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Education Statistics Quarterly

Volume 3 · Issue 1 · Spring 2001

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National Center for Education Statistics

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Research and Improvement

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Editorial Note

National Center for Education Statistics

The National Center for Education Statistics (NCES) fulfills a congressional mandate to collect and report "statistics and information showing the condition and progress of education in the United States and other nations in order to promote and accelerate the improvement of American education."

Education Statistics Quarterly

Purpose and goals

At NCES, we are convinced that good data lead to good decisions about education. The *Education Statistics Quarterly* is part of an overall effort to make reliable data more accessible. Goals include providing a quick way to

- identify information of interest;
- review key facts, figures, and summary information; and
- obtain references to detailed data and analyses.

Content

The *Quarterly* gives a comprehensive overview of work done across all parts of NCES. Each issue includes short publications, summaries, and descriptions that cover all NCES publications and data products released during a 3-month period. To further stimulate ideas and discussion, each issue also incorporates

- a message from NCES on an important and timely subject in education statistics; and
- a featured topic of enduring importance with invited commentary.

A complete annual index of NCES publications will appear in the Winter issue (published each January). Publications in the *Quarterly* have been technically reviewed for content and statistical accuracy.

General note about the data and interpretations

Many NCES publications present data that are based on representative samples and thus are subject to sampling variability. In these cases, tests for statistical significance take both the study design and the number of comparisons into account. NCES publications only discuss differences that are significant at the 95 percent confidence level or higher. Because of variations in study design, differences of roughly the same magnitude can be statistically significant in some cases but not in others. In addition, results from surveys are subject to nonsampling errors. In the design, conduct, and data processing of NCES surveys, efforts are made to minimize the effects of nonsampling errors, such as item nonresponse, measurement error, data processing error, and other systematic error.

For complete technical details about data and methodology, including sample sizes, response rates, and other indicators of survey quality, we encourage readers to examine the detailed reports referenced in each article.

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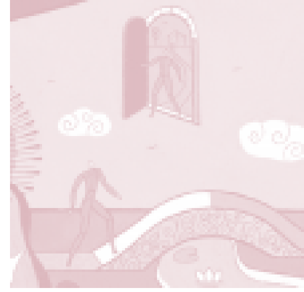

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Note From the Acting Commissioner

Gary W. Phillips

How Americans Measure Up: Assessing the Knowledge and Skills of Children and Adults

This issue of the *Education Statistics Quarterly* highlights the 1999 Third International Mathematics and Science Study–Repeat (TIMSS–R), which focuses on the mathematics and science achievement of eighth-grade students in participating nations. TIMSS–R is but one of an extensive set of NCES assessment surveys that collectively measure a wide variety of knowledge and skills in populations ranging from toddlers to adults. In addition to collecting data from "tests," these surveys collect contextual data about home, school, and societal factors that may affect participants' performance. By providing objective measures of achievement in connection with related factors, these surveys offer invaluable guidance for policy reform efforts. A number of these surveys also place the achievement of Americans in an international context by including results from other countries; such international surveys are conducted in cooperation with international organizations.

New Data on America's Youngest Learners

The Early Childhood Longitudinal Study (ECLS) is designed to provide information about America's youngest learners by collecting information from two cohorts—the kindergarten class of 1998–99 (ECLS-K) and the birth cohort of 2001 (ECLS-B). ECLS-K began collecting data on a nationally representative sample of about 22,000 American kindergartners in fall 1998 and will follow these children through the fifth grade. ECLS-B will follow a nationally representative sample of about 15,000 children born in 2001 from 9 months of age through the first grade. Both ECLS-K and ECLS-B include periodic assessments of children's cognitive, social, emotional, and physical development.

Focus on U.S. Elementary and Secondary Students

At the heart of the NCES assessment program is the congressionally mandated National Assessment of Educational Progress (NAEP), also known as "the Nation's Report Card." For about 3 decades, NAEP has reported on what American elementary and secondary students know and can do in academic subjects. NAEP conducts both long-term trend assessments and main assessments. *Long-term trend assessments* cover several core subjects, providing national and regional data on changes in student achievement over the decades. Most recently, about 30,000 students took part in the 1999 long-term trend assessment in reading, mathematics, and science. Another long-term assessment in the same subjects is scheduled for 2003. *Main assessments* collect data about a large number of subjects, including reading, mathematics, science, writing, civics, U.S. history, geography, and the arts. In addition to providing results at the national and regional levels, many main assessments provide state-level data for those states that choose to participate (47 states participated in 1996). Main assessments generally involve about 130,000 students. In 2000, mathematics, science, and reading were covered by main assessments; U.S. history and geography are scheduled for the next main assessments, to be conducted in 2001.

Comparisons of U.S. Students to Those of Other Countries

The 1999 TIMSS–R, a successor to the 1995 TIMSS, focuses on the mathematics and science achievement of eighth-grade students. The original TIMSS collected data from fourth-, eighth-, and twelfth-graders in 41 countries, while TIMSS–R collected data from eighth-graders in 38 countries. TIMSS–R allows the United States to compare the achievement of its eighth-graders in the 1995 TIMSS to the achievement of its eighth-graders 4 years later. The performance of U.S. fourth-graders relative to those of other nations in 1995 can also be compared to the performance of U.S. eighth-graders relative to those of the same nations 4 years later.

The Civic Education Study (CivEd), conducted in 1999, measures ninth-graders' knowledge and attitudes about democratic practices and institutions. In addition to allowing comparisons of U.S. students with those of 27 other participating countries, CivEd results are also invaluable for understanding U.S. students' attitudes about democracy, national identity, international relations, and social cohesion and diversity.

The new Program for International Assessment (PISA) is designed to monitor, on a regular 3-year cycle, the achievement of 15-year-old students in three subject areas: reading literacy, mathematical literacy, and scientific literacy. In each assessment cycle, PISA will focus on one of the three subject areas. The first assessment cycle, for which data was collected in the United States in spring 2000, focuses on reading literacy. Results are expected to be available beginning in late 2001.

In spring 2001, the Progress in International Reading Literacy Survey (PIRLS) will collect data on the reading literacy of 9-year-olds. PIRLS is planned as a regular international assessment to be conducted every 4 years, allowing for the measurement of trends over time.

Measures of Skills That Adults Need to Function in Society

NCES has conducted assessments of U.S. adult literacy since 1985. The 1992 National Adult Literacy Survey (NALS), administered to over 13,000 American adults, measured a variety of literacy skills, including the ability to understand and use information in connected texts, the ability to locate and use information in other types of documents, and the ability to apply arithmetic operations to numbers in printed materials. Building upon NALS, the 2002 National Assessment of Adult Literacy (NAAL) will provide an indication of the nation's progress in adult literacy since 1992.

Also planned for 2002 is an international survey of adult skills, the Adult Literacy and Lifeskills (ALL) survey. While ALL is designed to assess the adult literacy skills that were assessed by previous international studies, it also aims to go beyond previous studies by including a broader range of lifeskills than were previously assessed. The results will allow comparisons of U.S. adults with adults in other countries.

Featured Topic: Third International Mathematics and Science Study–Repeat

Pursuing Excellence: Comparisons of International Eighth-Grade Mathematics and Science Achievement From a U.S. Perspective: 1995 and 1999
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TIMSS–Repeat

Pursuing Excellence: Comparisons of International Eighth-Grade Mathematics and Science Achievement From a U.S. Perspective: 1995 and 1999

Patrick Gonzales, Christopher Calsyn, Leslie Jocelyn, Kitty Mak, David Kastberg, Sousan Arafeh, Trevor Williams, and Winnie Tsen

This article was originally published as the* Highlights From the Third International Mathematics and Science Study–Repeat (TIMSS–R)*. The sample survey data are from TIMSS–R.

The 1999 Third International Mathematics and Science Study–Repeat (TIMSS–R) is a successor to the 1995 TIMSS and focuses on the mathematics and science achievement of eighth-grade students in participating nations. It provides a second data point in a regular cycle of international assessments of mathematics and science that are planned to chart trends in achievement over time, much like the regular cycle of national assessments in this nation, such as the National Assessment of Educational Progress (NAEP).

The 1995 TIMSS assessed the mathematics and science performance of U.S. students in comparison to their peers in other nations at three different grade levels. The 1995 TIMSS assessments revealed that U.S. 4th-graders performed well in both mathematics and science in comparison to students in other nations, U.S. 8th-graders performed near the international average in both mathematics and science, and U.S. 12th-graders scored below the international average and among the lowest of the TIMSS nations in mathematics and science general knowledge, as well as in physics and advanced mathematics.

Thirty-eight nations chose to compare the mathematics and science performance of their students in 1999. TIMSS–R allows the United States to compare the achievement of its eighth-graders in the original TIMSS to the achievement of its eighth-graders 4 years later. It also provides an opportunity to compare the relative performance of U.S. fourth-graders in 1995 to the relative performance of U.S. eighth-graders 4 years later, in 1999. TIMSS–R includes a videotape study of eighth-grade mathematics and science teaching in seven nations, a voluntary benchmarking study for 27 U.S. states and districts, and a linking study between NAEP and TIMSS–R. Through these components, TIMSS–R has collected information on schools, curricula, instruction, lessons, and the lives of teachers and students to understand the educational context in which mathematics and science learning takes place.

Performance in the United States is presented relative to that of other nations that participated in each assessment. Comparisons are made between the 38 nations that participated in TIMSS–R in 1999; between the 23 nations that participated in both TIMSS and TIMSS–R at the eighth-grade level; and between the 17 nations that participated at the fourth-grade level in TIMSS and at the eighth-grade level in TIMSS–R. Following are highlights of the findings presented in the complete report.

The Mathematics and Science Achievement of Eighth-Graders in 1999

Comparisons of mathematics and science achievement in 1999 are made between the 38 nations that participated in TIMSS–R.

- In 1999, U.S. eighth-graders exceeded the international average of the 38 TIMSS–R nations in mathematics and science.
- In mathematics, U.S. eighth-grade students outperformed their peers in 17 nations, performed similarly to their peers in 6 nations, and performed lower than their peers in 14 nations in 1999 (figure 1).
- In science, U.S. eighth-grade students outperformed their peers in 18 nations, performed similarly to their peers in 5 nations, and performed lower than their peers in 14 nations in 1999 (figure 1).
- Of the five mathematics content areas assessed in 1999, U.S. eighth-graders performed higher than the international average in *fractions and number sense; data representation, analysis, and probability;* and *algebra.* They performed at the international average of the 38 TIMSS–R nations in *measurement* and *geometry.*
- Of the six science content areas assessed in 1999, U.S. eighth-graders performed higher than the international average in *earth science, chemistry, life science, environmental and resource issues,* and *scientific inquiry and the nature of science.* They performed at the international average of the 38 TIMSS–R nations in *physics.*
- In 1999, the United States was one of 34 TIMSS–R nations in which eighth-grade boys and girls performed similarly in mathematics. In four nations, eighth-grade boys outperformed eighth-grade girls in mathematics.
- In 1999, the United States was one of 16 TIMSS–R nations in which eighth-grade boys outperformed eighth-grade girls in science. In 22 nations, no difference between the achievement of eighth-grade boys and girls was found.

The Mathematics and Science Achievement of Eighth-Graders Between 1995 and 1999

Comparisons of mathematics and science achievement between 1995 and 1999 are made between the 23 nations that participated at the eighth-grade level in both TIMSS and TIMSS–R.

- Between 1995 and 1999, there was no change in eighth-grade mathematics or science achievement in the United States (figures 2 and 3). Among the 22 other nations, there was no change in mathematics achievement for 18 nations, and no change in science achievement for 17 nations.
- Across the five mathematics content areas in common[1] between TIMSS and TIMSS–R, there was no change in achievement for eighth-graders in the United States and most of the other 22 nations.
- Across the four science content areas in common[2] between TIMSS and TIMSS–R, there was no change in achievement for eighth-graders in the United States and most of the other 22 nations.
- U.S. eighth-grade black students showed an increase in their achievement in mathematics over the 4 years. They showed no change in their achievement in science over the same period. U.S. eighth-grade white and Hispanic students showed no change in their mathematics or science achievement between 1995 and 1999.
- There were no changes in mathematics and science achievement for U.S. eighth-grade boys and girls between 1995 and 1999.

The Mathematics and Science Achievement of the 1995 Fourth-Grade Cohort in 1999

Because both TIMSS and TIMSS–R used nationally representative samples of students in a particular grade, the 1995

[1]TIMSS and TIMSS–R had the following mathematics content areas in common: *fractions and number sense; measurement; data representation, analysis, and probability; geometry;* and *algebra.*

[2]TIMSS and TIMSS–R had the following science content areas in common: *earth science, life science, physics,* and *chemistry.*

Figure 1.—Average mathematics and science achievement of eighth-grade students, by nation: 1999

Mathematics

Nation	Average
Singapore	604
Korea, Republic of	587
Chinese Taipei	585
Hong Kong SAR	582
Japan	579
Belgium-Flemish	558
Netherlands	540
Slovak Republic	534
Hungary	532
Canada	531
Slovenia	530
Russian Federation	526
Australia	525
Finland[1]	520
Czech Republic	520
Malaysia	519
Bulgaria	511
Latvia-LSS[2]	505
United States	502
England	496
New Zealand	491
Lithuania[3]	482
Italy	479
Cyprus	476
Romania	472
Moldova	469
Thailand	467
(Israel)	466
Tunisia	448
Macedonia, Republic of	447
Turkey	429
Jordan	428
Iran, Islamic Republic of	422
Indonesia	403
Chile	392
Philippines	345
Morocco	337
South Africa	275
International average of 38 nations	487

Science

Nation	Average
Chinese Taipei	569
Singapore	568
Hungary	552
Japan	550
Korea, Republic of	549
Netherlands	545
Australia	540
Czech Republic	539
England	538
Finland	535
Slovak Republic	535
Belgium-Flemish	535
Slovenia	533
Canada	533
Hong Kong SAR	530
Russian Federation	529
Bulgaria	518
United States	515
New Zealand	510
Latvia-LSS[2]	503
Italy	493
Malaysia	492
Lithuania[3]	488
Thailand	482
Romania	472
(Israel)	468
Cyprus	460
Moldova	459
Macedonia, Republic of	458
Jordan	450
Iran, Islamic Republic of	448
Indonesia	435
Turkey	433
Tunisia	430
Chile	420
Philippines	345
Morocco	323
South Africa	243
International average of 38 nations	488

Average is significantly higher than the U.S. average.

Average does not differ significantly from the U.S. average.

Average is significantly lower than the U.S. average.

[1]The shading of Finland may appear incorrect; however, statistically, its placement is correct.

