District Of Columbia
Maine
Montana
Wyoming

1 in 4 school districts have closed the equity gap in DE participation between Black or Hispanic students and their White peers

Figure 6

Distribution of Racial/Ethnic Gaps in AP and DE Participation Among School Districts



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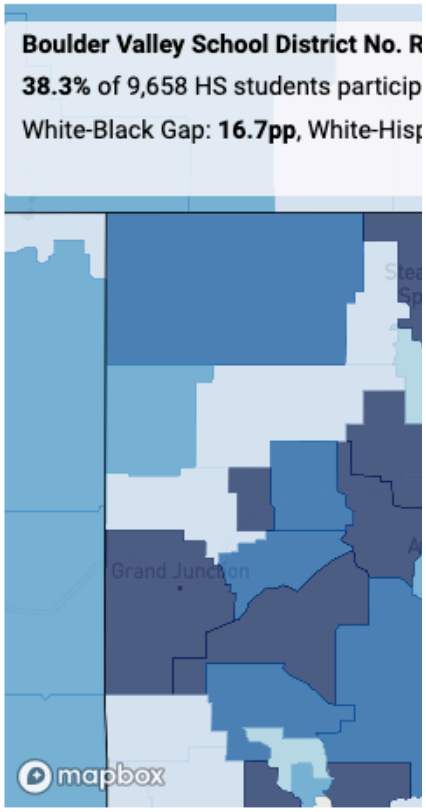
Explore t

Advanced Placement and Districts)



Gaps in districts with too few students in

https://ccrc.tc.columb

Explore the Data by School District, State, or Metro Area

Lookup a District | Schools in a District | Districts within States | Schools within Metros

Equity in Access to College Acceleration
Civil Rights Data Collection District Lookup

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Examine High School DE/AP Participation and Racial Equity Gaps within a District (2015-16 School Year)

Select a District: Boulder Valley School District No. R...

Show results for:
- (•) Advanced Placement
- ( ) Dual Enrollment

Advanced Placement Participation and Gaps

Boulder Valley School District No. Re2, CO High Schools

High School	HS Enrolment	All Students Partic.	Black Partic.	Hispanic Partic.	White Partic.	White-Black Gap	White-Hispanic Gap
FAIRVIEW HIGH SCHOOL	2,191	28%		11%	29%		18.6pp
BOULDER HIGH SCHOOL	2,002	47%	18%	25%	53%	35.2pp	28.0pp
MONARCH HIGH SCHOOL	1,754	40%		30%	40%		10.2pp
BROOMFIELD HIGH SCHOOL	1,559	37%		26%	40%		14.1pp
CENTAURUS HIGH SCHOOL	1,094	38%		23%	46%		23.3pp
PEAK TO PEAK CHARTER SCHOOL	584	73%		65%	71%		6.6pp
NEW VISTA HIGH SCHOOL	301	0%		0%	0%		
NEDERLAND MIDDLE-SENIOR HI..	173	15%			15%		

tableau

Given the substantial variation nationally in access to and success in dual enrollment,

What can be learned from high schools and colleges that are highly effective in serving underrepresented students through dual enrollment?

Project Overview

- Quantitative Research
  - National study of access to DE and AP using new data elements in the US Dept. of Education Civil Rights Data Collection
  - In-depth analyses on effects of different acceleration strategies (e.g., dual enrollment, AP, ECHS, etc.) on college going and outcomes, tracking cohorts of Florida 9th graders into college
  - Analysis of statewide data from WA, OH, and FL to identify HS-CC pairings highly effective in providing access to and success in DE to racially minoritized and low-income students
- Fieldwork & Practice Guide (Fall 2020)
  - Based on 8 site visits in FL, OH, and WA to HSs and CCs identified as highly effective in helping racially minoritized and low-income students gain momentum for college

