



The Performance of Preuss School Students in AP Courses and on AP Exams

A CREATE Policy Brief

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Abstract

After a brief introduction to the rationale and mission of the Preuss School, this Policy Brief summarizes the AP course-taking and AP exam-taking patterns of students enrolled in the Preuss School during the 2005-2006 academic year. State Department of Education data show that there were 2.6 AP exams passed for every grade 12 Preuss School student enrolled in 2005-2006. This exam-passage rate surpasses every other high school in San Diego County. Indeed, the Preuss School ranks ninth out of 988 high schools statewide. For the state as a whole, the passage rate was only 0.6 AP exams passed per grade 12 student. Data for 2006-2007 show that the passage rate at Preuss increased further.

The “number of exams taken and passed per student” measure is more accurate than a comparison of “percentage of AP exams passed” between a given school and its district on AP exams: It more accurately displays the number of times that students at each school *actually pass* the College Board exams.

Perhaps most importantly, the “number of exams taken and passed per student” measure validates the Preuss School strategy of preparing all of its students for university. By giving the students ample access to college-level course-work, and, crucially, having them take an externally administered exam approved by the College Board, the School gives its students an invaluable foretaste of the level of rigor that universities will expect.

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Introduction to the Preuss School

The Preuss School at UCSD is a college preparatory middle and high school for students from low-income backgrounds who will be the first in their families to graduate from a 4-year college or university. It is intended to serve as a model for the education of under represented youth and as a partial remedy for the lack of diversity on campuses of the University of California. The Preuss School at UCSD selects through a lottery low-income sixth grade students with high potential but under-developed skills, and immediately enrolls them in rigorous college-prep classes. Their course of study at the high school level includes 4 years of English; 4 years of math; 4 years of science, including 3 lab sciences; 4 years of a foreign language; and 1 year of a visual and performing art. These courses fulfill or exceed entry requirements into the University of California and California State University.

The School's curriculum is predicated on the "universal development principle" that students can perform well in college-prep classes and then succeed at selective colleges and universities when they are provided with the appropriate academic and social supports (Cicourel & Mehan 1983; LCHC 1983; Bruner 1986; Meier 1985; Resnick 1995). The supports in place at the Preuss School include a longer school day, week and year, and smaller classes. The school complements these structural "scaffolds" with a "college-going culture," which includes teachers who hold high expectations for their students, counselors and teachers who take a deep personal interest in their students, tutors from UCSD, and mentors from the community.

This modern conception of cognitive potential is supported by sociological critiques of tracking (Cicourel & Mehan, 1983; Oakes 1985, 2003; Oakes et al., 1992; Haycock & Navarro, 1988; Lucas, 1999; Education Trust, 2003a, 2003b), and by research on the insufficiency of courses in schools attended by economically disadvantaged children. The distribution of students to high-, middle-, and low-ability groups or academic and general tracks in conventional high

schools correlates with ethnicity and socioeconomic status. Children from low-income or one-parent households, or from families with an unemployed worker, or from linguistic and ethnic minority groups, are more likely to be assigned to low-ability groups or tracks. Furthermore, African American and Latino students are consistently underrepresented in programs for the "gifted and talented" but over represented in special education programs (Mercer, 1975; Mehan et al., 1986).

In addition, students segregated into low-track classes are often exposed to a limited range of cognitive tasks that do not stretch their higher-order thinking and communicative skills, do not extend them to solve new and complex problems, and do not facilitate the transfer of knowledge gained in one situation to another situation. The implication of the universal development thesis is that schools should not segregate students into high and low tracks. Indeed, *all* students—those enrolling in college and those entering the world of work-- benefit from a rigorous academic curriculum.

Even without tracking, economically disadvantaged children of low socio economic status tend to be in schools that do not offer courses at the college preparatory level. They lack the opportunity to take courses on the “scaffold” which prepare them for college level work and the AP and SAT type exams that indicate readiness to college admissions officers.