[2]Designated LSS because only Latvian-speaking schools were tested, which represents 61 percent of the population.

[3]Lithuania tested the same cohort of students as other nations, but later in 1999, at the beginning of the next school year.

NOTE: Data are for the eighth grade in most nations; see the complete report for details. Parentheses indicate nations not meeting international sampling and/or other guidelines; see the complete report for details. The international average is the average of the national averages of the 38 nations.

SOURCE: Previously published as figure 2 on p.13 of the complete report that this article summarizes *(Pursuing Excellence: Comparisons of International Eight-Grade Mathematics and Science Achievement From a U.S. Perspective: 1995 and 1999* [NCES 2001–028]).

Figure 2.—Comparisons of eighth-grade mathematics achievement, by nation: 1995 and 1999

Nation	1995 average	1999 average	1995–1999 difference[3]
(Latvia-LSS)[1]	488	505	17 ▲
Canada	521	531	10 ▲
Cyprus	468	476	9 ▲
Hong Kong SAR	569	582	13 ●
(Netherlands)	529	540	11 ●
(Lithuania)[2]	472	482	10 ●
United States	492	502	9 ●
Belgium-Flemish	550	558	8 ●
Korea, Republic of	581	587	6 ●
(Australia)	519	525	6 ●
Hungary	527	532	5 ●
Iran, Islamic Republic of	418	422	4 ●
Russian Federation	524	526	2 ●
Slovak Republic	534	534	0 ●
(Slovenia)	531	530	-1 ●
(Romania)	474	472	-1 ●
(England)	498	496	-1 ●
Japan	581	579	-2 ●
Singapore	609	604	-4 ●
Italy	491	485	-6 ●
New Zealand	501	491	-10 ●
(Bulgaria)	527	511	-16 ●
Czech Republic	546	520	-26 ▼
International average of 23 nations	519	521	2 ●

▲ The 1999 average is significantly higher than the 1995 average.

● The 1999 average does not differ significantly from the 1995 average.

▼ The 1999 average is significantly lower than the 1995 average.

[1]Designated LSS because only Latvian-speaking schools were tested.

[2]Lithuania tested the same cohort of students as other nations, but later in 1999, at the beginning of the next school year.

[3]Difference is calculated by subtracting the 1995 score from the 1999 score. Detail may not sum to totals due to rounding.

NOTE: Data are for the eighth grade in most nations; see the complete report for details. Parentheses indicate nations not meeting international sampling and/or other guidelines in 1995, 1999, or both years; see the complete report for details. The international average is the average of the national averages of the 23 nations with approved sampling procedures. The tests for significance take into account the standard error for the reported differences; thus, a small difference between the 1995 and 1999 averages for one nation may be significant while a large difference for another nation may not be significant. The 1995 scores are based on rescaled data.

SOURCE: Previously published as figure 18 on p. 33 of the complete report that this article summarizes *(Pursuing Excellence: Comparisons of International Eighth-Grade Mathematics and Science Achievement From a U.S. Perspective: 1995 and 1999* [NCES 2001–028]).

TIMSS fourth-graders and the 1999 TIMSS–R eighth-graders represent the same group (or "cohort") of students at two different points in time. These students' performance in 1995 can be compared to their performance in 1999. However, direct comparisons between the 1995 fourth-grade TIMSS assessment and the 1999 eighth-grade TIMSS–R assessment are complicated by several factors, including differences in the content areas assessed and the questions that can be asked between the two grade levels. Therefore, comparisons between TIMSS fourth-graders and TIMSS–R eighth-graders are based on their performance relative to the international average of the 17 nations that participated in fourth-grade TIMSS and eighth-grade TIMSS–R.

- The mathematics and science performance of the United States relative to this group of nations was lower for eighth-graders in 1999 than it was for fourth-graders 4 years earlier, in 1995.
- Among the 16 other nations, the mathematics performance of Canada relative to this group of nations was higher for eighth-graders in 1999 than it was for fourth-graders 4 years earlier, in 1995; the mathematics performance of the Czech Republic,

Figure 3.—Comparisons of eighth-grade science achievement, by nation: 1995 and 1999

Nation	1995 average	1999 average	1995–1999 difference[3]	
(Latvia-LSS)[1]	476	503	27	▲
(Lithuania)[2]	464	488	25	▲
Canada	514	533	19	▲
Hungary	537	552	16	▲
Hong Kong SAR	510	530	20	●
(Australia)	527	540	14	●
Cyprus	452	460	8	●
Russian Federation	523	529	7	●
(England)	533	538	5	●
(Netherlands)	541	545	3	●
Slovak Republic	532	535	3	●
Korea, Republic of	546	549	3	●
United States	513	515	2	●
Belgium-Flemish	533	535	2	●
(Romania)	471	472	1	●
Italy	497	498	1	●
New Zealand	511	510	-1	●
Japan	554	550	-5	●
(Slovenia)	541	533	-8	●
Singapore	580	568	-12	●
Iran, Islamic Republic of	463	448	-15	●
Czech Republic	555	539	-16	●
(Bulgaria)	545	518	-27	▼
International average of 23 nations	518	521	3	●

▲ The 1999 average is significantly higher than the 1995 average.

● The 1999 average does not differ significantly from the 1995 average.

▼ The 1999 average is significantly lower than the 1995 average.

[1]Designated LSS because only Latvian-speaking schools were tested.

[2]Lithuania tested the same cohort of students as other nations, but later in 1999, at the beginning of the next school year.

[3]Difference is calculated by subtracting the 1995 score from the 1999 score. Detail may not sum to totals due to rounding.

NOTE: Data are for the eighth grade in most nations; see the complete report for details. Parentheses indicate nations not meeting international sampling and/or other guidelines in 1995, 1999, or both years; see the complete report for details. The international average is the average of the national averages of the 23 nations with approved sampling procedures. The tests for significance take into account the standard error for the reported differences; thus, a small difference between the 1995 and 1999 averages for one nation may be significant while a large difference for another nation may not be significant. The 1995 scores are based on rescaled data.

SOURCE: Previously published as figure 19 on p. 34 of the complete report that this article summarizes *(Pursuing Excellence: Comparisons of International Eighth-Grade Mathematics and Science Achievement From a U.S. Perspective: 1995 and 1999* [NCES 2001–028]).

Italy, and the Netherlands relative to this group of nations was lower; and the mathematics performance of the 12 other nations was unchanged.

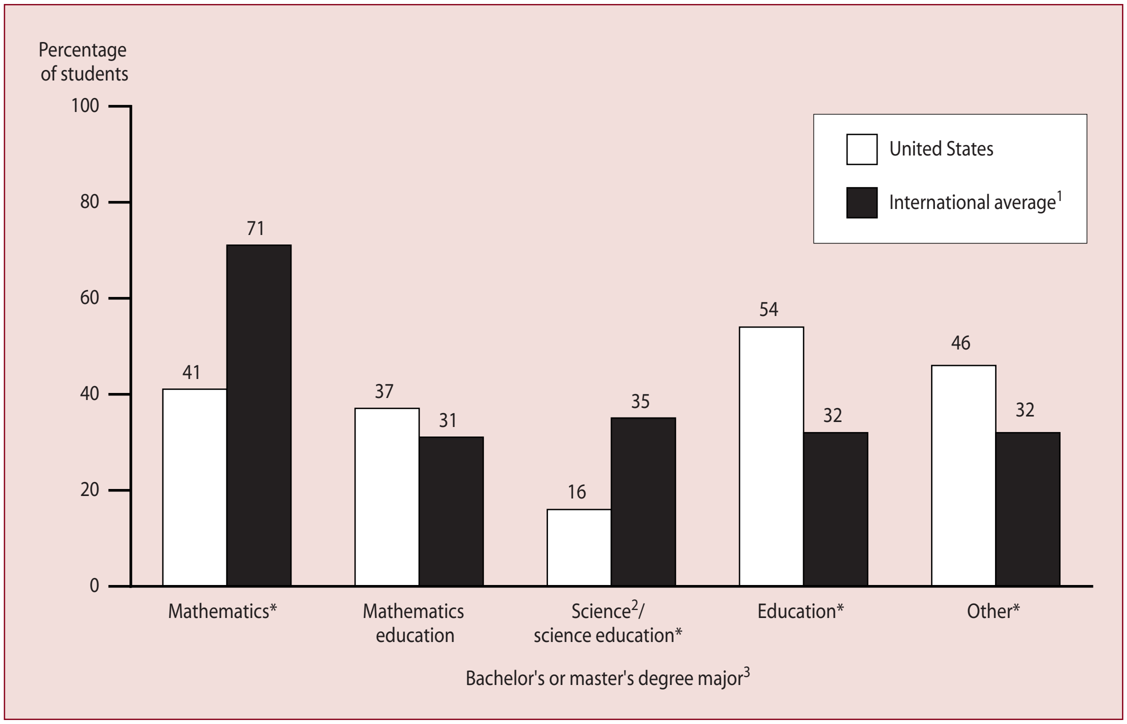
- Among the 16 other nations, the science performance of Hungary and Singapore relative to this group of nations was higher for eighth-graders in 1999 than it was for fourth-graders 4 years earlier, in 1995; the science performance of Italy and New Zealand relative to this group of nations was lower; and the science performance of the 12 other nations was unchanged.

Teaching and Curriculum in 1999

It is too early in the process of data analysis to provide strong evidence to suggest factors that may be related to patterns of achievement on TIMSS–R. However, differences in teaching and curriculum between the United States and other TIMSS–R nations were noted.

- According to their teachers, in 1999 U.S. eighth-grade students were less likely than their international peers to be taught mathematics by teachers with a major or main area of study in mathematics, but as likely as their international peers to be taught

Figure 4.—Eighth-grade mathematics teachers' reports on their main area of study: 1999



*Indicates significant difference between U.S. average and international average in this category.

[1]The item response rate for this question was less than 70 percent in some nations.

[2]Science includes biology, physics, and chemistry.

[3]Mathematics teachers' reports are of main area or areas of study for bachelor's and/or master's degree. More than one category could be selected.

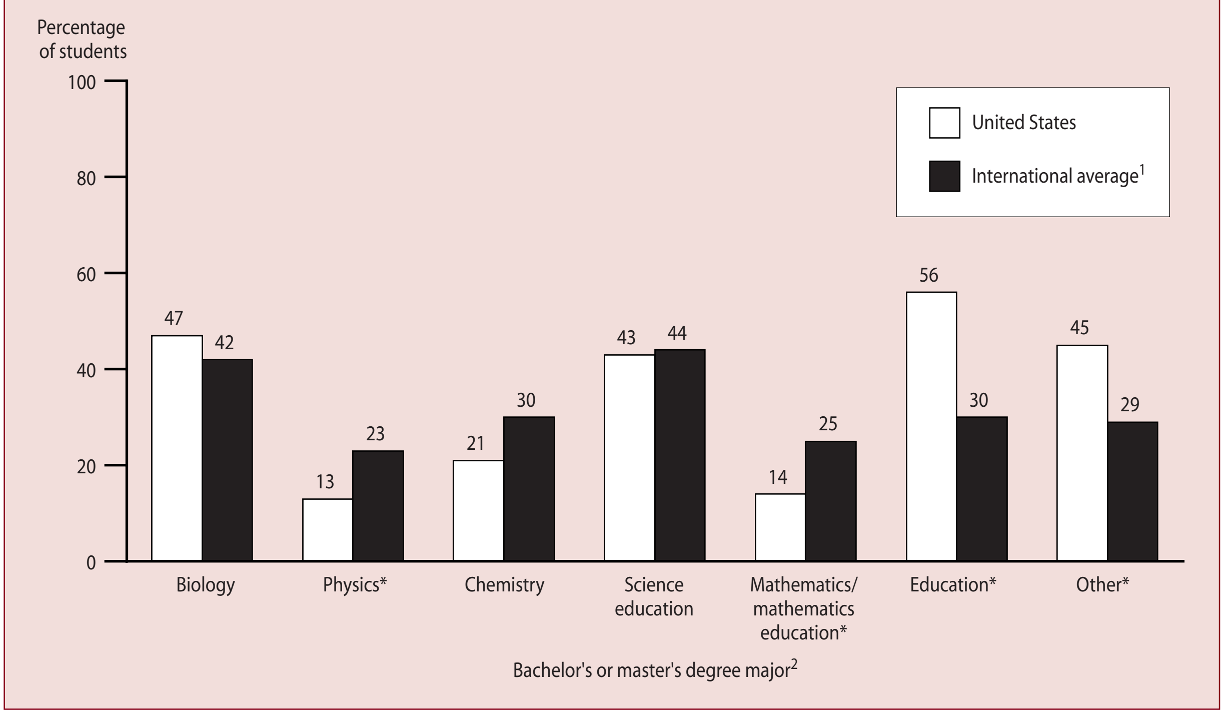
NOTE: Data are for the eighth grade in most nations; see the complete report for details. The international average is the average of the national averages of the nations that reported data.

SOURCE: Previously published as figure 25 on p. 45 of the complete report that this article summarizes *(Pursuing Excellence: Comparisons of International Eighth-Grade Mathematics and Science Achievement From a U.S. Perspective: 1995 and 1999* [NCES 2001–028]).

by teachers who majored in mathematics education (figure 4).

- According to their teachers, U.S. eighth-grade students were less likely than their international peers to be taught science by teachers with a degree in physics, but as likely as their international peers to be taught science by teachers with a major or main area of study in biology, chemistry, or science education in 1999 (figure 5).
- Ninety-four percent of U.S. eighth-graders said that their mathematics teachers showed them how to do mathematics problems almost always or pretty often in 1999, which was higher than the international average of 86 percent.
- Eighty-six percent of U.S. eighth-grade students reported that they worked from worksheets or textbooks on their own almost always or pretty often during mathematics lessons in 1999, which was higher than the international average of 59 percent.
- According to their teachers, 80 percent of U.S. eighth-grade students were asked to explain the reasoning behind an idea in most or every science lesson in 1999, a higher percentage than the international average of 67 percent.
- When students were asked how often they conducted an experiment or practical investigation in their science lessons, 65 percent of U.S. eighth-graders reported that this occurred almost always or pretty often during their science lessons in 1999. This was higher than the international average of 57 percent.
- A higher percentage of U.S. eighth-graders reported using computers almost always or pretty often in

Figure 5.—Eighth-grade science teachers' reports on their main area of study: 1999



*Indicates significant difference between U.S. average and international average in this category.

[1]The item response rate for this question was less than 70 percent in some nations.

[2]Science teachers' reports are of main area or areas of study for bachelor's and/or master's degree. More than one category could be selected.

