

Advanced Placement Program® (AP®): Validity Research and Recommendations for Providing Credit and/or Placement

College Board's Mission and Purpose

- The College Board is a **not-for-profit** membership association whose **mission is to connect students to college success and opportunity**.
- Founded in 1900, the association is **composed of more than 5,600 schools, colleges, universities and other educational organizations**.
- Each year, the College Board serves **seven million students** and their parents, **23,000 high schools**, and **3,800 colleges** through major programs and services in college admissions, guidance, assessment, financial aid, enrollment, and teaching and learning.
- The College Board is **committed to the principles of excellence and equity**, and that commitment is embodied in all of its programs, services, activities and concerns.



AP Mission

The College Board's Advanced Placement Program® (AP®) enables students to pursue college-level studies while still in high school. Through more than 30 college-level courses, each culminating in a rigorous exam, AP provides willing and academically prepared students with the opportunity to earn college credit and/or advanced placement.

AP Overview

- Started in 1955
- Rigorous college-level courses taught in high schools around the world
- Exam grades utilized for college credit and/or placement
- Over 30 Advanced Placement exams in over 20 subject areas
 - World Languages expansion: Chinese and Japanese (2007)

Introduction to AP

- In 2008, students representing **over 17,000 schools around the world**, both public and nonpublic, took AP Exams
- Enables students to pursue **college-level studies** while still in high school
- More than 30 **college-level courses**, each culminating in a **rigorous exam**
- Provides **willing and academically prepared students** with the opportunity to earn college credit and/or advanced placement
- Demonstrates to college admissions officers that students have sought out the most **rigorous curriculum** available to them
- Each AP teacher's syllabus is **evaluated and approved by college faculty** from some of the nation's leading institutions
- Exams developed and scored by **college faculty and experienced AP teachers**
- **Accepted by more than 3,600 colleges and universities worldwide** for college credit, advanced placement, or both on the basis of successful AP Exam grades



AP Courses

- Arts
 - Art History, Music Theory, Studio Art (drawing, 2-D, 3-D)
- English
 - Language and Composition, Literature and Composition
- History and Social Sciences
 - Comparative Government and Politics, European History, Human Geography, Macroeconomics, Microeconomics, Psychology, United States Government and Politics, United States History, World History
- Mathematics and Computer Science
 - Calculus AB, Calculus BC, Computer Science A, *Computer Science AB, Statistics
- Sciences
 - Biology, Chemistry, Environmental Science, Physics B, Physics C: Electricity and Magnetism, Physics C: Mechanics
- World Languages
 - Chinese Language and Culture, French Language, *French Literature, German Language, **Italian Language and Culture, Japanese Language and Culture, *Latin Literature, Latin: Vergil, Spanish Language, Spanish Literature

* indicates courses that have been discontinued beginning in the 2009-2010 academic year

** indicates course has been suspended beginning in the 2009-2010 academic year

Source: http://apcentral.collegeboard.com/apc/public/courses/teachers_corner/index.html

Who Participates in AP?

- 17,000+ secondary schools worldwide offer AP Exams
- More than 122,000 AP teachers in nearly 15,000 schools worldwide are authorized to teach AP courses
- In 2008, over 1.5 million students took about 2.7 million exams
- 5,000+ college faculty develop and score the AP Exams ensuring college-level standards
- 3,600+ colleges receive AP Exam grades annually



Faculty Involvement

- College faculty are involved in AP Course and Exam development. Currently, faculty:
 - Serve as Chairs and members of all AP Development Committees that develop all AP course descriptions and exams
 - Pre-test AP Exams by embedding them within exams offered in the college classroom
 - Score the free-response sections of AP Exams by attending the AP Reading every June
 - Are responsible for standard setting and are involved in the evaluation of student responses at the AP Reading; the Chief Reader for each AP subject is a college faculty member
 - Lead professional development workshops for new and experienced AP teachers
 - Serve as the senior reviewers in the annual AP Course Audit, ensuring AP teachers' syllabi meet the curriculum guidelines of college-level courses

What are College Faculty Saying about the AP Experience?

“We often observe a discernible difference between students without any AP experience, who typically only devote a few hours to homework each week, and AP students who have developed the time management skills and the discipline to do the type of time consuming intellectual work (studying) that is required to be successful in college.”

Spencer A. Benson
Director Center for Teaching Excellence
Associate Professor
Department of Cell Biology and Molecular Genetics
University of Maryland, College Park

What do AP Exam Grades Represent?