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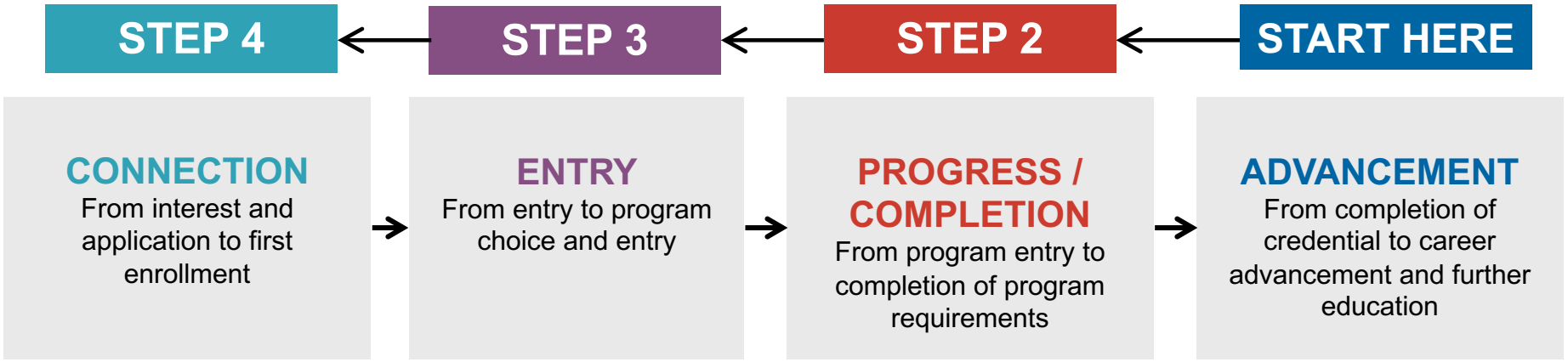
Strengthening Dual Enrollment

Connection to Guided Pathways Reform in Community Colleges

Redesign, Starting with the End in Mind



- Market program paths
- Build pathways into high schools and adult ed programs

- Help students explore options/ make full-program plan
- Integrate academic support into critical program gateway courses

- Clearly map out program paths
- Redesign advising/scheduling around maps/plans
- Monitor student progress, provide feedback and support as needed

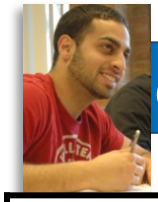
- Align program outcomes with requirements for success in career-path employment and further education

Lorain County Community College, Ohio

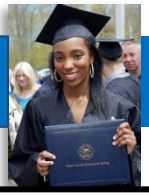
Mapping program pathways from high school through bachelor's and beyond

Lorain County Community College

Preparing Talent



College Readiness



Completion

Market-Driven

K-12 Partner Initiatives	Associate Degree and Certificate Program and Career Pathways	Bachelor and Master Degrees through University Partnership
CollegeCredit PLUS my UNIVERSITY Here. Now. Guaranteed. • Early College High School • College Tech Prep • Project Lead the Way	• Business and Entrepreneurship • Computers and Information Technologies (IT) • Culinary and Hospitality • Education • Engineering and Manufacturing • Health and Wellness • Human/Social Services and Public Safety • Liberal and Creative Arts • Science and Math	Over 43 Bachelor and 9 Master Degree Offerings •Ashland University •Bowling Green State University •Cleveland State University •Hiram College •John Carroll University •Kent State University •Lake Erie College •Ohio University •The Ohio State University •The University of Akron •University of Cincinnati •University of Toledo •Youngstown State University
11,700 students		3,000 students

Associate of Science, Lorain County Community College
Bachelor of Science in Biology, Bowling Green State University

11th Grade

HS Periods	HS Credit	HS Course	LCCC Course	College Credit
1	1	English III **and**	**ENGL 161: College Composition I**	**3**
	1	English IV	**ENGL 162: College Composition II**	**3**
2	1	Alg. II or College Algebra	**MTHM 171: College Algebra**	**4**
	1	Pre-calculus	**MTHM 172: Pre-Calculus**	**3**
3	1	Advanced Science	**BIOG 161: Principles of Biology I**	**4**
	1		**BIOG 162: Principles of Biology II**	**4**
4	1	Foreign Language III (Must be same language)		
5	1	Government	**PLSC 156: American National Govt.**	**3**
	.5	Physical Education		
6	0/1	Elective or Open		
7	0	Open/Leave Unused		
Yr. Total	9.5			**24**
Cum. Total	25.75			**47**

12th Grade

HS Periods	HS Credit	HS Course	LCCC Course	College Credit
1	1	Humanities/Cultural Diversity	**ENGL 266: African American Literature ***	**3**
	1	Humanities Elective	**HUMS 281: Introduction to American Cinema ***	**3**
2	1	College Level Math	**MTHM 181: Calculus I**	**5**
	1	Advanced Science	**PHYC 150: General Physics I**	**4**
3	1	Advanced Science	**CHMY 171: General Chemistry I**	**5**
	1		**CHMY 172: General Chemistry II**	**5**
4	1	Foreign Language IV (Must be same language)		
5	0	Open/ Leave Unused		
6	0	Open/Leave Unused		
7	0	Open/Leave Unused		
Yr. Total	7			**25**
Cum. Total	32.75			**72**

Will have earned Lorain County Community College Associate of Science degree at the completion of grade 12.