NOTE: Data are for the eighth grade in most nations; see the complete report for details. The international average is the average of the national averages of the 23 nations that reported teaching a general/integrated science curriculum.

SOURCE: Previously published as figure 26 on p. 46 of the complete report that this article summarizes *(Pursuing Excellence: Comparisons of International Eighth-Grade Mathematics and Science Achievement From a U.S. Perspective: 1995 and 1999* [NCES 2001–028]).

mathematics classes (12 percent) and science classes (21 percent) than their international peers in 1999 (5 and 8 percent, respectively).

- According to their schools, U.S. eighth-grade students in 1999 were more than twice as likely as their international peers to attend schools with networked computer access to the Internet (91 percent compared to 41 percent).
- A higher percentage of U.S. eighth-grade students reported that they could almost always or pretty often begin their mathematics or science homework during class (74 percent and 57 percent, respectively) than their international peers (42 percent and 41 percent, respectively).

Data source: The 1999 Third International Mathematics and Science Study–Repeat (TIMSS–R).

For technical information, see the complete report:

Gonzales, P., Calsyn, C. , Jocelyn, L., Mak, K., Kastberg, D., Arafeh, S., Williams, T., and Tsen, W. (2000). *Pursuing Excellence: Comparisons of International Eighth-Grade Mathematics and Science Achievement From a U.S. Perspective: 1995 and 1999* (NCES 2001–028).

For additional details on survey methodology, see

Martin, M.O., and Gregory, K.D. (Eds.). (2000). *TIMSS 1999 Technical Report.* Chestnut Hill, MA: Boston College.

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For questions about content, contact Patrick Gonzales *(patrick_gonzales @ed.gov).*

To obtain the complete report (NCES 2001–028), call the toll-free ED Pubs number (877–433–7827), visit the NCES Web Site *(http://nces.ed.gov)*, or contact GPO (202–512–1800).

Lessons From TIMSS–R

Invited Commentary: Lessons From the Third International Mathematics and Science Study–Repeat

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This commentary represents the opinions of the authors and does not necessarily reflect the views of the National Center for Education Statistics.

Pursuing Excellence: Comparisons of International Eighth-Grade Mathematics and Science Achievement From a U.S. Perspective: 1995 and 1999 (Gonzales et al. 2000) is a welcome addition to our growing knowledge base about mathematics and science performance and education in the United States. This report presents results from the second installment of the Third International Mathematics and Science Study (TIMSS)—the TIMSS–Repeat (TIMSS–R). TIMSS–R is the most comprehensive international comparative study of its kind, assessing eighth-grade students in 38 countries around the world in mathematics and science and collecting background information on students, schools, teachers, and curricula 4 years after its widely cited predecessor, TIMSS.

Hopeful Lessons From the TIMSS–R Achievement Data

In a nutshell, what TIMSS–R tells us is that U.S. eighth-graders are about average in mathematics and science compared to students in other countries. For example, compared to students in the five other G-8 countries that participated in the study,* U.S. students performed below students in Japan and Canada, while testing on a par with students in England and the Russian Federation (in one or the other subject) and above those in Italy. The U.S. results have not changed significantly since the first TIMSS study took place in 1995. We were in the middle then, too, at the middle grades.

Although perhaps we may have to wait a bit longer to see the effects of education reform reflected as statistically significant improvements in achievement in international studies, there are several hopeful lessons or messages from TIMSS–R that we can take away now. Primary among these lessons is that *children learn what they are taught*. According to the TIMSS–R findings, our students tend to perform better in the content areas that get the most attention in the curriculum. In mathematics, the content areas that are taught with the most frequency to the most students are the three areas in which U.S. students outperformed their international peers: *fractions and number sense; data representation, analysis, and probability;* and *algebra*. On the other hand, our students performed only at the international average in *geometry* and *measurement*, the two content areas that the study shows are emphasized the least. In many ways, this is very good news for our teachers and our education system. Children are, in fact, learning what they are being taught. However, these results also serve as a reminder that curriculum matters a great deal. We need to carefully consider the sequence and coherence of what we teach and to find ways to incorporate the more rigorous topics, currently underrepresented, into our classroom instruction.

Two other hopeful lessons from TIMSS–R relate to student differences and the exploration of whether any one group of students systematically outperforms another group of students. As in TIMSS 4 years ago and the more recent NAEP trend report (Campbell et al. 2000), there was *no achievement gap evident between U.S. boys and girls in mathematics* in the eighth grade. This is a positive finding. However, TIMSS–R did find an achievement gap favoring boys in science in the United States; thus, important questions are raised about why U.S. students consistently perform similarly in mathematics but not in science and about what factors cause the gender gap in science. Another hopeful finding is that, between TIMSS and TIMSS–R, *black students' performance improved significantly in mathematics*. Without making light of this important finding, we also need to remember, however, that it is not enough for any one racial or ethnic group to better itself. Differences *between* the groups must also cease to be significant, reflecting increasing equity in students' opportunities to learn and access to qualified teachers and rigorous curriculum. TIMSS–R shows that the gap between black students and white students has narrowed but still exists.

*The Group of Eight (G-8) countries are recognized as the world's major industrialized countries. All the G-8 countries except France and Germany participated in TIMSS–R.

Instructive Lessons From the TIMSS–R Contextual Data

In addition to important insights into achievement, TIMSS–R also provides information on what occurs in eighth-grade mathematics and science classrooms around the country—information such as how time is spent in the classroom and what qualifications teachers bring to the classroom. We take away several important messages and lessons from these data, as well. Although further analyses are needed about the relationship of these variables to achievement, their importance, even as descriptors, cannot be overstated. They provide important clues about the many, simultaneous factors that can enable quality learning in U.S. schools.

One of the indications from TIMSS–R is that *more time could be spent in U.S. classrooms on instruction*—time that the study suggests is currently being spent on other activities. For instance, TIMSS–R results show that U.S. students spend significantly more time in class on homework than does the average student in the study. Our eighth-graders are much more likely than their international peers to discuss their mathematics homework in class and to begin their homework assignments as part of their regular class work. The point here is not that students are getting too much or too little homework—the relationship between the time students spend doing homework and their achievement is debatable, after all. The point is that, in the United States, we give up more classroom time to activities that are intended for individual practice than nearly every other nation that participated in the study. By moving homework back into the home, we can reclaim precious minutes for active instruction.

Another lesson for instructional practice may be in the finding that the practices of *demonstrating how to do mathematics problems* and of *setting students to work on worksheets and textbook exercises* are much more common in the United States than in other countries. In other countries, students are more likely to work on project-oriented work of the type recommended by the National Council of Teachers of Mathematics in their well-known 1991 standards for mathematics teaching (National Council of Teachers of Mathematics 1991). One of the concerns among people working in education today is that teaching styles in the United States still tend to focus on demonstration of ideas and individual work rather than on facilitation of learning and collaboration among students. These data suggest that we still have progress to make in this area. We expect that the results from the TIMSS–R Videotape Classroom Study of teaching practices in the United States and six other countries will shed some additional light on this issue.

TIMSS–R also provides a status report on the *need for a competent, caring, and content-knowledgeable teacher in every classroom*. While we have many competent and caring teachers in the United States, TIMSS–R data show that we are comparatively lacking in content-knowledgeable teachers. U.S. students are less likely than their peers to have teachers who have degrees in the subject areas they teach. For instance, the TIMSS–R results show that almost three-quarters of students in other countries have mathematics teachers with a degree in mathematics, compared to less than half of students in the United States. Instead, U.S. students are much more likely to have mathematics teachers with a general education degree. Although the picture is slightly better in science, U.S. students still are more likely than their international peers to be taught by teachers with a general education degree and far less likely to have a teacher with a degree in physics. While the education community focuses on establishing and supporting high academic standards for all students, it must also encourage and provide the necessary supports for teachers to achieve those same high standards. Students deserve teachers who have a deep and conceptual understanding of specific content areas, which they are, in turn, able to share with students in the classes they teach.

Finally, at the same time that TIMSS–R suggests (or, rather, reminds us of) the importance of qualified teachers, it also shows us that *U.S. teachers have few opportunities for professional interaction*. According to the results, U.S. eighth-graders have mathematics and science teachers who spend, on average, only one class period per year observing another teacher's practice and only one or two periods being observed. Reform literature has long emphasized that teachers need regular opportunities to work with and learn from one another in meaningful ways. One hopeful finding from TIMSS–R is that U.S. science teachers with fewer than 5 years of teaching experience reported more opportunities, approximately three per year, to observe other teachers. This is a step in the right direction.

Our Neighbors to the North

One final set of findings from TIMSS–R merits a mention in our commentary and, perhaps, further exploration in secondary analyses. Although U.S. students did not show significant improvement in their mathematics or science performance between TIMSS and TIMSS–R, Canadian students did—in both subjects. Since the Canadian education community faces some of the same issues that we do—working within a large, federal system that supports local control and with increasingly diverse and needy student populations—there may be lessons to learn from our neighbors to the north about what factors may have accounted for their demonstrated increases. Although there clearly is no "silver bullet" or magic formula that can be picked up and copied, even from a country with which we have some things in common, it would be useful to explore the Canadian situation in more depth.

Looking Toward the Future

As the new administration continues to take shape, education clearly has emerged as a key issue, one that saw the first attention and action from our new President. In addition to the President's "Leave No Child Behind" plan, two other legislative proposals for the reauthorization and funding of the Elementary and Secondary Education Act have been put forth. Collectively, these plans, with varying levels of emphasis, address the need for early literacy, accountability in schools, and strategies for helping schools at risk of failing their students. At a time when our lawmakers are focused on selecting and on allocating funds for such programs and strategies, TIMSS–R reminds us that curriculum, instruction, and teacher preparation are crucial pieces of this picture—inseparable from and as worthy of immediate attention as any other aspect of education reform. Without getting more content-trained teachers into the classroom; without providing teachers with opportunities to interact with their colleagues to improve their pedagogical skills and perceptions of themselves as a part of a professional community; without examining what and why we teach—we will not be able to reduce existing educational disparities and meet the needs of our students who, when given the opportunity, can learn as well as any other students.

In the end, TIMSS–R is a means to an end. If we choose to use this study as the resource that it is, we can begin to make the kinds of changes necessary for our children to reach standards of achievement as high as any in the world. Going back to that first lesson from TIMSS–R and following our children's example, we, the American education community, should learn what we have been taught.

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Invited Commentary: TIMSS–R: Innovation in International Information for American Educators

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This commentary represents the opinions of the author and does not necessarily reflect the views of the National Center for Education Statistics.

The Internationalization of Information About American Education

The last 2 decades have witnessed the wholesale internationalization of the information used to make American education policy. Discussions and debates about educational performance in the United States among politicians, policymakers, and the general public routinely make reference to information from international comparisons of American education with that of other nations. Numerous important and sweeping proposals for the reform of American K–12 education over the past 2 decades have been aimed at national education problems brought to light through widely publicized cross-national comparisons of education organization and student performance. These international comparisons have not only shaped the national agenda, but are increasingly part of the dialogue about education at the state and local levels.

Over the last 20 years, an accumulating series of international studies have redefined in scope, sophistication, and data availability the influence of international information on American education policymaking. This process started in the early 1980s, when the Second International Mathematics Study (SIMS), which was followed by the Second International Science Study (SISS), served as a point of departure for the influential 1983 report *A Nation at Risk*. This report, in turn, set an education reform agenda for the following decades. During this period, a large international study of student reading performance, a study of levels of adult literacy across nations, an international study of civic education (with results just released), systemic comparisons among Organisation for Economic Co-operation and Development (OECD) nations on a wide array of education statistics, and a number of other international studies and accompanying data sets have provided a steady stream of international information with which to compare numerous aspects of American educational performance.

It is fitting that this period of internationalization has culminated in two of the largest and most technically sophisticated international studies ever attempted. The Third International Mathematics and Science Study (TIMSS) of 1995 and the recently released Third International Mathematics and Science Study–Repeat (TIMSS–R) of 1999 have set a very high standard for the generation of international data on education.

The Strengths of TIMSS and TIMSS–R Data

TIMSS–R and its predecessor, TIMSS, are remarkable for a number of reasons related to the internationalization of American education policy and data. First, the process of internationalization has led to greater direct control by national statistical agencies in international studies, with important consequences for the quality of the data and their use in education policymaking.

The main responsibility for the design, quality control of data, and dissemination plans for TIMSS and TIMSS–R belongs to ministry-level statistical agencies—in the United States, the U.S. Department of Education's National Center for Education Statistics (NCES) and its institutional partner for these studies, the National Science Foundation (NSF). These government agencies, working within the international collaborative network of the International Association for the Evaluation of Educational Achievement (IEA), have raised world standards for quality in international studies. Thus, TIMSS and TIMSS–R are more sophisticated than previous IEA studies in terms of their national samples, assessments of achievement, and supplementary data. These studies have elevated to new levels a number of earlier innovations developed in IEA studies—for example, the IEA "Opportunity to Learn" measures of the extent to which curricula are actually implemented in the classroom. By further developing these earlier IEA innovations in the measurement of implemented curricula, TIMSS and TIMSS–R have not only collected higher quality data, but have also made sophisticated measurement of curricula standard for future studies of achievement.

Second, increased national and international funding and institutional support for both TIMSS and TIMSS–R translate into greater incorporation of innovative data collection strategies than ever before. For example, the collection of video data from classrooms started with just 3 nations in TIMSS, but expanded to 7 out of the 38 nations in TIMSS–R. Adding these innovative sources of data collection to more tried-and-true survey methods broadens the informational scope of these studies and provides qualitatively different information. Moreover, these innovations offer a testing ground for the incorporation of new approaches to data collection into future domestic studies by NCES. Furthermore, the overall conception of TIMSS–R is innovative, as it is the first international study to rigorously assess change in mathematics and science performance across national populations of students over 4 years.

Third, intensive internationalization of education information has sparked interest among various American state and local policymakers in comparing subnational units with other nations. The past 2 decades have seen a rising demand for direct comparisons of individual states and local school districts with other nations on educational standards and performance levels of students. TIMSS–R is by far the most ambitious and innovative international study in this respect, as it includes a Benchmarking Project of 27 states, districts, and consortia of districts across the United States. By undertaking the exact same assessment tests in representative samples, states and districts can compare themselves on an international scale. This offers a number of exciting possibilities for international analysis of policy questions within and across U.S. states and districts.