Each AP Exam grade is a weighted combination of the student's score on the multiple-choice section and on the free-response section. The final grade is reported on a 5-point scale:

5 = extremely well qualified

4 = well qualified

3 = qualified

2 = possibly qualified

1 = no recommendation

- AP grades of 5 and 4 are comparable to a college course grade of A, while at some institutions, an AP grade of 4 is comparable to a college course grade of B
- An AP grade of 3 is approximately equal to a college course grade of B at many institutions, while at others it is more nearly comparable to a college course grade of C.



College Comparability Studies

College comparability studies are used to set AP grades in order to ensure that the AP standards are comparable to or higher than the grading standards that are applied by college professors when evaluating the performance of their own students in corresponding college courses.

Comparability Study Participation

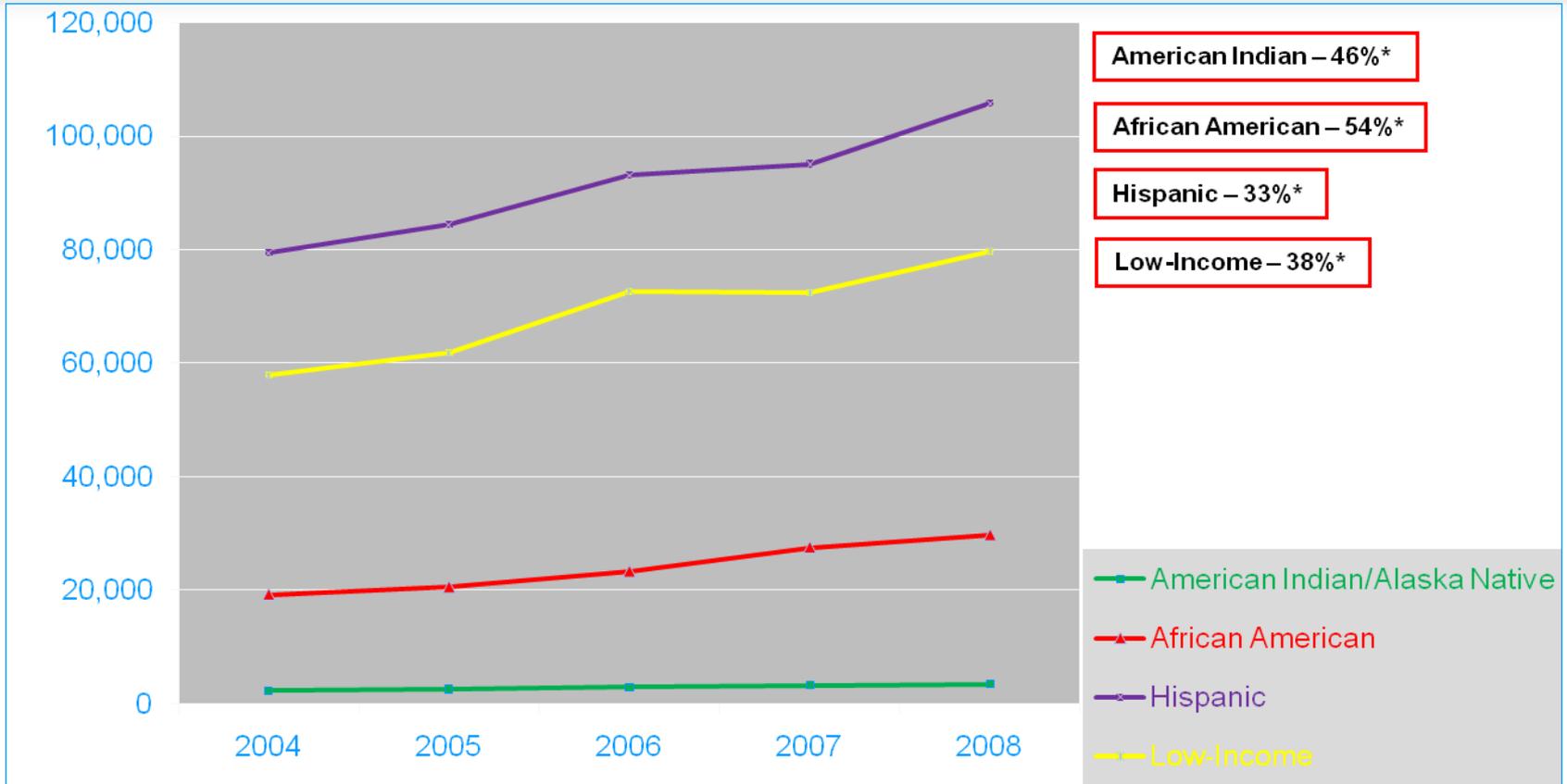
Faculty at the following institutions have participated in comparability studies in recent years:

- Baylor University
- Brigham Young University
- Duke University
- Grinnell College
- Harvard University
- Michigan State University
- Middlebury College
- Princeton University
- Purdue University
- Smith College
- Stanford University
- Tufts University
- UCLA
- UC-Berkeley
- University of Colorado-Boulder
- University of Maryland-College Park
- UNC-Chapel Hill
- University of Pennsylvania
- University of Southern California
- University of Virginia
- University of Washington
- University of Wisconsin-Madison
- Washington University in St. Louis
- Yale University

Key Benefits of AP

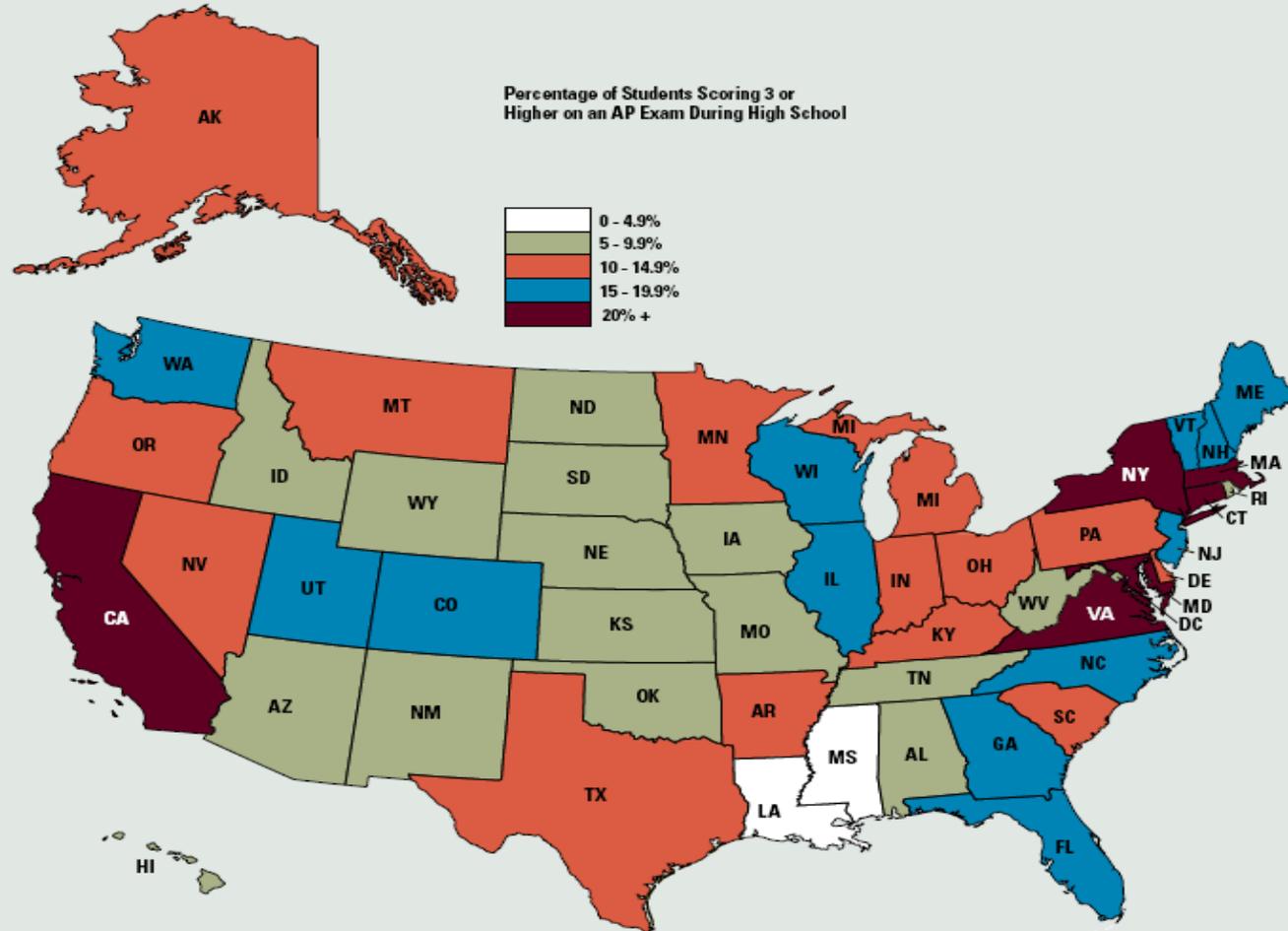
- AP courses establish a college-level standard in secondary schools that is measured through a national assessment designed and scored by college faculty.
- AP courses expose college-bound students to the amounts of homework, study skills, and habits of mind essential for success in college courses.
- AP provides leverage for aligning and strengthening the grades 6-12 curriculum.
- Students who take AP Exams and score a 3 or higher typically experience greater academic success and college graduation rates than non-AP students.
- The AP course is typically the most rigorous curriculum offered in secondary schools and is designated on the student transcript.
- Because AP is widely used for college credit and/or placement, it attracts motivated students eager to double major, or engage in deeper, upper-division courses at college.

