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Community College Students

Community College Students: Goals, Academic Preparation, and Outcomes

Gary Hoachlander, Anna C. Sikora, and Laura Horn

This article was originally published as the Executive Summary of the Postsecondary Education Descriptive Analysis Report of the same name. The sample survey data are from the Beginning Postsecondary Students Longitudinal Study (BPS), National Education Longitudinal Study of 1988 (NELS:88), and National Postsecondary Student Aid Study (NPSAS).

In 1999–2000, 42 percent of all undergraduates were enrolled at public 2-year institutions, commonly known as community colleges (Horn, Peter, and Rooney 2002). The lower fees and open-access policies at community colleges have broadened access to postsecondary education for students facing such barriers to entry as poor academic performance in high school, limited English-language skills or other basic skill deficiencies, or financial hardship (Grubb 1999). Community colleges also serve students seeking additional job skills, technical certification, and enrichment opportunities. However, while access to community colleges is easily attained, research has shown that a significant number of students who enter community colleges do not complete a formal credential (Berkner, Horn, and Clune 2000).

Currently, federal performance measures, as reflected in the Higher Education Act and the Carl D. Perkins Vocational and Technical Education Act, have been primarily limited to completion of formal credentials such as certificates and associate's degrees. However, because community colleges serve students with a wide range of goals and academic preparation (Berkner, Horn, and Clune 2000), holding community colleges accountable only for student attainment may understate their effectiveness in meeting a variety of objectives. This report provides information on the varying goals, preparation, and outcomes of community college students.

This report uses data from the 1996/01 Beginning Postsecondary Students Longitudinal Study (BPS:96/01),

the National Education Longitudinal Study of 1988 (NELS:88/2000), and the 1999–2000 National Postsecondary Student Aid Study (NPSAS:2000). Each data set provides a different perspective on the major questions of the analysis. BPS is a representative sample of all undergraduates, regardless of when they graduated from high school, who enrolled in postsecondary education for the first time in 1995–96 and were last interviewed in 2001, about 6 years later. This survey provides the latest data on degree attainment and persistence, as well as 4-year college transfer rates and outcomes. The analysis sample used in this report is limited to BPS students whose first postsecondary enrollment was in a community college.

The NELS survey comprises a grade cohort, which means all respondents are in one grade or are about the same age. NELS respondents were first surveyed in 1988 when they were in the eighth grade, and were followed through high school and college. They were last interviewed in 2000, about 8 years after most of the participants had graduated from high school. Unlike the BPS cohort, which includes first-time students regardless of age, the NELS cohort reflects a more “traditional” group of students—those who enroll in postsecondary education soon after high school graduation. In the analysis for this report, only 1992 high school graduates who first enrolled in a community college within 2 years of high school graduation are included. NELS provides several measures of high school academic preparation to determine how students’ academic performance is associated with their college outcomes.

Finally, the NPSAS survey consists of a representative sample of all students enrolled in postsecondary education at one point in time—the 1999–2000 academic year—including students of all ages as well as students who entered postsecondary education at various points in time and who are at different stages of their studies. NPSAS is used to examine the degree objectives of first-time and continuing community college students enrolled in 1999–2000. Drawing upon these three data sets, this study addresses the following research questions:

1. What percentage of students enrolled in community colleges seeks to complete a formal credential, either in a public 2-year institution or through transfer to a 4-year college or university?
2. How do different types of community college students differ in their intentions to complete a formal credential?
3. Among those intending to complete a certificate or degree or transfer to a 4-year institution, what percentage actually do so, and how do rates of completion vary among different types of students?
4. Among students intending to complete a formal credential, what is the relationship between rates of completion and different levels of postsecondary preparedness?
5. When students are asked about the impact of their postsecondary education on various aspects of their labor market participation, how do the responses of students who completed a formal credential differ from those of students who left without a certificate or degree?

The findings of this study suggest that success rates for community college students, as measured by completion of a formal degree or certificate or transfer to a 4-year institution, are roughly 50 to 60 percent among students who enroll with intentions to earn a credential or transfer.

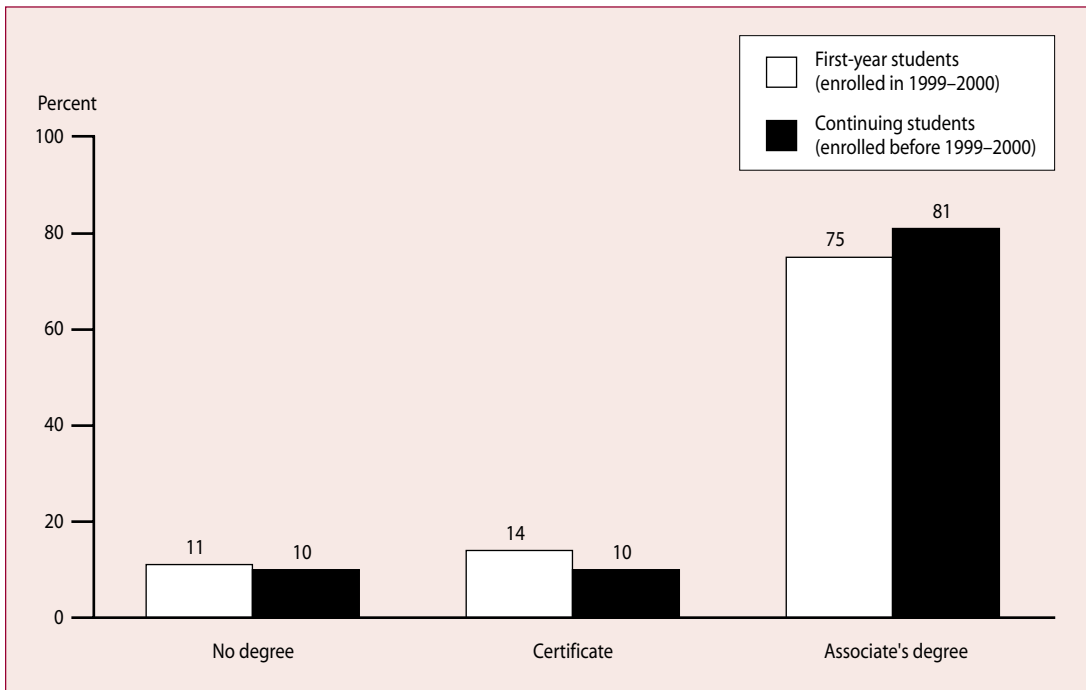
Community College Students Seeking Formal Credentials

Results from all three data sets suggest that roughly 9 in 10 community college students enroll intending to obtain a formal credential or to transfer to a 4-year institution. As shown in figure A, among all NPSAS undergraduates enrolled in public 2-year institutions in 1999–2000, 11 percent of first-year students and 10 percent of continuing students reported no degree or transfer intentions. Similarly, among BPS students who first enrolled in public 2-year institutions in 1995–96, 11 percent reported no intentions of earning a degree or transferring to a 4-year institution (figure B). NELS 1992 high school graduates were asked what their highest degree expectations were when they were in 12th grade. Among those who first enrolled in public 2-year institutions, 10 percent reported that they were not seeking a degree and that they expected to complete less than 2 years of postsecondary education and nearly two-thirds reported that they were seeking a bachelor’s degree or higher (figure C).

Completion and Persistence Rates Among Students Seeking Formal Credentials

This study first examined the outcomes of BPS students whose first enrollment was in a community college. Among students who intended to obtain a formal credential or to transfer to a 4-year institution, 11 percent had attained a bachelor’s degree or higher, 17 percent had earned an

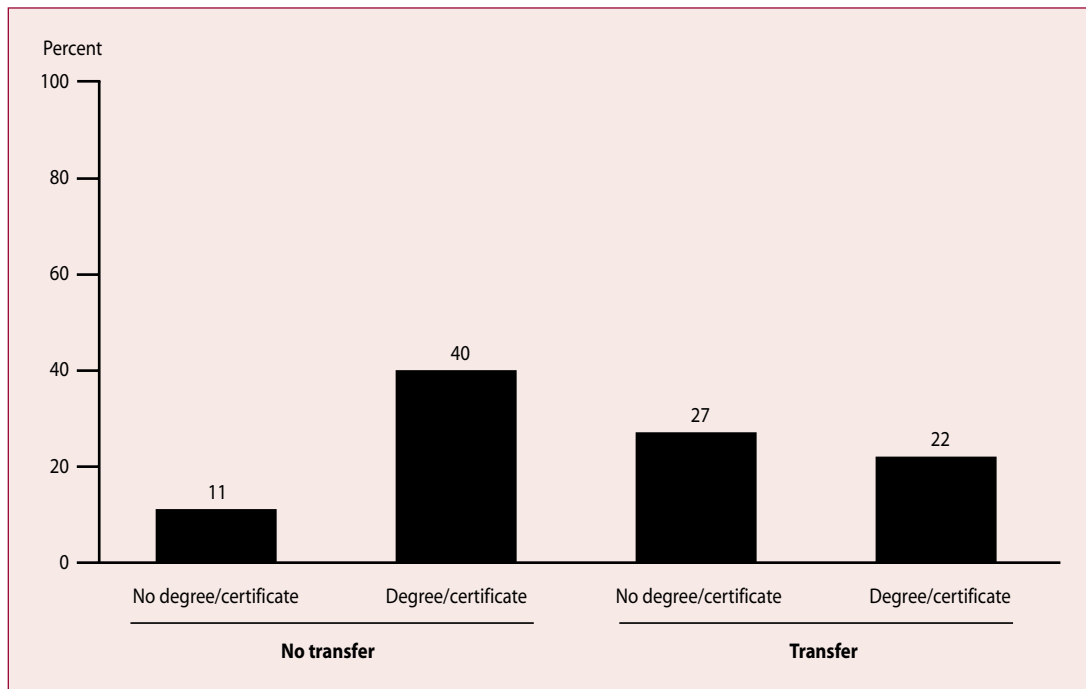
Figure A. Percentage distribution of 1999–2000 undergraduates in public 2-year institutions according to their current degree program and when they enrolled



NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1999–2000 National Postsecondary Student Aid Study (NPSAS:2000).

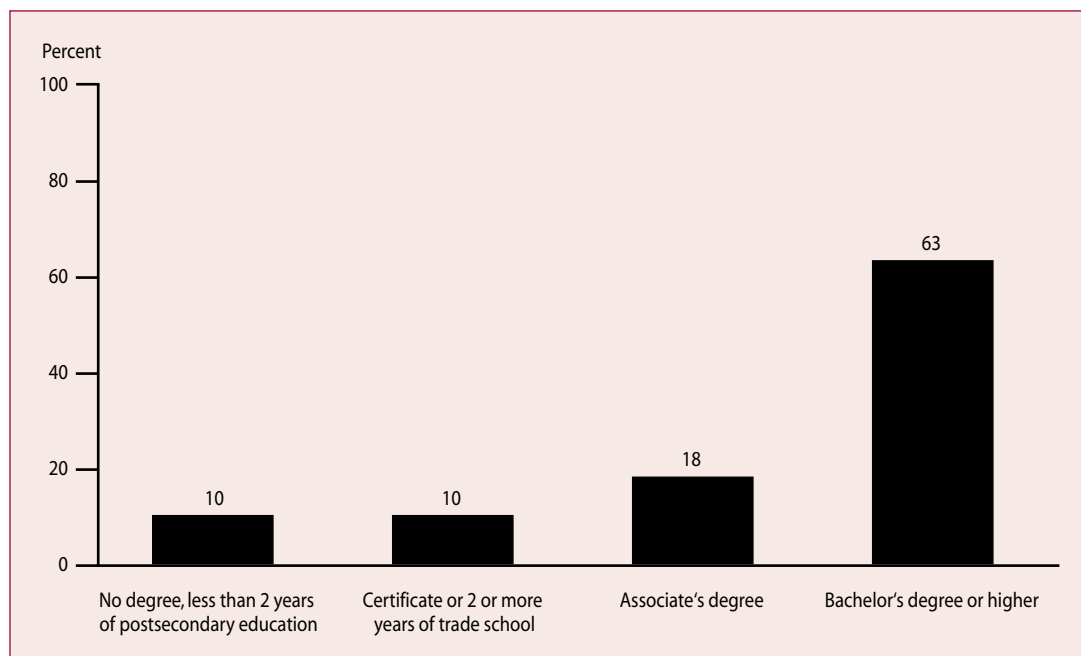
Figure B. Percentage distribution of 1995–96 beginning postsecondary students first enrolled in public 2-year institutions according to their degree/certificate and transfer expectations



NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1996/01 Beginning Postsecondary Students Longitudinal Study (BPS:96/01).

Figure C. Percentage distribution of 1992 high school graduates first enrolled in public 2-year institutions by December 1994 according to highest level of education they expected to complete as reported in 1992



NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, 2000, Data Analysis System."

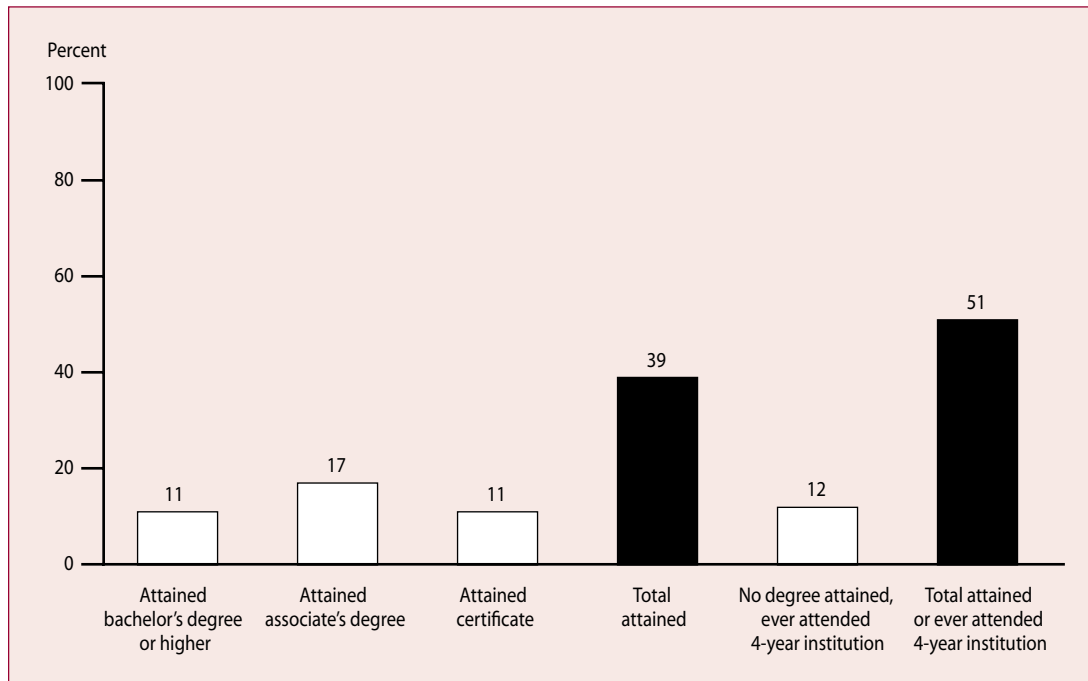
associate's degree, and 11 percent had earned a certificate as of 2001, for a total attainment rate of 39 percent (figure D). An additional 12 percent had transferred to a 4-year institution but had not yet attained a degree. In total, 51 percent of BPS community college students who intended to earn a degree or to transfer to a 4-year institution had fulfilled these expectations within 6 years of their initial enrollment.

The study then examined NELS students, who represent more traditional students who enroll in a community college soon after high school graduation. As shown in figure E, among students who intended to obtain a degree, 21 percent had attained a bachelor's degree or higher, 18 percent had attained an associate's degree, and 11 percent had earned a vocational certificate or license as of 2000 (6 to 8 years after entry), for a total attainment rate of 50 percent. An additional 13 percent had not attained a formal credential but had attended a 4-year institution. Thus, in total, about 63 percent of students intending to obtain a formal credential had either done so or had attended a 4-year institution.

Time to degree

About two-thirds of all community college students attend primarily on a part-time basis (Berkner, Horn, and Clune 2000). Therefore, it takes them longer to complete associate's and bachelor's degrees than the typical time expected—2 years and 4 years, respectively, of full-time study. The length of certificate programs varies, but they are typically 1-year full-time programs (Berkner, Horn, and Clune 2000). Among BPS students, the average time from first enrollment to attainment for students who had attained an associate's degree as their highest credential (16 percent of all students) was about 3 1/2 years (41 months). Students who had completed a certificate (10 percent of all students) took an average of about 2 1/2 years to complete their program. Students who had completed a bachelor's degree within the 6 years of the survey period (10 percent of all students) took nearly 5 years (56 months) to complete the degree. However, about 8 percent of BPS community college students, or roughly 44 percent of those in bachelor's degree programs, were still enrolled in a 4-year institution and had not yet completed a degree. These students required more than 6 years to complete their bachelor's degrees.

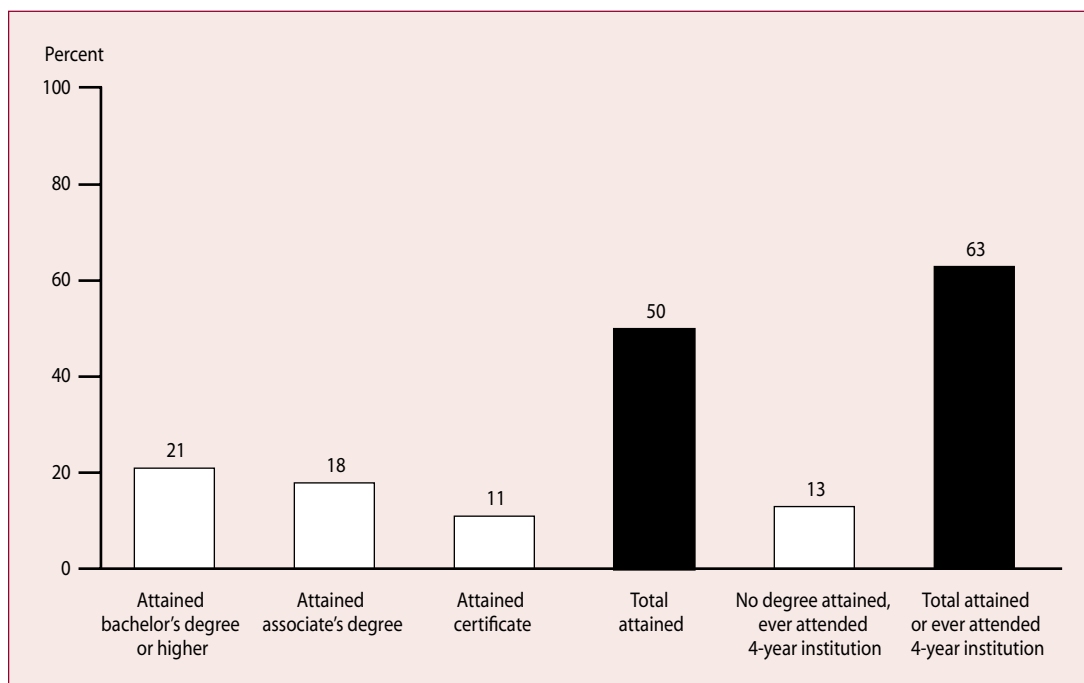
Figure D. Percentage distribution of 1995–96 beginning postsecondary students first enrolled in public 2-year institutions who intended to obtain a credential according to highest postsecondary education attained by 2001



NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1996/01 Beginning Postsecondary Students Longitudinal Study (BPS:96/01).

Figure E. Percentage distribution of 1992 high school graduates first enrolled in public 2-year institutions by December 1994 who intended to obtain a credential according to highest postsecondary education attained by 2000



NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, 2000, Data Analysis System."

Transfer students

An analysis of the rates at which BPS community college students transferred to 4-year institutions revealed that a total of about 29 percent had transferred. Among students who had reported bachelor's degree intentions when they first enrolled, 51 percent had transferred. Among those who had transferred, about 8 in 10 had either attained a bachelor's degree (35 percent) or were still enrolled in a 4-year institution (44 percent) as of 2001 (figure F). Moreover, community college students with bachelor's degree intentions were not likely to earn an associate's degree before transferring. Among transfers, roughly one-fifth of bachelor's degree seekers had earned an associate's degree before transferring.

Completion Rates and Postsecondary Preparedness

Many NELS 1992 high school graduates who began their postsecondary education in community colleges faced challenging obstacles to completing a credential. In 1988, when NELS students were in the eighth grade, 39 percent who enrolled in community colleges were "at risk" (had one or more risk factors) of dropping out of high school. In addition, roughly half (54 percent) entered college with one or more characteristics that placed them at risk of not completing their postsecondary education.

Proficiency test scores also showed that many NELS community college students began their postsecondary education with relatively low ability levels in mathematics and reading. Thirty percent of these students entered community college with 12th-grade mathematics proficiency scores at Level 1 or below. These students could perform simple arithmetical operations on whole numbers but could not perform simple operations on decimals, fractions, powers, or roots. In addition, 44 percent of NELS community college students enrolled with 12th-grade reading proficiency scores at Level 1 or below. These students had basic comprehension skills, but they could not make relatively simple inferences from reading a text beyond the author's main point.