Fourth, although less prominently reported than the results on national levels of mathematics and science achievement, TIMSS and TIMMS–R offer an abundance of other information about schooling, classroom processes, and students that will contribute to a rich understanding of education across nations. These data allow for extensive secondary analyses of TIMSS–R that will greatly add to the overall impact of this study. For example, the use of the TIMSS–R achievement assessments will be enhanced by

- further analyzing the role of national attributes of the mathematics and science implemented curricula in explaining cross-national achievement;
- exploring the changing dynamics across nations of the effects of students' family resources and school resources in determining mathematics and science achievement levels;
- tracing the changing role of gender across nations and its relationship to achievement; and
- examining the influence of national differences in education governance, such as decentralization, on between-classroom quality in pedagogy and achievement.

Lastly, both TIMSS and TIMSS–R include a larger number of nations and differing types of education systems than did past international studies. TIMSS includes 40 nations (Belgium was reported as two separate education systems, for a total of 41 national units). TIMSS–R includes 38 nations, including 26 that participated in the TIMSS eighth-grade study. Among the nations in TIMSS–R, most regions of the world are represented, as are most types of education governance structures. Unfortunately, the poorest nations are missing, as is China, with the world's largest single education system. But in general this data set provides U.S. educators with a wide array of national contexts with which to address many comparative issues.

Data provided by TIMSS–R represent a real treasure for the comparative assessment of education—in terms of general descriptive information on achievement and related facts that have already been reported, as well as additional information from more in-depth analyses that will appear in the near future. Several decades ago, notions about U.S. schooling relative to that of other nations were based mostly on speculation. Recent international studies such as TIMSS–R change all of that; speculation has given way to actual empirical fact. Like TIMSS, TIMSS–R increases the opportunities for NCES and NSF to help the American public and educators consider American education from an international perspective.

The Usefulness of TIMSS–R Data for Policy Discussions

There are a number of ways that the data from TIMSS–R can enrich our understanding of U.S. mathematics and science education from an international perspective. Unlike indicator data (such as those in OECD's *Education at a Glance* series), which provide sets of national indicators on various aspects of education, the cross-sectional data from TIMSS–R are derived from national samples of students, their teachers, and their schools. The analytic possibilities of having micro-data across nations are near limitless. Further, like the National Assessment of Educational Progress (NAEP), TIMSS–R includes state-of-the-art assessment of achievement (there is a NAEP/TIMSS–R Linking Study planned). But TIMSS–R offers more than NAEP by making it possible to analyze the achievement of students relative to pedagogical practices in their classrooms, the implemented curricula they receive, and the qualities of their teachers. All this, of course, is doable from a cross-national perspective, making TIMSS–R a very powerful analytic tool for education policy discussions in the United States.

An example of this analytic power is the opportunity that the TIMSS–R data provide to take initial findings and build on them to conduct in-depth secondary analyses on complex policy issues. For instance, one of the early descriptive findings from TIMSS–R shows that only 4 out of 10 U.S. students have mathematics teachers who were trained in mathematics as their main field of study in college, while in the total international sample the proportion is 7 out of 10. This so-called "out-of-field" teaching has been identified as a potential problem for the quality of instruction in the United States, and the TIMSS–R data will allow further analyses on how much of the achievement gap between nations can be accounted for by cross-national differences in the training of teachers. These data will also enable more detailed analysis determining to what degree certain characteristics of national systems, such as national standards for the mathematics curriculum, can diminish any detrimental effects of large proportions of out-of-field teaching in other nations. This is just one example of many possible ways that analysis of the extensive data in TIMSS–R will help improve mathematics and science achievement in the United States.

Any discussion of the analytic potential of the TIMSS–R data for policy analysis must address the originating purpose of the study: to examine national achievement change over the 4-year period following the TIMSS assessment in 1995. And there are some interesting results on educational change for American educators to consider. By and large, the results indicate that there is little change in the level of American students' achievement in mathematics and science from TIMSS to TIMSS–R. And, for the most part, this is true among other participating nations in the study. It is useful to speculate on the potential reasons behind a lack of change over this period.

Obviously, 4 years is a relatively short time, and probably most prudent observers of education systems would not expect much national change, even though significant reforms in mathematics and science education are taking hold. However, emerging NAEP results show evidence of long-term (over 10 years or more) increases in mathematics achievement among U.S. students. The TIMSS–R findings illustrate how difficult it is to change the relative performance of nations in these two academic subjects. Indeed, over a 20-year period, the general relative international standing of American eighth-graders in mathematics and science—as assessed by SIMS and SISS in the early 1980s as well as by TIMSS in 1995 and TIMSS–R in 1999—has not changed. The news for education reformers both here and in other nations is that whatever the underlying factors behind a nation's relative performance may be, they are difficult to change in ways that will improve overall national levels of achievement over a short period of time.

Lastly, another way to think about the stability of national achievement levels over time is to consider the fact that there has been substantial convergence in educational practice across nations in recent decades. Both historians and sociologists of worldwide macro-trends in schooling report evidence of a marked trend toward convergence across national systems on similar ways of organizing and managing schooling. This is not to say that national differences do not exist—they clearly have in the past and still do today—but there is evidence of substantial borrowing and modeling of general educational processes from one nation to another. Somewhat ironically, large and widely publicized international studies like TIMSS–R may actually increase this trend, as the data from such studies provide clearer understandings across nations of what each nation does in its classrooms and schools.

The TIMSS–R study is an impressive achievement in international cooperation that will enhance the level of information about schooling in the United States and elsewhere. Like other recent complex, rich international data generated by NCES and its institutional partners, TIMSS–R will continue to provide informational benefits to the American public for years to come.

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Vocational Coursetaking

Changes in High School Vocational Coursetaking in a Larger Perspective

David Hurst and Lisa Hudson

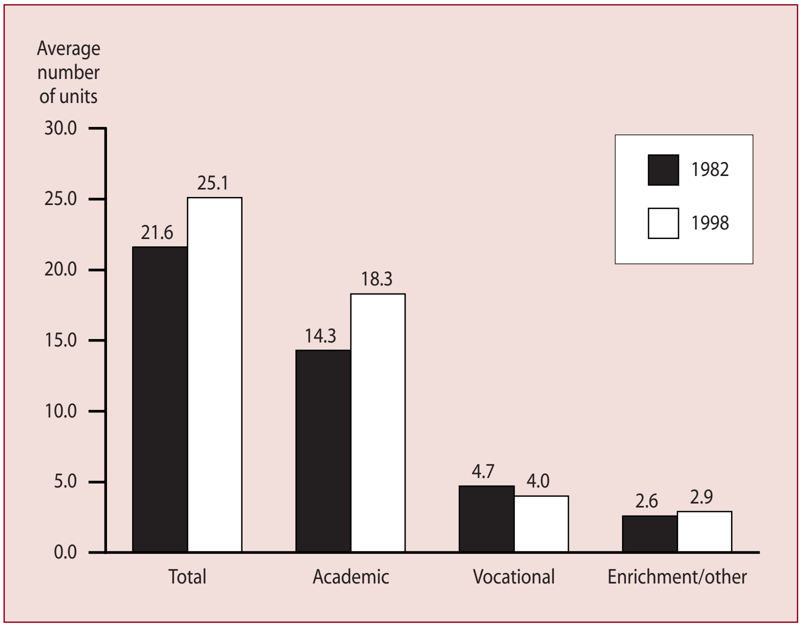
This article was originally published as a Stats in Brief. The data are from two High School Transcript Studies—one conducted in conjunction with the High School and Beyond (HS&B) Longitudinal Study—as well as from the National Industry-Occupational Employment Matrix of the U.S. Bureau of Labor Statistics (BLS).

From the 1980s to the mid-1990s, high school vocational coursetaking declined as academic coursetaking increased (Levesque et al. 2000). Increases in high school graduation requirements (Medrich et al. 1992) and long-term trends for higher skill levels in the labor market (Rosenthal 1995) are two potential factors related to the rise in academic coursetaking. The decline in vocational coursetaking is not as easy to evaluate. First, vocational education includes course offerings ranging from computer programming to welding; the overall decline in vocational coursetaking may not reflect trends within specific vocational program areas. Second, changes in coursetaking occurred during a period in which the labor market underwent pronounced changes that may have affected students' decisions to complete specific vocational courses. This Stats in Brief takes a closer look at vocational coursetaking trends, examining them in light of labor market changes.

Changes in Vocational Coursetaking

While increased academic requirements may have resulted in some students having less time to take vocational courses, students' predominant method for accommodating additional academic credits seems to have been to increase the total number of credits they earn rather than sacrifice

Figure 1.—Average number of Carnegie units accumulated by public high school graduates, by type of coursework: 1982 and 1998



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

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School and Beyond Longitudinal Study of 1980 Sophomores (HS&B-So:1980/1982), "High School Transcript Study"; and 1998 High School Transcript Study (HSTS).

vocational courses. In 1998, students earned an average of 18.3 academic Carnegie units,[1] 4.0 more academic credits than students earned on average in 1982 (figure 1). At the same time, students earned 3.5 more *total* credits in 1998 (25.1 credits) than in 1982 (21.6 credits). In contrast, students earned 0.7 fewer credits in the vocational curriculum in 1998 (4.0 credits) than in 1982 (4.7 credits).

Another way to examine changes in vocational coursetaking is to compare the percentage of high school graduates who follow various curricular paths. This analysis shows that the primary shift in coursetaking between 1982 and 1998 was from a general education curriculum to a college preparatory curriculum, with a relatively small decline in the percentage of students concentrating in vocational education compared to changes in the other areas.[2] Between 1982 and 1998, the percentage of students who completed a vocational concentration declined from 33.7 to 25.0, or by 8.7 percentage points (figure 2). Over the same time period, the percentage of students completing a college preparatory curriculum increased from 8.7 to 38.9, or by 30.2 percentage points, and the percentage completing a general education curriculum declined from 58.2 to 42.6, a decline of almost 16 percentage points (not shown in figures).

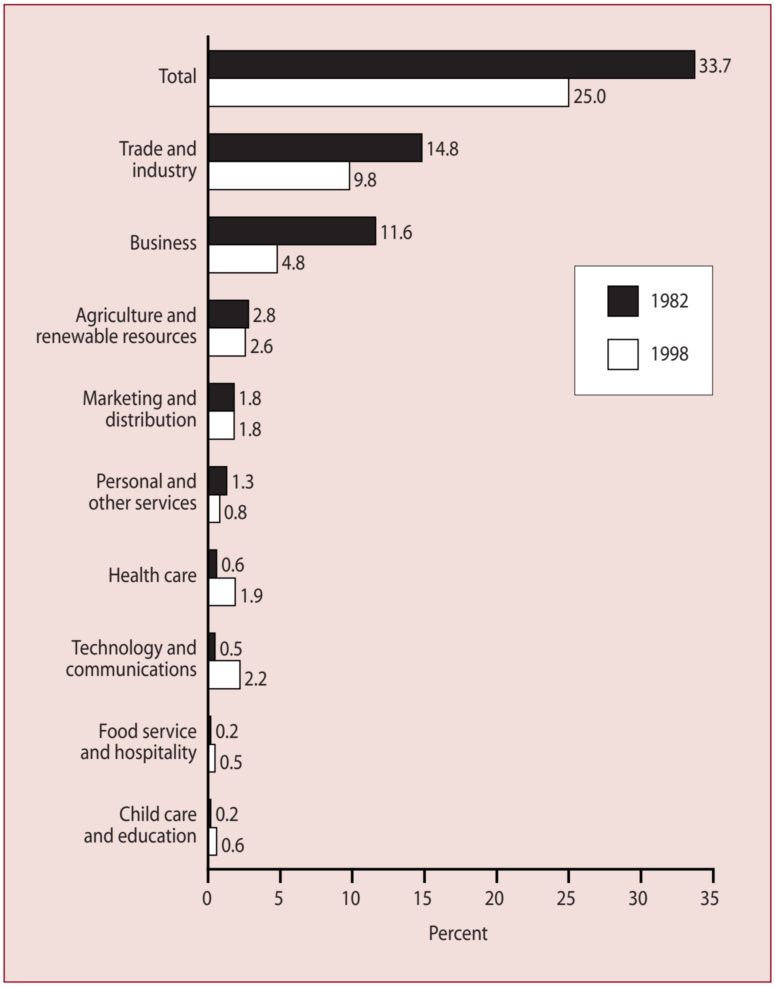
So while a smaller percentage of students completed a vocational concentration in 1998 than in 1982, the decline is relatively small given other changes in coursetaking. Moreover, most vocational program areas did *not* experience a decline from 1982 to 1998.[3] The overall decline in the percentage of students completing a vocational concentration was due primarily to declines in the two largest vocational areas—*trade and industry* and *business* (figure 2). While the percentage of students concentrating in *personal and other services* was also smaller in 1998 than in 1982, relatively few students concentrated in this area in either year. In contrast, the percentages of students concentrating in *health care*, *technology and communications*, *food service and hospitality*, and *child care and education* were *higher* in

[1]In secondary education, 1 Carnegie unit is awarded for the completion of a course that meets one period per day for 1 school year, or the equivalent. All student data included in this Stats in Brief refer to public high school graduates.

[2]A concentration in vocational education is defined as the completion of 3 or more credits in a single vocational program area such as *business*. A college preparatory curriculum includes the completion of at least 4 credits in English; 3 credits in mathematics at the algebra 1 level or higher; 2 credits in biology, chemistry, and/or physics; 2 credits in social studies with at least 1 credit in U.S. or world history; and 2 credits in a single foreign language. A general education curriculum meets neither of these criteria. Students meeting the criteria for both a vocational concentration and college preparatory curriculum are counted in both groups; therefore, the percentages sum to more than 100.

[3]This analysis does not examine the *protective services* vocational program area because less than 0.1 percent of students concentrated in this area in 1982 and 1998.

Figure 2.—Percentage of public high school graduates concentrating (accumulating 3 or more credits) in various vocational programs: 1982 and 1998



NOTE: Students may have concentrated in more than one program.

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School and Beyond Longitudinal Study of 1980 Sophomores (HS&B-So:1980/1982), "High School Transcript Study"; and 1998 High School Transcript Study (HSTS).

1998 than in 1982, although the percentages of students concentrating in these areas remained comparatively small. The percentages of students concentrating in *agriculture and renewable resources* and *marketing and distribution* were about the same in 1998 as they were in 1982.