Growth in Exam Grades of 3 and Higher Among Underrepresented Students: 2004-2008



Equity and Excellence: Students Scoring 3 or higher on AP Exams by State

U.S. Public Schools: High School Class of 2008



States with the Greatest Expansion of AP Scores of 3+ Since 2003

State	% Change
Vermont	6.0
Maine	5.8
Maryland	5.7
Arkansas	5.1
Washington	5.0
Oregon	5.0

AP Report to the Nation: How Does Ohio Compare?

Class of 2008 – Ohio

- 122,456* - HS students
- 21,502- # of HS students who took an AP exam
- 17.6% took an AP exam while in HS
- 10.8% earned a score of 3 or higher

Class of 2008 – Nation

- 3.03 million* - HS students
- 757,932 - # of HS students who took an AP exam
- 25.0% took an AP exam while in HS
- 15.2% earned a score of 3 or higher

AP Research

TIMSS Advanced Mathematics and Physics Tests

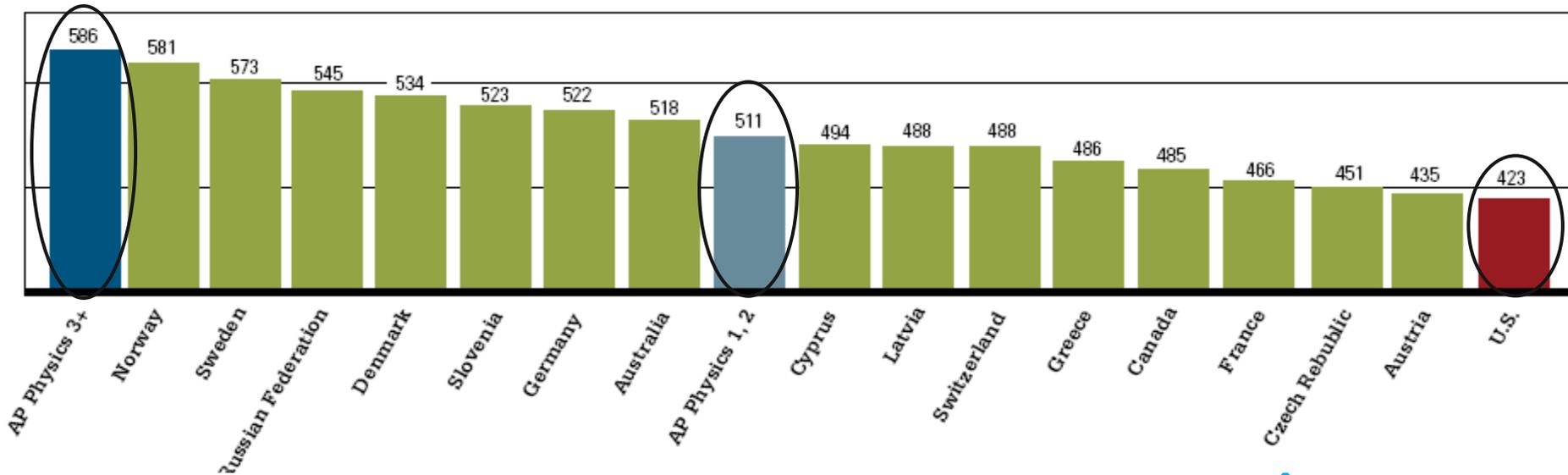
Eugenio J. Gonzalez, Kathleen M. O'Connor, & Julie A. Miles (2001)

- Gonzalez et al showed that students enrolled in AP Calculus courses earned the highest average scores on the TIMSS Advanced Mathematics tests, significantly outperforming students in all other countries, including U.S. students who did not take AP Calculus.
- Students enrolled in AP Physics also performed well, scoring significantly above the international average on the TIMSS Physics test; whereas U.S. students not taking AP scored significantly below the international average. It's also important to note that AP students who earned AP Exam grades of 3 or better on the AP Calculus Exams or the AP Physics Exams earned even higher scores on the TIMSS assessments compared to students who took the AP course but not necessarily the exam.