While many NELS 1992 high school graduates entered community college lacking strong academic preparation, about one-third (36 percent) were academically qualified to attend a 4-year institution. These are students who could possibly have enrolled in a 4-year college or university based on several measures of academic preparation, including SAT scores, rank in high school class, NELS achievement test scores, and the rigor of their coursetaking. In

addition, 17 percent and 24 percent, respectively, had scored at the highest proficiency levels tested in reading and mathematics as seniors in high school.

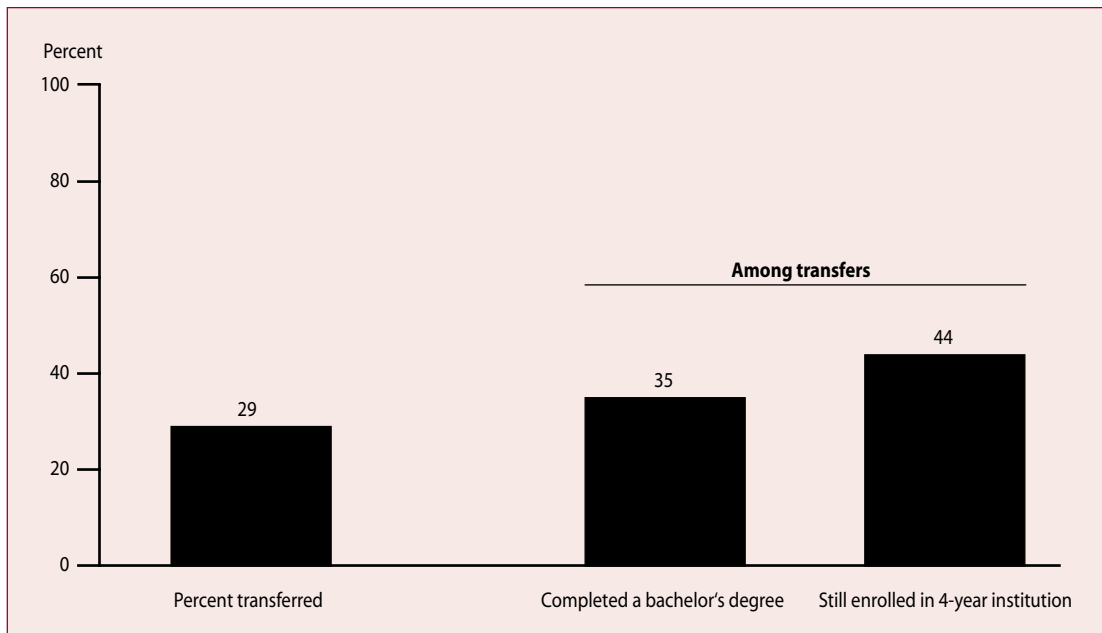
Taking into account students' academic profiles, college students who were better prepared academically to enter postsecondary education tended to complete a certificate or degree or attend a 4-year institution more often than those who were less prepared. For example, among those who scored at the highest proficiency level tested in mathematics as seniors in high school, about three-quarters had either attained a degree or certificate or had enrolled in a 4-year institution, compared with roughly half (54 percent) of those who scored at the lowest levels. Similarly, among community college students who were academically qualified for enrollment in a 4-year college, roughly three-quarters had either attained a degree (including 36 percent who had attained a bachelor's degree) or had enrolled in a 4-year institution, compared with 55 percent of those who were either not qualified or only minimally qualified to attend a 4-year college.

Community College Completion and Employment Outcomes

BPS community college students who were no longer enrolled 3 years after first attending were asked several questions about the impact of their education on their salary and other employment experiences. Earlier research on the BPS survey showed that 44 percent of community college students had left in 1998 with no credential, while about 8 percent had left with a certificate or an associate's degree (Berkner, Horn, and Clune 2000, table 2.1a). Despite the small percentage of completers, there were some obvious differences between these students and their peers who had not completed with respect to reporting positive employment outcomes. As shown in figure G, 63 percent of those who had attained a formal credential by 1998 reported that their postsecondary education resulted in salary increases, compared with 29 percent who had not attained a credential. Similarly, 71 percent of those who had attained a credential reported that their postsecondary enrollment had led to increased job responsibilities, while 48 percent of those who had not attained one reported the same.

NELS students were also asked about their employment outcomes when they were last interviewed in 2000 (i.e., 6 to 8 years after they had begun their postsecondary education). Community college students who had earned either a certificate or an associate's degree or had transferred

Figure F. Among 1995–96 beginning postsecondary students first enrolled in public 2-year institutions, the percentage who transferred to a 4-year institution, and among transfers, the percentage who completed a bachelor's degree or were still enrolled as of 2001



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1996/01 Beginning Postsecondary Students Longitudinal Study (BPS:96/01).

Figure G. Among 1995–96 beginning postsecondary students first enrolled in public 2-year institutions and who were no longer enrolled, the percentage who reported their enrollment resulted in a salary increase or improved their job responsibilities as reported in 1998, by degree attainment



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1996/01 Beginning Postsecondary Students Longitudinal Study (BPS:96/01).

to a 4-year institution were more likely to report positive employment outcomes than those who had left without a credential or had not transferred. In addition, community college students who had transferred to a 4-year institution but had not earned a degree were also more likely than those who had left without transferring to report positive outcomes.

Conclusions

Although educational objectives vary among students enrolled in community colleges, most community college students say that they desire a formal credential, either from the community college or through transfer to a 4-year institution. Nearly 90 percent of students beginning their postsecondary education in public 2-year institutions express an intent to attain a certificate or degree (including transfer).

In both the NELS and BPS surveys, roughly one-fifth of community college students with any degree or transfer intentions had earned an associate's degree. However, when success is defined as any degree attainment or 4-year transfer, about one-half (51 percent) of all community college students (BPS) and nearly two-thirds (63 percent) of more traditional students (NELS) had achieved successful outcomes.

At the same time, however, because about two-thirds of community college students attend primarily on a part-time basis, the average amount of time to complete an associate's degree was about 3 1/2 years (as measured by BPS). Those who earned a certificate took about 2 1/2 years to complete the credential, and roughly 44 percent of bachelor's degree seekers were still enrolled after 6 years.

The study also revealed that about 29 percent of all first-time community college students transferred to a 4-year college or university during the 6-year survey period, including about one-half of those with bachelor's degree

intentions. For those who did transfer, about 8 in 10 had either attained a bachelor's degree or were still working toward that degree 6 years after they first enrolled in a community college.

Finally, while many students who had left community college without completing a credential reported that their postsecondary education favorably affected their employment, students who had earned a credential were more likely to report positive impacts than students who had not earned one.

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Data sources: The NCES 1996/01 Beginning Postsecondary Students Longitudinal Study (BPS:96/01), National Education Longitudinal Study of 1988 (NELS:88/2000), and 1999–2000 National Postsecondary Student Aid Study (NPSAS:2000).

For technical information, see the complete report:

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Author affiliations: G. Hoachlander, A.C. Sikora, and L. Horn, MPR Associates, Inc.

For questions about content, contact Aurora D'Amico (aurora.d'amico@ed.gov).

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Racial/Ethnic Differences

Racial/Ethnic Differences in the Path to a Postsecondary Credential

Lisa Hudson

This article was originally published as an Issue Brief. The sample survey data are from the National Education Longitudinal Study of 1988 (NELS:88).

Educational achievement and attainment are often of central importance to education policymakers because of their relationship to economic outcomes. Racial/ethnic equity in these education measures is often of particular interest. Jacobson et al. (2001), for example, summarized differences in educational achievement and attainment between Black and White students,¹ as well as the relationship between achievement and attainment differences (e.g., educational achievement was found to mitigate race differences in college completion).²

This Issue Brief focuses on racial/ethnic differences in educational attainment. These differences are well documented, with Blacks and Hispanics typically having lower attainment rates than Whites, and Asians having a higher rate than other groups (U.S. Department of Education 2002, pp. 80–81; Ingels et al. 2002). These racial/ethnic differences represent the culmination of differences at various progression points in the education pipeline. For example, students from different racial/ethnic backgrounds have different likelihoods of graduating from high school and attending college, with Blacks and Hispanics typically having lower rates of educational progress (as measured by these indicators) than their White counterparts, and Asians having a higher rate of progress (at least for college attendance) (U.S. Department of Education 2002, p. 73; Sanderson et al. 1996; Jacobson et al. 2001).

This Issue Brief tracks student progress along the path from high school to a postsecondary credential, examining where in this path racial/ethnic differences arise. Specifically, this Issue Brief uses data from the National Education Longitudinal Study of 1988, “Fourth Follow-up, 2000” (NELS:88/2000) to examine various education milestones along the path to a postsecondary credential. This NELS:88/2000 survey tracks students who were in the eighth grade in 1988, and who were thus 8 years beyond their expected (1992) high school graduation in 2000.

The Issue Brief first examines three milestones that are traditional indicators of student progress—the on-time attainment of a regular high school diploma;³ enrollment in a postsecondary institution within the year following high school graduation (hereafter referred to as immediate enrollment); and attainment of a postsecondary credential within the “scheduled” time frame⁴ (i.e., within 4 years of enrollment for a bachelor’s degree, 2 years for an associate’s degree, and 1 year for a postsecondary certificate). Although this “on-time” schedule might be indicative of a traditional postsecondary path, few students follow it. For example, among NELS:88/2000 students, only 12 percent attained a postsecondary credential through this path.⁵

The traditional path is not the only route to obtaining a postsecondary credential. The American education system is relatively flexible, providing numerous opportunities for adults to further their education at later stages of their lives (e.g., high school equivalency programs such as the GED, open enrollments at community colleges, college programs for working adults). In fact, as of 2000, 15 percent of the NELS:88/2000 students who completed high school had done so through an alternate means, 30 percent of those who enrolled in a postsecondary institution had delayed their entry, and 59 percent of those who obtained a postsecondary credential had done so over an extended period (beyond the scheduled time frame). The second part of this Issue Brief examines student progress through high school and postsecondary education as of 2000 to show how this flexibility within the education system affects progress.

¹Throughout this Issue Brief, the terms Black and White are used as shorthand for non-Hispanic Black and non-Hispanic White, respectively. Asian is used as shorthand for Asian or Pacific Islander.

²Socioeconomic status is also related to race/ethnicity and may mitigate attainment differences among racial/ethnic groups (see, e.g., Jacobson et al. 2001).

³In this context, an on-time high school diploma is in reference to eighth-graders. Students who had been held back (or otherwise stayed back) prior to the eighth grade are counted as graduating on time as long as they were not also held back between the eighth grade and high school graduation. The on-time high school graduation measure used in this Issue Brief is from student transcripts; all other measures are based on students’ self-reports.

⁴These milestones may not describe typical paths; for example, 59 percent of postsecondary graduates fail to complete their credential within the scheduled time frame. However, these milestones are related to persistence factors. Berkner, Cuccaro-Alamin, and McCormick (1996) found that the following factors lowered postsecondary student persistence and attainment: being a high school dropout or GED recipient, delaying enrollment by a year or more, and attending part time.

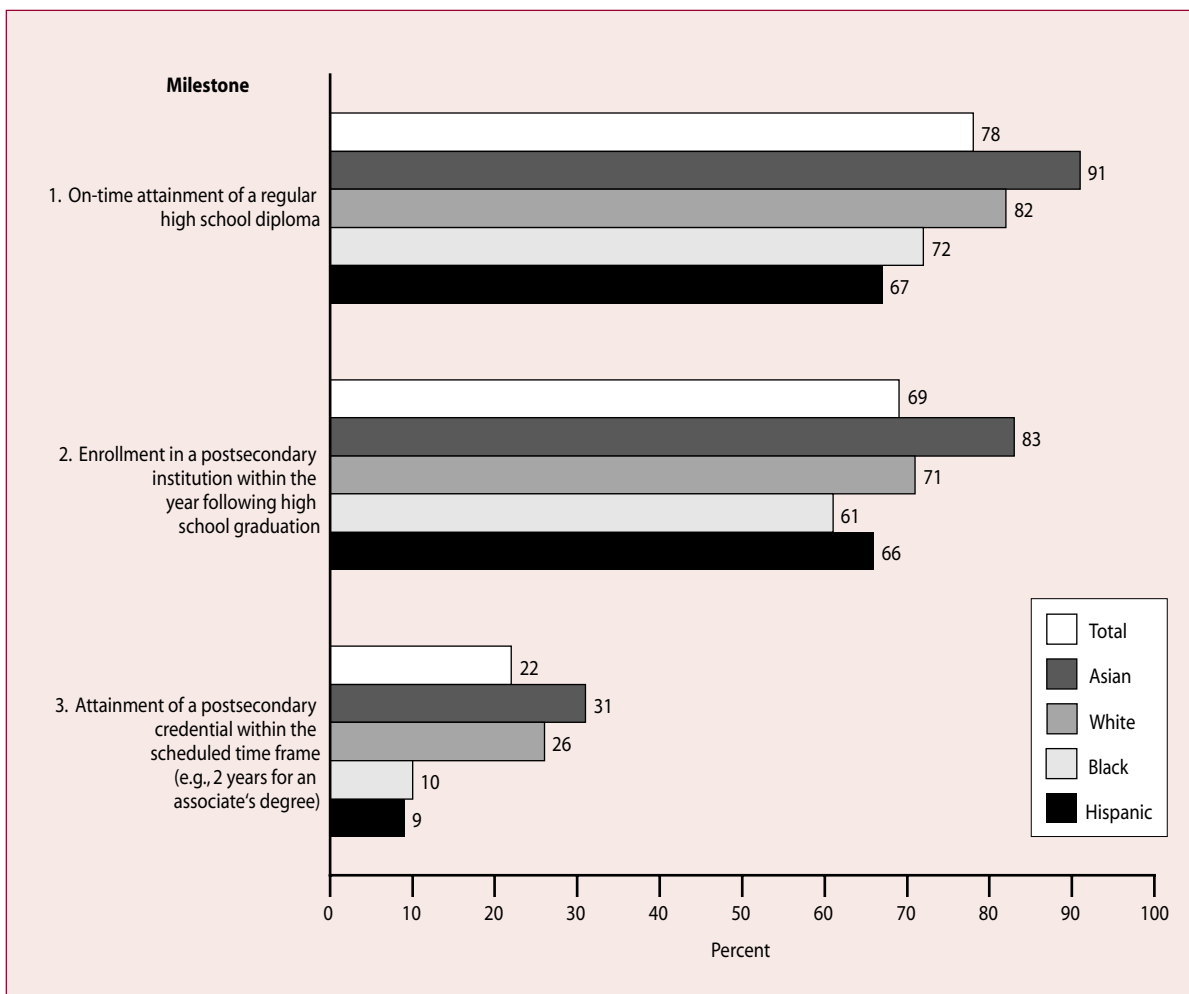
⁵Unless otherwise noted, all findings reported in this brief are from analyses of NELS:88/2000.

Racial/Ethnic Differences in Meeting Traditional Milestones

Figure 1 shows the progress of NELS:88/2000 students through each traditional education milestone. This figure shows the percentage of students of each racial/ethnic group who met each milestone, given that they had met the previous milestone(s). Racial/ethnic differences emerged at the first milestone, the receipt of a regular on-time high school diploma. Asian students were more likely than White, Black, and Hispanic students to receive a regular on-time diploma, with 91 percent doing so. White students also were more likely than Black and Hispanic students to receive a regular on-time diploma, with 82 percent of White

students doing so compared to 72 percent of Black students and 67 percent of Hispanic students. When these on-time high school graduates reached the next milestone—immediate entry to a postsecondary institution—similar (but not identical) patterns emerged. Asian students who graduated from high school with a regular on-time diploma were more likely than White, Black, and Hispanic students to immediately enroll in a postsecondary institution. White students were more likely to do so than their Black counterparts, but no differences were detected in the rates of immediate enrollment between White and Hispanic students.

Figure 1. Percentage of 1988 eighth-graders meeting each traditional milestone, of those who met the previous milestone(s), by student race/ethnicity



SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, 2000."

Finally, at the third milestone, Black and Hispanic students who had graduated on time and immediately enrolled in a postsecondary institution were again found to have lower attainment rates than their Asian and White peers. Although about one-quarter of both Asian and White students who had received a regular on-time high school diploma and had immediately enrolled in a postsecondary institution obtained an on-time credential, no more than 10 percent of their Black or Hispanic peers did so. The net result of these differences in progress is that 23 percent of *all* Asian students who were in the eighth grade in 1988 completed a postsecondary credential through the traditional path,

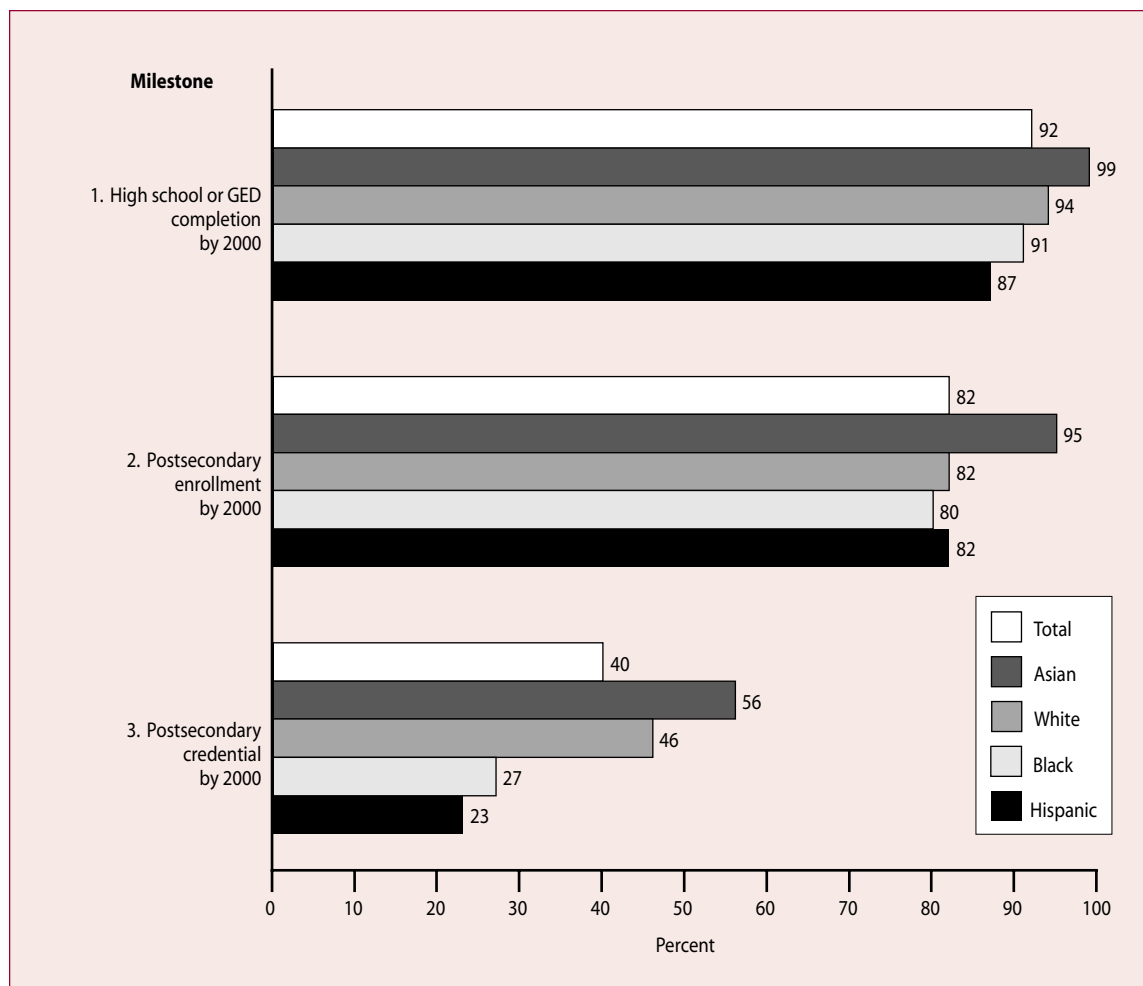
compared to 15 percent of all White students, 4 percent of all Black students, and 4 percent of all Hispanic students.⁶

Racial/Ethnic Differences in Attainment as of 2000

To examine progress regardless of the route taken, figure 2 shows the percentage of students who met three less

⁶The percentage for Asians is significantly higher than the percentages for all other groups; the percentage for Whites is significantly higher than the percentages for Blacks and Hispanics. Analysis of credentials by level was beyond the scope of this Issue Brief; however, the reader should bear in mind that the differences observed here may include racial/ethnic differences in credential level as well as in the attainment of a credential. For example, among NELS:88/2000 students, 51 percent of Asians obtained a bachelor's degree or higher by 2000, compared to 34 percent of Whites, 17 percent of Blacks, and 15 percent of Hispanics (Ingels et al. 2002).

Figure 2. Percentage of 1988 eighth-graders meeting each less stringent milestone, of those who met the previous milestone(s), by student race/ethnicity



SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, 2000."

stringent milestones—completing high school, enrolling in a postsecondary institution, or obtaining a postsecondary credential by the year 2000—given that they had met each previous milestone(s). The first milestone allows the completion of high school through alternative means such as the GED; allowing this second-chance route to high school completion (along with more time) results in a significantly greater high school completion rate among each group of students. Asian students, however, still had a higher completion rate than other students, and White students had a higher completion rate than Hispanic students (although there were no longer detectable differences between White and Black students). At the second milestone, more students in each racial/ethnic group who completed high school enrolled in a postsecondary institution by 2000 than had enrolled immediately after high school; although Asian students still had higher enrollment rates than the three other student groups, the enrollment rate for Whites was not significantly higher than for Blacks or Hispanics. Finally, at the third milestone, obtaining a postsecondary credential, completion rates again were higher among each group of postsecondary entrants, but the differences for Asians and Whites versus Blacks and Hispanics remained.