For these reasons, the Preuss School offers only one, college-prep course of study. Researchers in California and nationwide support the “detracking” model in place at Preuss: first, students’ selection of courses is key to their attending a four-year college (Rose and Betts, 2001, 2004); second, the sequence of these courses must start in middle school and early high school. Third, students learn more in advanced courses with a rigorous curriculum. Fourth, many poor students attend schools in which very few college preparatory courses are offered. Fifth,

advanced courses are required by competitive universities. Sixth, students who thought they were “succeeding” in high school by getting good grades are often devastated to find out that their courses have not prepared them with the skills to cope at a four-year college (Adelman 1999; Mathews, 1998; Oakes, 2003).

The record of the school in preparing students for the college admissions process is well established. An average of 83% of the graduates of the first 4 graduating classes attend such colleges as UC Berkeley, UCLA, UCSD, SDSU, Dartmouth, MIT, and Harvard (see Table 1).

Table 1 Number and Percentage of Students from the Graduating Classes of 2004 through 2007 Who Attended 4 Year or Community College after Graduation

	2004 N %	2005 N %	2006 N %	2007 N %
UC	25 44%	33 44%	39 45%	26 33%
CSU	9 16%	20 27%	20 23%	33 43%
Private	10 20%	12 16%	9 10%	9 12%
Sum 4- Yr	44 80%	64 87%	68 78%	68 87%
CCC*	11	9	19	9
Other	20%	13%	22%	12% 1** 1%
Totals	55 100%	75 100%	87 100%	78 100%

*Students attending California Community Colleges (CCC) were offered dual admission or Guaranteed Transfer in which students enter the UC as juniors after completing 2 years of community college course work.** One student entered the Marines

The Importance of Advanced Placement Courses and Tests

Advanced Placement (AP) courses are some of the most rigorous courses offered in high school. They are considered equivalent to introductory courses in many colleges and universities. The College Board develops and maintains the standards, and implicitly, the curricular content, for AP exams in various subject areas. In addition, it supports teachers of AP courses, supports universities as they define their policies regarding AP grades, and develops and coordinates the administration of annual AP examinations. These activities are funded through fees charged to students taking AP Exams. Individual teachers, and in some cases schools and districts, develop courses designed to prepare students for the AP exam.

To obtain college credit, students must take the AP test in the given subject. The College Board allows students to take an examination in a subject without participating in the course. This policy enables students from schools that do not offer AP courses to have an equal opportunity to take examinations. It also enables extremely well-qualified and enterprising students to increase their college preparation and likelihood of college admission.

AP tests are scored on a numeric scale, 1 to 5, with a score of 3 or above considered passing; the individual scores have the following general meanings:

5: Extremely well-qualified

4: Well-qualified

3: Qualified

2: Possibly qualified

1: No recommendation

Some colleges, including UC and CSU campuses, exempt students from certain introductory coursework if they demonstrate mastery by scoring 3, 4, or 5 on an AP test.

www.collegeboard.com

Numerous researchers have found that students who take AP courses and exams in high school tend to outperform otherwise similar students in college. Students who take the College Board exam and who pass with a score of 3 or higher do especially well in college relative to other college students. Recent research from Texas suggests that students who take an AP course and College Board exam outperform students who never took an AP course, and that even those who take an AP course without taking the AP exam outperform students who never took an AP course. (See College Board, 2007, pages 2 and 11-13.)

What about the achievement levels of AP students while they are still in high school? The Third International Math and Science Study (TIMSS) reported that in the United States advanced math and physics students score well behind other students in other countries in these subjects. Notably, AP students in the United States, even those scoring a 1 or 2 on the AP Exam, showed calculus and physics achievement on the same level as the highest achieving calculus and physics students in the world. (College Board, 2007, page 2)

In spite of these positive research findings, some observers question what is being taught in a typical AP course at the high school level. The fact that the College Board does not directly oversee high school courses with the AP moniker has led to concerns that many AP high school courses may be “watered down” in terms of their content. Consequently in 2007 the College Board launched a worldwide audit of high school AP courses. The College Board required each teacher to provide a detailed syllabus, which had to meet content standards for the course to retain AP accreditation.