AP Student Performance in Physics

- While the U.S. lags behind industrialized countries that participate in the TIMSS test, AP physics students who earned exam grades of 3 or higher outscore all other students.
- Students who earned a 1 or 2 on AP Physics Exams outscored students in more than half of participating industrialized countries

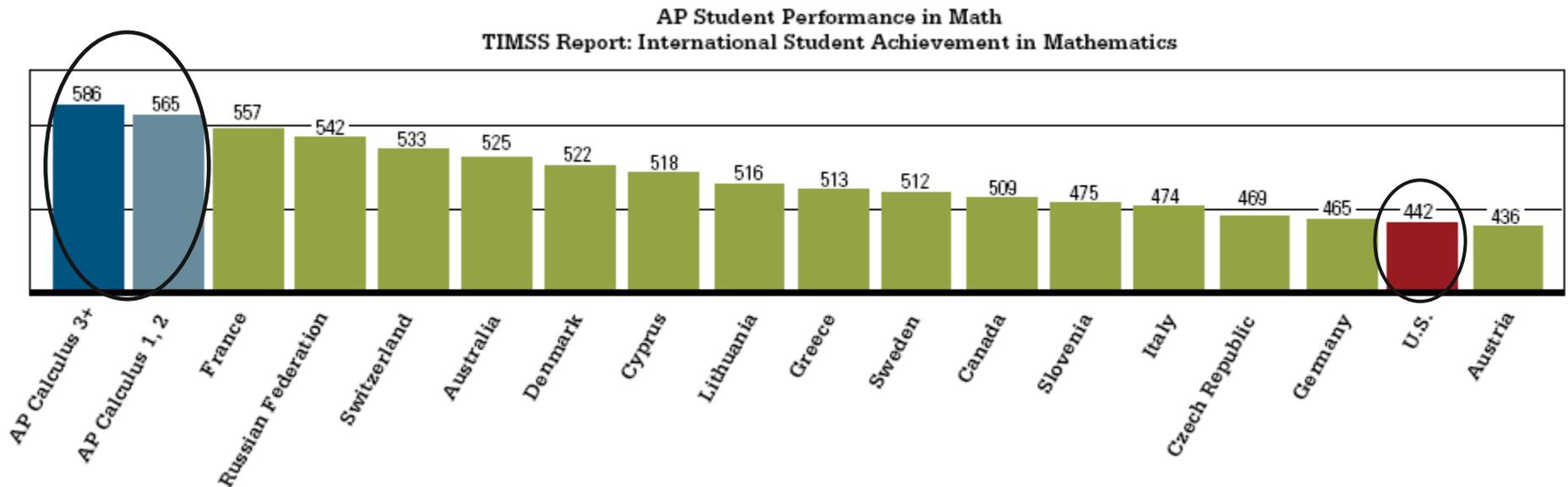
AP Student Performance in Advanced Science Achievement
TIMSS Report: International Student Achievement in Physics



Source: Gonzalez, E., O'Connor, K., & Miles, J. (2000). How well do Advanced Placement students perform on the TIMSS Advanced Mathematics and Physics Tests? Chestnut Hill, MA: The International Study Center, Lynch School of Education, Boston College.

AP Student Performance in Math

- While the U.S. lags behind nearly every industrialized country that participates in the TIMSS test, AP calculus students, regardless of exam grade, outscored all other students



Source: Gonzalez, E., O'Connor, K., & Miles, J. (2000). *How well do Advanced Placement students perform on the TIMSS Advanced Mathematics and Physics Tests?* Chestnut Hill, MA: The International Study Center, Lynch School of Education, Boston College.

Morgan and Klaric*: College Success Among AP and Non-AP Students

- Nationwide 2007 study that built on similar study from 1998
- Collected official student transcript data from numerous colleges and universities
- Compared sequent course grades of AP students and non-AP students
- Examined trends in course-taking
- Looked at underrepresented students majoring in science, technology, engineering, and mathematics (STEM)