Further, although the gaps in high school completion rates between Asians and their Black and Hispanic peers and between Whites and Hispanics were not eliminated, they were reduced when “nontraditional” completion was allowed in addition to on-time graduation with a regular diploma. Thus, nontraditional paths do seem to help reduce or eliminate at least some racial/ethnic attainment differences.

These findings also suggest that one issue for Black and Hispanic students, compared to White students, is persistence through high school and postsecondary education. As discussed above, Whites were more likely than Hispanics to graduate from high school by 2000, and among those who graduated from high school and enrolled in postsecondary education by 2000, Whites were more likely than Blacks and Hispanics to obtain a postsecondary credential by 2000. In addition, Whites were more likely than Blacks and Hispanics to graduate from high school on time, and even among those who graduated on time and immediately enrolled in college, Whites were more likely than Blacks and Hispanics to obtain an on-time postsecondary credential.

Finally, flexibility within the education system increases the proportion of all racial/ethnic groups who meet these

education milestones, and in some cases, seems to reduce differences in attainment. This attenuation of attainment differences reflects the fact that among those who met each milestone, Blacks and Hispanics often were more likely to meet the milestone via a nontraditional means than were Asians and Whites (figure 3).⁷ Attainment differences could be further attenuated over a longer time frame, which would provide more opportunity for meeting the milestones via a nontraditional path.

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⁷This analysis examined each milestone independently of whether the student had reached previous milestones. No difference was detected in the percentages of Black and White students who completed high school via a nontraditional means, possibly due to a relatively high standard error for these Black students. In all other cases, Blacks and Hispanics were more likely than their Asian and White counterparts to reach these milestones via a nontraditional means.

Data source: The NCES National Education Longitudinal Study of 1988 (NELS:88/2000), “Fourth Follow-up, 2000.”

For technical information, see

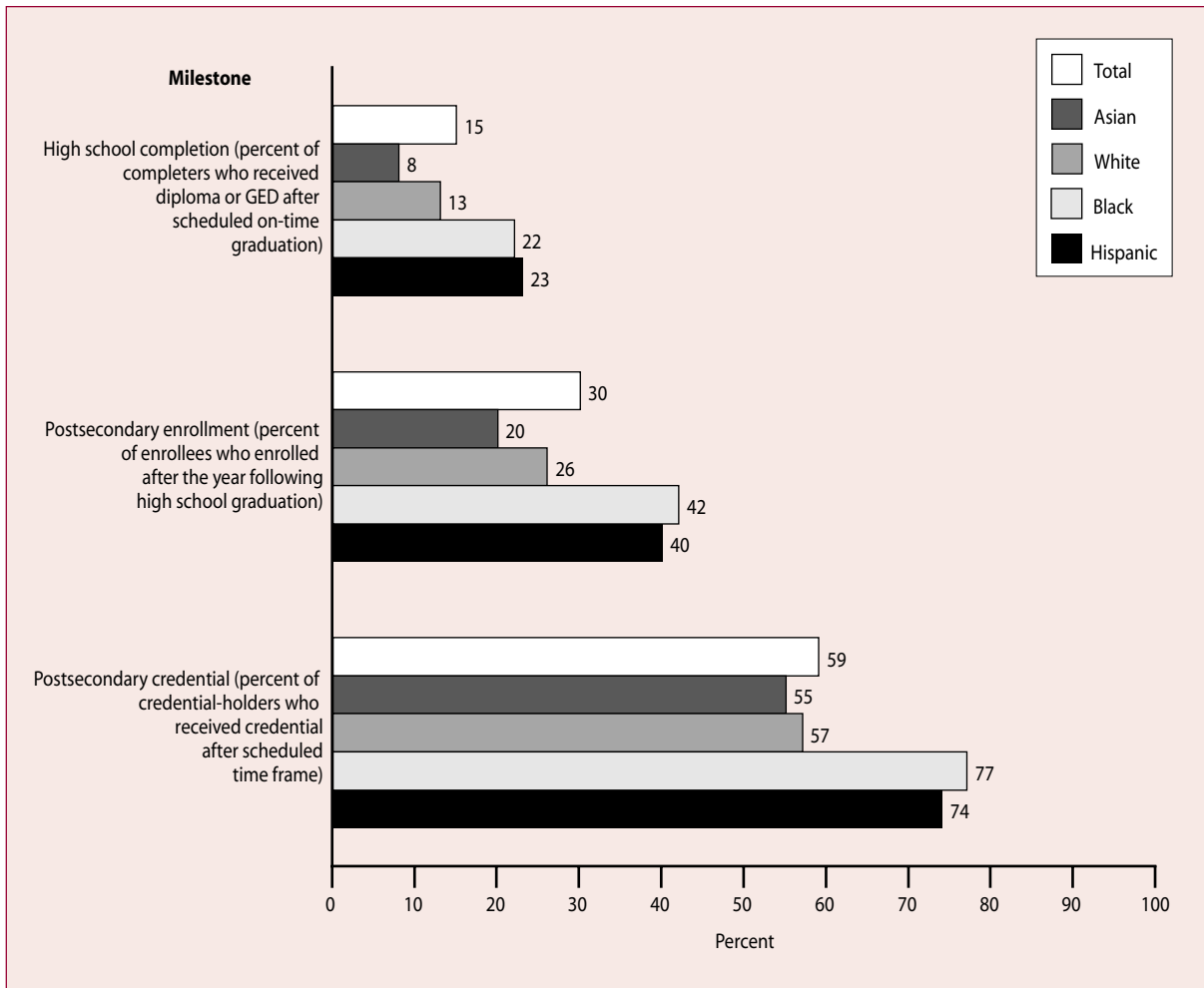
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Author affiliation: L. Hudson, NCES.

For questions about content, contact Lisa Hudson (lisa.hudson@ed.gov).

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Figure 3. Percentage of 1988 eighth-graders reaching each milestone by 2000 who did so via nontraditional means, by student race/ethnicity



SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, 2000."

Costs and Productivity

A Study of Higher Education Instructional Expenditures: The Delaware Study of Instructional Costs and Productivity

—Michael F. Middaugh, Rosalinda Graham, and Abdus Shahid

This article was originally published as the Executive Summary of the Research and Development Report of the same name. The sample survey data are from the Delaware Study of Instructional Costs and Productivity.

Research and Development Reports are intended to

- share studies and research that are developmental in nature;
- share results of studies that are on the cutting edge of methodological developments; and
- participate in discussions of emerging issues of interest to researchers.

These reports present results or discussion that do not reach definitive conclusions at this point in time, either because the data are tentative, the methodology is new and developing, or the topic is one on which there are divergent views. Therefore, the techniques and inferences made from the data are tentative and are subject to revision.

A Study of Higher Education Instructional Expenditures is an examination of higher education costs undertaken by the National Center for Education Statistics (NCES). This study of higher education costs was mandated by Congress in the 1998 Higher Education Act. The NCES response to the congressional mandate encompassed three reports: *Study of College Costs and Prices, 1988–89 to 1997–98* (Cunningham et al. 2001); *What Students Pay for College: Changes in Net Price of College Attendance Between 1992–93 and 1999–2000* (Horn, Wei, and Berker 2002); and this third and final report.

The first report in the congressionally mandated study drew the distinction between *sticker price*, i.e., the tuition that an institution charges for a college education, and *cost*, i.e., the fiscal resources expended by the institution to provide that education. Additionally, researchers for the first part of the study found that certain factors are associated with tuition rates. Most notable at state-supported institutions is the importance of annual budget appropriations. At private not-for-profit institutions, internal budget constraints, size of endowments, and external market competition were among factors associated with sticker price. There was little evidence indicating that expenditures for instruction were a major factor in determining tuition rates.

This report focuses solely on the issue of direct instructional expenditures, and the factors associated with the comparative magnitude of those expenditures at 4-year colleges and universities in the United States. As evident in the findings and conclusions, the factors associated with instructional expenditures are different from those associated with sticker price, as identified in the first part of the congressionally mandated study. Cost and price are *not* interchangeable constructs, and a strong statistical relationship between them has not been found.

The data source for this analysis is multiple cycles of the Delaware Study of Instructional Costs and Productivity, henceforth called the Delaware Study. Begun in 1992 by the Office of Institutional Research and Planning at the University of Delaware, the study has grown into a national data-sharing consortium embracing over 300 4-year colleges and universities across the United States. The foci of data-sharing activities are detailed analyses of teaching loads by faculty category, instructional costs, and externally funded scholarly activity, all at the level of the academic discipline.

Goals and Limitations of This Study

The primary objective of this analysis of instructional expenditures is the identification of those factors that contribute to describing direct instructional costs in the colleges and universities that participate in the Delaware Study.

The study is characterized by the following factors:

- Participation in the Delaware Study is *voluntary*, and is restricted to 4-year Title IV–eligible institutions only. The fact that the data population used in this study is self-selected raises the issue of nonresponse bias. For example, institutions that participate in the Delaware Study typically have enrollments of at least 5,000 students and are organizationally complex, with discrete academic departments or programs that correspond with the four-digit codes assigned to disciplines within the NCES *Classification of Instructional Programs* (CIP) taxonomy (Morgan, Hunt, and Carpenter 1991). In contrast, single-purpose institu-

tions with smaller enrollments frequently have multiple disciplines grouped within a given organizational structure, e.g., Division of Social Sciences or Department of Education, and participate in much smaller numbers than their larger, more complex counterparts. In addition, because participation is restricted to 4-year institutions, findings cannot be extended to the 2-year college sector.

- Because the population for this study is self-selected, it is, by definition, not a random sample. Descriptive statistics are applied to data from responding institutions to describe instructional expenditures for those institutions, but the findings cannot be inferentially generalized to the larger population of all Title IV-eligible 4-year colleges and universities in the United States. However, this study's findings nonetheless yield valuable descriptive information about expenditures in those institutions that participate in the Delaware data-sharing process.
- The Delaware Study expenditure data reflect *direct* instructional expense, and therefore cannot be used for a full cost model. There are methodological pitfalls and inconsistencies in full cost modeling in higher education, especially with respect to allocating indirect costs (as described in the full report).

Within the context of these characteristics, this study yields information about factors that contribute to direct instructional costs at an institution, and these expenditures generally compose the largest portion of the operating budget at most colleges and universities.

Study Design and Methodology

This study utilized data from multiple data collection cycles of the Delaware Study, focusing primarily on data collected during 1998, 2000, and 2001. Data were collected using an established survey instrument that requests detailed information on fall semester teaching loads by faculty category, and academic and fiscal year student credit hour production and direct expenses for instruction, research, and service activity.

Direct instructional cost per student credit hour taught is the focal dependent variable examined in this study. Patterns of dispersion and difference in cost across disciplines are examined through a series of analytical lenses that are typically assumed to be major cost factors in the literature. These include institutional mission as characterized by Carnegie institutional classification. The Delaware

Study employs the 1995 Carnegie taxonomy—research, doctoral, comprehensive, and baccalaureate institutions. The study also examines the impact of other variables such as highest degree offered within a discipline, and the relative emphasis on undergraduate versus graduate instruction within a discipline.

Using appropriate statistical tools, the relationship of cost to variables such as department size (measured in terms of number of faculty), proportion of faculty who are tenured, volume of student credit hours taught, and personnel expense as a percentage of total instructional costs is examined and measured. Effects of highest degree offered in the discipline, as well as Carnegie institutional classification, are also examined. Cost factors are determined by disciplines, or where more appropriate, groups of disciplines.

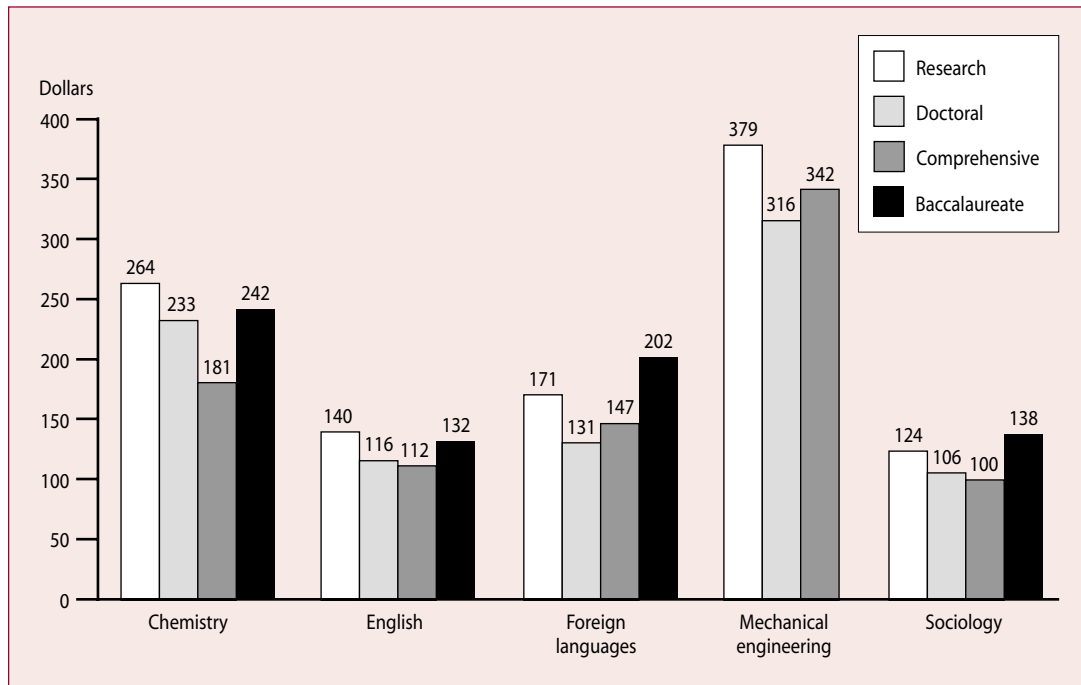
Findings

The key finding from analysis of multiple years of Delaware Study data is that most of the variance in instructional cost across institutions, as measured by direct expense per student credit hour taught, is associated with the disciplinary mix within an institution.

A secondary factor affecting cost is institutional mission, as related to Carnegie institutional classification. This result may be associated with different faculty responsibilities at institutions with different Carnegie classifications. For example, faculty at research universities, extensively engaged in research activity, might be expected to teach fewer student credit hours at higher costs than faculty at comprehensive institutions. However, Carnegie classification accounts for less of the cost differential between institutions than the disciplinary mix factor.

Figure A reflects actual academic year 2001 Delaware Study benchmarks for 5 of the 24 disciplines analyzed in this study. The benchmarks are mean values for direct expense per student credit hour taught, as reported by participating institutions. They have been refined to correct for outliers and influential cases, and as such, are fair reflections of the average cost of instruction in those disciplines.

In chemistry, average direct expense per student credit hour taught ranges from \$181 at comprehensive institutions to \$264 at research universities, an \$83 spread. The range in English is \$28, from a low of \$112 at comprehensive institutions to a high of \$140 at research universities. Foreign languages range from \$131 at doctoral universities

Figure A. Direct expense per student credit hour taught: Institution type within discipline, 2001

NOTE: Data for mechanical engineering at baccalaureate institutions are not applicable.

SOURCE: University of Delaware, The Delaware Study of Instructional Costs and Productivity, 1998–2001.

to \$202 at baccalaureate colleges, a \$71 spread, while mechanical engineering ranges from \$316 at doctoral universities to \$379 at research universities, a difference of \$63. And sociology ranges from \$100 at comprehensive institutions to \$138 at baccalaureate colleges, a spread of \$38. These examples in figure A are typical of the ranges in any given Delaware Study data collection cycle.

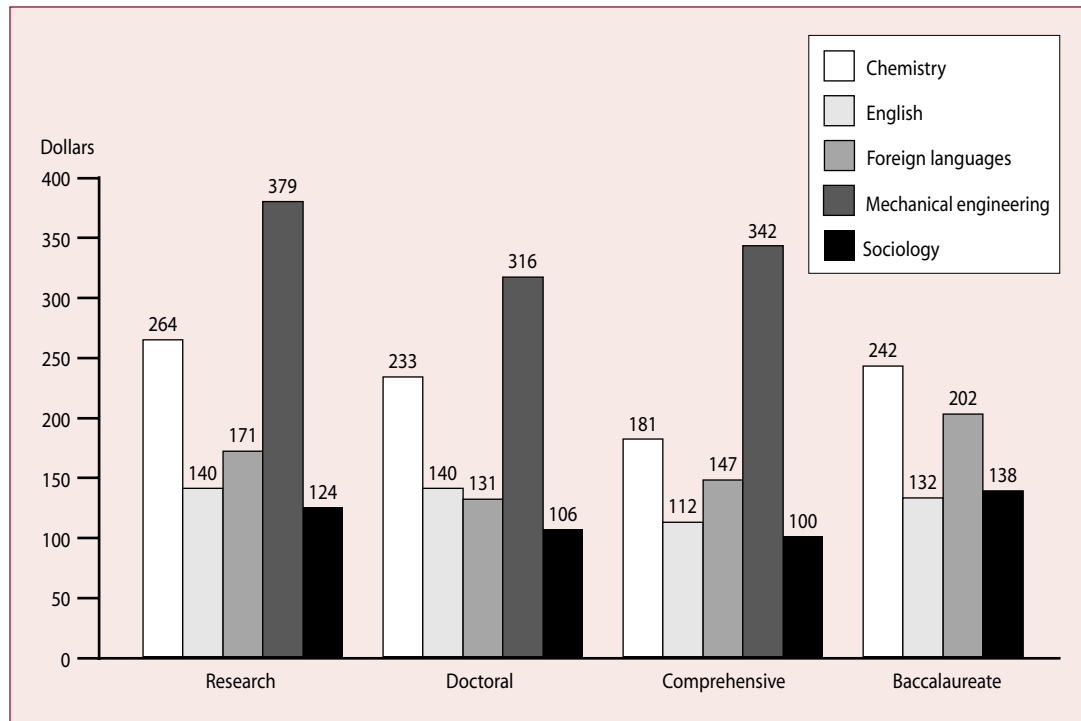
While the foregoing discussion demonstrates that there is variation within a discipline *across institution types*, figure B clearly illustrates there is also considerable variation *across the disciplines within an institution*. Using the same disciplinary examples, at a research university, the difference in direct expense per student credit hour taught between English and mechanical engineering is \$239; the difference between sociology and chemistry is \$140. Comparable patterns are apparent within the other Carnegie categories as well.

These cost differentials within disciplines across institution types and between disciplines within those types lead to an overarching question. In describing the cost of instruction at higher education institutions, which is the more impor-

tant factor—the designation of the institution as research, doctoral, comprehensive, or baccalaureate, or the configuration of disciplines that compose the institution?

Hierarchical linear modeling (HLM) is a statistical tool that provides the capability to disaggregate total variance in cost by institution, and by discipline within the institution. HLM helps to explore and describe the dispersion of instructional costs across institutions, and to identify those factors that are associated with the dispersion. The hierarchical linear model constructed in this study demonstrates that most of the variance in cost is at the discipline level within an institution, ranging from 76.0 percent in the 1998 data collection cycle to 82.6 percent in the 2000 cycle.

It can be asserted that Carnegie institutional classification, as a proxy for institutional mission, is tied to at least some of the dispersion of costs at the aggregate institutional level. When Carnegie classification is taken into account in the hierarchical linear model, the dispersion in cost across institutions decreases, and the relative variance due to disciplines within an institution ranges from 81.0 to 88.0 percent.

Figure B. Direct expense per credit hour taught: Discipline within institution type, 2001

NOTE: Data for mechanical engineering at baccalaureate institutions are not applicable.

SOURCE: University of Delaware, The Delaware Study of Instructional Costs and Productivity, 1998–2001.

This important finding underscores that the disciplines that compose a college or university's curriculum, not its Carnegie designation, are associated with most of the dispersion of costs among institutions. This further highlights the distinction between costs, i.e., instructional expenditures, and price, i.e., tuition. Stated plainly, *price* is a constant for all undergraduates at an institution; chemistry and engineering majors pay the same tuition rate as English and sociology majors. However, the *cost* of delivering instruction in those disciplines varies widely.

Finding that most of the variation in instructional expenditures is associated with the mix of disciplines within an institution is also important in light of the issues raised in the first part of the congressionally mandated study. Researchers found no apparent relationship between the level of instructional expenditures at an institution and the tuition rate charged by that institution. Results of this analysis of direct instructional expense underscore the difficulty in relating price to cost at the level of the academic discipline. While direct instructional expense per student credit hour taught in civil engineering is three times higher than that for sociology, it is not practical for an institution to charge engineering majors a tuition rate three times that charged to sociology majors.

Indeed, the first report in the cost study found that institutional tuition rates at public institutions are determined largely by state appropriation levels, while competitive market forces shape tuition at private institutions. Neither of these external factors has anything to do with what it costs to deliver instruction in a discipline. Price (i.e., tuition) and cost (i.e., institution expenditures) are not interchangeable constructs.

While the foregoing discussion described the forces that are associated with instructional cost *within an institution*, the study also focused on those factors that impact expenditures *within a discipline*. In *The Economics of American Universities* (Brinkman 1990), Paul Brinkman postulated that the behavior of marginal and average costs can be associated with four dimensions: size (i.e., quantity of activity or output), scope of services offered, level of instruction (for instructional costs), and discipline (for instructional costs).