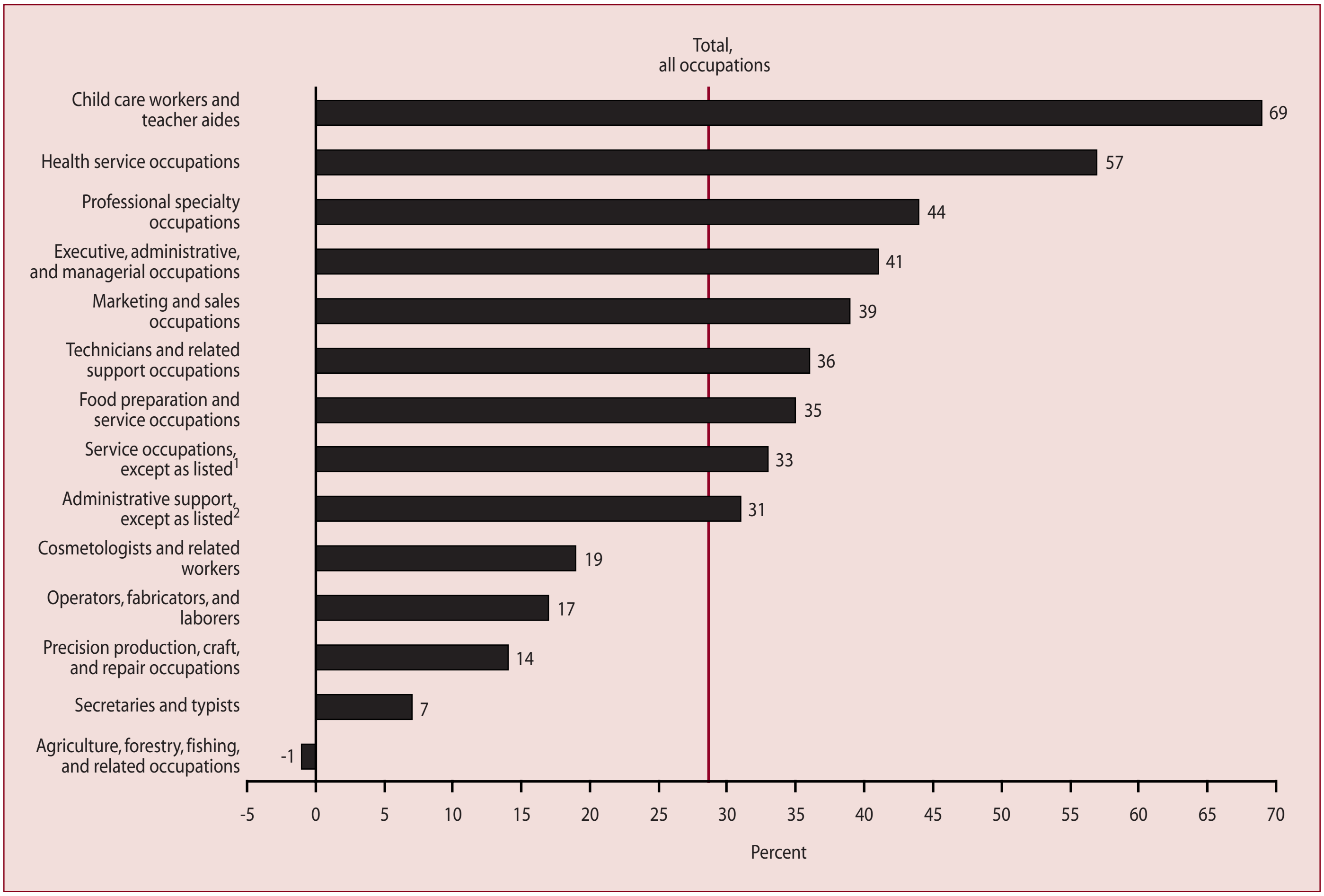
Vocational Coursetaking and Occupational Trends

One factor that may influence a student's decision to concentrate in a specific vocational area is labor market demand; students may be more likely to concentrate in vocational areas that prepare them for occupations with increasing job opportunities. Although the labor market influences on vocational enrollment are likely to be complex (e.g., the accuracy of students' perceptions of labor market demand is unknown), it is nevertheless useful to examine changes in vocational education in light of changes in the labor market.

Figure 3 presents the percentage change in the number of jobs in specific occupations between 1983 and 1996; the vertical line represents the average percentage change for all occupations during this time period.[4] At least some of the

[4]Note that figure 3 presents the percentage change rather than numerical change. Some of the occupational groups with high rates of growth account for a relatively small share of all jobs. The assumption made in this Stats in Brief is that changes in course enrollments are most likely to be influenced by occupational growth rates, even if the total number of jobs in those occupations is small compared to other occupations.

Figure 3.—Percentage change from 1983 to 1996 in number of jobs, by occupational grouping



[1]Excludes health service occupations; homemaker-home health aides; child care workers; food preparation and service occupations; and cosmetologists and related workers.

[2]Excludes secretaries, typists, and teacher aides.

NOTE: The Bureau of Labor Statistics (BLS) provided the occupational employment estimates, although the composition of several BLS categories was modified for this analysis to better match the classification of vocational education courses used by the National Center for Education Statistics (NCES). Standard errors for the BLS categories (not listed here) were estimated based on the relative standard errors from the BLS National Industry-Occupational Employment Matrix, the primary source of data for these occupational employment estimates.

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, National Industry-Occupational Employment Matrix 1983–96 Time Series.

change in student concentration in specific vocational areas appears to coincide with these changes in occupational employment. As noted above, *child care and education*, *health care*, *food service and hospitality*, and *technology and communications* were vocational areas in which the percentage of students concentrating was higher in 1998 than in 1982. Consistent with these changes, the occupational groupings of *child care workers and teacher aides, health service occupations, food preparation and service occupations*, and *technicians and related support occupations* experienced higher-than-average growth rates between 1983 and 1996.

Further, the two vocational areas that largely account for the overall decline in the percentage of students concentrating in vocational education—*trade and industry* and *business*—roughly correspond to *precision production, craft, and repair occupations* and *secretaries and typists*,[5] both of which experienced below-average growth rates between 1983 and 1996.[6]

[5]The occupations of *secretaries and typists* were pulled out of *administrative support* occupations to highlight the main occupations for which *business* vocational education programs prepare students. The more general category of *administrative support* (excluding *secretaries and typists*), which includes a number of clerical occupations, experienced about average growth between 1983 and 1996.

[6]The other vocational area in which fewer students concentrated in 1998 than in 1982, *personal and other services*, roughly corresponds to *cosmetologists and related workers,* which also appears to have experienced below-average growth since 1983. However, there is not enough statistical evidence to determine if the growth rate of *cosmetologists and related workers* is significantly different from the total growth rate of all occupations.

In the two remaining vocational areas, the link to the labor market is not as apparent. The percentage of students concentrating in *marketing and distribution* was statistically no different in 1998 than in 1982, while *marketing and sales occupations* grew at a higher-than-average rate between 1983 and 1996. About the same percentage of students concentrated in *agriculture and renewable resources* in 1998 as in 1982, although *agriculture, forestry, fishing, and related occupations* experienced a decline relative to other occupations between 1983 and 1996. This broad occupational group, however, consists of farmers and other farm occupations, which made up about half of *agriculture, forestry, fishing, and related occupations* in 1996, as well as a variety of other occupations, such as veterinary assistants and gardening workers. While farmers and other farm occupations have declined over the past 2 decades, other occupations in this group have generally experienced average growth or better (not shown in figures). Thus, to the degree that courses in *agriculture and renewable resources* are relevant to occupations related to agriculture but not necessarily farming, enrollment trends may be consistent with occupational trends, remaining at roughly stable levels.

Conclusion

The decline in vocational coursetaking from 1982 to 1998 is relatively small compared to increases in academic coursetaking. The potential tradeoff between academic and vocational coursetaking seems to have been mitigated by students taking more courses overall and fewer courses in the "general" curriculum. Further, the decline in vocational concentration was due primarily to declines in the *trade and industry* and *business* program areas. These vocational areas roughly correspond to occupations that have experienced below-average growth rates since the early 1980s. In addition, the four vocational program areas in which a larger proportion of students concentrated in 1998 than in 1982 prepare students for occupations that have experienced above-average growth rates. These findings suggest that changes in vocational coursetaking may at least in part reflect responses to labor market trends.

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Data sources: The NCES High School and Beyond Longitudinal Study of 1980 Sophomores (HS&B-So:1980/1982), "High School Transcript Study"; 1998 High School Transcript Study (HSTS); and U.S. Department of Labor, Bureau of Labor Statistics, National Industry-Occupational Employment Matrix 1983–96 Time Series.

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Key Statistics

Key Statistics on Public Elementary and Secondary Schools and Agencies: School Year 1997–98

Lee M. Hoffman

This article is based on a section of the report of the same name (the section "Characteristics of Public Schools and Agencies"). The universe data are from the NCES Common Core of Data (CCD).

Introduction

The tables in this report provide basic information about public elementary and secondary schools and education agencies during the 1997–98 and 1996–97 school years. The data describe the numbers and types of these institutions, their students, and their staff. The purpose is to make this information easily accessible through a number of summary tables presented in print and on the Internet.

Data sources for this report

The statistics were collected through the Common Core of Data (CCD) survey system. The CCD reports data provided voluntarily each year by the education agencies of the 50 states, the District of Columbia, the Department of Defense Dependents Schools (overseas), and five outlying areas. The system includes the "Public Elementary/Secondary School Universe Survey" and the "Local Education Agency Universe Survey," which are the major focus of this report. Data from the "State Nonfiscal Survey of Public Elementary/Secondary Education" are also used in some analyses.

General focus of this report

The CCD collects information about the full range of local education agencies, including those that typically offer some services other than the direct instruction of students. The same is true for schools; the CCD includes regular and specialized schools, and those with and without student membership. This discussion is limited to the 50 states and the District of Columbia (collectively referred to as "the states"). The tables in the full report include data for the Department of Defense Dependents Schools (overseas), American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, Puerto Rico, and the U.S. Virgin Islands; however, these data are excluded from the U.S. totals. In general, the following groups are the focus of the tables and discussion:

- *regular school districts:* locally administered education agencies that are directly responsible for instruction (including components of supervisory unions). This excludes supervisory and special service education agencies, and those operated by the state or federal government.
- *regular schools:* those primarily offering a regular academic curriculum, although specialized curricula may be included as well. This excludes schools whose primary offering is vocational, special, or alternative education.
- *with membership:* schools and districts that report at least one student in membership. Membership is the number of students enrolled on October 1 or the school day closest to that date.

Students attending class in more than one school must be reported with a single school on the CCD; the same is true for education agencies. Thus, some schools that do offer instruction are reported with no membership. This is most likely to occur with vocational, special, or alternative schools in which students presumably take classes while being reported under a regular "home" school. Figure A illustrates this.

General Trends Since 1980–81

Between the 1980–81 and 1997–98 school years, a number of school districts were consolidated, and the number of public school students grew by almost 13 percent (table A). This growth in enrollment was accompanied by a smaller increase in the number of schools (4 percent), with the result that schools and districts served, on average, more students in 1997–98 than in 1980–81. The pupil/teacher ratio, however, dropped by almost two students per teacher.

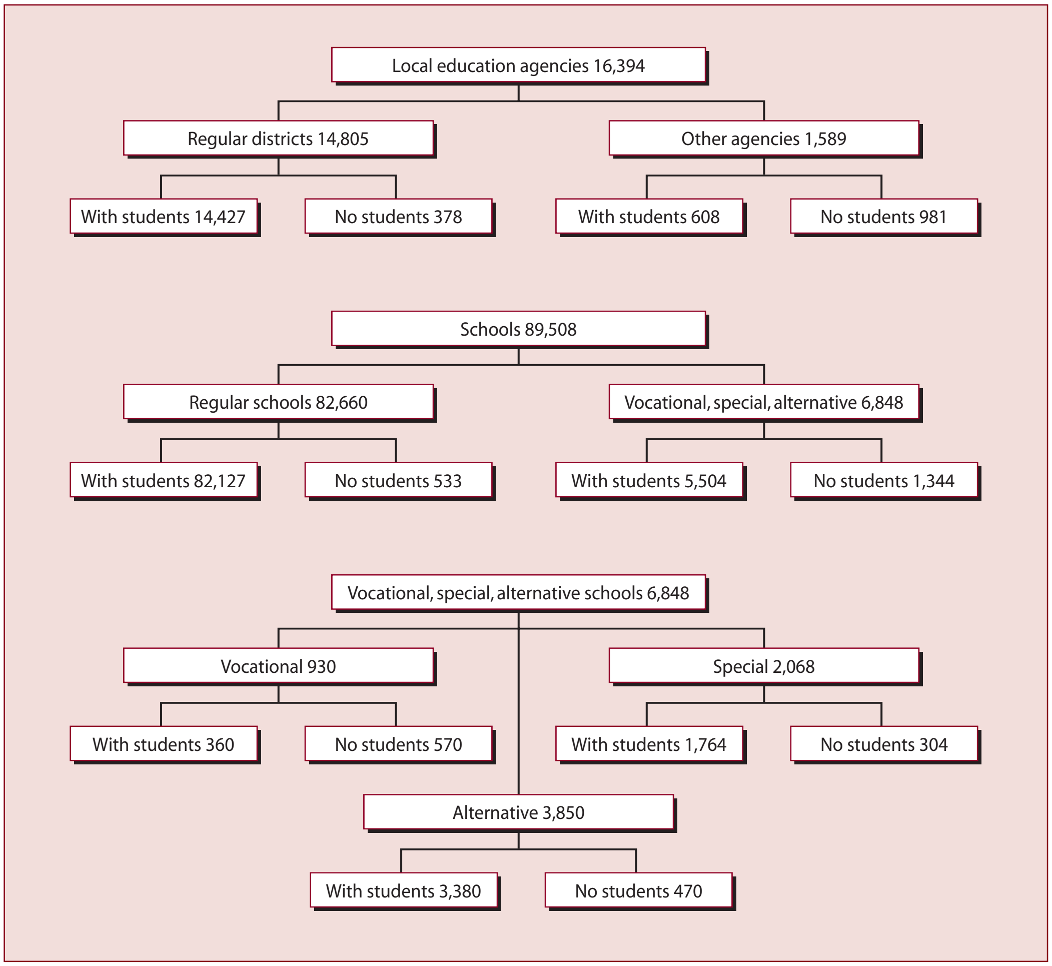
Types and Numbers of Agencies and Schools in 1997–98

There is no standard organizational structure for public elementary/secondary education from state to state. Most students do attend regular elementary or secondary schools within traditional school districts. However, state education systems vary in how they deliver and manage instruction and provide the other specialized services that support instruction.

Education agencies

Across the United States there were 16,394 local education agencies in 1997–98 (figure A). Both the District of Columbia

Figure A.—Types and numbers of local education agencies and schools: School year 1997–98



SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "Public Elementary/Secondary School Universe Survey" and "Local Education Agency Universe Survey," 1997–98.