As a result, for the first time in 50 years, the steady growth in the number of schools worldwide offering AP courses reversed: the number of schools offering at least one AP course has dropped this year from roughly 16,000 to 14,000. (Cech, 2007)

Advanced Placement Courses at the Preuss School

Courses Accredited and Typical Student Schedule

Consistent with its college-prep mission, educators at the Preuss School offer students a wide range of AP courses. The Preuss School was examined in the College Board's worldwide audit and it passed. The College Board's website confirms that there are 13 AP courses at the school that passed the College Board auditing of course level. Table 2 below shows the AP courses currently accredited at the Preuss School. Twenty courses in 13 different subjects have been approved.

Table 2 Courses at the Preuss School that Have Been Accredited by the College

Board for 2007-2008

Authorized AP Courses	# of Teachers' AP Courses Authorized
AP Art History	1
AP Biology	2
AP Calculus AB	1
AP Chemistry	2
AP English Language and Composition	2
AP English Literature and Composition	1
AP European History	2
AP Spanish Language	2
AP Spanish Literature	1
AP Statistics	1
AP Studio Art: 2-D Design	1
AP U.S. Government and Politics	2
AP United States History	2

Note: downloaded 2007/12/12 from
<https://apcourseaudit.epiconline.org/ledger/qsearch.php>.

A second factor that is key to understanding the Preuss School's AP data is the schedule on which students enroll in AP classes. Many AP classes are mandatory (for students who have passed the prerequisites); these AP classes begin in grade 10 (or grade 9 in the case of students who are already fluent in Spanish):

The mandatory AP courses are:

AP European History (10th grade)

AP US History (11th grade)

AP Government (12th grade)

AP English Language (11th grade)

AP English Literature (12th grade)

AP Spanish (9th - 12th grade)

Semi mandatory AP courses are:

AP Biology/AP Chemistry/AP Physics (12th grade)

(These courses are taken in their senior year if the students have already passed physics, chemistry and biology.)

Elective AP courses are:

AP Art History (11th and 12th grade)

AP Spanish Literature (10th, 11th and 12th grade)

AP Statistics (12th grade)²

AP Exams Taken and Passed, AP Exam Takers and Enrollment

Preuss School results on the AP exams are best interpreted in comparison to high schools around California, San Diego County, and the School's host district San Diego Unified School District. The California Dept of Education (CDE) website provides detailed results on the number of AP exams taken, the number of AP exams passed, and grade 11 and 12 enrollment for each high school in California. We calculated the number of AP exams passed in 2005-2006 and in 2006-2007 divided by grade 12 enrollment. Although this can be interpreted as "the number

² We thank Scott Barton for providing the schedule of AP classes to us.

of AP exams passed per grade 12 student,” we caution that in many schools some students who are not yet in grade 12 take and pass one or more AP exams.

Table 3 compares various AP outcomes for the Preuss School, SDUSD, San Diego County and California as a whole.

Table 3 Comparison of AP Outcomes in 2005-2006 for the Preuss School, SDUSD, San Diego County and California High Schools

Entity	Percent of AP Exams Passed	AP Exams Passed Divided by Grade 11+12 Enrollment	AP Exams Taken Divided by Grade 11+12 Enrollment	AP Exam Takers Divided by Grade 11+12 Enrollment
2005-2006				
Preuss	31.24	1.31	4.19	1.93
SDUSD	45.60	0.32	0.70	0.37
San Diego County	53.86	0.34	0.63	0.34
California	57.05	0.26	0.46	0.25
2006-2007				
Preuss	34.92	1.49	4.27	1.99
SDUSD	47.14	0.36	0.76	0.43
San Diego County	56.56	0.37	0.65	0.36
California	57.19	0.27	0.47	0.26

Source: Authors’ calculations based on data downloaded Dec. 14, 2007 from

<http://www.cde.ca.gov/ds/sp/ai/>.