The analyses in this study determined that 60 to 75 percent of the variation in cost *within a discipline or groups of disciplines* is associated with specific cost factors consistent with those identified by Brinkman. While the association of a given variable with cost, as measured by direct expense

per student credit hour taught, may vary from discipline to discipline, the following general patterns are consistently observed:

- The volume of teaching activity, as measured by total student credit hours taught, is a major cost factor. Cost decreases as volume increases.
- Department size, as measured in terms of total number of faculty, is a consistent cost indicator. The larger the department, the higher the cost.
- The proportion of faculty holding tenure is a cost factor. The higher the proportion of tenured faculty, the higher the cost.
- The presence of graduate instruction in a discipline increases costs, although the measured effect of this variable on direct expense in this study is smaller than teaching volume, department size, and faculty tenure rate.
- Similarly, the extent to which expense is associated with personnel costs, as opposed to equipment costs, has less impact on total direct instructional expenditures within a discipline than do teaching volume, department size, and tenure rate.

Conclusions

While the first report in the congressionally mandated study of expenditures in higher education provided evidence that the price that students pay for an education is largely associated with factors external to the institution, the analyses in this report suggest that the direct cost of providing that education is more associated with internal institutional decisions and priorities.

The mix of disciplines that compose an institution's overall curriculum is associated with direct instructional expense at that institution and, to a smaller extent, its designation as a research, doctoral, comprehensive, or baccalaureate institution. Costs vary more substantially across disciplines within a given institution than they do across institutions within a given discipline.

Within the individual disciplines at an institution, economies of scale have the greatest impact on instructional costs. When given a faculty of fixed size, the more student credit hours taught, the lower the unit cost. Increasing the size of that faculty without a concomitant increase in student

credit hour production raises instructional expense. Increasing the proportion of tenured faculty—that cadre of faculty who are better compensated and are essentially a “fixed cost”—will increase instructional expense. And to a lesser extent, introducing or increasing the level of graduate instruction raises instructional costs.

While the data analyzed in this study reflect cost patterns for those 4-year colleges and universities participating in the Delaware Study of Instructional Costs and Productivity only, they nonetheless provide a clear and measurable understanding of cost behaviors within those institutions. These are fresh data, collected at the academic discipline level of analysis, and lend themselves to descriptive statistics that illuminate and clarify cost patterns within those institutions that elect to belong to this data-sharing consortium.

A college or university's tuition rate is tied to what competing institutions charge, i.e., marketplace conditions, and what state legislatures provide as an operating subsidy. Instructional expenditures are tied more to fixed-cost factors, i.e., the mix of disciplines in place at the institution, and within those disciplines, student credit hour production, department size, and tenure rate. This study suggests that depending upon their magnitude, these variables constitute a baseline level for instructional costs within a discipline, and these costs vary less by discipline across institutions than they do among disciplines within an institution.

Most higher education institutions have multiple revenue streams, tuition being but one, to cover instructional costs. It is evident from this study that the factors that are associated with instructional costs are very different from the factors that are associated with tuition prices.

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Data source: University of Delaware, The Delaware Study of Instructional Costs and Productivity, 1998–2001.

For technical information, see the complete report:

Middaugh, M.F., Graham, R., and Shahid, A. (2003). *A Study of Higher Education Instructional Expenditures: The Delaware Study of Instructional Costs and Productivity* (NCES 2003–161).

Author affiliations: M.F. Middaugh, R. Graham, and A. Shahid, University of Delaware.

For questions about content, contact Aurora D'Amico (aurora.d'amico@ed.gov).

To obtain the complete report (NCES 2003–161), call the toll-free ED Pubs number (877–433–7827) or visit the NCES Electronic Catalog (<http://nces.ed.gov/pubsearch>).

Institutions and Degrees

Postsecondary Institutions in the United States: Fall 2001 and Degrees and Other Awards Conferred: 2000–01

Laura G. Knapp, Janice E. Kelly, Roy W. Whitmore, Shiyong Wu, and Lorraine M. Gallego

This article was originally published as the Summary of the E.D. Tabs report of the same name. The universe data are from the Integrated Postsecondary Education Data System (IPEDS).

Introduction

This report presents findings from the Integrated Postsecondary Education Data System (IPEDS) fall 2001 data collection, which included institutional characteristics data for the 2001–02 academic year and completions data covering the period July 1, 2000, through June 30, 2001. These data were collected through the IPEDS web-based data collection system.

IPEDS collects data from postsecondary institutions in the United States (the 50 states and the District of Columbia) and its outlying areas.¹ For IPEDS, a postsecondary institution is defined as an organization that is open to the public and has as its primary mission the provision of postsecondary education. IPEDS defines postsecondary education as formal instructional programs with a curriculum designed primarily for students who are beyond the compulsory age for high school. This includes academic, vocational, and continuing professional education programs and excludes institutions that offer only avocational (leisure) and adult basic education programs.

Participation in IPEDS was a requirement for the 6,458 institutions in the United States and the 157 in the outlying areas that participated in Title IV federal student financial aid programs such as Pell Grants or Stafford Loans during the 2001–02 academic year.² In addition, institutions that do not participate in Title IV programs are offered the opportunity to participate in the IPEDS data collection.

Tabulations in this report present selected data items collected from the 6,615 Title IV institutions in fall 2001. Additional detailed information is available through the various IPEDS web tools.³ Institutions provided institutional characteristics and price data for the 2001–02

academic year and completions data (degrees and other formal awards conferred) during the 2000–01 academic year. This report presents data for all Title IV institutions.

Institutional Characteristics

NCES and other researchers use data from the Institutional Characteristics component of IPEDS to classify postsecondary institutions based on a variety of characteristics. Data on sector, level, control, and affiliation allow classification within general categories. More specific categories of institutions can be defined by using additional data, such as types of programs offered, levels of degrees and awards, accreditation, calendar system, admission requirements, student charges, and basic enrollment information.

Institutions were classified as degree-granting if they awarded at least one associate's or higher degree in academic year 2000–01. Of the 6,458 Title IV institutions in the United States, 4,197 institutions, or 65 percent of all U.S. Title IV institutions, granted a degree during this period (table A).

Institutions may be further classified by their control and level. Among the Title IV degree-granting institutions located in the United States, 59 percent offered a bachelor's or higher degree, while 41 percent offered an associate's as the highest degree (figure 1). Considering Title IV institutions in the United States that award certificates only (non-degree-granting), 76 percent offered certificates for completing programs of less than 2 years' duration, another 22 percent offered certificates requiring at least 2 but less than 4 years of study, and 1 percent offered certificates at the postbaccalaureate level or higher.

Further examination of the Title IV degree-granting institutions located in the United States indicates that 41 percent were public institutions, 40 percent were private not-for-profit institutions, and 19 percent were private for-profit institutions. Of the non-degree-granting Title IV institutions located in the United States, 17 percent were public institutions, 12 percent were private not-for-profit institutions, and 71 percent were private for-profit institutions.

¹Outlying areas include American Samoa, the Federated States of Micronesia, Guam, the Marshall Islands, the Northern Marianas, Palau, Puerto Rico, and the Virgin Islands.

²Institutions participating in Title IV programs are accredited by an agency or organization recognized by the U.S. Department of Education, have a program of over 300 clock hours or 8 credit hours, have been in business for at least 2 years, and have a signed Program Participation Agreement (PPA) with the Office of Postsecondary Education (OPE), U.S. Department of Education.

³See <http://nces.ed.gov/ipeds>.

Table A. Title IV institutions, by geographic area, control of institution, degree-granting status, and level of institution: United States and outlying areas, academic year 2001-02

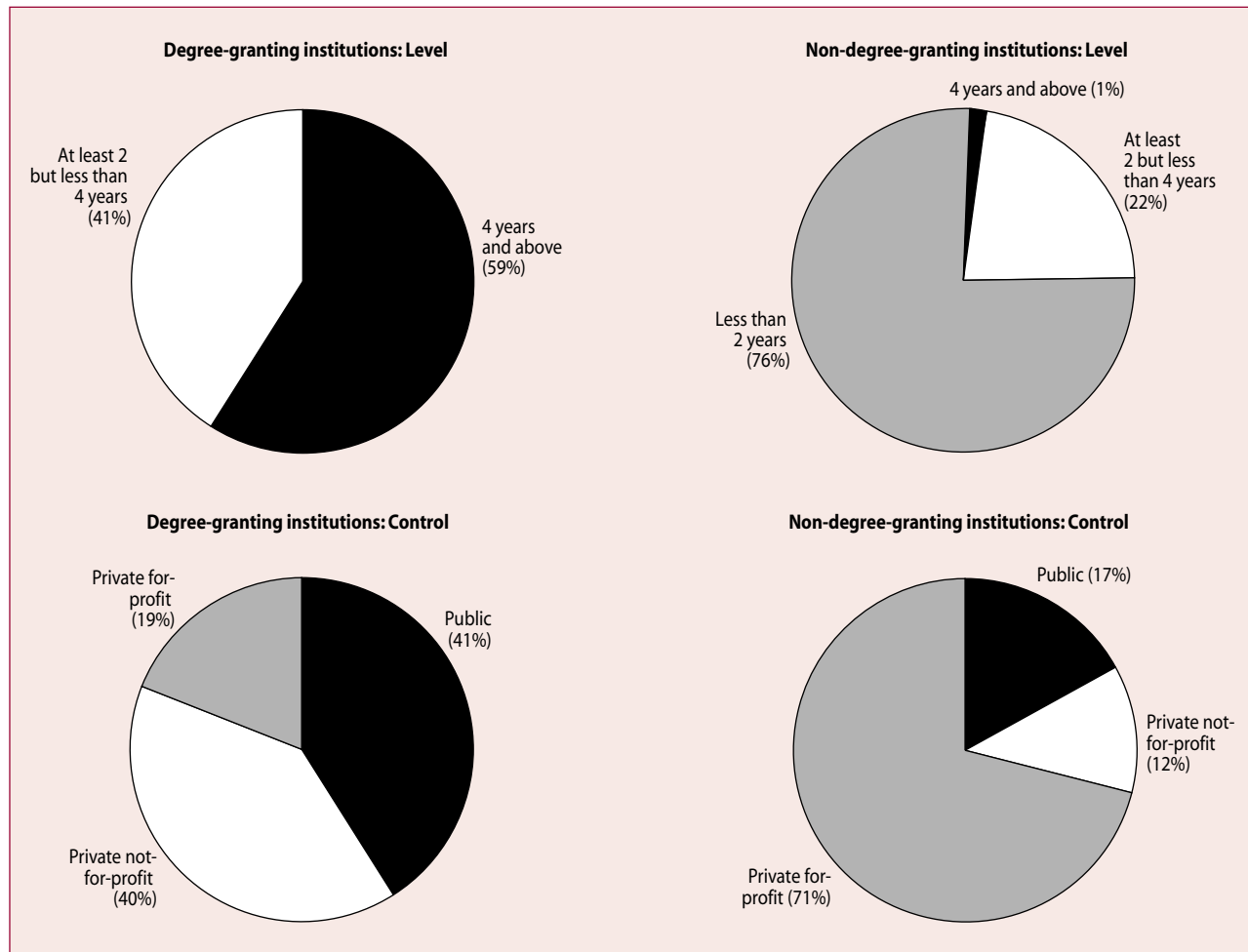
Degree-granting status and level of institution	Total	United States				Outlying areas			
		Total	Public	Private		Total	Public	Private	
				Not-for-profit	For-profit			Not-for-profit	For-profit
All institutions	6,615	6,458	2,099	1,941	2,418	157	30	49	78
4 years and above	2,578	2,520	629	1,567	324	58	17	35	6
At least 2 but less than 4 years	2,240	2,213	1,165	269	779	27	13	2	12
Less than 2 years	1,797	1,725	305	105	1,315	72	0	12	60
Degree-granting	4,279	4,197	1,713	1,676	808	82	30	37	15
4 years and above	2,545	2,487	628	1,541	318	58	17	35	6
At least 2 but less than 4 years	1,734	1,710	1,085	135	490	24	13	2	9
Less than 2 years	†	†	†	†	†	†	†	†	†
Non-degree-granting	2,336	2,261	386	265	1,610	75	0	12	63
4 years and above	33	33	1	26	6	0	0	0	0
At least 2 but less than 4 years	506	503	80	134	289	3	0	0	3
Less than 2 years	1,797	1,725	305	105	1,315	72	0	12	60

†Not applicable.

NOTE: Data are not imputed. The item response rates for all cells on this table are 100 percent. Outlying areas include American Samoa, the Federated States of Micronesia, Guam, the Marshall Islands, the Northern Marianas, Palau, Puerto Rico, and the Virgin Islands.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Fall 2001.

Figure 1. Title IV institutions, by degree-granting status and level and control of institution: United States, academic year 2001-02



NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Fall 2001.

Completions

During the 2000–01 academic year, about 2.4 million degrees were awarded by Title IV degree-granting institutions located in the United States. Of the total number of degrees awarded, 24 percent were associate’s degrees, 51 percent were bachelor’s degrees, 19 percent were master’s degrees, 2 percent were doctor’s degrees, and 3 percent were first-professional degrees⁴ (table B).

Control of institutions

Public institutions awarded two-thirds (65 percent) of all degrees from Title IV degree-granting institutions in the United States during the 2000–01 academic year, while private not-for-profit institutions awarded 30 percent and private for-profit institutions accounted for the remaining 5 percent (table C). Public and private not-for-profit institutions awarded more bachelor’s degrees than any other type of degree. Bachelor’s degrees accounted for 52 percent

of all degrees awarded by public institutions and 56 percent of all degrees awarded by private not-for-profit institutions during 2000–01 (table B). Private for-profit institutions, on the other hand, were more likely to award associate’s degrees. Associate’s degrees accounted for 68 percent of the degrees awarded by private for-profit institutions during the 2000–01 academic year.

Public institutions awarded the majority of degrees at all levels, except at the first-professional level. They awarded 79 percent of associate’s degrees, 65 percent of bachelor’s degrees, 53 percent of master’s degrees, and 63 percent of doctor’s degrees (table C). The majority of first-professional degrees (59 percent) were awarded by private not-for-profit institutions, while public institutions awarded 41 percent of the degrees at this level.

Gender and race/ethnicity of recipients

Women earned more degrees than men in academic year 2000–01 (table C). Overall, about 58 percent of all degrees were awarded to women. Women earned more associate’s, bachelor’s, and master’s degrees than men in 2000–01. They received 60 percent of the associate’s degrees, 57 percent of

⁴First-professional degrees are awarded after completion of the academic requirements to begin practice in the following professions: chiropractic (D.C. or D.C.M.); dentistry (D.D.S. or D.M.D.); law (L.L.B. or J.D.); medicine (M.D.); optometry (O.D.); osteopathic medicine (D.O.); pharmacy (Pharm.D.); podiatry (D.P.M., D.P., or Pod.D.); theology (M.Div., M.H.L., B.D., or Ordination); or veterinary medicine (D.V.M.).

Table B. Number and percentage of degrees conferred by Title IV degree-granting institutions, by control of institution and level of degree: United States, academic year 2000–01

Level of degree	Total	Public	Private not-for-profit	Private for-profit
Total, all degrees	2,416,123	1,575,799	727,949	112,375
Percent of total	100.0	100.0	100.0	100.0
Associate’s degrees	578,865	456,487	45,711	76,667
Percent of total	24.0	29.0	6.3	68.2
Bachelor’s degrees	1,244,171	812,438	408,701	23,032
Percent of total	51.5	51.6	56.1	20.5
Master’s degrees	468,476	246,054	210,789	11,633
Percent of total	19.4	15.6	29.0	10.4
Doctor’s degrees	44,904	28,187	15,920	797
Percent of total	1.9	1.8	2.2	0.7
First-professional degrees ¹	79,707	32,633	46,828	246
Percent of total	3.3	2.1	6.4	0.2

¹First-professional degrees are awarded after completion of the academic requirements to begin practice in the following professions: chiropractic (D.C. or D.C.M.); dentistry (D.D.S. or D.M.D.); law (L.L.B. or J.D.); medicine (M.D.); optometry (O.D.); osteopathic medicine (D.O.); pharmacy (Pharm.D.); podiatry (D.P.M., D.P., or Pod.D.); theology (M.Div., M.H.L., B.D., or Ordination); or veterinary medicine (D.V.M.).

NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Fall 2001.

Table C. Degrees conferred by Title IV institutions, by level of degree, control of institution, gender, and race/ethnicity: United States, academic year 2000-01

Control of institution, gender, and race/ethnicity	Total degrees		Associate's degrees		Bachelor's degrees	
	Number	Percent of total	Number	Percent of total	Number	Percent of total
All institutions	2,416,123	100.0	578,865	100.0	1,244,171	100.0
Control of institution						
Public	1,575,799	65.2	456,487	78.9	812,438	65.3
Private not-for-profit	727,949	30.1	45,711	7.9	408,701	32.8
Private for-profit	112,375	4.7	76,667	13.2	23,032	1.9
Gender						
Men	1,025,426	42.4	231,645	40.0	531,840	42.7
Women	1,390,697	57.6	347,220	60.0	712,331	57.3
Race/ethnicity						
White, non-Hispanic	1,664,805	68.9	396,403	68.5	890,077	71.5
Black, non-Hispanic	211,044	8.7	61,600	10.6	106,775	8.6
Hispanic	154,687	6.4	55,230	9.5	74,493	6.0
Asian/Pacific Islander	136,700	5.7	27,418	4.7	75,595	6.1
American Indian/Alaska Native	18,062	0.7	6,392	1.1	8,683	0.7
Race/ethnicity unknown	104,983	4.3	20,261	3.5	48,737	3.9
Nonresident alien	125,842	5.2	11,561	2.0	39,811	3.2
Control of institution, gender, and race/ethnicity	Master's degrees		Doctor's degrees		First-professional degrees ¹	
	Number	Percent of total	Number	Percent of total	Number	Percent of total
All institutions	468,476	100.0	44,904	100.0	79,707	100.0
Control of institution						
Public	246,054	52.5	28,187	62.8	32,633	40.9
Private not-for-profit	210,789	45.0	15,920	35.5	46,828	58.8
Private for-profit	11,633	2.5	797	1.8	246	0.3
Gender						
Men	194,351	41.5	24,728	55.1	42,862	53.8
Women	274,125	58.5	20,176	44.9	36,845	46.2
Race/ethnicity						
White, non-Hispanic	296,108	63.2	25,865	57.6	56,352	70.7
Black, non-Hispanic	35,364	7.5	2,091	4.7	5,214	6.5
Hispanic	19,879	4.2	1,430	3.2	3,655	4.6
Asian/Pacific Islander	22,272	4.8	2,440	5.4	8,975	11.3
American Indian/Alaska Native	2,293	0.5	170	0.4	524	0.7
Race/ethnicity unknown	31,136	6.6	1,945	4.3	2,904	3.6
Nonresident alien	61,424	13.1	10,963	24.4	2,083	2.6

¹First-professional degrees are awarded after completion of the academic requirements to begin practice in the following professions: chiropractic (D.C. or D.C.M.); dentistry (D.D.S. or D.M.D.); law (L.L.B. or J.D.); medicine (M.D.); optometry (O.D.); osteopathic medicine (D.O.); pharmacy (Pharm.D.); podiatry (D.P.M., D.P., or Pod.D.); theology (M.Div., M.H.L., B.D., or Ordination); or veterinary medicine (D.V.M.).

NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Fall 2001.

the bachelor's degrees, and 59 percent of the master's degrees. On the other hand, men earned more doctor's and first-professional degrees, 55 percent and 54 percent, respectively.

Over two-thirds (69 percent) of all degrees conferred during the 2000–01 academic year were awarded to White, non-Hispanic students; 22 percent were awarded to minority students; and 10 percent were awarded to nonresident aliens (5.2 percent) or individuals whose race/ethnicity was unknown (4.3 percent). The majority of degrees at each level were awarded to White, non-Hispanic students: 68 percent of associate's degrees, 72 percent of bachelor's degrees, 63 percent of master's degrees, 58 percent of doctor's degrees, and 71 percent of first-professional degrees.

The proportion of degrees awarded to minority students was highest at the associate's level, where they received 26 percent of these degrees. Minorities were also awarded 21 percent of bachelor's degrees, 17 percent of master's degrees, 14 percent of doctor's degrees, and 23 percent of first-professional degrees.

Although the proportion of degrees awarded to nonresident aliens varied by level, they received 13 percent of all master's degrees and 24 percent of all doctor's degrees, much higher proportions than any individual or specific group other than White, non-Hispanic.

Tuition and Fees

The overall increase in tuition and fees charged by institutions between 1996–97 and 2001–02 varied by student level and state residency status (table D). Note that these are average institutional charges; the numbers do not reflect average amounts paid by students because charges are *not* weighted by enrollment nor is financial aid taken into consideration.⁵ Undergraduate tuition and required fees at public 4-year institutions rose 26 percent between 1996–97 and 2001–02 for in-state students and 25 percent for out-of-state students. Between 1996–97 and 2001–02, graduate tuition and required fees at public institutions rose 30 percent for in-state students and 27 percent for out-of-state students.

Among 4-year institutions, private for-profit institutions reported the largest increases in tuition and required fees.

At 4-year private not-for-profit institutions, tuition and fees charged to both undergraduates and graduates rose during this period (37 percent and 31 percent, respectively).