Key Questions from Community College Leaders on Improving Dual Enrollment using Guided Pathways Framework

- What courses are our DE students taking & how are they selecting them?
- Are our DE students gaining momentum in a program of study in HS?
- Where do our DE students go to college after HS, how many return to our college, and what's happening with DE students who don't go to college?
- How many end up earning college credentials, from which institutions, and in what majors?
- What are the course-taking patterns and outcomes among DE students who continued at our college after HS?
- Are DE students passing college-level math and critical program courses either in HS or in their first year in college (after HS)?
- Are DE credits being applied to students' degree programs?
- How do results vary by HS and program of study?
- How do results vary for students by race, income, gender, & geography?

Reimagining Developmental Education

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Thank you!

John Fink
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The Center for the Analysis of Postsecondary Readiness (CAPR) is funded through a grant (R305C140007) from the Institute of Education Sciences, U.S. Department of Education.

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ALMY EDUCATION

Solving your math problems

State Policy as a Driver of Transitional Math Courses in Illinois

Kathleen Almy

Almy Educational Consulting

The Problem

Large percentage of recent high school graduates taking developmental math, which reduces the chances of them completing college

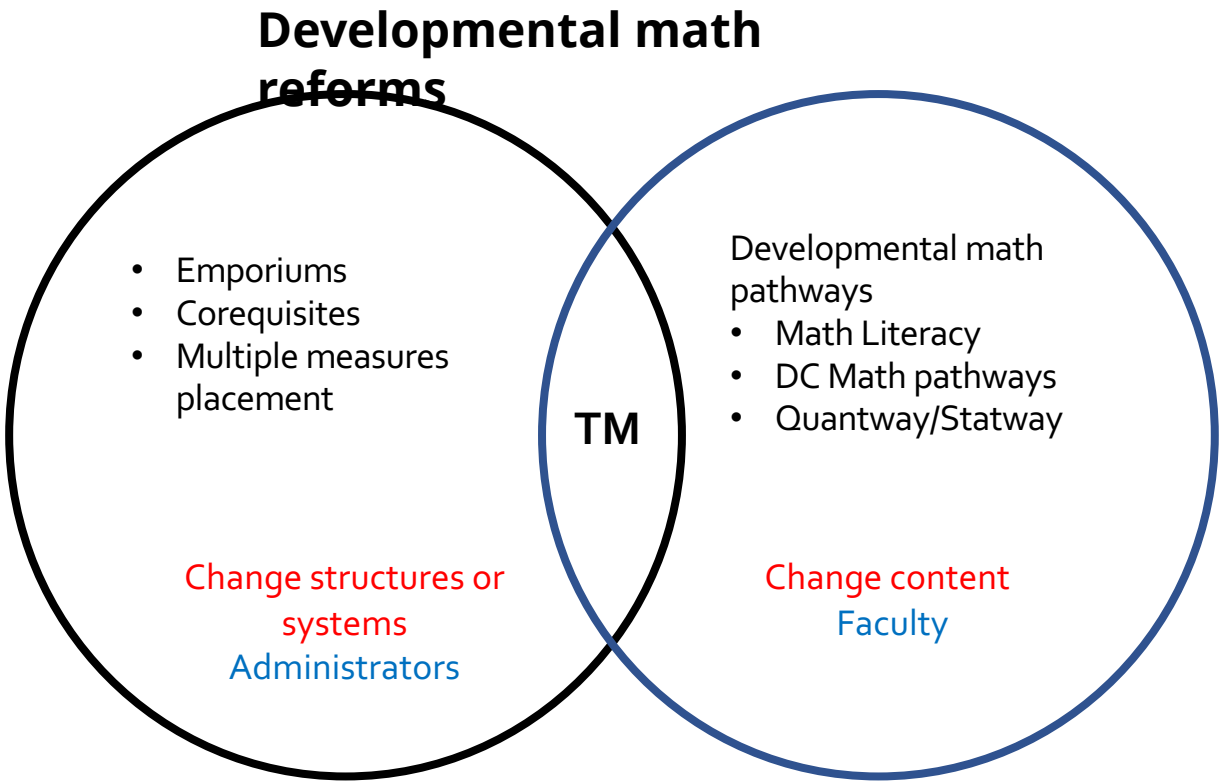
Why?

- Students may skip 4th year of math
- Plentiful options for dual credit and AP, but not for students below them
- Traditional placement tests often underplace students
- Placement by grades or GPA is still not common practice
- Many students are not ready for the rigors and expectations of college

Why else?