The table shows that the percentage of AP exams granted passing grades by the College Board, at 31% in 2005-2006 and 35% in 2006-2007, was below averages in SDUSD, the county, or the state. However, this tells only part of the story. The second column shows that the number of AP exams passed per student enrolled in grades 11 and 12 was markedly above the average in any of these more aggregated entities. The final column shows that the average number of AP exams taken per student enrolled in grades 11 and 12 was also far above the average in the district, county or state. We emphasize that because at the Preuss School many

students in grade 10 and even earlier take at least one AP exam, we should not infer that on average each grade 11 and 12 student passed at a rate of 31% or 35% in the two years.

The table also indicates that the gap in the percentage of AP exams passed fell meaningfully in 2006-2007. For instance the gap between the School and the district fell from 14.4 percentage points to 12.2 percentage points. The reduction in the School:state gap was even larger.

Table 4 shows the top 20 schools in the state in 2005-2006 when ranked by the criterion of number of AP exams passed divided by grade 12 enrollment. This figure gives a rough estimate of the total number of AP classes passed by a student by the time he or she finishes grade 12, at least at schools with stable enrollment and similar class sizes across grades.

The table shows that the number of passing AP exams divided by grade 12 enrollment at the Preuss School in 2005-2006 was 2.57, one of the very highest passage rates of any school in California.

We emphasize several points.

1. The ranking by number of AP courses passed per grade 12 student enrolled places the Preuss School ninth out of 988 high schools in the state of California.

Table 4 The Top 20 High Schools in California When Ranked by the Number of AP Exams Passed in 2005-2006 Divided by

Grade 12 Enrollment

Rank	County Name	District Name	School Name	Grade 11+12 Enrollment	Number of AP Exam Takers	Total Number of Exams Taken	# of AP Exams Passing Divided by Grade 12 Enrollment	# of AP Exams Passing Divided by Grade 11+12 Enrollment
1	Santa Cruz	Santa Cruz County Office of Education	Pacific Collegiate Charter	117	155	324	5.55	2.42
2	Orange	Anaheim Union High	Oxford High	311	364	990	5.01	2.27
3	Los Angeles	ABC Unified	Gretchen Whitney High	352	435	903	4.57	2.26
4	San Francisco	San Francisco Unified	Lowell High	1255	1161	2582	3.82	1.86
5	Santa Clara	Palo Alto Unified	Henry M. Gunn High	847	552	1486	3.10	1.60
6	Orange	Fullerton Joint Union High	Troy High	1105	699	1777	2.98	1.50
7	Santa Clara	Fremont Union High	Monta Vista High	1155	754	1705	2.75	1.28
8	Alameda	Fremont Unified	Mission San Jose High	1034	680	1385	2.59	1.21
9	San Diego	San Diego Unified	Preuss School UCSD	175	339	733	2.57	1.31
10	San Diego	San Dieguito Union High	Torrey Pines High	1768	1207	2704	2.52	1.19
11	San Diego	San Diego Unified	La Jolla Senior High	816	556	1141	2.46	1.15
12	Santa Clara	Los Gatos-Saratoga Joint Union High	Saratoga High	673	407	925	2.40	1.22
13	Orange	Irvine Unified	University High	1058	688	1436	2.37	1.20
14	Fresno	Sierra Unified	University High	175	136	253	2.32	0.97
15	Los Angeles	La Canada Unified	La Canada High	764	502	992	2.25	1.08
16	Los Angeles	Palos Verdes Peninsula Unified	Palos Verdes Peninsula High	1277	807	1789	2.20	1.09
17	Los Angeles	Santa Monica-Malibu Unified	Malibu High	327	229	440	2.10	1.04
18	Ventura	Conejo Valley Unified	Westlake High	1031	596	1257	2.02	0.89
19	Mono	Eastern Sierra Unified	Eastern Sierra Academy	11	11	29	2.00	0.91
20	San Diego	Poway Unified	Westview High	1123	716	1302	1.99	0.96