Increases at public 2-year institutions were lowest during the period; charges to in-state students increased 18 percent, while charges to those attending out-of-state rose 20 percent. Private not-for-profit 2-year institutions increased their tuition and required fees between 1996–97 and 2001–02 more than any other type of institution—61 percent, while tuition at 2-year private for-profit institutions increased 40 percent.

Price of Attendance

Price of attendance is an estimate of the total amount an incoming undergraduate student will be required to pay to attend college. This price includes tuition and fees, books and supplies, room and board, and certain designated other expenses such as transportation. IPEDS collects price of attendance information for full-time, first-time, degree/certificate-seeking students from Title IV institutions. These estimates are the amounts provided by the institutions' financial aid offices and are used to determine a student's financial need.

Considering differences in price of attendance for full-time, first-time, degree/certificate-seeking students (referred to here as “undergraduates”) by institutional control, 4-year private not-for-profit institutions were more expensive than either private for-profit or public institutions of the same level (table E). The average price of attendance for undergraduates attending 4-year private not-for-profit institutions in 2001–02 was \$20,667. This was higher than the price of \$18,978 for these same students at 4-year private for-profit institutions. Public institutions reported the lowest prices among 4-year institutions, \$10,559 for in-state undergraduates and \$16,285 for out-of-state undergraduates, during the 2001–02 academic year.

Two-year public institutions offered the lowest price of attendance overall during this same period, \$8,020 to in-state students and \$10,615 to out-of-state students. For the 2001–02 academic year, students attending private institutions paid higher prices. At private for-profit 2-year institutions, first-time students could expect to pay \$16,802 on average, while their counterparts at private not-for-profit institutions paid \$14,966.

⁵See also Choy and Berker (2003).

Table D. Changes in average charges by institutions for tuition and required fees to full-time, full-year students at Title IV degree-granting institutions, by student level, residency, and year of tuition and required fees: United States, academic years 1996-97 and 2001-02

Student level, residency, and year of tuition and required fees	Tuition and required fees: 4-year and above institutions		
	Public	Private	
		Not-for-profit	For-profit
Undergraduate			
In-state			
1996-97	\$2,947	†	†
2001-02	\$3,705	†	†
Percent change	26	†	†
All other			
1996-97	\$7,578	\$9,985	\$7,835
2001-02	\$9,441	\$13,631	\$10,809
Percent change	25	37	38
Graduate			
In-state			
1996-97	\$3,282	†	†
2001-02	\$4,252	†	†
Percent change	30	†	†
All other			
1996-97	\$7,567	\$7,934	\$8,320
2001-02	\$9,596	\$10,416	\$12,097
Percent change	27	31	45
Student level, residency, and year of tuition and required fees	Tuition and required fees: At least 2-year but less than 4-year institutions		
	Public	Private	
		Not-for-profit	For-profit
Undergraduate			
In-state			
1996-97	\$1,601	†	†
2001-02	\$1,890	†	†
Percent change	18	†	†
All other			
1996-97	\$3,722	\$5,032	\$6,911
2001-02	\$4,482	\$8,095	\$9,699
Percent change	20	61	40

†Not applicable.

NOTE: Tuition data are not imputed. The item response rates for all cells on this table range from 86.0 percent to 100.0 percent. For public institutions, "all other" reflects out-of-state tuition and fees. Tuition and required fees are average institutional charges, not average amounts paid by students (i.e., charges are not weighted by enrollment).

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Fall 1996 and Fall 2001.

Table E. Average price of attendance for full-time, first-time, degree/certificate-seeking students at Title IV degree-granting institutions, by control of institution, residency, and level of institution: United States, academic year 2001–02

Control of institution, residency, and level of institution	On-campus price	Off-campus (not with family) price	Off-campus (with family) price
Public institutions			
In-state			
4 years and above	\$11,721	\$12,734	\$7,222
At least 2 but less than 4 years	8,098	10,496	5,466
Out-of-state			
4 years and above	17,447	18,459	12,948
At least 2 but less than 4 years	10,693	13,091	8,060
Private not-for-profit institutions			
4 years and above	21,970	22,787	17,245
At least 2 but less than 4 years	15,406	17,780	11,711
Private for-profit institutions			
4 years and above	20,889	20,703	15,341
At least 2 but less than 4 years	17,716	18,788	13,901

NOTE: Price data are not imputed. The item response rates for all cells on this table range from 86.6 percent to 100.0 percent. Price of attendance includes tuition and fees, room and board charges, books and supplies, and other expenses.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Fall 2001.

Reference

Choy, S.P., and Berker, A.M. (2003). *How Families of Low- and Middle-Income Undergraduates Pay for College: Full-Time Dependent Students in 1999–2000* (NCES 2003–162). U.S. Department of Education. Washington, DC: National Center for Education Statistics.

Data source: The NCES Integrated Postsecondary Education Data System (IPEDS), Fall 1996 and Fall 2001.

For technical information, see the complete report:

Knapp, L.G., Kelly, J.E., Whitmore, R.W., Wu, S., and Gallego, L.M. (2003). *Postsecondary Institutions in the United States: Fall 2001 and Degrees and Other Awards Conferred: 2000–01* (NCES 2003–158).

Author affiliations: L.G. Knapp, consultant; J.E. Kelly, R.W. Whitmore, S. Wu, and L.M. Gallego, RTI International.

For questions about content, contact Aurora D'Amico (aurora.d'amico@ed.gov).

To obtain the complete report (NCES 2003–158), visit the NCES Electronic Catalog (<http://nces.ed.gov/pubsearch>).

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Public Libraries

Public Libraries in the United States: Fiscal Year 2001

*Adrienne Chute, P. Elaine Kroe, Patricia O'Shea, Maria Polcari, and
Cynthia Jo Ramsey*

This article was originally published as the Introduction and Highlights of the E.D. Tabs report of the same name. The universe data are from the Public Libraries Survey (PLS).

Introduction

The tables in this report summarize information about public libraries in the 50 states and the District of Columbia for state fiscal year (FY) 2001. Forty-nine states, the District of Columbia, and two outlying areas (Guam and the U.S. Virgin Islands) submitted data for FY 2001.¹ Data from Guam and the U.S. Virgin Islands are included in the tables, but not in the table totals. Minnesota did not respond to the survey—all of its data are imputed. The data were collected through the Public Libraries Survey (PLS), conducted annually by the National Center for Education Statistics (NCES) through the Federal-State Cooperative System

(FSCS) for Public Library Data. The FY 2001 survey is the 14th in the series.² This report is based on the final data file.

This report includes information about service measures such as access to the Internet and other electronic services, number of Internet terminals used by staff only, number of Internet terminals used by the general public, reference transactions, public service hours, interlibrary loans, circulation, library visits, children's program attendance, and circulation of children's materials. It also includes information about size of collection, staffing, operating income and expenditures, type of geographic service area,

¹Data were not reported by the following outlying areas: American Samoa, the Northern Marianas, Palau, and Puerto Rico.

²Trend data from some of the earlier surveys are discussed in *Public Library Trends Analysis: Fiscal Years 1992–1996* (Glover 2001), a Statistical Analysis Report released by NCES in the summer of 2001.

type of legal basis, type of administrative structure, and number and type of public library service outlets.³ Data were imputed for nonresponding libraries.

Number of Public Libraries and Population of Legal Service Area

- There were 9,129⁴ public libraries (administrative entities) in the 50 states and the District of Columbia in FY 2001.
- Public libraries served 97 percent⁵ of the total population of the states and the District of Columbia, either in legally established geographic service areas or in areas under contract.
- Eleven percent of the public libraries served 72 percent of the population of legally served areas in the United States; each of these public libraries had a legal service area population of 50,000 or more.

Service Outlets

- In FY 2001, 81 percent of public libraries had one single direct service outlet (an outlet that provides service directly to the public). Nineteen percent had more than one direct service outlet. Types of direct service outlets include central library outlets, branch library outlets, and bookmobile outlets.
- A total of 1,528 public libraries (17 percent) had one or more branch library outlets, with a total of 7,450 branch outlets. The total number of central library outlets was 8,971. The total number of stationary outlets (central library outlets and branch library outlets) was 16,421. Eight percent of public libraries had one or more bookmobile outlets, with a total of 879 bookmobiles.

Legal Basis and Interlibrary Relationships

- In FY 2001, 55 percent of public libraries were part of a municipal government, 11 percent were part of a county/parish, 15 percent were nonprofit association libraries or agency libraries, 9 percent were separate government units known as library districts, 5 percent had multijurisdictional legal basis under an

intergovernmental agreement, 3 percent were part of a school district, 1 percent were part of a city/county, and 2 percent reported their legal basis as “other.”

- Seventy-six percent of public libraries were members of a system, federation, or cooperative service, while 23 percent were not. Two percent served as the headquarters of a system, federation, or cooperative service.⁶

Collections

- Nationwide, public libraries had 767.1 million books and serial volumes in their collections, or 2.8 volumes per capita, in FY 2001. By state, the number of volumes per capita ranged from 1.7 to 5.0.
- Public libraries nationwide had 34.3 million audio materials and 25.2 million video materials in their collections.
- Nationwide, public libraries provided 8.5 materials in electronic format per 1,000 population (e.g., CD-ROMs, magnetic tapes, and magnetic disks).

Library Services

Children’s services

- Nationwide, circulation of children’s materials was 653.9 million, or 37 percent of total circulation, in FY 2001. Attendance at children’s programs was 51.8 million.

Internet access and electronic services

- Nationwide, 96 percent of public libraries had access to the Internet. Ninety-one percent of all public libraries made the Internet available to patrons directly or through a staff intermediary, 4 percent of public libraries made the Internet available to patrons through a staff intermediary only, and 1 percent of public libraries made the Internet available only to library staff.
- Internet terminals available for public use in public libraries nationwide numbered 123,000, or 2.2 per 5,000 population. The average number of Internet terminals available for public use per stationary outlet was 7.5.⁷

³See the glossary in the full report for definitions of the terms used in the report.

⁴Of the 9,129 public libraries, 7,352 were single-outlet libraries, 1,776 were multiple-outlet libraries, and 1 had zero public-service outlets (provided books-by-mail-only service).

⁵This percentage was derived by dividing the total unduplicated population of legal service areas for the 50 states and the District of Columbia by the sum of their official state total population estimates. (Also see *Data File, Public Use: Public Libraries Survey: Fiscal Year 2001* [NCES 2003–398] on the NCES web site.)

⁶Libraries that identify themselves as the headquarters of a system, federation, or cooperative service are not included in the count of members of a system, federation, or cooperative service.

⁷The average was calculated by dividing the total number of Internet terminals available for public use in central and branch outlets by the total number of such outlets.

- Ninety-nine percent⁸ of the unduplicated population of legal service areas had access to the Internet through their local public library.
- Nationwide, 90 percent of public libraries provided access to electronic services.⁹

Other services

- Total nationwide circulation of public library materials was 1.8 billion, or 6.5 materials circulated per capita. By state, the highest circulation per capita was 13.8, and the lowest was 2.1.
- Nationwide, 19.5 million library materials were loaned by public libraries to other libraries.
- Nationwide, reference transactions in public libraries totaled 296.2 million, or 1.1 reference transactions per capita.
- Nationwide, library visits in public libraries totaled 1.2 billion, or 4.3 library visits per capita.

Staff

- Public libraries had a total of 133,000 paid full-time-equivalent (FTE) staff in FY 2001, or 12.18 paid FTE staff per 25,000 population. Of the total FTE staff, 23 percent, or 2.75 per 25,000 population, had master's degrees from programs of library and information studies accredited by the American Library Association ("ALA-MLS" degrees); 11 percent were librarians by title but did not have the ALA-MLS degree; and 67 percent were in other positions.
- Forty-five percent of all public libraries, or 4,072 libraries, had librarians with ALA-MLS degrees.

Operating Income and Expenditures

Operating income

- In FY 2001, 77 percent of public libraries' total operating income of about \$8.2 billion came from local sources, 13 percent from state sources, 1 percent from federal sources, and 9 percent from other sources, such as monetary gifts and donations, interest, library fines, and fees.

⁸This percentage was derived by summing the unduplicated population of legal service areas for (1) all public libraries in which the Internet was used by patrons through a staff intermediary only and (2) all public libraries in which the Internet was used by patrons either directly or through a staff intermediary, and then dividing the total by the unduplicated population of legal service areas in the United States. (Also see *Data File, Public Use: Public Libraries Survey: Fiscal Year 2001* [NCES 2003-398] on the NCES web site.)

⁹Access to electronic services refers to electronic services (e.g., bibliographic and full-text databases, multimedia products) provided by the library due to subscription, lease, license, consortial membership or agreement. It includes full-text serial subscriptions and electronic databases received by the library or an organization associated with the library.

- Nationwide, the average total per capita¹⁰ operating income for public libraries was \$30.02. Of that, \$23.20 was from local sources, \$3.82 from state sources, \$.17 from federal sources, and \$2.82 from other sources.
- Per capita operating income from local sources was under \$3.00 for 9 percent of public libraries, \$3.00 to \$14.99 for 36 percent of libraries, \$15.00 to \$29.99 for 33 percent of libraries, and \$30.00 or more for 22 percent of libraries.

Operating expenditures

- Total operating expenditures for public libraries were \$7.6 billion in FY 2001. Of this, 64 percent was expended for paid staff and 15 percent for the library collection.
- Thirty-one percent of public libraries had operating expenditures of less than \$50,000, 41 percent expended \$50,000 to \$399,999, and 28 percent expended \$400,000 or more.
- Nationwide, the average per capita operating expenditure for public libraries was \$27.64. By state, the highest average per capita operating expenditure was \$51.58, and the lowest was \$12.28.
- Expenditures for library collection materials in electronic format were 1 percent of total operating expenditures for public libraries. Expenditures for electronic access were 3 percent of total operating expenditures.

Reference

Glover, D. (2001). *Public Library Trends Analysis: Fiscal Years 1992-1996* (NCES 2001-324). U.S. Department of Education. Washington, DC: National Center for Education Statistics.

Data source: The NCES Public Libraries Survey (PLS), fiscal year 2001.

For technical information, see the complete report:

Chute, A., Kroe, P.E., O'Shea, P., Polcari, M., and Ramsey, C.J. (2003). *Public Libraries in the United States: Fiscal Year 2001* (NCES 2003-399).

Author affiliations: A. Chute and P.E. Kroe, NCES; P.O'Shea, M. Polcari, and C.J. Ramsey, U.S. Census Bureau.

For questions about content, contact Adrienne Chute (adrienne.chute@ed.gov).

To obtain the complete report (NCES 2003-399), visit the NCES Electronic Catalog (<http://nces.ed.gov/pubsearch>).

¹⁰Per capita figures are based on the total unduplicated population of legal service areas (which excludes populations of unserved areas) in the 50 states and the District of Columbia, not on the state total population estimates.



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Findings From PIRLS

International Comparisons in Fourth-Grade Reading Literacy: Findings From the Progress in International Reading Literacy Study (PIRLS) of 2001

Laurence T. Ogle, Anindita Sen, Erin Pahlke, Leslie Jocelyn, David Kastberg, Stephen Roey, and Trevor Williams

This article was excerpted from the Statistical Analysis Report of the same name. The sample survey data are primarily from the Progress in International Reading Literacy Study (PIRLS).

PIRLS 2001 in Brief

The Progress in International Reading Literacy Study of 2001 (PIRLS 2001) is an assessment of reading comprehension conducted by the International Association for the Evaluation of Educational Achievement (IEA). Thirty-five countries assessed the reading literacy of students in the upper of the two grades with the most 9-year-olds (fourth grade in most countries, including the United States). PIRLS 2001 provides comparative information on the reading literacy of these fourth-graders and also examines factors that may be associated with the acquisition of reading literacy in young children.

PIRLS 2001 will help educators and policymakers by answering questions such as the following:

- How well do fourth-grade students read?
- How do students in one country compare with students in another country?

- Do fourth-grade students value and enjoy reading?
- Internationally, how do the reading habits and attitudes of students vary?

As the sponsor for PIRLS 2001 in the United States, the National Center for Education Statistics (NCES) is reporting findings from the study that compare the United States with other countries and that take a closer look at performance within the United States. The full report on the international study is available at www.pirls.org. Also available at this site is the *PIRLS 2001 Technical Report* (Martin, Mullis, and Kennedy 2003), which examines specific technical issues related to the assessment. Supporting data for the tables and analyses in this report are available at www.nces.ed.gov/surveys/pirls.

Background

PIRLS 2001 follows by 10 years a prior IEA study of reading literacy called the IEA International Reading Literacy Study

of 1991. Over the 10 years between these studies, progress has been made in the ways in which students are assessed and in the construction of the assessment instruments themselves. There has also been a shift in the design of the assessments. Thus, while PIRLS 2001 can trace its evolution from the 1991 IEA study, it is nevertheless a different study.

PIRLS 2001 is the first in a planned 5-year cycle of international trend studies in reading literacy by the IEA. PIRLS is designed to assist participating countries in monitoring the reading literacy of their fourth-grade populations in comparison to other countries.

Construction and administration

A group of distinguished international reading scholars, the Reading Development Group, was formed to construct the *PIRLS 2001 Framework* (see Campbell et al. 2001) and endorse the final reading assessment. Each country followed internationally prescribed procedures to ensure valid translations and representative samples of students. Quality Control Monitors were then appointed in each country to monitor the testing sessions at the schools to ensure that the high standards of the PIRLS 2001 data collection process were met.

Reading literacy achievement was measured by using a selection of four literary passages drawn from children's storybooks and four informational texts. Submitted and reviewed by the PIRLS 2001 countries, the literary passages included realistic stories and traditional tales. The informational texts included chronological and nonchronological articles, a biographical article, and an informational leaflet.

Data collection

Data were collected in the final months of the 2000–01 school year. In the United States, data were collected in the spring of 2001 from both public and private schools.

Definition and aspects of reading literacy

PIRLS 2001 measures reading abilities at a time in students' schooling when most have learned how to read and are now using reading to learn.

PIRLS 2001 defines reading literacy as follows:

The ability to understand and use those written language forms required by society and/or valued by the individual. Young readers can construct meaning from a variety of texts. They read to learn, to participate in communities of

readers, and for enjoyment (Campbell et al. 2001, p. 3).

In PIRLS 2001, three aspects of reading literacy are assessed: purposes of reading, processes of comprehension, and reading behavior and attitudes. The first two aspects of reading literacy form the basis of the written test of reading comprehension, while the student background questionnaire addresses the third aspect.

Purposes of reading refers to the two types of reading that account for most of the reading young students do, both in and out of school: (1) reading for literary experience, and (2) reading to acquire and use information. In the assessment, narrative fiction is used to assess students' ability to read for literary experience, while a variety of informational texts are used to assess students' ability to acquire and use information while reading. The PIRLS 2001 assessment contains an equal proportion of text assessing each purpose.

Processes of comprehension refers to ways in which readers construct meaning from the text. Readers (1) focus on and retrieve specific ideas, (2) make inferences, (3) interpret and integrate ideas and information, and (4) examine or evaluate text features. As shown in figure A, each process is assessed within each purpose of reading.

Average Scores of Students in the United States and Other Countries

PIRLS 2001 scores are reported on a scale of 0 to 1000, with an international average of 500 and a standard deviation of 100.¹ For the 35 countries that participated in PIRLS 2001, figure B presents the average scores for three scales: the combined reading literacy scale and its two components, the literary and informational subscales.² The average scores of U.S. students are compared to the average scores of students in other participating countries and the international average score.³

¹The international average is the mean of all countries participating in the study calculated so that all participating countries have the same contribution to the average. The PIRLS 2001 scale average for each scale (the combined reading literacy scale and the literary and informational subscales) across countries was set to 500 and the standard deviation to 100.

²Average scores for each country are based on a sample of students, rather than all students, and are estimates of the population value of all 9-year-olds in each country. The combined literacy scale is based on the distribution of scores on all the test items, while the subscales are based on only the items that belong to each subscale. Hence, the combined reading literacy score is not the statistical average of the scores of the two subscales.

³No statistical adjustments (such as Bonferonni) are made while carrying out multiple comparisons between the United States and other countries. In order to be consistent with the comparisons carried out for the international report, the t-tests used in this report do not adjust for the correlation between the U.S. average and the international average.

Figure A. Percentage of PIRLS assessment items devoted to reading purposes and processes

Process of comprehension	Purpose of reading (percent)		Total
	Literary items	Informational items	
Total	49	50	100
Focus on and retrieve explicitly stated information	9	13	22
Make straightforward inferences	14	9	23
Interpret and integrate ideas and information	20	20	40
Examine and evaluate content, language, and textual elements	6	8	14

NOTE: Detail may not sum to totals due to rounding.

SOURCE: International Association for the Evaluation of Educational Achievement, Progress in International Reading Literacy Study (PIRLS), 2001. (Originally published as figure 2 on p. 3 of the complete report from which this article is excerpted.)

U.S. student performance on the combined reading literacy scale

- U.S. fourth-grade students perform significantly better than the international average of 500 on the combined reading literacy scale.
- U.S. fourth-graders outperform their counterparts in 23 of the 34 other countries participating in PIRLS 2001, although they score lower than students in England, the Netherlands, and Sweden. No detectable differences in scores are found between U.S. students and their counterparts in eight of the remaining PIRLS 2001 countries.