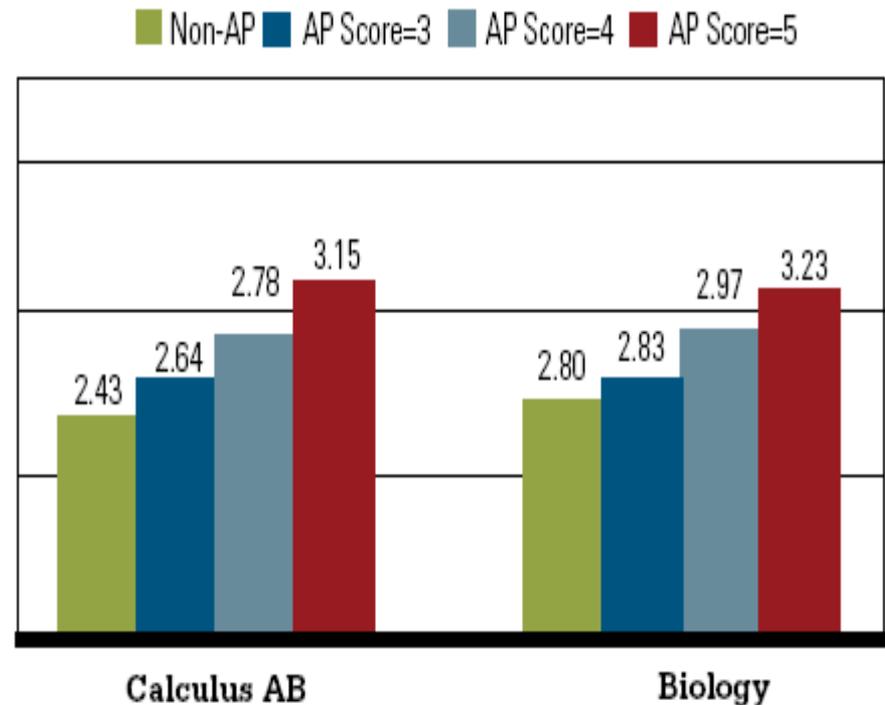
Morgan and Klaric: Participating Colleges*

- Barnard College
- Binghamton University
- Brigham Young University**
- Carnegie Mellon University**
- College of William and Mary**
- Cornell University**
- Dartmouth College
- George Washington University
- Georgia Institute of Technology
- Miami University (Ohio)
- North Carolina State University
- Northwestern University
- Stanford University**
- Texas A&M University
- University of California – Davis**
- University of California – Los Angeles
- University of Florida
- University of Illinois – Urbana**
- University of Iowa
- University of Maryland
- University of Miami
- University of Southern California
- University of Texas at Austin**
- University of Washington
- Wesleyan College
- Williams College

Morgan and Klaric: Grade Point Averages of AP and Non-AP Students

- AP students who scored a 3 or higher on AP Exams outperformed matched non-AP students

Average Grades of Matched AP and Non-AP Students' Performance in Intermediate-Level STEM Coursework in College¹³



Morgan and Klaric: Trends in Course Taking

Amount of College Course Work in a Closely Related Discipline

AP Exam	AP Students Taking at Least One Course in a Related Area (%)	Non-AP Students Taking at Least One Course in a Related Area (%)	All AP Students:	All Non-AP Students:
			Number of Courses in Related Areas	Number of Courses in Related Areas
U.S. History	61	70	1.7	1.6
Art History	45	14	1.5	0.3
Art—Drawing	36	9	4.4	0.3
Art—General	43	9	4.4	0.3
Biology	63	59	4.5	2.6
Chemistry	71	56	5.5	2.7
Computer Science A	58	28	3.7	0.9
Computer Science AB	56	28	4.9	0.9
Microeconomics	74	46	2.6	1.2
Macroeconomics	68	46	2.1	1.2
English Language and Composition	96	92	3.3	3.1
English Literature and Composition	83	96	3.2	3.3
European History	59	59	1.9	1.3
French Language	56	13	2.2	0.4
French Literature	59	13	2.2	0.4
German Language	54	7	2.5	0.2

Amount of College Course Work in a Closely Related Discipline

AP Exam	AP Students Taking at Least One Course in a Related Area (%)	Non-AP Students Taking at Least One Course in a Related Area (%)	All AP Students:	All Non-AP Students:
			Number of Courses in Related Areas	Number of Courses in Related Areas
U.S. Government and Politics	60	70	2.8	2.3
Comparative Government and Politics	51	63	2.7	2.2
Latin*	25	13	0.9	0.2
Calculus AB	84	90	7.7	5.7
Calculus BC	89	90	10.7	5.7
Music Theory	56	30	10.1	1.0
Physics B	72	59	8.2	4.2
Physics Mechanics	70	59	10.0	4.2
Physics E & M	80	59	11.3	4.2
Psychology	68	61	3.2	1.7
Spanish Language	44	27	1.9	0.8
Spanish Literature	50	27	2.2	0.8

Morgan and Klaric: Underrepresented Students Majoring in STEM Disciplines

Course	Female Students Who:		African-American Students Who:		Hispanic Students Who:	
	Took AP & Chose Major	Did Not Take AP & Chose Major	Took AP & Chose Major	Did Not Take AP & Chose Major	Took AP & Chose Major	Did Not Take AP & Chose Major
Biology	20%	6%	18%	6%	16%	4%
Chemistry	15%	1%	14%	2%	13%	2%
Computer Science	11%	1%	14%	2%	17%	2%
Calculus AB	11%	4%	21%	9%	23%	8%
Calculus BC	16%	4%	28%	9%	23%	6%
Physics B	16%	3%	31%	7%	25%	8%
Physics C: Mechanics	22%	3%	29%	6%	41%	7%
Physics C: Electricity & Magnetism	25%	2%	48%	6%	47%	7%