- Colleges and high schools are not aligned in practice or philosophy

Solving the Problem



Goal: Reduce Remediation

1. Determine who is not college-ready for math in the junior year using **multiple measures**. (projected readiness determination)

2. Enroll students in new **transitional** courses in the senior year that address math and college readiness.

3. Provide **guaranteed placement** at all IL community colleges and some universities without a placement test. Placement lasts 18 months.

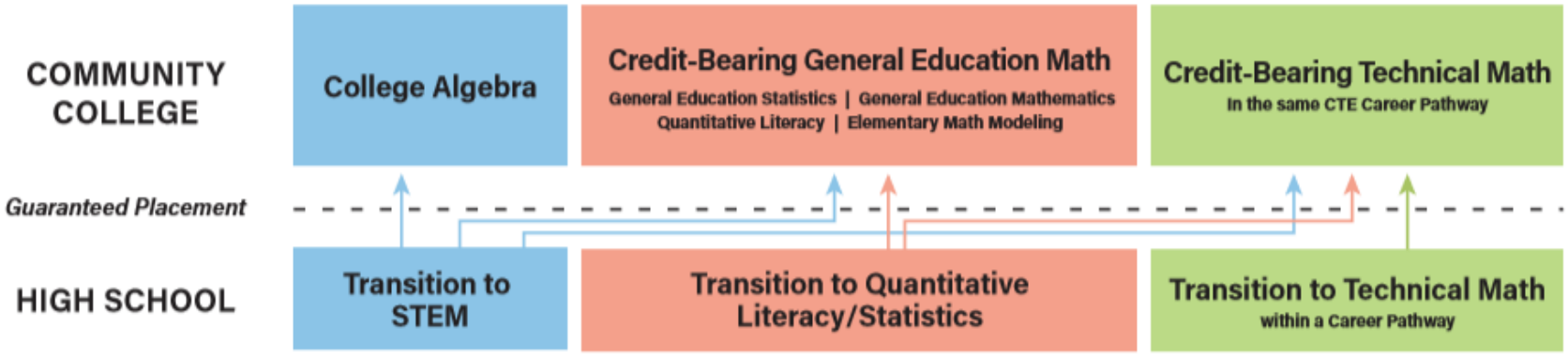
Result: Better prepared students start at college-level coursework, increasing their chances of completing a certificate or degree.

Postsecondary and Workforce Readiness Act (PWR Act)

Public Act 99-0674 (HB 5729); signed by Governor on 7/29/16

1. Postsecondary and Career Expectations (PaCE)
2. Pilot of Competency-based High School Graduation Requirements
3. College and Career Pathway Endorsements on High School Diplomas
4. **Transitional Math Courses**

Transitional Math Pathways

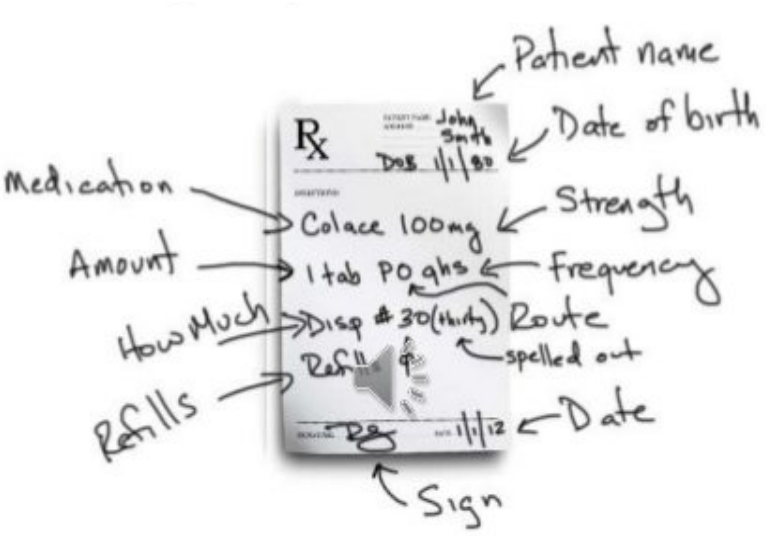


- Courses are based on a student's meta major. Default is QL.
- Content is contextualized and rigorous.
- Courses are transcripted by the HS using portability codes.
- Courses can be one semester or one year (allows for senior year dual credit).

Source: www.iltransitionalmath.org

Curriculum contextualized to a HS senior:
future citizen, employee, and college student

A doctor orders dicloxacillin sodium 125 mg p.o. q.6.h. for a child who weighs 55 lb. The recommended dosage of dicloxacillin sodium for children weighing less than 40 kg is 12.5 to 25 mg/kg/day p.o. in equally divided doses q.6.h for moderate to severe infections. Is the dosage safe?

