

## *The Virtual University and Educational Opportunity*

The Washington Office of the College Board conducts policy analysis that supports the Board's mission of educational equity and excellence for all students. Our aim is to spark constructive debate and produce accessible, reliable information and analysis for state and federal policymakers, College Board constituents, educators, the media, and the public. We do this by collecting reference data on key issues, conducting and publishing research, commissioning papers, sponsoring conferences, and presenting legislative testimony.



Copyright © 1999 College Entrance Examination Board. All rights reserved. College Board, College Board Online, and the acorn logo are registered trademarks of the College Entrance Examination Board.

Copies of this report (item no. 209170) may be ordered for \$12.00 each plus \$4.00 postage and handling from College Board Publications, Box 886, New York, NY 10101-0886. Credit card orders may be placed by calling (800) 323-7155 Monday through Friday, 8 a.m. to 11 p.m. (EST). Shipping and handling charges are additional. For additional information call College Board Publications Customer Service at (212) 713-8165 Monday through Friday, 9 a.m. to 5 p.m. (EST). Purchase orders over \$25.00 are accepted.

A free, downloadable .pdf version is available from College Board Online®.

*[www.collegeboard.org](http://www.collegeboard.org)*

## A New Set of Barriers for the Traditionally Underrepresented in Higher Education?

The Web shatters geographical barriers to educational access, but it also may create new ones. Virtual universities will only help those who have the necessary equipment and experience to be comfortable with the technologies.

*Not all students have equal access to computers and the Internet. In fact, there is evidence that students with the greatest need get the least access.*

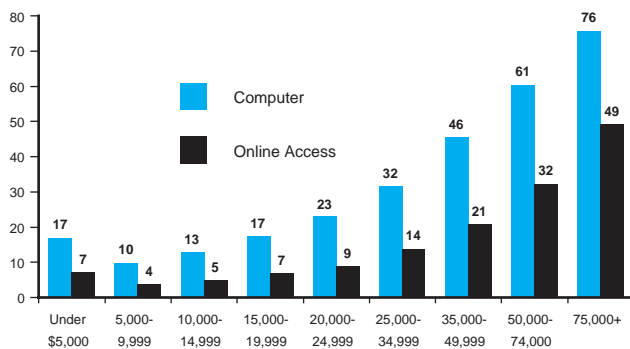
While computers may seem ubiquitous in today's society, their distribution is highly stratified by socioeconomic class. Figures 1-3 illustrate, by income, race/ethnicity, and educational attainment, the wide disparities in access to computers as well as online services in the U.S. as of 1997. Three-quarters of households with incomes over \$75,000 have a computer, compared to one-third of households with incomes between

\$25,000 and \$35,000, and one-sixth with incomes below \$15,000.

Online access is similarly stratified by income. And white households are twice as likely as black and Hispanic households to have access to computers and online services. Those with a B.A. degree or higher are about four times as likely as those with only a high school education to have online service.

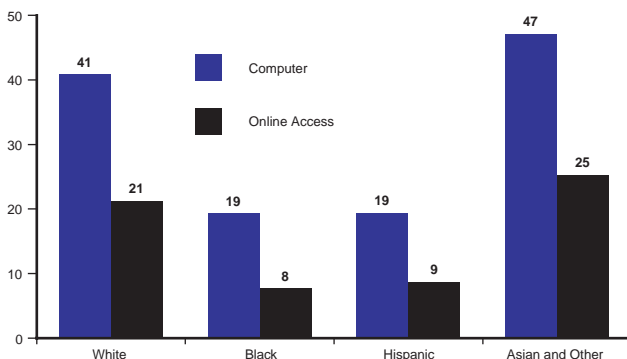
While technology has widely penetrated elementary and secondary schools, not all students have equal access to computers and the Internet at school. In fact, there is evidence that students with the greatest need get the least access. According to a 1997 study by the Educational Testing Service, the ratio of students to

**Figure 1. Percentage of U.S. Households with a Computer and Online Service, by Household Income, 1997.**



Source: *Falling Through the Net II*, National Telecommunications & Information Administration (NTIA), U.S. Department of Commerce, July 28, 1998.

**Figure 2. Percentage of U.S. Households with a Computer and Online Service, by Race/Ethnicity, 1997.**



Source: *Falling Through the Net II*, National Telecommunications & Information Administration (NTIA), U.S. Department of Commerce, July 28, 1998.

computers is highest in schools with the largest proportions of poor and minority students, and the availability of Internet access goes down as the percentage of such students increases (Coley, Cradler, & Engel, 1997).