Table A.—Numbers of education agencies, schools, and students: 1980–81 and 1997–98

	1980–81	1997–98	17-year change
School districts	15,912	14,805	-7.0 percent
Average number of students per district	2,569	3,116	+21.3 percent
Schools	85,987	89,508	+4.1 percent
Average number of students per school	475	515	+8.4 percent
Pupil/teacher ratio	18.7	16.8	-1.9 pupils
Total students	40,877,481	46,127,194	+12.8 percent

NOTE: All districts in 1980–81 are compared with regular districts in 1997–98 to compensate for expansion of CCD coverage after 1980–81. "Average student" ratios include districts and schools with and without membership, and do not agree with average school and district sizes reported elsewhere.

SOURCE: U.S. Department of Education, National Center for Education Statistics: (1996) *Digest of Education Statistics: 1996* (NCES 96–133) and (1997) *Digest of Education Statistics: 1997* (NCES 98–015); Common Core of Data (CCD), "Public Elementary/Secondary School Universe Survey" and "Local Education Agency Universe Survey," 1997–98.

and Hawaii consist of a single, regular school district; there were 14,805 regular school districts nationwide in 1997–98. A small proportion of these—378—did not report any students enrolled for that year. About 1 in 10 education agencies, or a total of 1,589, were specialized organizations. These included regional education service agencies, which typically provide testing, program management, specialized student services, research and evaluation, or similar services other than direct regular instruction, and supervisory unions, through which a single district provides administrative services for several smaller ones. Agencies operated directly by the state (for example, residential schools for the deaf or blind) and by federal agencies were also in this category.

Schools

There were 89,508 public elementary/secondary schools in 1997–98. Of these, 82,660 were regular schools while 6,848 were primarily directed toward vocational, special, or alternative education. A total of 1,877 schools reported having no students in membership.

As previously noted, the CCD directions state that when students attend multiple schools they be reported for only one (this avoids duplicating student counts). Typically, the enrollment is attributed to the student's regular school, with the result that many active special, vocational, and alternative schools are shown as having no students. For example, figure A shows that almost two-thirds of the vocational schools were reported with no students.

Table B, however, indicates that the numbers of special, vocational, and alternative schools actually increased somewhat between 1993–94 (the first year of the *Key Statistics* report series) and 1997–98. Growth was greatest among the alternative schools, which increased by almost 48 percent in this time. However, the numbers of vocational and regular schools grew by about 3 percent and the number of special education schools increased by almost 7 percent.

Content of the Tables

The complete report includes tables from two school years, 1997–98 and 1996–97. The more current data are presented first. Tables 1 through 14 and 30 through 43 include information about the public schools and education agencies. They cover numbers, size (in terms of pupils), urbanicity (ranging from large city to rural), and grades served.

Tables 15 through 24 and 44 through 53 provide information about student characteristics and outcomes. This includes the distribution of students by grade level, the distribution by various racial/ethnic groups, the numbers eligible for free lunch, and the numbers with special education Individualized Education Programs (IEPs). There is also information about the numbers of students completing high school. The student data are broken out by school or district urbanicity or by school instructional level, where appropriate.

The last tables, 25 through 29 and 54 through 58, report the numbers of teachers and other school staff. These tables focus on pupil/teacher ratios and ratios of teachers to administrators and teachers to support staff.

Data sources: The following components of the NCES Common Core of Data (CCD): "Public Elementary/Secondary School Universe Survey," "Local Education Agency Universe Survey," and "State Nonfiscal Survey of Public Elementary/Secondary Education," 1993–94, 1996–97, and 1997–98.

For technical information, see the complete report:

Hoffman, L.M. (2001). *Key Statistics on Public Elementary and Secondary Schools and Agencies: School Year 1997–98* (NCES 2001–304).

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Table B.—Number of regular, special education, vocational, and alternative schools: 1993–94 and 1997–98

School type	1993–94	1997–98	4-year change
All schools	85,393	89,508	+4.8 percent
Regular	79,948	82,660	+3.4 percent
Special education	1,938	2,068	+6.7 percent
Vocational	901	930	+3.2 percent
Alternative	2,606	3,850	+47.7 percent

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "Public Elementary/Secondary School Universe Survey" and "Local Education Agency Universe Survey," 1993–94 and 1997–98.

Early Estimates

Early Estimates of Public Elementary and Secondary Education Statistics: School Year 2000–2001

Lena McDowell

This article was originally published as an Early Estimates report. The universe data are from the NCES Common Core of Data (CCD). Technical notes and definitions from the original report have been omitted.

The Early Estimates System

The early estimates system is designed to allow the National Center for Education Statistics (NCES) to publish selected key statistics during the school year in which they are reported. The source of universe statistical information about public elementary and secondary education is the Common Core of Data (CCD)—data collected annually by NCES from state education agencies. For most CCD surveys, these data are reported to NCES from March 2001 through September 2001, after which they undergo NCES and state editing and are adjusted for missing data. (High school graduate and fiscal data are reported a year later than student and teacher data.) In contrast, the estimates included in this report were reported in December of 2000 for the 2000–01 school year.

In early October 2000, survey forms were sent to each state education agency. States were asked to complete the form and return it by mail or facsimile (fax). States that had not responded by mid-November were contacted by telephone. All data were checked for reasonableness against prior years' reports, and follow-up calls were made to resolve any questions. When states did not supply a data item, NCES imputed a value. These values are footnoted in the tables. If one or more states required an imputed number, then the national total for that item is marked as imputed. Any state early estimate that indicated a change of greater than 10 percentage points more or less than the national growth rate was replaced with an adjusted early estimate. That is, the estimate was calculated using the same method as that employed to impute missing data.

Forty-five states, the District of Columbia, and two outlying areas participated in the 2000–01 "Early Estimates of Public Elementary/Secondary Education Survey." The estimates reported here were provided by state education agencies and represent the best information on public elementary and secondary schools available to states at this stage of the school year. They are, however, subject to revision. All estimates for the five nonreporting states and the three outlying areas were calculated by NCES. (Arizona, California, New Jersey, Virginia, Washington, America Samoa, Guam, and Puerto Rico did not return the completed survey form.) NCES also estimated missing data items for a number of reporting states.

The tables in this publication include three kinds of data. "Reported" data are previously published figures. "Preliminary" data have not been published previously by NCES; for these, data collection is complete, and processing and data adjustments are through all but the final stage of review. "Estimated" data are those for the current (2000–01) school year.

Estimated data for the current school year are of three types: estimates derived by the states for NCES (most of the data are of this type); early actual counts reported by individual states; and imputed or adjusted estimates developed by NCES using a combination of state-specific and national data.

Highlights

The estimates in this publication are key statistics reported during the 2000–01 school year. They include the number of students in membership, teachers, and high school graduates for public elementary and secondary schools, and total revenues and expenditures for the operation of public elementary and secondary schools. Highlights of these statistics include the following:

- There were approximately 47.2 million prekindergarten through grade 12 students in the nation's public elementary and secondary schools in fall 2000, compared with 46.9 million in fall 1999. Student membership has increased by 1.5 million since fall 1996 (table 1).
- Public school students were taught by an estimated 3.0 million teachers in school year 2000–01 (table 2).
- The student membership and teacher count data show a pupil/teacher ratio of 16.0 for grades prekindergarten through 12 for public schools in school year 2000–01 (table 7).
- An estimated 2.5 million public school students graduated from high school in the 1999–2000 school year. In the 2000–01 school year, 2.5 million students are expected to graduate from high school (table 3).

- Revenues for public elementary and secondary education in fiscal year (FY) 2000 are estimated to be $364.0 billion, and they are expected to rise to approximately $384.7 billion in FY 2001 (table 4).
- Current expenditures for public elementary and secondary education for FY 2001 are estimated to be $333.8 billion, an increase of 4.6 percent over the FY 2000 estimate of $319.2 billion. The per pupil expenditure is anticipated to be $7,079 per student in membership for the 2000–01 school year (tables 5 and 7).

Data sources: The NCES Common Core of Data (CCD): "Early Estimates of Public Elementary/Secondary Education Survey," 2000–01; "State Nonfiscal Survey of Public Elementary/Secondary Education," 1996–97 through 1999–2000; and "National Public Education Financial Survey," 1996–97 through 1999–2000.

For technical information, see the complete report:

McDowell, L. (2001). *Early Estimates of Public Elementary and Secondary Education Statistics: School Year 2000–2001* (NCES 2001–331).

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To obtain the complete report (NCES 2001–331), visit the NCES Web Site (*http://nces.ed.gov*) or contact Lena McDowell (*lena_mcdowell@ed.gov*).

Table 1.—Student membership in public elementary and secondary schools, by state, for grades prekindergarten through 12: Fall 1996 to fall 2000

State	Reported fall 1996	Reported fall 1997	Reported fall 1998	Reported fall 1999	Estimated fall 2000
United States	45,611,046	46,126,897	46,425,986	46,857,321	[1]47,159,682
Alabama	747,932	749,207	737,639	740,732	726,259
Alaska	129,919	132,123	135,373	134,391	135,869
Arizona	799,250	814,113	848,262	852,612	[1]856,984
Arkansas	457,349	456,497	452,256	451,034	[3]448,018
California	5,686,198	5,803,887	5,844,111	6,038,589	[1]6,239,539
Colorado	673,438	687,167	699,135	708,109	[3]724,508
Connecticut	527,129	535,164	544,698	553,993	562,138
Delaware	110,549	111,960	113,262	112,836	114,424
District of Columbia	78,648	77,111	71,889	77,194	[3]78,751
Florida	2,242,212	2,294,077	2,337,633	2,381,396	[3]2,434,403
Georgia	1,346,761	1,375,980	1,401,291	1,422,762	1,444,937
Hawaii	187,653	189,887	188,069	185,860	[3]184,360
Idaho	245,252	244,403	244,722	245,331	245,650
Illinois	1,973,040	1,998,289	2,011,530	2,027,600	2,048,197
Indiana	982,876	986,836	989,001	988,702	988,963
Iowa	502,941	501,054	498,214	497,301	497,301
Kansas	466,293	468,687	472,353	472,188	469,747
Kentucky	656,089	669,322	655,687	648,180	623,231
Louisiana	793,296	776,813	768,734	756,579	743,089
Maine	213,593	212,579	210,981	209,253	[3]213,461
Maryland	818,583	830,744	841,671	846,582	853,406
Massachusetts	933,898	949,006	963,761	971,425	[3]985,000
Michigan	1,685,714	1,702,717	1,720,287	1,725,617	1,705,800
Minnesota	847,204	853,621	856,455	854,034	847,000
Mississippi	503,967	504,792	502,379	500,716	[3]499,362
Missouri	900,517	910,613	913,494	914,110	897,081
Montana	164,627	162,335	159,988	157,556	155,860
Nebraska	291,967	292,681	291,140	288,261	286,176
Nevada	282,131	296,621	311,061	325,610	340,707
New Hampshire	198,308	201,629	204,713	206,783	210,454
New Jersey	1,227,832	1,250,276	1,268,996	1,289,256	[1]1,309,839
New Mexico	332,632	331,673	328,753	324,495	316,548
New York	2,843,131	2,861,823	2,877,143	2,887,776	2,940,000
North Carolina	1,210,108	1,236,083	1,254,821	1,275,925	[3]1,265,810
North Dakota	120,123	118,572	114,927	112,751	[3]105,635
Ohio	1,844,698	1,847,114	1,842,163	1,836,554	1,821,200
Oklahoma	620,695	623,681	628,492	627,032	625,577
Oregon	537,854	541,346	542,809	545,033	547,200
Pennsylvania	1,804,256	1,815,151	1,816,414	1,816,716	1,811,030
Rhode Island	151,324	153,321	154,785	156,454	[2]158,141
South Carolina	652,816	659,273	655,412	666,780	647,400
South Dakota	143,331	142,443	132,495	131,037	128,133
Tennessee	904,818	893,044	892,936	916,202	[3]905,100
Texas	3,828,975	3,891,877	3,945,367	3,991,783	4,033,697
Utah	481,812	482,957	481,176	480,255	[3]475,269
Vermont	106,341	105,984	105,120	104,559	104,001
Virginia	1,096,093	1,110,815	1,124,022	1,133,994	[1]1,144,054
Washington	974,504	991,235	998,053	1,003,714	[1]1,009,407
West Virginia	304,052	301,419	297,530	291,811	285,169
Wisconsin	879,259	881,780	879,542	877,753	876,243
Wyoming	99,058	97,115	95,241	92,105	[3]89,553
Outlying areas					
American Samoa	14,766	15,214	15,372	15,477	[1]15,583
Guam	33,393	32,444	32,222	32,951	[1]33,696
Northern Marianas	9,041	9,246	9,498	9,732	[3]10,004
Puerto Rico	618,861	617,322	613,862	613,019	[1]612,177
Virgin Islands	22,385	22,136	20,976	20,866	20,757

[1]Data imputed by NCES based on previous year's data.

[2]Early estimate number reported by state, adjusted by NCES.

[3]Actual count reported by state.

NOTE: All fall 2000 data are state estimates, except where noted. Estimates are as of December 2000. Some data may have been revised from previously published figures.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data: "Early Estimates of Public Elementary/Secondary Education Survey," 2000–01, and "State Nonfiscal Survey of Public Elementary/Secondary Education," 1996–97 through 1999–2000.