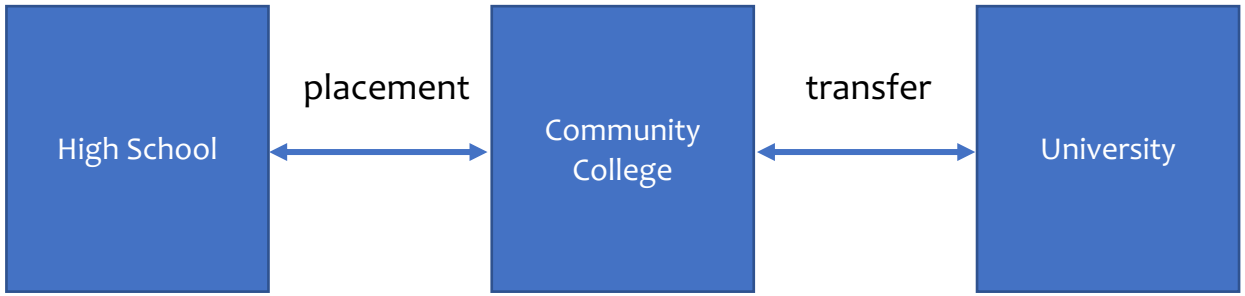


Abbreviation definitions

p.o. – medication is taken orally

q.6.h. – frequency of medication taken (every 6 hours in this case)

Portability
QC and Useful Placement



Portability panel ensures fidelity of the courses and faculty involvement

Courses that meet statewide required policies and competencies are approved portable, giving students placement throughout IL CCs and some IL universities.

See policies and competencies document on www.iltransitionalmath.org for more information

Other states use grades, a common test, or a combo of both.

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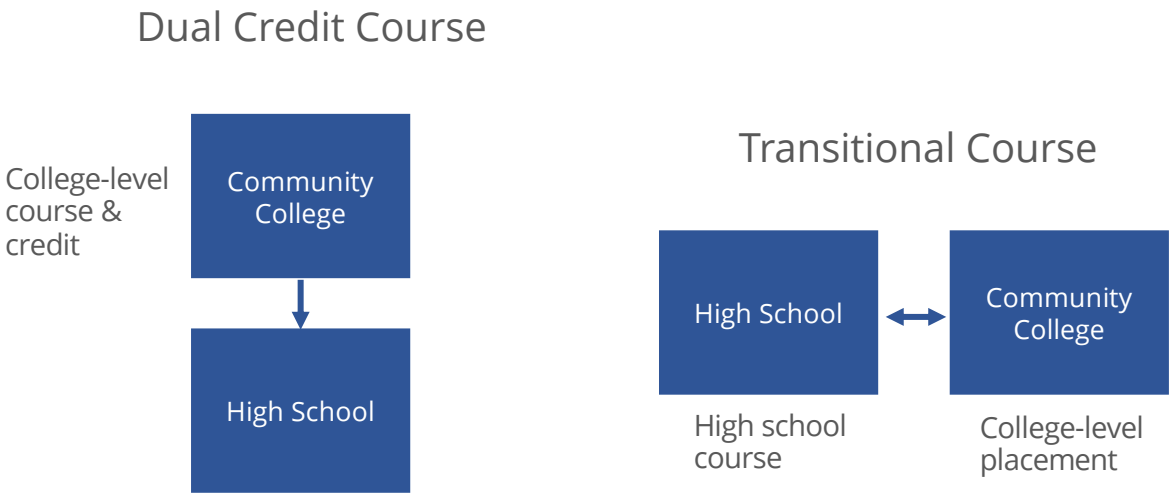
Solving your math problems

Making Transitional Math Happen

A Different Approach to HS Partnerships



Source: www.iltransitionalmath.org

ALMY EDUCATION
Solving your math problems

Impacts of Legislation

- Can get change started but buy-in is not guaranteed
- Legislation begets legislation (IL ex: DCQA, coreqs)
- Sometimes only way to ensure best practices are implemented

Key Takeaways

- Bottom-up reform can still come with top-down mandates
- Collaboration and partnerships are paramount – across schools & agencies
  - **This work moves at the speed of trust.**
- Policy matters, but needs practitioners to be effective
- Consistency and flexibility are essential for buy-in and success
- TM does not compete with, but instead supports other reform efforts (e.g., completion, guided pathways, corequisites)
- Scale is possible but a comprehensive implementation is needed

Contact Information

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www.almyeducation.com

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Supporting Multiple Mathematics Pathways in Transition Courses

Kathi Cook, Manager, Online Course Programs
Charles A. Dana Center, The University of Texas at Austin

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About the Dana Center

Equity — Access — Excellence

“College ready” for what (math)?”