Notes: Authors' calculations based on data downloaded Dec. 14, 2007 from <http://www.cde.ca.gov/ds/sp/ai/>. Two Elk Grove Unified School District schools were discarded because of incorrect enrollment information on the above website. Pleasant Grove High School had enrollment in grades 11 and 12 reported as 0 and 1 respectively, while Monterey Trail High reported enrollment of 372 and 7 in grades 11 and 12 respectively. Enrollment data downloaded separately from <http://dq.cde.ca.gov/DataQuest/downloads/sifenr.asp> (California Basic Education Data System) contained the same enrollment numbers. Use of either of these enrollment numbers for grade 12 enrollment led to spuriously high rankings for these schools of 1st and 18th in the state for number of AP exams passed per grade 12 enrollee. Separate downloads from the Elk Grove Unified School District suggested quite different (and higher) enrollment numbers, which if true would have placed either of these schools outside of the top 20 in the above table. Once these two schools were excluded, schools originally ranked 2nd through 17th moved up one rank to the ranks shown and schools ranked 19th through 22nd in the original list moved up 2 spots to the ranks shown above.

2. Although we have not shown it, we have also ranked high schools by the number of AP exams given passing grades by the College Board, divided by the sum of grade 11 and 12 enrollment. In this calculation, the Preuss School ranks 7th out of 1009 high schools statewide.³

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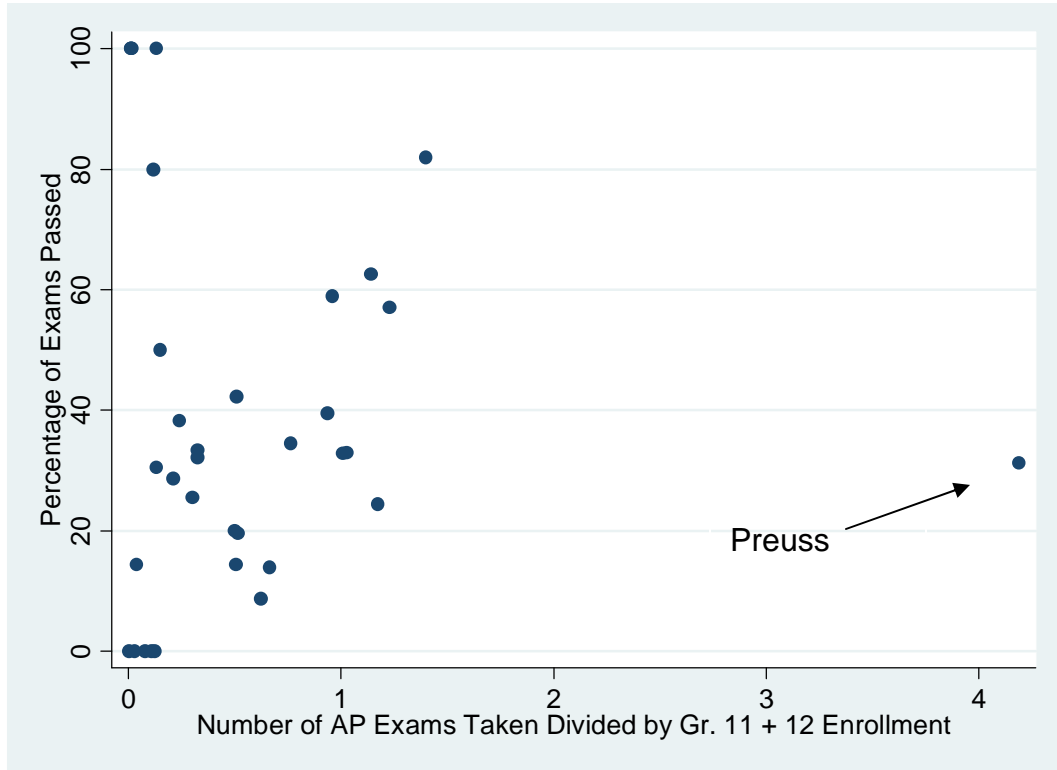
3. The number of Preuss students taking at least one AP exam in 2005-2006 (and 2006-2007) exceeded the combined enrollment in grades 11 and 12. This reflects the Preuss School practice of encouraging students to take the AP exam in earlier grades, in part to gain experience with the rigor of the exam. This fact helps to reconcile the accomplishments detailed above with the idea of a low percentage of AP exams at Preuss that received passing grades.