U.S. student performance on subscales

- U.S. fourth-grade students perform better than the international averages on both of the reading subscales.
- Sweden outscores the United States on the literary subscale, and five countries—Bulgaria, England, Latvia, the Netherlands, and Sweden—outperform the United States on the informational subscale.
- U.S. fourth-graders outscore students in 26 countries on the literary subscale and outperform their counterparts in 17 countries on the informational subscale.

Distribution of Average Combined Reading Literacy Scores

The average scores for reading literacy describe how a country performs overall compared to other nations, but they provide no information about the way scores are

distributed within the countries. One country with an average score similar to another could have large numbers of high- and low-scoring students, while the other country could have large numbers of students performing at about the average score. Figure C details how scores are distributed across countries.

- In the United States, the 5th percentile score for combined reading literacy is 389. Ninety-five percent of U.S. students score above 389; in the same way, 5 percent of students score above 663, the 95th percentile score. This means that the top 5 percent of U.S. students score at least 274 points higher than the bottom 5 percent.

Looking at the length of the bars in figure C gives a sense of how large the differences are between a country's highest and lowest performing students, but it does not describe how many students are high or low performing. As with average scores, because of the statistical techniques used to sample students, it is not accurate to rank countries' scoring variation based simply on the length of the bars shown in figure C. Standard deviations of the combined reading literacy average scores give a mathematical way to tell how greatly scores are spread out from the country's average score.

- Seventeen countries, or about half of the countries participating in PIRLS 2001, show less variation in student performance than the United States. Ten countries show more variation, while the remaining eight countries show no detectable differences in variation in student performance compared to the United States.

Figure B. Fourth-graders' average scores for the combined reading literacy scale, literary subscale, and informational subscale, by country: 2001

Country	Average combined reading literacy score	Country	Average literary subscale score	Country	Average informational subscale score
Sweden	561	Sweden	559	Sweden	559
Netherlands ¹	554	England ^{1,2}	559	Netherlands ¹	553
England ^{1,2}	553	Netherlands ¹	552	Bulgaria	551
Bulgaria	550	United States¹	550	Latvia	547
Latvia	545	Bulgaria	550	England ^{1,2}	546
Canada (O, Q) ^{3,4}	544	Hungary	548	Canada (O, Q) ^{3,4}	541
Lithuania ³	543	Lithuania ³	546	Lithuania ³	540
Hungary	543	Canada (O, Q) ^{3,4}	545	Germany	538
United States¹	542	Italy	543	Hungary	537
Italy	541	Latvia	537	Hong Kong, SAR ⁵	537
Germany	539	Germany	537	Czech Republic	536
Czech Republic	537	Czech Republic	535	Italy	536
New Zealand	529	New Zealand	531	United States¹	533
Scotland ¹	528	Scotland ¹	529	France	533
Singapore	528	Singapore	528	Russian Federation ²	531
Russian Federation ²	528	Greece ²	528	Singapore	527
Hong Kong, SAR ⁵	528	Russian Federation ²	523	Scotland ¹	527
France	525	Iceland	520	New Zealand	525
Greece ²	524	France	518	Slovak Republic	522
Slovak Republic	518	Hong Kong, SAR ⁵	518	Greece ²	521
Iceland	512	Slovak Republic	512	Romania	512
Romania	512	Romania	512	Israel ⁶	507
Israel ⁶	509	Israel ⁶	510	Moldova	505
Slovenia	502	Norway	506	Iceland	504
Norway	499	Slovenia	499	Slovenia	503
Cyprus	494	Cyprus	498	Norway	492
Moldova	492	Moldova	480	Cyprus	490
Turkey	449	Turkey	448	Turkey	452
Macedonia	442	Macedonia	441	Macedonia	445
Colombia	422	Colombia	425	Colombia	424
Argentina	420	Iran	421	Argentina	422
Iran	414	Argentina	419	Iran	408
Kuwait	396	Kuwait	394	Kuwait	403
Morocco ⁷	350	Morocco ⁷	347	Morocco ⁷	358
Belize	327	Belize	330	Belize	332
International average	500	International average	500	International average	500

Average is significantly higher than the U.S. average
 Average is not significantly different from the U.S. average
 Average is significantly lower than the U.S. average

¹Met guidelines for sample participation rates only after replacement schools were included.

²National Defined Population covers less than 95 percent of National Desired Population.

³National Desired Population does not cover all of International Desired Population because coverage falls below 65 percent.

⁴Canada is represented by the provinces of Ontario and Quebec (O, Q) only.

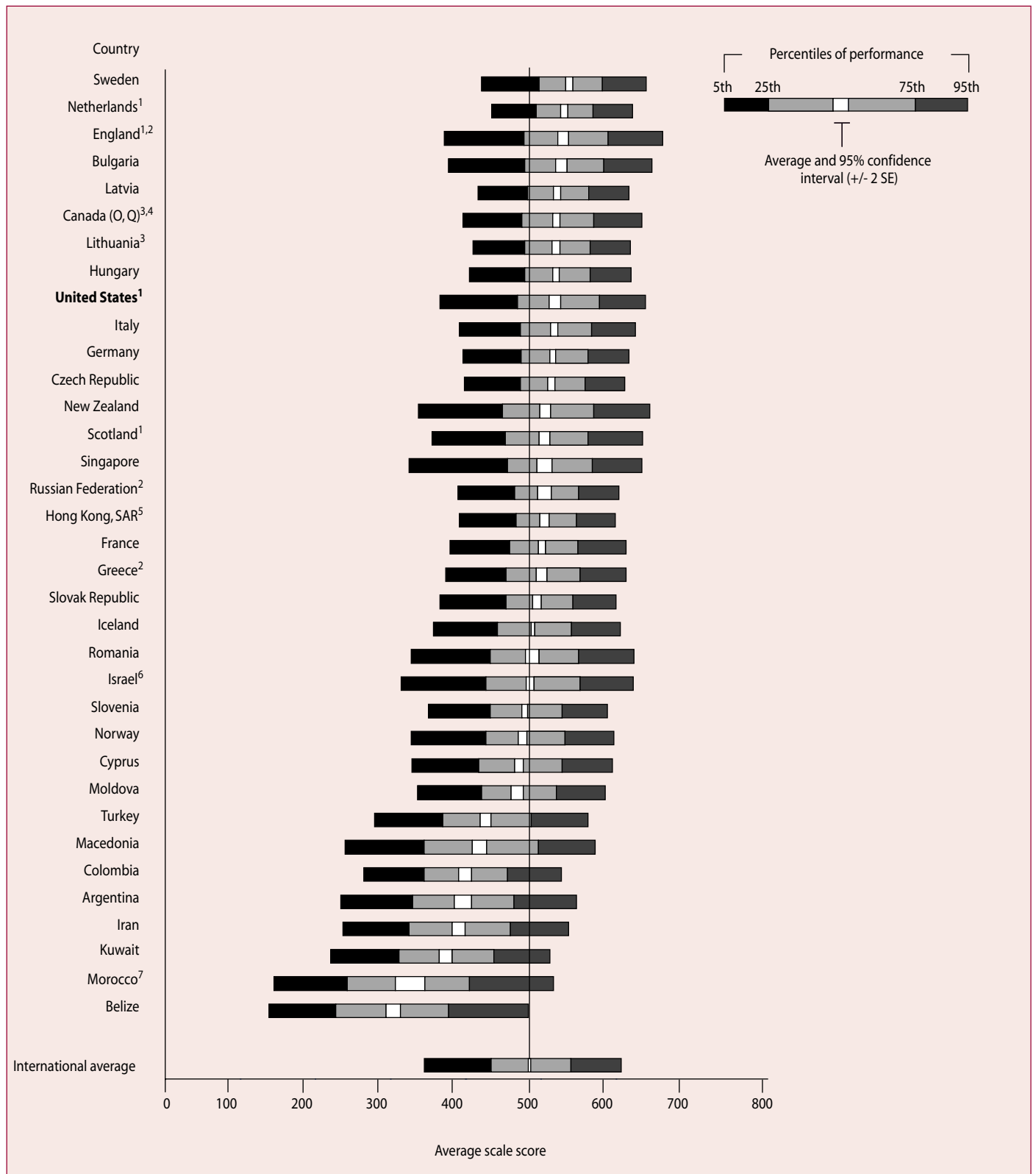
⁵Hong Kong is a Special Administrative Region (SAR) of the People's Republic of China.

⁶National Defined Population covers less than 80 percent of National Desired Population.

⁷Nearly satisfied guidelines for sample participation rates after replacement schools were included.

SOURCE: International Association for the Evaluation of Educational Achievement, Progress in International Reading Literacy Study (PIRLS), 2001. (Originally published as figure 3 on p. 5 of the complete report from which this article is excerpted.)

Figure C. Distribution of average combined reading literacy scale scores of fourth-graders by percentiles, by country: 2001



¹Met guidelines for sample participation rates only after replacement schools were included.

²National Defined Population covers less than 95 percent of National Desired Population.

³National Desired Population does not cover all of International Desired Population because coverage falls below 65 percent.

⁴Canada is represented by the provinces of Ontario and Quebec (O, Q) only.

⁵Hong Kong is a Special Administrative Region (SAR) of the People's Republic of China.

⁶National Defined Population covers less than 80 percent of National Desired Population.

⁷Nearly satisfied guidelines for sample participation rates after replacement schools were included.

SOURCE: International Association for the Evaluation of Educational Achievement, Progress in International Reading Literacy Study (PIRLS), 2001. (Originally published as figure 4 on p. 7 of the complete report from which this article is excerpted.)

Reading Literacy by Benchmarks

Average scores in figure B indicate how well the United States performs relative to other countries, but the scores do not indicate the proficiency required to reach a particular score. To gain a better understanding of what scores represent in terms of reading proficiency, PIRLS 2001 selected four cutoff points on the combined reading literacy scale labeled *international benchmarks*. These benchmarks were selected to correspond to the score points at or above which the lower quarter, median, upper quarter, and top 10 percent of fourth-graders in the international PIRLS 2001 sample performed.⁴

Student responses at the four benchmarks were analyzed to describe a set of reading skills and strategies displayed by

fourth-graders at those points. These descriptions, together with the cut point scores, are listed in figure D.⁵

- On the combined reading literacy scale, 19 percent of the fourth-grade students in the United States reach the top 10 percent benchmark, 41 percent the upper quarter benchmark, 68 percent the median benchmark, and 89 percent the lower quarter benchmark. The percentage of U.S. fourth-graders reaching each of these benchmarks is higher than the international averages.
- Compared to the United States, no other country but England (24 percent) reports a higher percentage of students at the top 10 percent benchmark on the combined reading literacy scale. Sweden (47 percent)

⁴Benchmarking in PIRLS describes the performance of students at four international benchmarks based on the distribution of scores and the pattern of items answered correctly. Proficiency levels for the National Assessment of Educational Progress (NAEP) (i.e., *Basic*, *Proficient*, and *Advanced*) are established by the National Assessment Governing Board based on recommendations from broadly representative panels of educators and the general public who determine what students should know and be able to do at the three levels of performance in each subject area and in each grade assessed.

⁵If students' reading achievement was distributed in the same way in every country, then each country would be expected to have approximately 10 percent of fourth-graders reaching the top 10 percent benchmark, 25 percent the upper quarter benchmark, 50 percent the median benchmark, and 75 percent the lower quarter benchmark.

Figure D. Fourth-graders' reading skills and strategies, and cut point scores, by benchmark points for the combined reading literacy scale: 2001

Benchmark	Cut point scores	Reading skills and strategies ¹
Top 10 percent	615 and above	<ul style="list-style-type: none"> → Demonstrate ability to integrate ideas and information → Provide interpretations about characters' feelings and behaviors with text-based support → Integrate ideas across the text to explain the broader significance or theme of the story → Demonstrate understanding of informational materials by integrating information across various types of materials and successfully applying it to real-world situations
Upper quarter	570 and above	<ul style="list-style-type: none"> → Demonstrate ability to make inferences and recognize some text features in literary texts → Make inferences to describe and contrast characters' actions
Median	510 and above	<ul style="list-style-type: none"> → Make elementary interpretations → Locate specific parts of text to retrieve information → Make observations about whole texts
Lower quarter	435 and above	<ul style="list-style-type: none"> → Retrieve explicitly stated details from various literary and informational texts

¹The responses of students who score within 5 points of each of the cut point scores were evaluated to determine reading skills and strategies displayed by fourth-graders at those points. Procedures used for anchoring these items to the benchmarks are explained more fully in the *PIRLS Technical Report* at www.pirls.org.

SOURCE: International Association for the Evaluation of Educational Achievement, Progress in International Reading Literacy Study (PIRLS), 2001. (Originally published as figure 5 on p.8 of the complete report from which this article is excerpted.)

reports a higher share of students at the upper quarter benchmark compared to the United States.

- On the literary subscale, for the United States, 22 percent of students reach the top 10 percent benchmark, 43 percent the upper quarter benchmark, 70 percent the median benchmark, and 90 percent the lower quarter benchmark. The percentage of U.S. fourth-graders reaching each of these benchmarks on the literary subscale is higher than the corresponding international averages.
- On the informational subscale, for the United States, 15 percent of students reach the top 10 percent benchmark, 36 percent the upper quarter benchmark, 66 percent the median benchmark, and 89 percent the lower quarter benchmark. The percentage of U.S. fourth-graders reaching these benchmarks on the informational subscale is higher than the corresponding international averages.

How Different Groups Perform

Achievement by sex

In the United States and many other countries, policymakers and educators are interested not only in overall achievement but also in achievement by specific groups of students. For example, patterns of differences between boys and girls in reading achievement across countries can point to areas where additional educational resources might be focused.

- Fourth-grade girls score higher than fourth-grade boys on the combined reading literacy scale, on average, in every participating PIRLS 2001 country (figure E). In the United States, on average, girls score 18 points higher than boys on the combined reading literacy scale. Internationally, the average score difference between boys and girls ranges from 8 points (Italy) to 27 points (Belize, Iran, and New Zealand).⁶
- Fourth-grade girls score higher than boys on both the literary and informational subscales in all of the participating PIRLS 2001 countries. In the United States, fourth-grade girls, on average, outscore boys by 16 points on both the literary and informational subscales.
- Fourth-grade girls in Sweden, England, the Netherlands, and Bulgaria outscore U.S. girls on the com-

bined reading literacy scale. However, U.S. girls perform better than their counterparts in 21 of the participating PIRLS 2001 countries.

- Fourth-grade boys in the Netherlands and Sweden outperform U.S. boys on the combined reading literacy scale, although U.S. boys perform better than their peers in 22 of the participating PIRLS 2001 countries.

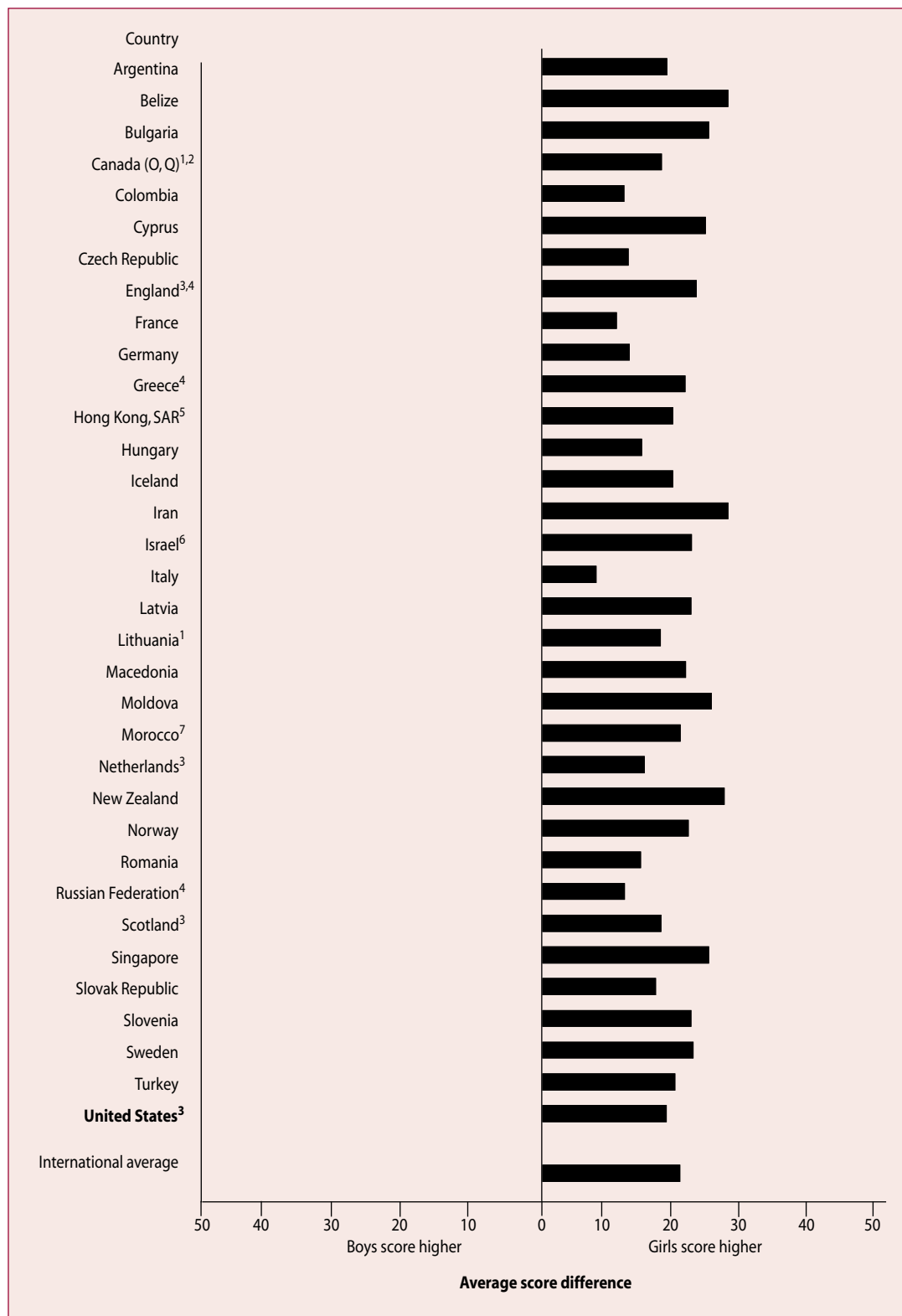
U.S. achievement by race/ethnicity

Another area of interest among policymakers and educators is the achievement of racial/ethnic groups. A number of countries that participated in PIRLS 2001 have large and diverse racial/ethnic groups. However, since these groups vary considerably across countries, it is not possible to compare their performance internationally. Thus, the findings in this section refer only to PIRLS 2001 results for the United States.

- With the exception of Black fourth-graders, each racial/ethnic group in the United States scores higher than the international average (i.e., 500) on the combined reading literacy scale, as well as on the two reading subscales.
- There is considerable variation in scores among the racial/ethnic groups in the United States. On average, White fourth-grade students perform better than Black and Hispanic fourth-graders on the combined reading literacy scale, as well as on the two subscales (figure F). Asian fourth-grade students, on average, also perform better than Black and Hispanic students on the combined reading literacy scale, as well as on the informational subscale. On the literary subscale, Asian students perform better than Black students, while there are no detectable differences in performance between Asian and Hispanic students. There are no detectable differences in scores between White and Asian fourth-grade students across any of the reading scales.
- A larger percentage of White fourth-graders in the United States reach the top 10 percent benchmark on the combined reading literacy scale than do Black or Hispanic fourth-graders. Thus, 25 percent of White fourth-graders reach the top 10 percent benchmark, while 6 percent of Black and 10 percent of Hispanic fourth-graders reach the same benchmark. There is no detectable difference in the percentages of White and Asian fourth-graders who reach the top 10 percent benchmark, but a larger percentage of Asian

⁶Differences in scores by sex are not shown here for Kuwait due to low response rates on the question related to sex. However, the international average includes Kuwait's average scale score.

Figure E. Difference in average scores between boys and girls for the combined reading literacy scale of fourth-graders, by country: 2001



¹National Desired Population does not cover all of International Desired Population because coverage falls below 65 percent.

²Canada is represented by the provinces of Ontario and Quebec (O, Q) only.

³Met guidelines for sample participation rates only after replacement schools were included.

⁴National Defined Population covers less than 95 percent of National Desired Population.

⁵Hong Kong is a Special Administrative Region (SAR) of the People's Republic of China.