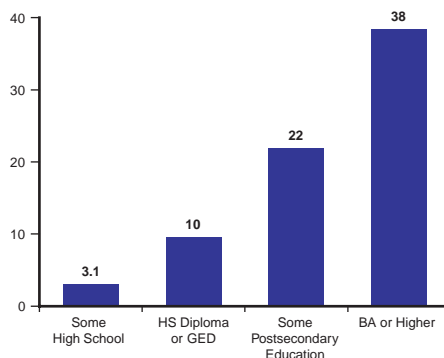
More recent data from the National Center for Education Statistics indicate progress in closing such gaps and meeting the Clinton administration's goal of connecting every school to the Internet by the year 2000. Table 1 shows that 89 percent of public schools had access to the Internet in fall 1998, compared to only 35 percent four years earlier. But school access is not a good indicator of student access. In fact, one study suggests that half the schools that are linked to the Internet are connected only at the library/media center or principal's office (Quality Education Data, 1998).

A better indicator of penetration in the schools is percentage of classrooms connected to the Internet. Here the disparities remain significant. As indicated in Table 1, about 40 percent of classrooms in schools with the highest concentration of poor students (measured by percentage of students eligible for free or reduced-price lunch) have Internet access,

compared to more than 60 percent of classrooms in schools with the lowest concentration of poor students. There are similarly wide gaps by race/ethnicity.

Figure 4 shows the average number of students per computer with Internet access in fall 1998. On average, there were 17 students per computer in schools with

**Figure 3. Percentage of U.S. Households with Online Service, by Educational Attainment, 1997.**

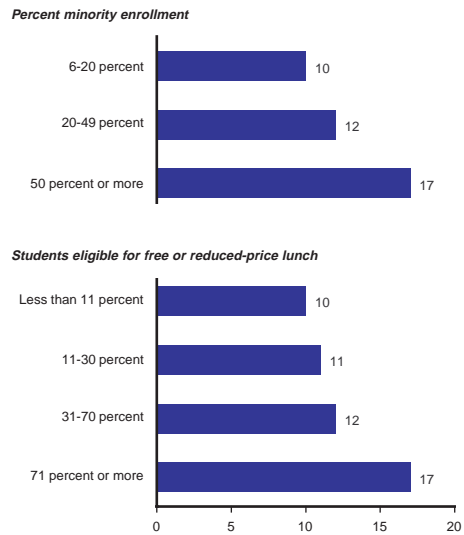


Source: *Falling Through the Net II*, National Telecommunications & Information Administration (NTIA), U.S. Department of Commerce, July 28, 1998.

the highest concentrations of poor students, compared to 10 in schools with the lowest concentration of such students. The same gap exists between schools with the lowest and highest concentrations of minority students.

Not surprisingly, differentials in experience with technology show up when students enter postsecondary education. UCLA's Higher Education Research Institute concludes from its most recent annual freshman survey: "Despite the overall high levels of computer and Internet use, not all students enter college with Internet savvy" (Higher Education Research Insti-

**Figure 4. Ratio of Students per Instructional Computer with Internet Access, by School Characteristics, Fall 1998.**



Source: U.S. Department of Education (1999). "Internet Access in Public Schools and Classrooms: 1994-98." *Issue Brief* (NCES 1999-017). Washington, DC: National Center for Education Statistics.

**Table 1. Percentage of Public Schools and Instructional Rooms With Internet Access, by Selected School Characteristics: Fall 1994-98.**

School characteristics	Percentage of schools with Internet access					Percentage of instructional rooms with Internet access <sup>1</sup>				
	1994	1995	1996	1997	1998	1994	1995	1996	1997	1998
<b>Total</b>	35	50	65	78	89	3	8	14	27	51
Level of school <sup>2</sup>										
Elementary	30	46	61	75	88	3	8	13	24	51
Secondary	49	65	77	89	94	4	8	16	32	52
<b>Percentage of students eligible for free or reduced-price lunch</b>										
Less than 11	—	62	78	88	87	—	9	18	36	62
11-30	—	59	72	83	94	—	10	16	32	53
31-70	—	47	58	78	91	—	7	14	27	52
71 or more	—	31	53	63	80	—	3	7	14	39
<b>Percentage of minority students enrolled</b>										
Less than 6	—	52	65	84	91	—	9	18	37	57
6-20	—	58	72	87	93	—	10	18	35	59
21-49	—	54	65	73	91	—	9	12	22	52
50 or more	—	40	56	63	82	—	3	5	13	37

— Indicates data not available.