Figure 1 further illustrates by plotting the number of AP exams passed in 2005-2006 versus the number of AP exams taken divided by enrollment in grades 11 and 12. The Preuss School is in the middle of the pack in terms of the percentage of exams passed, but the students take far more per capita than in every other high school, virtually guaranteeing a lower pass rate when defined as the percentage of exams passed.

³ The state Department of Education publishes the number of exams passed and grade 11 and 12 enrollment. The rankings are based upon the number of high schools for which both AP exams and grade 11 and/or grade 12 enrollment are available. This explains the slight variations in the number of high schools in these two rankings.

⁴ The performance of the Preuss School in 2006-2007 was perhaps even stronger than in 2005-2006. The number of AP exams passed divided by grade 12 enrollment rose from 2.6 to 3.4. The School's ranking for AP courses passed divided by grade 12 enrollment was 6th in the state (after removing 5 schools that reported fewer than 5 students in grade 12); when the ratio was calculated as AP courses passed divided by grade 11 and 12 enrollment, the School ranked 8th statewide.

Figure 1 Comparison of the % of AP Exams Passed versus the Number of AP Exams Taken per Capita (Based on Grade 11 and 12 Enrollment) in SDUSD, 2005-2006

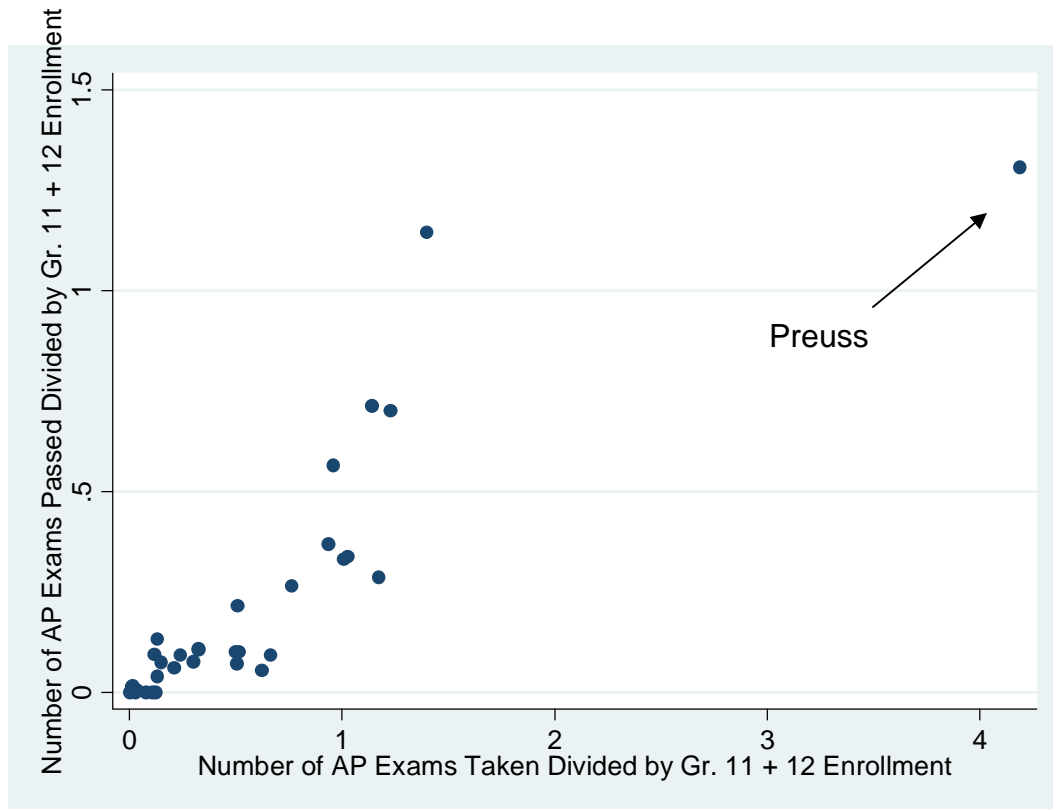


Note: The Preuss School is the school at the far right of the figure. Calculations based on data cited in earlier tables, and cover the 2005-2006 school year.

Figure 2 shows the other half of the equation: the Preuss School outpaces all other high schools in SDUSD in terms of *both* the number of exams passed and the number of exams taken, when both are calculated relative to grade 11 and 12 enrollment.

Figure 2 Comparison of the Number of AP Exams Passed Divided by Grade 11 and 12

Enrollment versus the Number of AP Exams Taken per Capita (Based on Grade 11 and 12 Enrollment) in SDUSD, 2005-2006.



Note: The Preuss School is the school at the far right of the figure. Calculations based on data cited in earlier tables, and cover the 2005-2006 school year.

Discussion

The “rate of exams taken and passed per student enrolled” measure is a more accurate gauge of students’ ultimate level of accomplishment than is a “comparison of pass rates per exam taken” between a given school and its district on AP exams. Recent comparisons of pass

rates on AP exams have cited a 45% pass rate in San Diego Unified School District vs a 26% pass rate at the Preuss School. (Su and Magee, 2007) This comparison is quite misleading.⁵