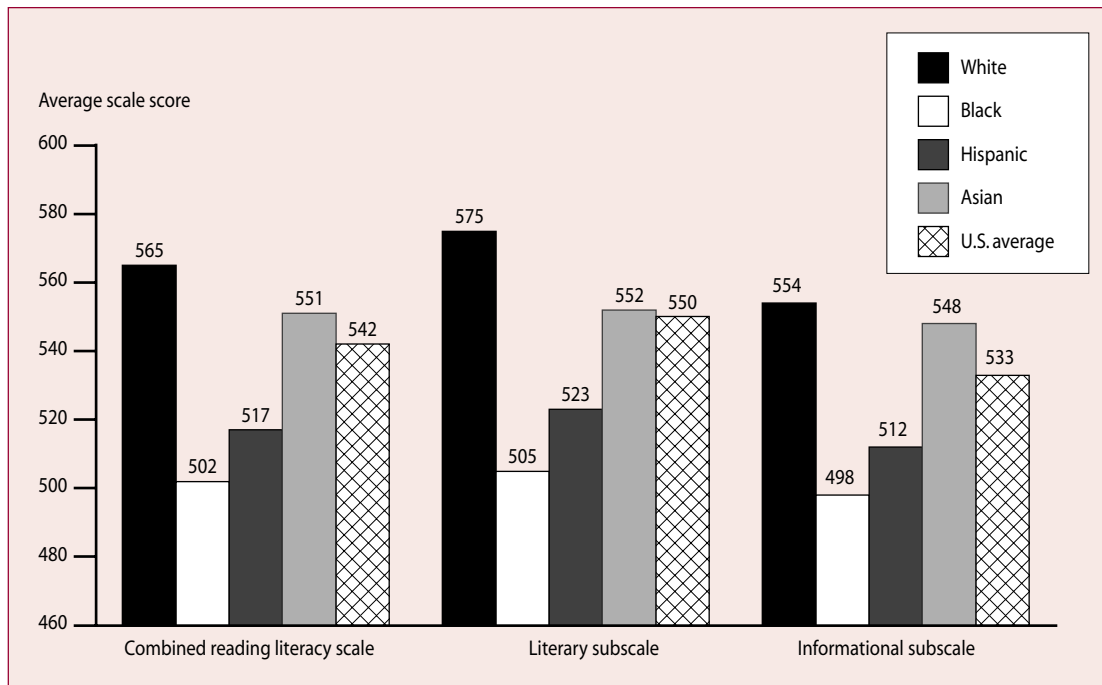
⁶National Defined Population covers less than 80 percent of National Desired Population.

⁷Nearly satisfied national guidelines for sample participation rates after replacement schools were included.

NOTE: All average score differences reported are statistically significant.

SOURCE: International Association for the Evaluation of Educational Achievement, Progress in International Reading Literacy Study (PIRLS), 2001. (Originally published as figure 7 on p.11 of the complete report from which this article is excerpted.)

Figure F. U.S. fourth-graders' average scores for the combined reading literacy scale, literacy subscale, and informational subscale, by race/ethnicity: 2001



NOTE: Black includes African American, and Hispanic includes Latino. Race categories exclude Hispanic origin unless specified. The United States met guidelines for sample participation rates after replacement schools were included.

SOURCE: International Association for the Evaluation of Educational Achievement, Progress in International Reading Literacy Study (PIRLS), 2001. (Originally published as figure 9 on p. 13 of the complete report from which this article is excerpted.)

fourth-graders reach this benchmark than do Black fourth-graders.

- A larger percentage of both White and Asian fourth-graders in the United States reach the upper quarter benchmark on the combined scale than do Black and Hispanic fourth-graders. Thus, 51 percent of White and 46 percent of Asian fourth-graders reach the upper quarter benchmark, while 19 percent of Black and 27 percent of Hispanic fourth-graders reach the same benchmark.

U.S. achievement by control of school

On average, fourth-grade students in private schools in the United States score significantly higher than fourth-grade students in public schools on the combined reading literacy scale, and also on the literary and informational subscales. For example, on the combined reading literacy scale and the informational subscale, on average, fourth-grade students in private schools score 42 points higher than students in public schools. On the literary subscale, private school fourth-graders score an average of 45 points higher than public school fourth-graders.

U.S. achievement by poverty level in public schools

One measure of poverty in U.S. public elementary schools is the percentage of students eligible for free or reduced-price

lunch.⁷ In order to examine how fourth-graders' scores on the combined reading literacy scale are associated with their schools' poverty level (percentage of students receiving free or reduced-price lunch), U.S. public schools were classified into five groups: (1) schools with the lowest poverty levels of less than 10 percent; (2) schools with poverty levels ranging from 10 to 24.9 percent; (3) schools with poverty levels ranging from 25 to 49.9 percent; (4) schools with poverty levels ranging from 50 to 74.9 percent; and (5) schools with the highest poverty levels of 75 percent or more.⁸

- Fourth-graders in U.S. public elementary schools with the highest poverty levels score lower on the combined reading literacy scale compared to their counterparts in schools with lower poverty levels.
- Fourth-graders in schools with intermediate poverty levels of 10 to 24.9 percent and 25 to 49.9 percent score higher on the combined reading literacy scale than students in schools with poverty levels of 50 to 74.9 percent and 75 percent or more. However, there are no detectable differences in scores between U.S.

⁷Data for the percentage of students eligible for free or reduced-price lunch in U.S. public elementary schools participating in PIRLS 2001 were taken from the U.S. Department of Education, NCES Common Core of Data (CCD), "Public Elementary/Secondary School Universe Survey," 1999–2000.

⁸Since the measure of school poverty used for the United States in this analysis cannot be applied to other countries, only data for U.S. schools are used in these comparisons.

fourth-graders in public schools with poverty levels of 10 to 24.9 percent and 25 to 49.9 percent.

- On average, lower percentages of fourth-graders in the highest poverty public schools in the United States reach the upper two international benchmarks (top 10 percent and upper quarter) than their counterparts in the lowest poverty schools. For example, in the highest poverty schools, about 3 percent of fourth-grade students reach the top 10 percent international benchmark, while in the lowest poverty schools, about 34 percent of fourth-grade students reach the same benchmark. Additionally, about 14 percent of students in the highest poverty schools reach the upper quarter benchmark, but in the lowest poverty schools, 64 percent of students reach that benchmark.

Reading and Instruction in the Classroom

Reading curriculum and instructional time

Do school principals and teachers encourage reading instruction through a variety of initiatives? What proportion of the school day is spent in reading instruction? Answers to these questions can give an indication of the emphasis that reading instruction receives in the curriculum of a country.

- According to school principals, 72 percent of U.S. fourth-graders attend schools that have a written statement describing the reading curriculum, which is nearly double the international average of 37 percent.
- Almost all U.S. fourth-grade students (95 percent) attend schools with a curricular emphasis on reading. This is greater than the international average of 78 percent.
- Principals report that 95 percent of U.S. fourth-grade students attend schools with informal initiatives to encourage reading, which is greater than the international average of 76 percent.⁹
- Based on teacher reporting, 65 percent of U.S. fourth-graders receive more than 6 hours of reading instruction per week, a higher percentage than the international average of 28 percent (figure G). This percentage is also higher than the national average in 31 of the other 34 participating PIRLS 2001 countries.

⁹Informal initiatives to promote reading include book clubs, independent reading contests, and schoolwide recreational reading periods to encourage students to read.

- The average combined reading literacy achievement scores of U.S. fourth-graders do not vary by the amount of instructional time they receive.

Teacher preparation and experience

Examining teachers' preparation and tenure indicates the experience of teachers in the classroom. On the teacher questionnaire in PIRLS 2001, teachers were asked about the training they have received and the number of years they have been teaching.

- Based on teacher reports of their preparation for teaching, 95 percent of U.S. fourth-graders are taught by certified teachers.¹⁰ This is higher than the corresponding international average of 89 percent.
- U.S. fourth-graders appear to be taught by teachers who have more experience teaching fourth grade than their counterparts in the majority of the participating PIRLS 2001 countries. On average, U.S. fourth-grade students are taught by teachers who have been teaching fourth grade for 7 years.¹¹ Twenty-six of the other 34 participating countries reported that their fourth-graders are taught by teachers with fewer years of experience teaching fourth grade.

Reading Outside of School

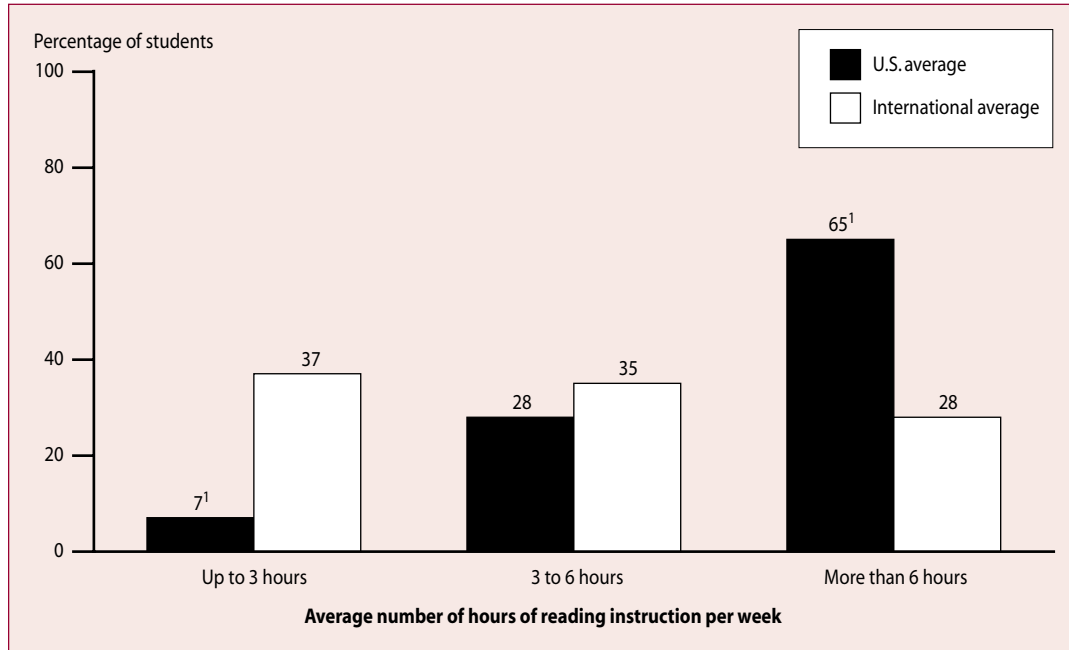
Reading outside of school for enjoyment

To investigate the reading habits of fourth-graders outside of school, PIRLS asked students a series of questions about whether they read for fun outside of school and how often they did so. Students could indicate that they read for fun "every day or almost every day," "once or twice a week," "once or twice a month," or "never or almost never."

- Thirty-five percent of U.S. fourth-graders report reading for fun every day or almost every day. This percentage is smaller than the international average of 40 percent.
- Thirty-two percent of U.S. fourth-graders report that they never or almost never read for fun outside of school, a significantly higher percentage than the international average of 18 percent.

¹⁰Indicates that students are taught by a teacher with a teaching certificate. The NAEP reading assessment data from 1994 show that 95 percent of the teachers of fourth-grade students were certified in the state in which they taught. In the 2001 Schools and Staffing Survey (SASS), 97 percent of fourth-grade teachers reported that they were certified.

¹¹In the 2001 SASS, fourth-grade teachers reported that, on average, they had been teaching for 14 years.

Figure G. Percentage of fourth-graders by average number of hours of reading instruction each week: 2001

¹Significant difference between U.S. average and international average in this category.

NOTE: The United States met guidelines for sample participation rates after replacement schools were included.

SOURCE: International Association for the Evaluation of Educational Achievement, Progress in International Reading Literacy Study (PIRLS), 2001. (Originally published as figure 11 on p.16 of the complete report from which this article is excerpted.)

- In the United States, fourth-graders who read for fun every day or almost every day have higher average scores on the combined reading literacy scale compared to those who never or almost never read for fun, or do so once or twice a month. This pattern holds at the international level as well, based on the international averages.

Choice of activities outside of school

To learn more about students' reading habits, PIRLS 2001 asked students about their choice of reading materials and how often they read different types of texts when they are not in school.

- In the United States, 92 percent of fourth-graders report reading for information at least once or twice a month, a higher percentage than those who report reading either literary fiction, such as stories or novels (79 percent), or comics (43 percent) at least once or twice a month.
- In the United States, 43 percent of fourth-graders report that they read comics at least once or twice a month, a significantly lower percentage than the international average of 74 percent.

- U.S. fourth-graders who report reading literary fiction outside of school at least once or twice a month have higher scores on the combined reading literacy scale than those who never or almost never do so. This pattern is also evident at the international level, based on international averages.
- No measurable differences in scores on the combined reading literacy scale are detected between U.S. fourth-graders who read informational materials every day or almost every day, and those who never or almost never do so.

PIRLS 2001 also asked students about their TV- and video-watching habits.


- Eighteen percent of U.S. fourth-graders report watching TV or videos on a normal school day for 5 hours or more. This is significantly higher than the international average of 12 percent. On average, U.S. fourth-graders report watching TV or videos daily for a greater number of hours than the international average (2.2 hours vs. 2 hours).
- Looking at the international average for the combined reading literacy scale, fourth-graders who

watch TV for more than 5 hours on a normal school day score lower than those who watch TV for 3 to 5 hours a day or less frequently. In the United States, the same finding holds.

Sample Items From PIRLS 2001

The sample items presented here show actual student responses and compare U.S. fourth-graders' performance to the international average. The items also demonstrate acceptable performance at the four benchmarks (top 10 percent, upper quarter, median, and lower quarter). The reading passage (exhibit A) and all of these items have been released to the public by IEA.

Exhibit A. One of the reading passages used in PIRLS 2001



The Upside-Down Mice

by Roald Dahl

Once upon a time there lived an old man of 67 whose name was Labon. All his life he had been a quiet and peaceful person. He was very poor and very lumpy.

When Labon discovered that he had mice in his house, it did not bother him much at first. But the mice multiplied. They began to bother him. They kept on multiplying and finally there came a time when even he could stand it no longer.


"This is too much," he said. "This really is going a bit too far." He hobbled out of the house down the road to a shop where he bought some mousetraps, a piece of cheese and some glue.

When he got home, he put the glue on the underneath of the mousetraps and stuck them to the ceiling. Then he baited them carefully with pieces of cheese and set them to go off.

That night when the mice came out of their holes and saw the mousetraps on the ceiling, they thought it was a tremendous joke. They walked around on the floor, nudging each other and pointing up with their front paws and roaring with laughter. After all, it was pretty silly, mousetraps on the ceiling.

When Labon came down the next morning and saw that there were no mice caught in the traps, he smiled but said nothing.

He took a chair and put glue on the bottom of its legs and stuck it upside-down to the ceiling, near the mousetraps. He did the same with the table, the television set and the lamp. He took everything that was on the floor and stuck it upside-down on the ceiling. He even put a little carpet up there.



The next night when the mice came out of their holes they were still joking and laughing about what they had seen the night before. But now, when they looked up at the ceiling, they stopped laughing very suddenly.

"Good gracious me!" cried one. "Look up there! There's the floor!"

"Heavens above!" shouted another. "We must be standing on the ceiling!"

"I'm beginning to feel a little giddy," said another.

"All the blood's going to my head," said another.

"This is terrible!" said a very senior mouse with long whiskers. "This is really terrible! We must do something about it at once!"

"I shall faint if I have to stand on my head any longer!" shouted a young mouse.

"Me too!"

"I can't stand it!"


"Save us! Do something, somebody, quick!"

They were getting hysterical now. "I know what we'll do," said the very senior mouse. "We'll all stand on our heads, then we'll be the right way up."

Obediently, they all stood on their heads, and after a long time, one by one they fainted from a rush of blood to their brains.

When Labon came down the next morning the floor was littered with mice. Quickly he gathered them up and popped them all in a basket.

So the thing to remember is this: whenever the world seems to be terribly upside-down, make sure you keep your feet firmly on the ground.



SOURCE: Previously published on p. 20 of the complete report from which this article is excerpted.

Sample item at the top 10 percent PIRLS 2001 international benchmark, with response illustrating performance at this benchmark

You learn what Labon is like from the things he does. Describe what he is like and give two examples of what he does that show this.

He was smart. He thought of a good way to trick the mice.

This sample item was worth up to 3 points. The sample response shown earned partial credit (2 out of 3 points).

Percentage of students earning at least 2 points	
U.S. average	49*
International average	30

*Significant difference between U.S. average and international average.

Sample item at the upper quarter PIRLS 2001 international benchmark, with response illustrating performance at this benchmark

Do you think the mice were easy to fool? Give one reason why or why not.

No It took two nights to trick them.

This sample item was worth 1 point. The sample response shown earned full credit.

Percentage of students earning full credit (1 point)	
U.S. average	54*
International average	37

*Significant difference between U.S. average and international average.

Sample item at the top 10 percent PIRLS 2001 international benchmark, with response illustrating performance at this benchmark

Why did Labon smile when he saw there were no mice in the traps?

Labon knew the mice did not know his trick yet.

This sample item was worth 1 point. The sample response shown earned full credit.

Percentage of students earning full credit (1 point)	
U.S. average	47*
International average	31

*Significant difference between U.S. average and international average.

Sample item at the median PIRLS 2001 international benchmark, with response illustrating performance at this benchmark

Which words best describe this story?

- serious and sad
- scary and exciting
- funny and clever
- thrilling and mysterious

This sample item was worth 1 point. Students earned full credit by selecting the correct multiple-choice response (indicated by the shaded oval).

Percentage of students earning full credit (1 point)	
U.S. average	81*
International average	68

*Significant difference between U.S. average and international average.

Sample item at the lower quarter PIRLS 2001 international benchmark, with response illustrating performance at this benchmark

Where did Labon put the mice when he picked them up from the floor?

In a basket

This sample item was worth 1 point. The sample response shown earned full credit.

Percentage of students earning full credit (1 point)	
U.S. average	87
International average	84

Sample item at the lower quarter PIRLS 2001 international benchmark, with response illustrating performance at this benchmark

Why did Labon want to get rid of the mice?

- He had always hated mice.
- There were too many of them.
- They laughed too loudly.
- They ate all his cheese.

This sample item was worth 1 point. Students earned full credit by selecting the correct multiple-choice response (indicated by the shaded oval).

Percentage of students earning full credit (1 point)	
U.S. average	84*
International average	79

*Significant difference between U.S. average and international average.

IEA International Reading Literacy Study of 1991

Reading performance over time

Ten years before PIRLS 2001 was administered, the IEA conducted the IEA International Reading Literacy Study of 1991. This study, like PIRLS 2001, assessed the reading literacy of fourth-graders in over 30 countries using 42 items taken from 6 reading passages. However, when a follow-up for the 1991 study was being planned, the IEA decided to discontinue it and develop a new assessment incorporating the latest approaches to measuring reading literacy (Campbell et al. 2001). This new study would become PIRLS 2001.

In anticipation of the simultaneous release of PIRLS 2001 and the IEA International Reading Literacy Study of 1991, NCES commissioned a comparative analysis of the two assessments. Frameworks, passages, and items in both studies were reviewed and compared. Results indicate that the two studies are quite different. To cite a few examples: Reading passages in PIRLS 2001 were found to be “longer, more engaging, and more complex in most cases” than those found in the IEA International Reading Literacy Study of 1991 (Kapinus 2003, p. 8). PIRLS 2001 also used many more constructed-response (essay-type) questions and presented them in a way “that might have improved students’ motivation to read and respond to the texts” (Kapinus 2003, p. 8). The analysis also found that, in general, PIRLS 2001 tapped skills “requiring deeper thinking” than those in the IEA International Reading Literacy Study of 1991 (Kapinus 2003, p. 8). Because of these and other differences, it is impossible to directly compare results from these two assessments. However, separately, each study provides important clues about how well students in these countries, including U.S. fourth-graders, perform in reading literacy.

While participating in PIRLS 2001, some countries expressed interest in comparing reading performance between 1991 and 2001. Since comparisons between the two assessments were impossible, the IEA gave participating countries an opportunity to readminister the 1991 study during the PIRLS 2001 administration. This readministered study was identical in content, timing, and directions to that given to students in 1991 and allowed comparisons of the performance of students in 2001 with those in 1991. A separate sample of students was drawn in each country so

as not to overburden students assessed in PIRLS 2001. Nine countries, including the United States, participated in the 2001 readministration of the IEA International Reading Literacy Study of 1991.

Performance on the IEA International Reading Literacy Study of 1991

- Based on the readministration of the 1991 study in 2001, no detectable change is observed in the achievement of fourth-graders on the combined reading literacy scale in the United States in 2001 compared to 1991.
- Fourth-graders in five of the nine participating countries perform significantly better, on average, on the 1991 study combined reading literacy scale in 2001 compared to 1991, while fourth-graders in three countries show no detectable difference in average achievement between 1991 and 2001. One country, Sweden, has a significantly lower average score in 2001 than in 1991.

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Data sources: The Progress in International Reading Literacy Study (PIRLS), 2001; the International Association for the Evaluation of Educational Achievement (IEA) International Reading Literacy Study of 1991; and the NCES Common Core of Data (CCD), "Public Elementary/Secondary School Universe Survey," 1999–2000.

For technical information, see the complete report:

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Author affiliations: L.T. Ogle, NCES; A. Sen and E. Pahlke, Education Statistics Services Institute; and L. Jocelyn, D. Kastberg, S. Roey, and T. Williams, Westat.

For questions about content, contact Laurence Ogle (laurence.ogle@ed.gov).

To obtain the complete report (NCES 2003–073), call the toll-free ED Pubs number (877–433–7827) or visit the NCES Electronic Catalog (<http://nces.ed.gov/pubsearch>).

Education Indicators

Comparative Indicators of Education in the United States and Other G-8 Countries: 2002

Joel D. Sherman, Steven D. Honegger, and Jennifer L. McGivern

This report was originally published as the Highlights of the Statistical Analysis Report of the same name. Data sources, outlined at the end of this article, include collections and assessments of the Organization for Economic Cooperation and Development (OECD) and the International Association for the Evaluation of Educational Achievement (IEA).