Hargrove, Godin, and Dodd: College Outcomes Among Three Student Groups

- 2007 statewide study of public four-year institutions in Texas
- Provides an extensive comparison of students' performance on several college outcomes (first and fourth-year GPA and 4-year graduation status) among three groups:
 - Students who took the AP course and exam
 - Students who took only the AP course
 - Students who took standard high school courses but not AP
- Controls for SAT scores and SES (as measured by Free or Reduced Price Lunch status)

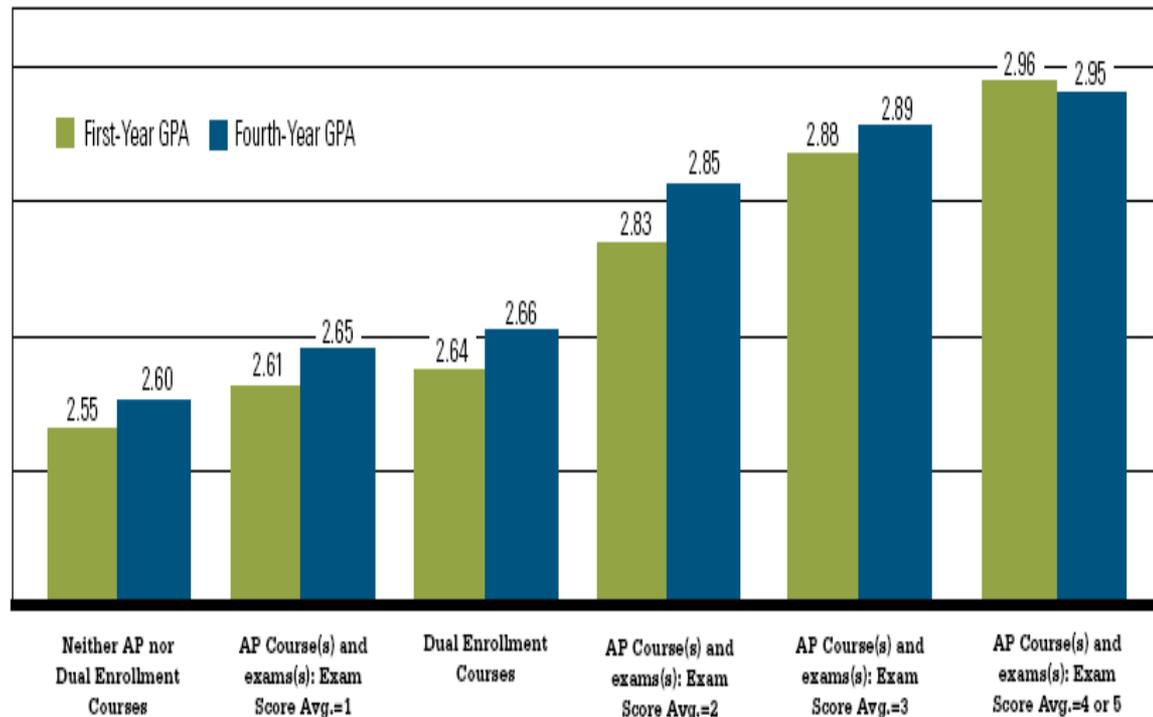
Hargrove, Godin and Dodd: Results

- The “AP course and exam” group significantly outperformed the “standard high school courses” group on all college outcomes in all years, after statistically controlling for SAT scores and SES.
- The “AP course and exam” group also significantly outperformed the “AP course only” group on all college outcomes.