Table 2.—Number of teachers in public elementary and secondary schools, by state, for grades prekindergarten through 12: School years 1996–97 to 2000–01

State	Reported 1996–97	Reported 1997–98	Reported 1998–99	Reported 1999–2000	Estimated 2000–01
United States	2,667,419	2,746,157	2,824,889	2,906,554	[1]2,953,311
Alabama	45,035	45,967	47,193	48,614	47,527
Alaska	7,418	7,625	8,118	7,838	8,136
Arizona	40,521	41,129	42,352	43,892	[1]44,562
Arkansas	26,681	26,931	27,953	31,362	[3]29,025
California	248,818	268,535	277,246	287,344	[1]299,897
Colorado	36,398	37,840	39,434	40,772	42,100
Connecticut	36,551	37,658	38,772	39,907	42,512
Delaware	6,642	6,850	7,074	7,318	[3]7,466
District of Columbia	5,288	4,388	5,187	4,779	5,000
Florida	120,471	124,473	126,796	130,336	[3]133,545
Georgia	81,795	86,244	88,658	90,638	93,636
Hawaii	10,576	10,653	10,639	10,866	10,785
Idaho	13,078	13,207	13,426	13,641	13,900
Illinois	116,274	118,734	121,758	124,815	128,817
Indiana	56,708	57,371	58,084	58,864	59,728
Iowa	32,593	32,700	32,822	33,480	34,203
Kansas	30,875	31,527	32,003	32,969	33,010
Kentucky	39,331	40,488	40,803	41,954	[1]40,746
Louisiana	47,334	48,599	49,124	50,031	50,366
Maine	15,551	15,700	15,890	16,349	17,000
Maryland	47,943	48,318	49,840	50,995	53,673
Massachusetts	64,574	67,170	69,752	77,596	[2]79,473
Michigan	88,051	90,529	93,220	96,111	95,200
Minnesota	48,245	51,998	54,449	56,010	56,000
Mississippi	29,293	29,441	31,140	30,722	[3]30,782
Missouri	59,428	60,889	62,449	63,890	64,000
Montana	10,268	10,228	10,221	10,353	10,290
Nebraska	20,174	20,065	20,310	20,766	[3]20,939
Nevada	14,805	16,053	16,415	17,380	17,838
New Hampshire	12,692	12,931	13,290	14,037	14,019
New Jersey	87,642	89,671	92,264	95,883	[1]98,395
New Mexico	19,971	19,647	19,981	19,797	20,078
New York	185,104	190,874	197,253	202,078	216,000
North Carolina	75,239	77,785	79,531	81,914	[3]80,390
North Dakota	7,892	8,070	7,974	8,150	[2]7,713
Ohio	108,515	110,761	113,984	116,200	113,000
Oklahoma	39,568	40,215	40,876	41,498	42,120
Oregon	26,757	26,935	27,152	27,803	27,900
Pennsylvania	106,432	108,014	111,065	114,525	114,700
Rhode Island	10,656	10,598	11,124	11,041	[2]11,272
South Carolina	41,463	42,336	43,689	45,468	44,449
South Dakota	9,625	9,282	9,273	9,384	9,296
Tennessee	54,790	54,142	59,258	60,702	56,971
Texas	247,650	254,557	259,739	267,935	274,345
Utah	19,734	21,115	21,501	21,832	21,500
Vermont	7,751	7,909	8,221	8,474	8,710
Virginia	74,526	77,575	79,037	81,073	[1]82,616
Washington	48,307	49,074	49,671	50,368	[1]51,164
West Virginia	20,888	20,947	20,989	21,082	20,337
Wisconsin	54,769	55,732	61,176	60,778	[2]61,285
Wyoming	6,729	6,677	6,713	6,940	6,895
Outlying areas					
American Samoa	734	762	764	801	[1]815
Guam	1,552	1,363	1,052	1,809	[1]1,869
Northern Marianas	441	483	496	488	[2]521
Puerto Rico	39,743	38,953	39,849	41,349	[1]41,708
Virgin Islands	1,580	1,559	1,567	1,528	1,520

[1]Data imputed by NCES based on previous year's data.

[2]Early estimate number reported by state, adjusted by NCES.

[3]Actual count reported by state.

NOTE: All school year 2000–01 data are state estimates, except where noted. Estimates are as of December 2000. Some data may have been revised from previously published figures.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data: "Early Estimates of Public Elementary/Secondary Education Survey," 2000–01, and "State Nonfiscal Survey of Public Elementary/Secondary Education," 1996–97 through 1999–2000.

Table 3.—Number of public high school graduates, by state: School years 1996–97 to 2000–01

State	Reported 1996–97	Reported 1997–98	Reported 1998–99	Estimated 1999–2000	Estimated 2000–01
United States	2,358,403	2,439,050	2,488,605	2,531,524	[1]2,542,399
Alabama	35,611	38,089	36,244	[3]38,429	39,377
Alaska	6,133	6,462	6,810	6,668	6,705
Arizona	34,082	36,361	35,728	[1]36,189	[1]36,310
Arkansas	25,146	26,855	26,896	[3]26,896	27,335
California	269,071	282,897	299,221	311,573	[1]321,371
Colorado	34,231	35,794	36,958	38,933	35,193
Connecticut	27,029	27,885	28,284	29,650	30,300
Delaware	5,953	6,439	6,484	[3]6,186	6,669
District of Columbia	2,853	2,777	2,675	[3]2,695	2,507
Florida	95,082	98,498	102,386	[3]102,879	104,555
Georgia	58,996	58,525	59,227	[3]64,775	64,738
Hawaii	8,929	9,670	9,714	[3]10,437	[3]10,023
Idaho	15,407	15,523	15,716	16,160	16,200
Illinois	110,170	114,611	112,556	111,835	103,174
Indiana	57,463	58,899	58,908	57,236	58,173
Iowa	32,986	34,189	34,378	[3]33,926	33,888
Kansas	26,648	27,856	28,685	28,890	29,082
Kentucky	36,941	37,270	37,179	[3]36,909	36,620
Louisiana	36,495	38,030	37,802	38,484	38,022
Maine	12,019	12,171	12,093	[3]13,367	13,581
Maryland	42,856	44,555	46,214	[3]47,849	48,538
Massachusetts	49,008	50,452	51,465	[3]51,000	50,000
Michigan	89,695	92,732	94,125	96,100	99,000
Minnesota	48,193	54,628	56,964	53,000	52,500
Mississippi	23,388	24,502	24,198	[3]24,198	24,065
Missouri	50,543	52,095	52,531	52,498	52,569
Montana	10,322	10,656	10,925	10,862	10,757
Nebraska	18,636	19,719	20,550	19,629	19,763
Nevada	12,425	13,052	13,892	13,058	13,665
New Hampshire	10,487	10,843	11,251	11,563	11,725
New Jersey	70,028	65,106	67,410	[1]69,017	[1]69,994
New Mexico	15,700	16,529	17,317	[3]18,303	18,445
New York	140,861	138,531	139,426	141,800	142,000
North Carolina	57,886	59,292	60,081	[3]59,776	61,887
North Dakota	8,025	8,170	8,388	[3]8,606	8,409
Ohio	107,422	111,211	111,112	111,000	111,000
Oklahoma	33,536	35,213	36,556	[2]36,754	[2]36,603
Oregon	27,720	27,754	28,245	29,500	29,800
Pennsylvania	108,817	110,919	112,632	114,850	114,790
Rhode Island	7,850	8,074	8,179	8,495	8,580
South Carolina	30,829	31,373	31,495	33,900	32,800
South Dakota	9,247	9,140	8,757	[3]9,224	9,072
Tennessee	41,617	39,866	40,823	[3]41,568	40,911
Texas	181,794	197,186	203,393	209,405	214,953
Utah	30,753	31,567	31,574	32,501	31,482
Vermont	6,181	6,469	6,521	[3]6,468	6,348
Virginia	60,587	62,738	63,875	[1]64,941	[1]65,401
Washington	51,609	53,679	58,213	[1]58,997	[1]59,226
West Virginia	19,573	20,164	19,889	[3]19,440	18,773
Wisconsin	55,189	57,607	58,312	58,636	59,099
Wyoming	6,381	6,427	6,348	[3]6,469	6,420
Outlying areas					
American Samoa	710	665	725	[1]736	[1]739
Guam	1,103	923	1,326	[1]1,367	[1]1,395
Northern Marianas	309	374	341	360	341
Puerto Rico	29,692	29,881	30,479	[1]30,673	[1]30,576
Virgin Islands	1,076	1,069	951	[1]1,057	[1]1,050

[1]Data imputed by NCES based on previous year's data.

[2]Early estimate number reported by state, adjusted by NCES.

[3]Actual count reported by state.

NOTE: All school year 1999–2000 and school year 2000–01 data are state estimates, except where noted. Estimates are as of December 2000. Some data may have been revised from previously published figures.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data: "Early Estimates of Public Elementary/Secondary Education Survey," 2000–01, and "State Nonfiscal Survey of Public Elementary/Secondary Education," 1996–97 through 1999–2000.

Table 4.—Revenues for public elementary and secondary education, by state, for grades prekindergarten through 12: Fiscal years 1997 to 2001 (School years 1996–97 to 2000–01)

(In thousands of dollars)

State	Reported FY 1997	Reported FY 1998	Preliminary FY 1999	Estimated FY 2000	Estimated FY 2001
United States	$305,065,192	$325,976,011	$347,325,696	[1]$364,031,569	[1]$384,690,254
Alabama	3,955,039	4,146,629	4,469,278	[1]4,787,186	[1]5,026,545
Alaska	1,219,017	1,218,425	1,290,358	1,332,053	1,372,015
Arizona	4,400,591	4,731,675	5,079,076	[1]5,302,690	[1]5,596,841
Arkansas	2,371,834	2,600,655	2,610,267	2,560,408	2,655,266
California	34,477,895	38,142,613	40,002,760	[1]42,933,577	[1]46,584,281
Colorado	4,045,015	4,327,326	4,714,756	4,737,696	4,908,254
Connecticut	4,899,852	5,160,728	5,605,822	5,956,000	6,301,000
Delaware	878,326	913,616	959,482	1,073,035	1,112,730
District of Columbia	711,504	706,935	760,592	[1]848,327	[1]908,785
Florida	13,861,434	14,988,118	16,460,206	17,944,147	[1]19,262,337
Georgia	8,129,250	9,041,434	10,263,338	[3]11,363,068	11,874,406
Hawaii	1,215,924	1,282,702	1,328,572	1,348,501	1,368,729
Idaho	1,251,263	1,320,647	1,420,902	1,600,900	1,720,300
Illinois	13,161,954	14,194,654	15,338,740	15,338,740	16,259,064
Indiana	7,638,406	7,513,407	7,980,582	7,938,000	8,527,000
Iowa	3,167,763	3,346,481	3,516,165	3,632,198	3,770,222
Kansas	3,040,600	3,122,238	3,282,779	3,453,483	3,639,971
Kentucky	3,794,129	3,932,068	4,210,793	[3]4,425,658	4,537,058
Louisiana	4,154,495	4,494,429	4,696,640	4,860,677	[1]4,957,890
Maine	1,510,999	1,600,635	1,703,252	1,797,271	1,896,480
Maryland	6,042,059	6,454,696	6,806,086	6,923,995	7,627,347
Massachusetts	7,229,486	7,893,657	8,534,080	9,195,349	9,847,646
Michigan	13,437,615	14,329,715	14,678,359	15,206,780	15,754,224
Minnesota	6,109,916	6,529,420	6,785,487	6,595,454	7,180,471
Mississippi	2,259,053	2,407,954	2,544,561	[3]2,681,802	2,815,892
Missouri	5,571,655	6,005,256	6,265,697	6,459,627	6,718,012
Montana	991,653	1,029,939	1,047,338	1,126,000	1,130,000
Nebraska	1,954,789	1,964,205	2,168,308	2,277,809	2,401,950
Nevada	1,705,232	1,910,794	2,094,467	2,164,395	2,326,725
New Hampshire	1,282,509	1,364,943	1,441,115	1,587,411	1,672,883
New Jersey	12,376,750	13,189,983	14,192,543	[1]14,977,152	[1]15,978,406
New Mexico	1,829,725	1,952,452	2,098,648	[3]2,197,582	2,242,468
New York	26,564,743	27,782,468	29,874,220	30,630,171	32,192,310
North Carolina	6,515,608	7,188,615	8,137,116	[2]8,594,171	[2]8,953,084
North Dakota	642,984	682,419	709,427	[3]786,764	818,234
Ohio	12,587,117	13,458,095	14,399,472	[3]15,000,000	15,700,000
Oklahoma	3,251,302	3,416,296	3,652,130	3,875,469	3,991,733
Oregon	3,472,609	3,883,939	4,047,900	4,071,000	4,254,000
Pennsylvania	14,441,126	14,837,945	15,525,301	16,385,000	17,293,000
Rhode Island	1,193,754	1,264,156	1,319,597	[1]1,385,445	[1]1,470,525
South Carolina	3,889,383	4,055,072	4,398,145	4,670,830	4,960,421
South Dakota	749,052	794,256	829,028	861,768	902,339
Tennessee	4,411,971	4,815,833	5,089,341	[1]5,429,421	[1]5,626,692
Texas	22,372,808	24,179,060	25,647,339	27,222,419	28,467,028
Utah	2,198,285	2,305,397	2,449,890	2,559,430	2,687,402
Vermont	812,166	861,643	908,146	948,877	1,015,963
Virginia	7,204,512	7,757,954	8,356,258	[1]8,756,648	[1]9,276,821
Washington	6,642,158	6,895,693	7,212,175	[1]7,533,776	[1]7,955,993
West Virginia	2,082,049	2,216,984	2,229,692	2,190,470	2,250,464
Wisconsin	6,701,115	7,059,759	7,409,485	7,732,428	8,119,049
Wyoming	656,713	702,001	779,985	[3]770,512	780,000
Outlying areas					
American Samoa	47,430	49,677	57,667	[1]60,308	[1]63,761
Guam	168,835	173,339	177,963	[1]189,033	[1]202,992
Northern Marianas	56,010	58,239	53,720	[3]51,420	51,686
Puerto Rico	1,832,790	2,094,025	2,121,183	[1]2,200,247	[1]2,307,278
Virgin Islands	141,786	152,499	160,253	160,253	[1]167,401

[1]Data imputed by NCES based on previous year's data.

[2]Data include adjusted estimates by NCES for a few specific local revenues, based on current-year data.

[3]Actual amount reported by state.

NOTE: All fiscal year 2000 and fiscal year 2001 data are state estimates, except where noted. Estimates are as of December 2000. Details may not sum to totals due to rounding. Some data may have been revised from previously published figures.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data: "Early Estimates of Public Elementary/Secondary Education Survey," 2000–01, and "National Public Education Financial Survey," 1996–97 through 1999–2000.