Introduction

This report is designed to describe how the U.S. education system compares with the education systems in the Group of Eight, or G-8, countries. These countries, which include Canada, France, Germany, Italy, Japan, the Russian Federation, the United Kingdom, and the United States, are among the world's most economically developed economies. *Comparative Indicators of Education in the United States and Other G-8 Countries: 2002* draws on the most current information about education from the Indicators of National Education Systems (INES) project at the Organization for Economic Cooperation and Development (OECD), the international assessments conducted by the International Association for the Evaluation of Educational Achievement (IEA), and more recently, the OECD's Program for International Student Assessment (PISA). The main findings of this report are highlighted below. The highlights are organized around the five major sections of the report.

Context of Education

Potential demand for education

Relative size of the school-age population. Primary and secondary school-age children (between the ages of 5 and 19) represented a larger proportion of the total population in the United States than in all seven other countries presented except the Russian Federation. The United States was one of only three G-8 countries whose school-age population grew in absolute number between 1992 and 1999—the other two being the United Kingdom and Germany.

Educational attainment of the population

Completion of upper secondary education. In 1999, the proportion of adults who completed at least an upper secondary education was higher in the United States than in the six other countries presented. Among younger adults (ages 25 to 34), the upper secondary completion rate was still higher in the United States than in five of the six other countries presented, despite broadened access to upper secondary education in these countries. Only Japan had a

higher upper secondary school completion rate for people in this age group than the United States.

Completion of higher education. Similarly, in 1999, the United States had a higher proportion of all adults (ages 25 to 64), as well as younger adults (ages 25 to 34), who had completed a first university degree than the six other countries presented (figure A). However, the difference in the proportion of younger adults (ages 25 to 34) and older adults (ages 55 to 64) who had completed a first university degree was smaller in the United States than in Japan and Canada, suggesting that these two countries have expanded access to higher academic education to a larger segment of their populations in recent years.

Preprimary and Primary Education

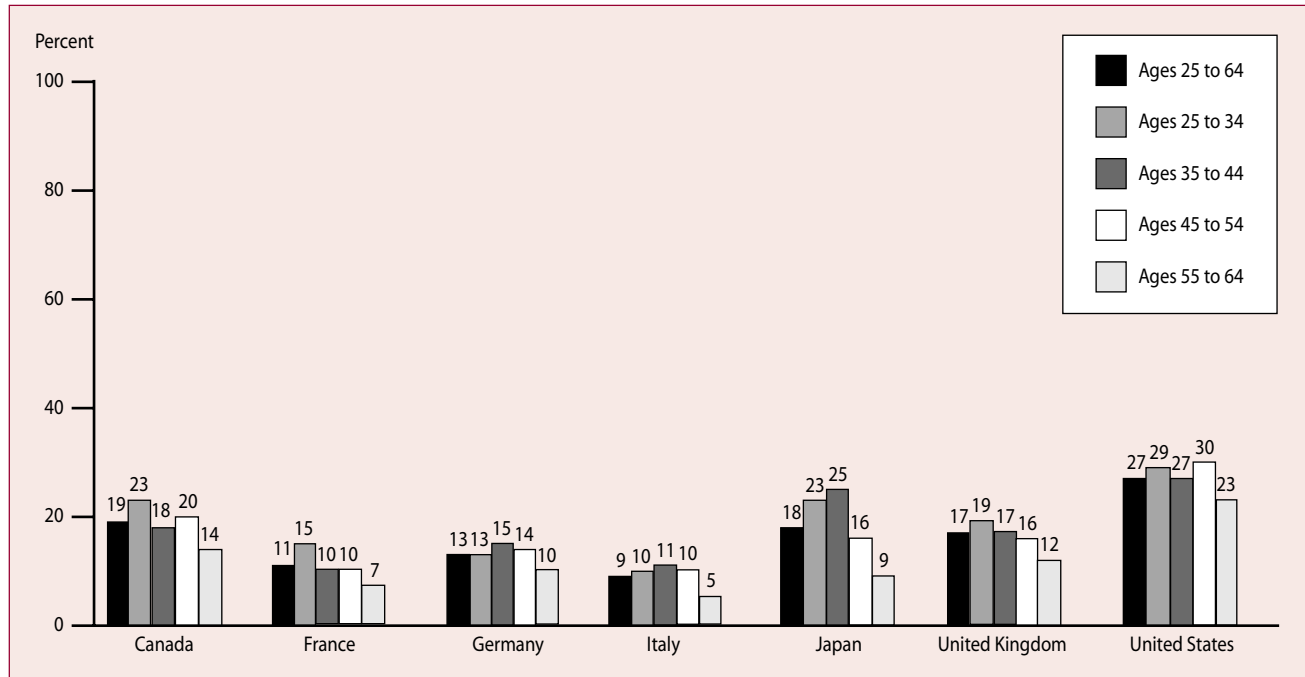
Access to preprimary education

Participation in preprimary education. In 1999, enrollment rates of children ages 3 to 5 in preprimary education were lower in the United States than in France, Germany, Italy, and Japan. France and Italy had nearly universal enrollment of 3- to 5-year-olds in preprimary education. The United States had lower enrollment rates of 3- and 4-year-olds in preprimary education than all other countries presented except Canada and lower enrollment rates of 5-year-olds in preprimary and primary education than all other countries presented except Canada and Germany (figure B).

Human resources in primary education

Student/teacher ratios in primary education. The United States had the second-lowest student/teacher ratio in primary education of the countries presented in 1999 (figure C). Only Italy had a lower student/teacher ratio.

Teachers' salaries in public primary education. In 1999, primary school teachers in the United States with minimum qualifications had higher average starting salaries than teachers in France, Italy, England, and Scotland, but lower average starting salaries than teachers in Germany. U.S. primary teachers with minimum qualifications at the top of the salary schedule had higher average salaries than their counterparts in all of these countries.

Figure A. Percentage of the population ages 25 to 64 that has completed at least a first university degree, by age group and country: 1999

NOTE: The United Kingdom includes England, Northern Ireland, Scotland, and Wales. Data for the United Kingdom exclude individuals who have completed short programs that do not provide access to higher education, since these programs do not meet the minimum requirements to qualify as upper secondary education based on the international standard (ISCED).

SOURCE: Organization for Economic Cooperation and Development, *Education at a Glance*, 2001, table A.2.2b. (Previously published as figure 2b on p.19 of the complete report from which this article is excerpted.)

Achievement of primary school students

Achievement in mathematics and science. According to the Third International Mathematics and Science Study conducted in 1994–95 (TIMSS 1995), American fourth-graders had higher average scores in both mathematics and science than their counterparts in Canada, England, and Scotland, but lower average scores in mathematics than Japanese students. No differences were detected in Japanese fourth-grade students' average scores in science relative to American students' average scores.

Secondary Education

Human resources in secondary education

Student/teacher ratios in secondary education. In contrast with primary education, in 1999, the United States had the second-highest student/teacher ratio in secondary education of the eight countries presented—second only to Canada (figure C).

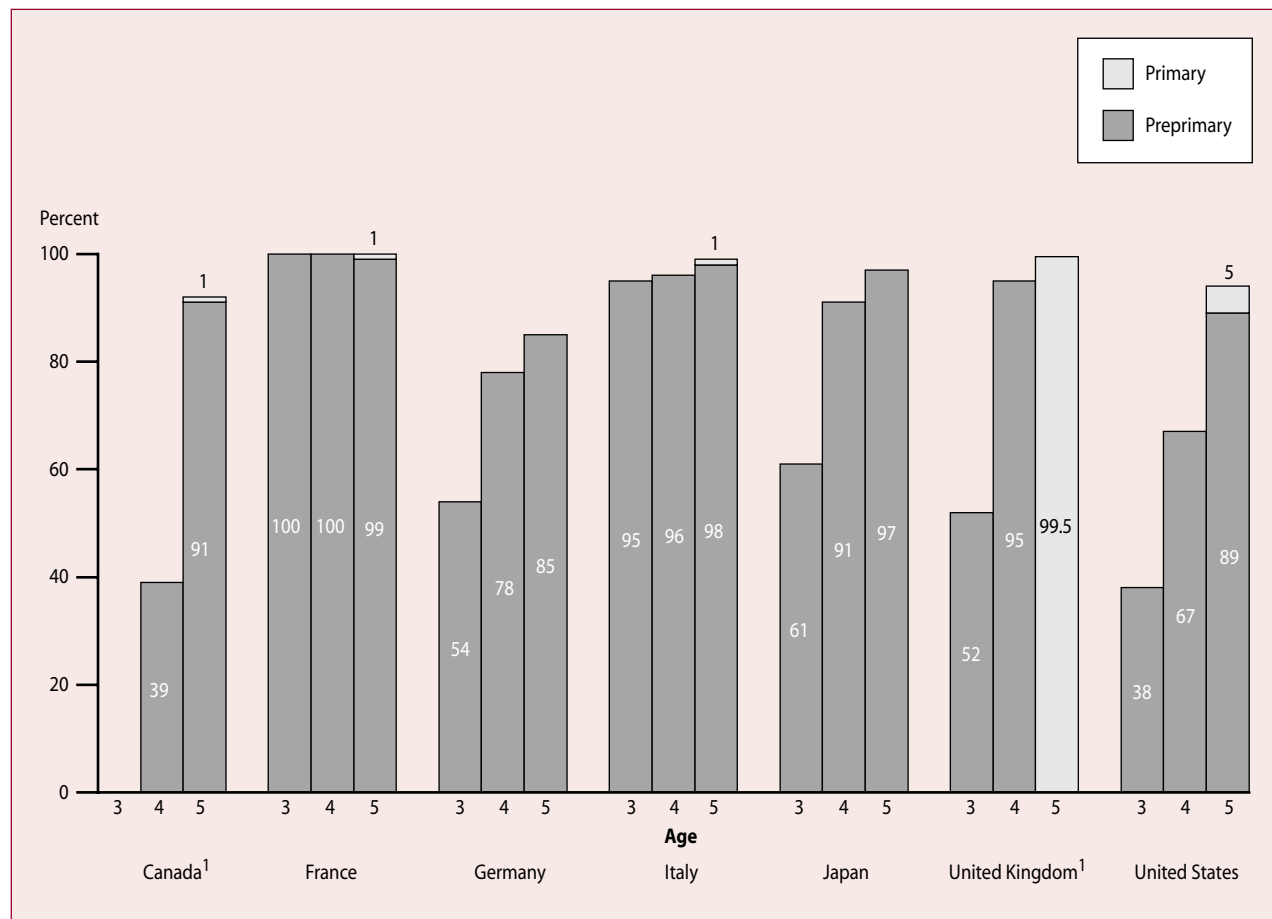
Teachers' salaries in public upper secondary education.

Similar to teachers' salaries in primary education, in 1999, public upper secondary teachers in the United States with minimum qualifications had higher average starting salaries than teachers in France, Italy, England, and Scotland, but lower starting salaries than teachers in Germany. U.S. public upper secondary teachers with minimum qualifications at the top of the salary schedule had higher average salaries than teachers in all other countries reporting data except Germany.

Achievement of secondary school students

Achievement in mathematics and science. According to TIMSS 1999,¹ American eighth-grade students had lower average scores in both mathematics and science than Japanese and Canadian students, but higher average scores than Italian students. Students from the Russian Federation also scored higher, on average, in mathematics, but no differences were detected in the scores of Russian and U.S. students in science. No differences were detected in the

¹In earlier reports, TIMSS 1999 is also referred to as TIMSS-R (TIMSS-Repeat).

Figure B. Percentage of children ages 3 to 5 enrolled in preprimary and primary education, by selected age and country: 1999

¹The preprimary enrollment for 3-year-olds in Canada and for 5-year-olds in the United Kingdom rounds to zero.

NOTE: The United Kingdom includes England, Northern Ireland, Scotland, and Wales. To conform to the international standard, figures for preprimary education for the United States include enrollments in kindergarten and prekindergarten classes in elementary schools in preprimary education. Figures for the United States are from the Current Population Survey and do not correspond with figures published previously by OECD. Only 0.2 percent of 5-year-olds in the United Kingdom are enrolled in preprimary education; over 99 percent are enrolled in primary education.

SOURCE: Organization for Economic Cooperation and Development, Education Database, 2001; U.S. Census Bureau, Current Population Survey, October 1998. (Previously published as figure 5b on p. 27 of the complete report from which this article is excerpted.)

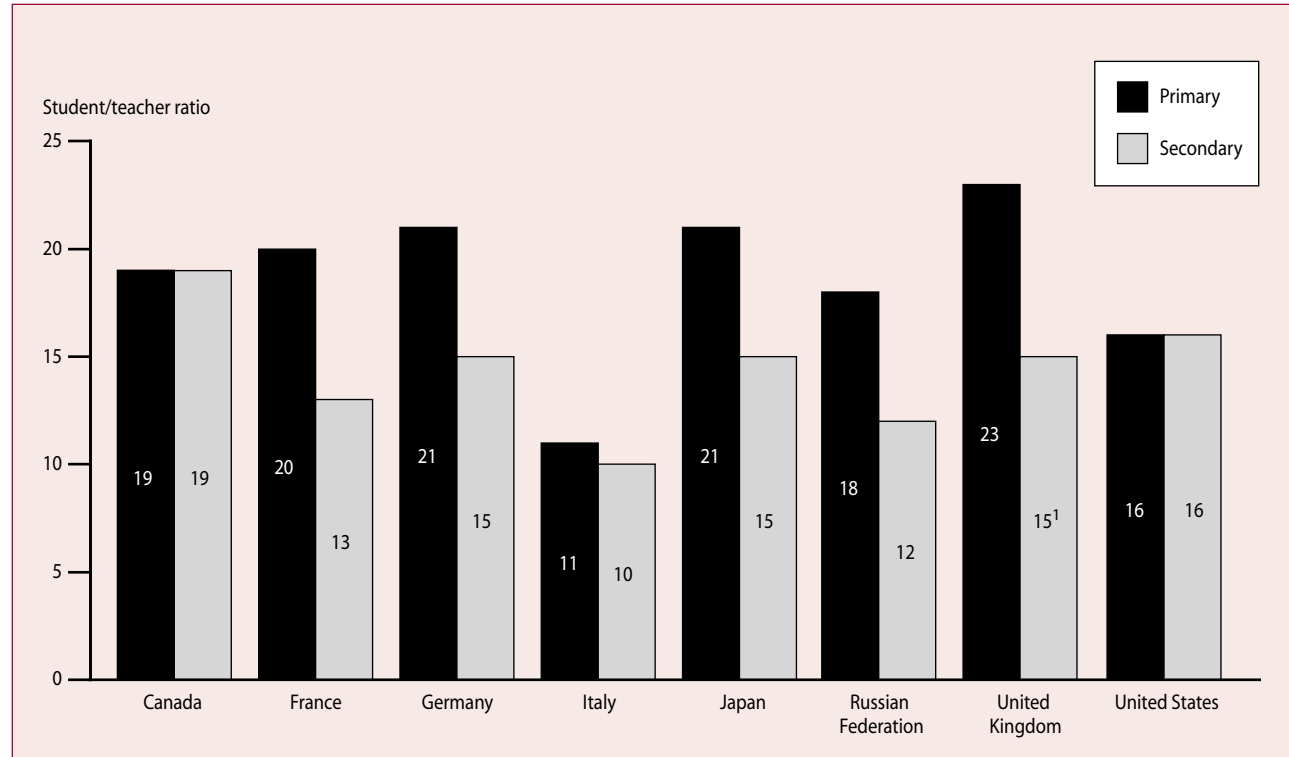
mathematics scores of English and U.S. students, but U.S. students had lower average science scores than their English counterparts.

Proficiency in reading. In 2000, American 15-year-olds had lower average scores than their Canadian counterparts on the PISA reading literacy scale, but no difference was detected between average U.S. 15-year-olds' performance compared to the performance of 15-year-olds in France, Italy, Germany, Japan, or the United Kingdom. The proportion of 15-year-olds performing at the highest level was higher in the United States than in Italy and the Russian Federation, but no difference was detected between the United States and Canada, France, Germany, Japan, and the United Kingdom.

Achievement in civic education. American 14-year-olds had higher scores on the assessment of total civic knowledge (comprised of a civic content and civic skills set of questions) than their counterparts in England, Germany, and the Russian Federation on the Civic Education Study (1999). No difference was detected in the scores of American and Italian 14-year-olds.

Completion of upper secondary education

Graduation rates from upper secondary education. In 1999, the United States had a lower secondary school graduation rate than Japan, Germany, and France, but a higher rate than Italy.

Figure C. Ratio of full-time-equivalent students to full-time-equivalent teachers in public and private primary and secondary schools, by country: 1999

¹Includes only general programs.

NOTE: The United Kingdom includes England, Northern Ireland, Scotland, and Wales.

SOURCE: Organization for Economic Cooperation and Development, *Education at a Glance*, 2001, table D 5.1. (Taken from figures 6 and 12 on pp. 29 and 43 of the complete report from which this article is excerpted.)

Expenditures for primary and secondary education

Expenditures per student for primary education. Expenditures per student for primary education were higher in the United States than in the five other countries presented in 1994 and 1998.

Expenditures per student for secondary education. Expenditures per student for secondary education were also higher in the United States than in the five other countries that reported data in 1994 and 1998.

Expenditures for primary and secondary education as a percent of gross domestic product (GDP). While the United States had higher expenditures per student for primary and secondary education compared to the other countries presented, the United States placed in the middle of the countries presented based on public expenditures for primary and secondary education as a percent of GDP in 1998. With the addition of private expenditures for primary and secondary education, the United States still placed in the middle of the countries presented based on total public

and private expenditures as a percent of GDP—behind France and Canada, about the same as Germany, and ahead of Italy and Japan.

Higher Education

Access to higher education

Participation in higher education. The enrollment rate in higher education was higher in the United States than in the five other countries presented in 1999. While the net enrollment rate in higher education was relatively stable in the United States, France, and Germany between 1994 and 1999, the rate increased in the United Kingdom.

Completion of higher education

Graduation from first university programs of higher education. In 1999, the graduation rate from first university programs of medium length (3 to less than 5 years) was higher in the United States than in all G-8 countries except the United Kingdom. In the United States, the graduation rate from first university programs that prepare students for advanced research training and highly qualified professions

was more than three and a half times the graduation rate from technical and vocational programs that prepare students for direct entry into the labor market.

Science degrees

First university degrees in science,² including mathematics. In 1999, the United States awarded a smaller percentage of first university degrees in science than Canada, France, Germany, and the United Kingdom. About 10 percent of all first university degrees awarded in science in the United States were in mathematics and statistics—the lowest percentage of the five countries presented.

Expenditures for higher education

Expenditures per student for higher education. In 1998, expenditures per student for higher education were higher in the United States than in all other countries presented—more than twice as high as in Germany, Japan, and the United Kingdom, and more than two and one-half times as high as in France. Between 1995 and 1998, all countries presented showed increases in average expenditures per student for higher education. During this period, the gap widened in average expenditures per student for higher education between the United States and the other countries presented.

Expenditures for higher education as a percent of GDP. In 1998, public expenditures for higher education as a percent of GDP were higher in the United States than in the six other countries presented, except Canada. With the addition of private expenditures, the United States replaced Canada as the country with the highest expenditures for higher education as a percent of GDP. This contrasts with the position of the United States (in the middle of the six countries) for expenditures on primary and secondary education as a percent of GDP.

Education and the Labor Force

Labor market outcome of education

Labor force participation rates. In 1999, adults ages 25 to 64 in the United States who completed upper secondary education (high school or its equivalent) had a higher labor force participation rate than high school noncompleters. The difference in labor force participation rates between upper secondary school completers and noncompleters was smaller in the United States than in Canada, Germany, Italy, and the United Kingdom; about the same as in France; and greater than in Japan.

²"Science" is defined as comprising four content areas: computing, life sciences, mathematics and statistics, and physical sciences.

In 1999, adults ages 25 to 64 in the United States who completed a program of academic higher education had a labor force participation rate that was 8 percentage points higher than the participation rate of adults who completed high school or its equivalent. The difference in labor force participation rates between completers of academic higher education and completers of upper secondary education (high school in the United States) was smaller in the United States than in Germany, Italy, and Japan; about the same as in the United Kingdom; and greater than in Canada and France.

Average earnings. In 1999, adults ages 25 to 64 in the United States who completed less than an upper secondary education (high school) earned, on average, about 67 percent of the earnings of adults who completed upper secondary education. The earnings disadvantage for noncompleters of upper secondary education was smaller in the United States than in the United Kingdom and Italy, but greater than in Germany, Canada, and France.

In the United States, the earnings of adults ages 25 to 64 who completed a program of academic higher education were, on average, about 180 percent of the earnings of completers of upper secondary education. The relative advantage of U.S. higher education completers over upper secondary education completers was greater than in the other four countries presented, although in every country presented those who completed academic higher education earned more than those who completed only upper secondary education.

Data sources:

OECD: Indicators of National Education Systems (INES) project—including data from OECD's *Education at a Glance* (1996, 2000, 2001) and the OECD 2001 database—and Program for International Student Assessment (PISA) 2000.

IEA: Third International Mathematics and Science Study (TIMSS), 1995 and 1999; and Civic Education Study (CivEd), 1999.

Other: The U.S. Census Bureau's Current Population Survey (CPS) and International Database; the NCES Common Core of Data (CCD), Integrated Postsecondary Education Data System (IPEDS), and Schools and Staffing Survey (SASS); and national data sources for other member countries.

For technical information, see the complete report:

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Author affiliations: J.D. Sherman, S.D. Honegger, and J.L. McGivern, American Institutes for Research.

For questions about content, contact Mariann Lemke (mariann.lemke@ed.gov).

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