College Algebra?

- College Algebra was originally intended to prepare students for calculus.

- In 2004, the Mathematical Association of America (MAA) called for the end of using College Algebra as a terminal mathematics course, citing a serious mismatch between the original rationale for College Algebra and the mathematical needs of students who take the course.

Charles A. Dana Center. (2016). *DCMP Call to action: The case for mathematics pathways.* Austin, TX: Author.

https://dcmathpathways.org/sites/default/files/resources/2016-11/The Case for Mathematics Pathways.pdf

Or something else?

- In 2015, the MAA, along with four major mathematical professional associations, called for multiple mathematics pathways that are aligned to fields of study.

- Colleges and universities have responded by implementing math pathways, such as quantitative reasoning, statistics, technical mathematics (for certificate programs), and a redesigned algebraic-intensive/or Calculus pathway.

Charles A. Dana Center. (2016). *DCMP Call to action: The case for mathematics pathways.* Austin, TX: Author.

https://dcmathpathways.org/sites/default/files/resources/2016-11/The Case for Mathematics Pathways.pdf

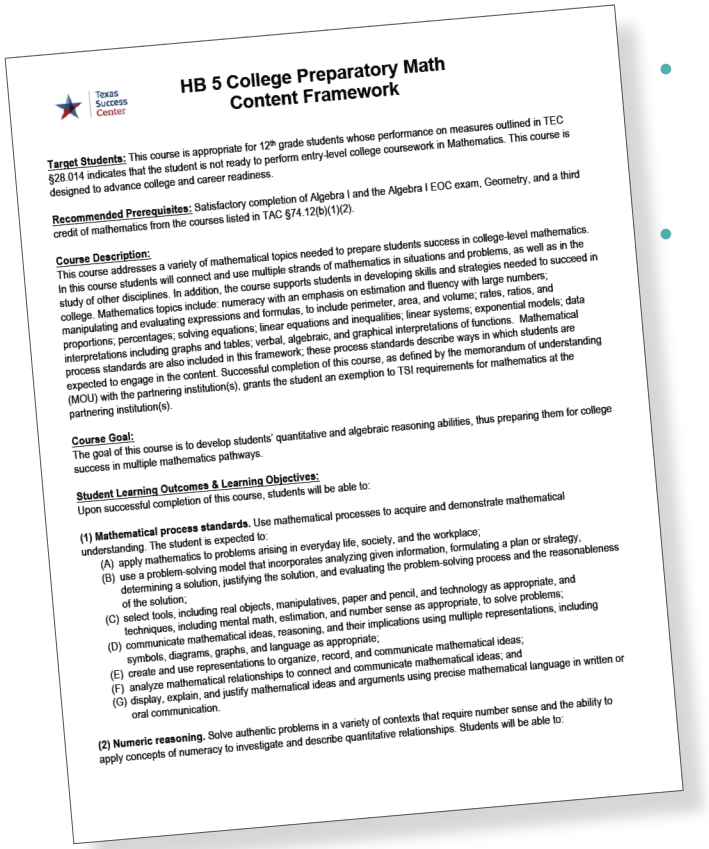
Texas HB 5 College Prep Math Course

- Required to be offered within every district
- Designed for seniors who are not deemed college ready
- Earns a 4th math credit for students
- Must be developed in partnership between K12 district and IHE
- Successful completion allows students to enter credit bearing math course at partnering college

Texas Success Center Leadership

- Convened a statewide mathematics task force of K12 and Higher Education Mathematics leaders to create a framework for the College Prep math course to prepare students for enrollment in *any* entry-level college math course, *including,* but not limited to, College Algebra
- Subjected the framework to public review, comment, and revision
- In 2014, released recommendations for districts and institutions of higher education to consider

Anatomy of the Framework



Texas Success Center

HB 5 College Preparatory Math Content Framework

Target Students: This course is appropriate for 12th grade students whose performance on measures outlined in TEC §28.014 indicates that the student is not ready to perform entry-level college coursework in Mathematics. This course is designed to advance college and career readiness.

Recommended Prerequisites: Satisfactory completion of Algebra I and the Algebra I EOC exam, Geometry, and a third credit of mathematics from the courses listed in TAC §74.12(b)(1)(2).