SOURCE: U.S. Department of Education (1999). "Internet Access in Public Schools and Classrooms: 1994-98." *Issue Brief* (NCES 1999-017). Washington, DC: National Center for Education Statistics. "Internet Access in Public Schools." *Issue Brief* (NCES 98-031). Washington, DC: National Center for Education Statistics.

<sup>1</sup>Based on the total number of instructional rooms in regular public schools.

<sup>2</sup>Data for combined schools are not reported as a separate level of school because there are too few sample observations for reliable estimates. Data for combined schools are included in the totals.

tute, 1999, p. 1). As illustrated in Figure 5, the percentage of students using e-mail varies widely by type of institution, with the greatest use among students enrolling in private universities and the lowest rates among students at public black colleges. Such disparities could preclude significant numbers of students from participating in the virtual university.

*The most advantaged citizens—and schools—are most able to benefit from cutting-edge technologies. Advantage magnifies advantage.*

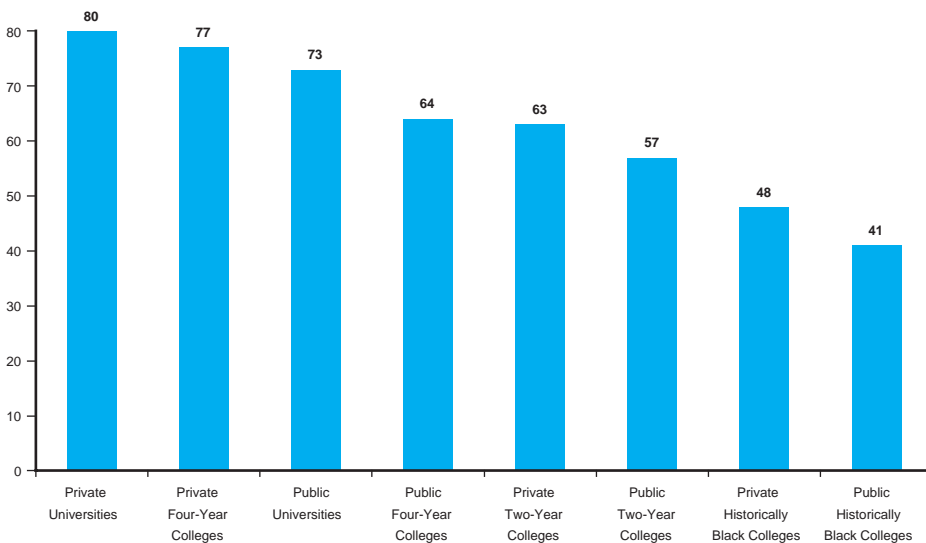
In the final analysis, data probably cannot capture the full story here. While education is the great equalizer, technology appears to be a new engine of inequality. Access to technology is not only about hardware and software.

It is about effective use, teacher training, and careful integration of technology into the curriculum. The most advantaged citizens—and schools—are most able to benefit from cutting-edge technologies.

Advantage magnifies advantage. Those who use computers on a regular basis are more apt to use them routinely in problem solving and critical thinking. They use computers as past generations used pen and

paper. Those with limited computer experience will be handicapped in their ability to access knowledge and avail themselves of the ever increasing variety of learning experiences.

**Figure 5. Percentage of Freshmen Using E-mail During the Last Year, by Institution Type, 1998.**



Source: Higher Education Research Institute (1999). "Freshman Embrace the Internet as an Educational Tool." *The American Freshman: National Norms for Fall 1998*. Los Angeles, CA: UCLA.

## *Perspectives*

Even when computers are available, technological problems—equipment malfunctioning, Internet congestion and delay—can interfere with online learning and lead to frustration for students and teachers. Internet users know that ability to “surf” the Web is tied to the speed and reliability of the

Internet provider, CPU, and modem speed, and ultimately to the costs of these services and equipment. Technical difficulties can befall anyone in cyberspace, and usually do at one time or another, but they disproportionately affect those who have the least ability to pay.