Hargrove, Godin and Dodd: College Grade Point Averages

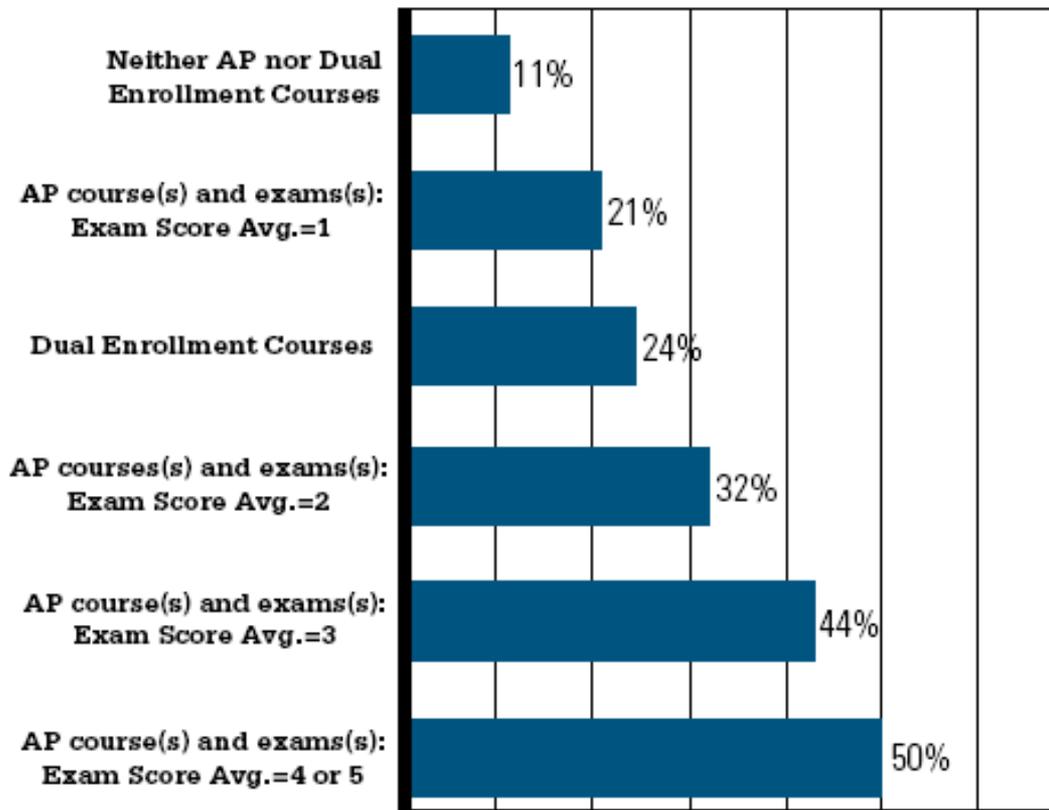
- AP students who scored a 1 on AP Exams outperformed students who had taken neither AP nor dual enrollment
- AP students who scored a 2 or higher on AP Exams outperformed all students

First-Year and Fourth-Year Average College GPAs of Students with Varying AP and Non-AP Experiences



Time to Degree

Percentage of Students with Varying AP and Non-AP Experiences Who Earn a Bachelor's Degree Within 4-Years



Students who scored a 3 or higher on an AP Exam were more likely than other students to earn a bachelor's degree within 4 years.

Dougherty, Mellor and Jian: Time to Graduation

- 2006 statewide study in Texas
- Followed a cohort of students from 1994 (8th grade) to 2003 (five years after enrolling in college)
- Students who were enrolled in public colleges and universities in Texas
- Focused on likelihood of students graduating from college within five years of enrolling

Dougherty, Mellor and Jian: Results

- AP students who were exempted from the introductory course generally did at least as well, if not better, in the subsequent course as those who took the introductory course
- Students who score a 3 or higher on an AP Exam are more likely to graduate from college in five years or less compared to non-AP students

Dougherty, Mellor and Jian: Results

*College Graduation Rate differences between “matched” AP and non-AP students**

Student Demographic	AP Exam Grade of 3 or higher
African-American	28% higher
Hispanic	28% higher
White	33% higher
Low-Income	26% higher
Not Low-Income	34% higher

AP and College Success

- Research continues to suggest that AP Exam grades of 3 or higher are consistently predictive of student college success
- Emphasis should be on strong partnerships between K-12, higher education, states and College Board to help more students earn grades of 3 or higher
- College Board believes that willing and academically prepared students should be encouraged and supported in taking on the challenge of college-level courses in high school
- Students **may** experience college success regardless of exam grade

Sources

- *College Board / AP Program*
- *AP Report to the Nation 2009*
- *College Board Staff Data Resource Software (SDRS)*
- *Dougherty, Chrys, Lynn Mellor and Shuling Jian. 2006. The Relationship Between Advanced Placement and College Graduation. 2005 AP Study Series, Report 1. National Center for Educational Accountability.*
- *Gonzalez, E., O'Connor, K., & Miles, J. (2000). How well do Advanced Placement students perform on the TIMSS Advanced Mathematics and Physics Tests? Chestnut Hill, MA: The International Study Center, Lynch School of Education, Boston College.*
- *Organisation for Economic Co-Operation and Development (OECD) 2003*
- *Programme for International Student Assessment (PISA) 2006 database*
- **Morgan, Rick and John Klaric. 2007. AP Students in College: An Analysis of Five-Year Academic Careers. Research Report No. 2007-4. The College Board: New York, NY.*
- **Hargrove, Linda, Donn Godin and Barbara Dodd. 2007. College Outcomes Comparisons by AP and Non-AP High School Experiences. Research Report No. 2008-3. The College Board: New York, NY.*

* Available on collegeboard.com/research