Course Description:
This course addresses a variety of mathematical topics needed to prepare students success in college-level mathematics. In this course students will connect and use multiple strands of mathematics in situations and problems, as well as in the study of other disciplines. In addition, the course supports students in developing skills and strategies needed to succeed in college. Mathematics topics include: numeracy with an emphasis on estimation and fluency with large numbers; manipulating and evaluating expressions and formulas, to include perimeter, area, and volume; rates, ratios, and proportions; percentages; solving equations; linear equations and inequalities; linear systems; exponential models; data interpretations including graphs and tables; verbal, algebraic, and graphical interpretations of functions. Mathematical process standards are also included in this framework; these process standards describe ways in which students are expected to engage in the content. Successful completion of this course, as defined by the memorandum of understanding (MOU) with the partnering institution(s), grants the student an exemption to TSI requirements for mathematics at the partnering institution(s).

Course Goal:
The goal of this course is to develop students' quantitative and algebraic reasoning abilities, thus preparing them for college success in multiple mathematics pathways.

Student Learning Outcomes & Learning Objectives:
Upon successful completion of this course, students will be able to:

(1) Mathematical process standards. Use mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:
- (A) apply mathematics to problems arising in everyday life, society, and the workplace;
- (B) use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution;
- (C) select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems;
- (D) communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;
- (E) create and use representations to organize, record, and communicate mathematical ideas;
- (F) analyze mathematical relationships to connect and communicate mathematical ideas; and
- (G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

(2) Numeric reasoning. Solve authentic problems in a variety of contexts that require number sense and the ability to apply concepts of numeracy to investigate and describe quantitative relationships. Students will be able to:

- **Organized around student learning goals and objectives**
- **Reflects mathematics pathways**
  - Applying mathematical processes
  - Numeric reasoning
  - Proportional reasoning
  - Algebraic reasoning
  - Probabilistic reasoning
  - Quantitative reasoning

The Sequence of Mathematical Content

Numerical and proportional reasoning	4 weeks
Statistical and probabilistic reasoning	6 weeks
Algebraic representations and measurement	4 weeks
Linear functions, equations, and inequalities	5 weeks
Modeling with linear and exponential functions	5 weeks
Other nonlinear models	5 weeks

Link Between Learning Mindsets and Achievement

Learning mindsets and strategies are critical to lifelong learning skills and students' success in school and beyond.

In our model course, we integrated both the cognitive (i.e., rich academic content) and noncognitive (i.e., motivational) domains that are highly effective for improving academic achievement, including for struggling students.

Pellegrino, J. W., & Hilton, M. L. (Eds). (2012). *Education for work and life: Developing transferable knowledge and skills in the 21st century*. Washington, DC: National Academy Press.

West, M. R., Kraft, M. A., Finn, A. S., Martin, R., Duckworth, A. L., Gabrieli, C. F. O., & Gabrieli, J. D. E. (2014). *Promise and paradox: Measuring students' non-cognitive skills and the impact of schooling*. Cambridge, MA: National Center for Teacher Effectiveness,Harvard University.

Model Course Implementation

2016-17 and 2017-18

- **Cohort 1: 2016-2017**
  - 353 students
  - 10 school districts
  - 4 institutions of higher education
  - 61% of students college ready
- **Cohort 2: 2017-2018**
  - 1,066 students
  - 32 school districts
  - 8 institutions of higher education
  - 52% of students college ready

Student voices

- "This class has helped me learn how to think and put a plan into action before giving [up] or saying I can't do something."
- "I've been able to interact and by interacting I learn new strategies and things I've never learned before that make processes simpler and more understandable."
- "It has showed me problem solving skills and has convinced me that I can get smarter."
- "I've learned real world math that I know I will use in the future."
- "It has taught me that I am smarter than I thought."

The Dana Center's Launch Years Initiative

- Focuses on the transition from junior year of high school through junior year in college.
- Backed by a $6.68 million grant from the Bill & Melinda Gates Foundation and includes work with partners from Education Strategy Group, Achieve, and Community College Research Center (CCRC).
- Includes work on the ground in 2-3 states to address high school mathematics offerings and policies, bringing institutions together at a regional level to ensure students have clear paths for success.

The Launch Years approach

- **Strategy 1: Agreement.** Create consensus around a common understanding of mathematics pathways that extend from high school into post-secondary education and prepare students for success.
- **Strategy 2: Outreach.** Mobilize a wide range of constituencies to advance the new paradigm for college and career readiness in mathematics and reduce persistent equity gaps.
- **Strategy 3: Tools.** Create new pathways for mathematics instruction in the third and fourth years of high school and initiate the implementation of transition math courses.