There are three flaws in this method of comparison. First, it completely neglects the number of times that students at each school *actually pass* the College Board exams.

Second, the comparison of passing rates does not consider what percentage of students in a school who *actually take* the College Board exam. At Preuss, virtually all students take at least one AP course and then take the external College Board exam; in the SDUSD, only a minority of students take the exam, and many of these students attend elite high schools in the most affluent areas of San Diego. The College Board (2007, page 88) reports that only 31% of college seniors in California's class of 2006 took at least one AP exam. In stark contrast, virtually all of the Preuss School's students in grades 12, 11 *and* 10 took at least one AP exam in 2005-2006.

The third flaw in the comparison of passage rates is an implication, perhaps unintentional, that students who fail to reach the magic passing score of 3 on an AP exam have learned nothing. This is simply untrue. Research shows that having taken AP classes increases success rates in college, regardless of score. This confirms the finding that disadvantaged students in schools that don't offer AP classes are blocked from higher education. (See College Board, 2007, pp. 2 and 11-13 for evidence on the academic gains students experience in college if they are able to take AP classes while in high school.) Putting students in schools like the Preuss School that have college prep courses is a vital to achieving the goal of expanding opportunities to college.

The Preuss School strategy is to prepare all of its students for university. By giving the students ample access to college-level course-work, and, crucially, having them take an

⁵ Further, our own calculations of this misleading statistic are slightly more favorable, showing a pass rate of 31% at the Preuss School versus 46% for the district as a whole in 2005-2006.

externally administered exam approved by the College Board, the School gives its students an invaluable foretaste of the level of rigor that universities will expect. The facts demonstrated here, that the Preuss School ranks in the top ten in the entire state in terms of the number of AP exams passed per student, is a testament to the organizing principles of the school to offer rigorous instruction to all students, supported by a system of academic and social scaffolds. In addition to reflecting the hard work of students and their teachers alike, the results suggest that this educational approach could provide a path to college for motivated but economically disadvantaged students in settings outside San Diego as well.

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