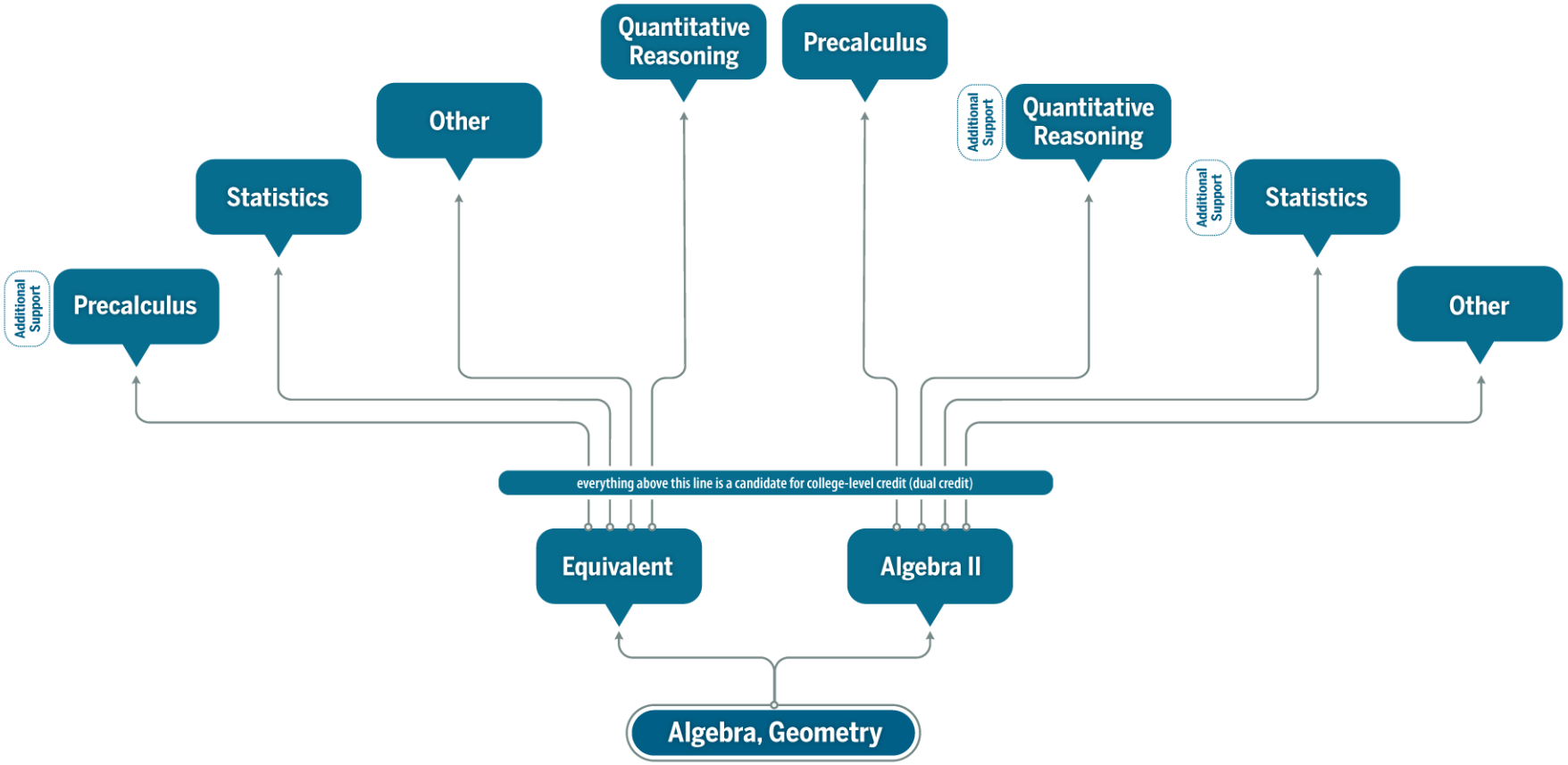
Strategy 3: Tools for transition courses

- Course framework comprising student learning outcomes, course design principles, and sample syllabus
- Designed to help 12th-grade "at-risk" students meet a college readiness measure in mathematics before graduation, thus avoiding developmental courses in college

Strategy 3: Tools for A2EP

- Course frameworks comprising content specifications and course design principles, and other information for 4 courses.
- Designed for on-grade level students in 11th or 12th grade planning to pursue a program of study that privileges statistics, quantitative reasoning, and/or computational thinking over calculus
- Comprise an equivalent to Algebra II plus 3 follow-on courses

Strategy 3: Tools



The Transition Course might follow Algebra II or the Equivalent course. Remember, its audience and purpose are different than the audience and purpose for other courses shown here that students might take in their senior year.

Reimagining Developmental Education

CAPR \ 2019

Thank you!

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