Table 5.—Current expenditures for public elementary and secondary education, by state, for grades prekindergarten through 12: Fiscal years 1997 to 2001 (School years 1996–97 to 2000–01)

(In thousands of dollars)

State	Reported FY 1997	Reported FY 1998	Preliminary FY 1999	Estimated FY 2000	Estimated FY 2001
United States	$270,174,298	$285,489,511	$302,869,531	[1]$319,158,261	[1]$333,828,141
Alabama	3,436,406	3,633,159	3,880,188	4,127,751	4,334,139
Alaska	1,069,379	1,092,750	1,137,610	1,191,230	1,226,966
Arizona	3,527,473	3,740,638	3,963,483	[1]4,160,096	[1]4,257,374
Arkansas	2,074,113	2,149,237	2,241,244	[2]2,334,098	[2]2,360,599
California	29,909,168	32,759,492	34,379,878	[1]37,095,936	[1]39,026,563
Colorado	3,577,211	3,886,872	4,140,699	4,255,473	4,408,670
Connecticut	4,522,718	4,765,077	5,074,389	5,385,000	5,697,000
Delaware	788,715	830,731	872,786	913,583	1,001,457
District of Columbia	632,951	647,202	693,207	[1]777,300	[1]807,381
Florida	12,018,676	12,737,325	13,534,374	13,991,183	[1]14,562,376
Georgia	7,230,405	7,770,241	8,537,177	[2]9,051,555	[2]9,359,589
Hawaii	1,057,069	1,112,351	1,143,713	1,160,868	1,178,281
Idaho	1,090,597	1,153,778	1,239,755	[2]1,297,838	[2]1,323,127
Illinois	11,720,249	12,473,064	13,602,965	[2]14,318,395	[2]14,726,541
Indiana	6,055,055	6,234,563	6,697,468	7,166,000	7,668,000
Iowa	2,885,943	3,005,421	3,110,585	3,213,234	3,335,337
Kansas	2,568,525	2,684,244	2,841,147	3,008,774	3,189,301
Kentucky	3,382,062	3,489,205	3,645,631	[3]4,010,533	4,256,345
Louisiana	3,747,508	4,030,379	4,263,982	4,358,424	4,445,592
Maine	1,372,571	1,433,175	1,510,024	1,548,708	1,634,197
Maryland	5,529,309	5,843,685	6,165,934	6,178,289	6,633,866
Massachusetts	6,846,610	7,381,784	7,948,502	8,499,362	9,050,308
Michigan	11,686,124	12,003,818	12,785,480	13,245,757	13,722,604
Minnesota	5,087,353	5,452,571	5,816,329	6,576,231	7,159,543
Mississippi	2,035,675	2,164,592	2,293,188	[3]2,512,308	2,637,923
Missouri	4,775,931	5,067,720	5,348,366	5,177,929	5,385,046
Montana	902,252	929,197	955,695	975,630	995,900
Nebraska	1,707,455	1,743,775	1,821,310	1,913,286	2,017,561
Nevada	1,434,395	1,570,576	1,738,009	1,784,925	1,918,795
New Hampshire	1,173,958	1,241,255	1,316,946	1,461,060	1,536,740
New Jersey	11,771,941	12,056,560	12,874,579	[1]13,658,938	[1]14,129,045
New Mexico	1,557,376	1,659,891	1,788,382	[3]1,881,930	2,045,977
New York	24,237,291	25,332,735	26,885,444	[2]28,178,914	[2]29,209,562
North Carolina	5,964,939	6,497,648	7,097,882	[3]7,207,191	7,630,436
North Dakota	577,498	599,443	625,428	[3]778,080	809,204
Ohio	10,948,074	11,448,722	12,207,147	11,800,000	12,400,000
Oklahoma	2,990,044	3,138,690	3,332,697	3,716,865	3,717,980
Oregon	3,184,100	3,474,714	3,706,044	3,843,000	4,026,000
Pennsylvania	12,820,704	13,084,859	13,532,211	14,281,000	15,070,000
Rhode Island	1,151,888	1,215,595	1,283,859	1,419,479	1,504,648
South Carolina	3,296,661	3,507,017	3,759,042	4,003,380	4,263,599
South Dakota	628,753	665,082	696,785	734,713	783,489
Tennessee	4,145,380	4,409,338	4,638,924	[3]5,159,192	[1]5,189,243
Texas	20,167,238	21,188,676	22,430,153	24,319,431	25,753,029
Utah	1,822,725	1,916,688	2,025,714	1,978,731	2,077,668
Vermont	718,092	749,786	792,664	828,216	886,771
Virginia	6,343,768	6,739,003	7,135,644	[1]7,517,511	[1]7,721,950
Washington	5,587,808	5,986,648	6,098,036	[1]6,404,000	[1]6,557,294
West Virginia	1,847,560	1,905,940	1,986,562	2,087,662	2,157,163
Wisconsin	5,975,122	6,280,696	6,620,653	6,979,011	7,327,962
Wyoming	591,488	603,901	651,622	[3]690,259	710,000
Outlying areas					
American Samoa	33,780	33,088	35,092	[1]36,895	[1]37,822
Guam	156,561	168,716	181,815	[1]194,156	[1]202,155
Northern Marianas	53,140	56,514	50,450	[3]53,228	54,558
Puerto Rico	1,740,074	1,981,603	2,024,499	[1]2,111,182	[1]2,146,574
Virgin Islands	122,188	131,315	146,474	146,474	[1]154,107

[1]Data imputed by NCES based on previous year's data.

[2]Data include imputations by NCES for food services and/or enterprise operations.

[3]Actual amount reported by state.

NOTE: All fiscal year 2000 and fiscal year 2001 data are state estimates, except where noted. Estimates are as of December 2000. Details may not sum to totals due to rounding. Some data may have been revised from previously published figures.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data: "Early Estimates of Public Elementary/Secondary Education Survey," 2000–01, and "National Public Education Financial Survey," 1996–97 through 1999–2000.

Table 6.—Reported student membership and number of teachers, and estimates of revenues, expenditures, and pupil/teacher ratio, for public elementary and secondary schools, by state, for grades prekindergarten through 12: School year 1999–2000/Fiscal year 2000

	Reported		Estimates				
State	Student membership	Number of teachers	Revenues (in thousands)	Current expenditures (in thousands)	Pupil/teacher ratio	Per pupil revenue	Per pupil expenditure
United States	46,857,321	2,906,554	[1]$364,031,569	[1]$319,158,261	16.1	$7,769	$6,811
Alabama	740,732	48,614	4,787,186	[1]4,127,751	15.2	6,463	5,573
Alaska	134,391	7,838	1,332,053	1,191,230	17.1	9,912	8,864
Arizona	852,612	43,892	[1]5,302,690	[1]4,160,096	19.4	6,219	4,879
Arkansas	451,034	31,362	[2]2,560,408	[2]2,334,098	14.4	5,677	5,175
California	6,038,589	287,344	[1]42,933,577	[1]37,095,936	21.0	7,110	6,143
Colorado	708,109	40,772	4,737,696	4,255,473	17.4	6,691	6,010
Connecticut	553,993	39,907	5,956,000	5,385,000	13.9	10,751	9,720
Delaware	112,836	7,318	1,073,035	913,583	15.4	9,510	8,097
District of Columbia	77,194	4,779	[1]848,327	[1]777,300	16.2	10,989	10,069
Florida	2,381,396	130,336	17,944,147	13,991,183	18.3	7,535	5,875
Georgia	1,422,762	90,638	[3]11,363,068	[2]9,051,555	15.7	7,987	6,362
Hawaii	185,860	10,866	1,348,501	[2]1,160,868	17.1	7,255	6,246
Idaho	245,331	13,641	1,600,900	[2]1,297,838	18.0	6,525	5,290
Illinois	2,027,600	124,815	15,338,740	[2]14,318,395	16.2	7,565	7,061
Indiana	988,702	58,864	7,938,000	7,166,000	16.8	8,029	7,248
Iowa	497,301	33,480	3,632,198	3,213,234	14.9	7,281	6,441
Kansas	472,188	32,969	3,453,483	3,008,774	14.3	7,314	6,372
Kentucky	648,180	41,954	[3]4,425,658	[3]4,010,533	15.4	6,828	6,187
Louisiana	756,579	50,031	4,860,677	4,358,424	15.1	6,425	5,761
Maine	209,253	16,349	1,797,271	1,548,708	12.8	8,589	7,401
Maryland	846,582	50,995	6,923,995	6,178,289	16.6	8,179	7,298
Massachusetts	971,425	77,596	9,195,349	8,499,362	12.5	9,466	8,749
Michigan	1,725,617	96,111	15,206,780	13,245,757	18.0	8,812	7,676
Minnesota	854,034	56,010	6,595,454	6,576,231	15.2	7,723	7,700
Mississippi	500,716	30,722	[3]2,681,802	[3]2,512,308	16.3	5,356	5,017
Missouri	914,110	63,890	6,459,627	5,177,929	14.3	7,067	5,664
Montana	157,556	10,353	1,126,000	975,630	15.2	7,147	6,192
Nebraska	288,261	20,766	2,277,809	1,913,286	13.9	7,902	6,637
Nevada	325,610	17,380	2,164,395	1,784,925	18.7	6,647	5,482
New Hampshire	206,783	14,037	1,587,411	1,461,060	14.7	7,677	7,066
New Jersey	1,289,256	95,883	[1]14,977,152	[1]13,658,938	13.4	11,616	10,594
New Mexico	324,495	19,797	[3]2,197,582	[3]1,881,930	16.4	6,772	5,800
New York	2,887,776	202,078	30,630,171	[2]28,178,914	14.3	10,607	9,757
North Carolina	1,275,925	81,914	[2]8,594,171	[3]7,207,191	15.6	6,735	5,649
North Dakota	112,751	8,150	[3]786,764	[3]778,080	13.8	6,978	6,901
Ohio	1,836,554	116,200	[3]15,000,000	[3]11,800,000	15.8	8,167	6,425
Oklahoma	627,032	41,498	3,875,469	3,716,865	15.1	6,181	5,928
Oregon	545,033	27,803	4,071,000	3,843,000	19.6	7,469	7,051
Pennsylvania	1,816,716	114,525	16,385,000	14,281,000	15.9	9,019	7,861
Rhode Island	156,454	11,041	[1]1,385,445	1,419,479	14.2	8,855	9,073
South Carolina	666,780	45,468	4,670,830	4,003,380	14.7	7,005	6,004
South Dakota	131,037	9,384	861,768	734,713	14.0	6,577	5,607
Tennessee	916,202	60,702	[1]5,429,421	[3]5,159,192	15.1	5,926	5,631
Texas	3,991,783	267,935	27,222,419	24,319,431	14.9	6,820	6,092
Utah	480,255	21,832	2,559,430	1,978,731	22.0	5,329	4,120
Vermont	104,559	8,474	948,877	828,216	12.3	9,075	7,921
Virginia	1,133,994	81,073	[1]8,756,648	[1]7,517,511	14.0	7,722	6,629
Washington	1,003,714	50,368	[1]7,533,776	[1]6,404,000	19.9	7,506	6,380
West Virginia	291,811	21,082	2,190,470	2,087,662	13.8	7,506	7,154
Wisconsin	877,753	60,778	7,732,428	6,979,011	14.4	8,809	7,951
Wyoming	92,105	6,940	[3]770,512	[3]690,259	13.3	8,366	7,494
Outlying areas							
American Samoa	15,477	801	[1]60,308	[1]36,895	19.3	3,896	2,384
Guam	32,951	1,809	[1]189,033	[1]194,156	18.2	5,737	5,892
Northern Marianas	9,732	488	[3]51,420	[3]53,228	19.9	5,284	5,492
Puerto Rico	613,019	41,349	[1]2,200,247	[1]2,111,182	14.8	3,589	3,444
Virgin Islands	20,866	1,528	160,253	146,474	13.7	7,680	7,360

[1]Data imputed by NCES based on previous year's data.

[2]Early estimate number reported by state, adjusted by NCES.

[3]Actual count/amount reported by state.

NOTE: All estimated data are state estimates, except where noted. Estimates are as of December 2000. Details may not sum to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data: "Early Estimates of Public Elementary/Secondary Education Survey," 2000-01; "National Public Education Financial Survey" and "State Nonfiscal Survey of Public Elementary/Secondary Education," 1996–97 through 1999–2000.

Table 7.—Estimated student membership, number of teachers, revenues, expenditures, and pupil/teacher ratio, for public elementary and secondary schools, by state, for grades prekindergarten through 12: School year 2000–01/Fiscal year 2001

State	Student membership	Number of teachers	Revenues (in thousands)	Current expenditures (in thousands)	Pupil/teacher ratio	Per pupil revenue	Per pupil expenditure
United States	[1]47,159,682	[1]2,953,311	[1]$384,690,254	[1]$333,828,141	16.0	$8,157	$7,079
Alabama	726,259	47,527	5,026,545	4,334,139	15.3	6,921	5,968
Alaska	135,869	8,136	1,372,015	1,226,966	16.7	10,098	9,031
Arizona	[1]856,984	[1]44,562	[1]5,596,841	[1]4,257,374	19.2	6,531	4,968
Arkansas	[3]448,018	[3]29,025	2,655,266	[2]2,360,599	15.4	5,927	5,269
California	[1]6,239,539	[1]299,897	[1]46,584,281	[1]39,026,563	20.8	7,466	6,255
Colorado	[3]724,508	42,100	4,908,254	4,408,670	17.2	6,775	6,085
Connecticut	562,138	42,512	6,301,000	5,697,000	13.2	11,209	10,135
Delaware	114,424	[3]7,466	1,112,730	1,001,457	15.3	9,725	8,752
District of Columbia	[3]78,751	5,000	[1]908,785	[1]807,381	15.8	11,540	10,252
Florida	[3]2,434,403	133,545	[1]19,262,337	[1]14,562,376	18.2	7,913	5,982
Georgia	1,444,937	93,636	11,874,406	[2]9,359,589	15.4	8,218	6,478
Hawaii	[3]184,360	10,785	1,368,729	1,178,281	17.1	7,424	6,391
Idaho	245,650	13,900	1,720,300	[2]1,323,127	17.7	7,003	5,386
Illinois	2,048,197	128,817	16,259,064	[2]14,726,541	15.9	7,938	7,190
Indiana	988,963	59,728	8,527,000	7,668,000	16.6	8,622	7,754
Iowa	497,301	34,203	3,770,222	3,335,337	14.5	7,581	6,707
Kansas	469,747	33,010	3,639,971	3,189,301	14.2	7,749	6,789
Kentucky	623,231	[1]40,746	4,537,058	4,256,345	15.3	7,280	6,829
Louisiana	743,089	50,366	[1]4,957,890	4,445,592	14.8	6,672	5,983
Maine	[3]213,461	17,000	1,896,480	1,634,197	12.6	8,884	7,656
Maryland	853,406	53,673	7,627,347	6,633,866	15.9	8,938	7,773
Massachusetts	[3]985,000	[2]79,473	9,847,646	9,050,308	12.4	9,998	9,188
Michigan	1,705,800	95,200	15,754,224	13,722,604	17.9	9,236	8,045
Minnesota	847,000	56,000	7,180,471	7,159,543	15.1	8,478	8,453
Mississippi	[3]499,362	[3]30,782	2,815,892	2,637,923	16.2	5,639	5,283
Missouri	897,081	64,000	6,718,012	5,385,046	14.0	7,489	6,003
Montana	155,860	10,290	1,130,000	995,900	15.1	7,250	6,390
Nebraska	286,176	[3]20,939	2,401,950	2,017,561	13.7	8,393	7,050
Nevada	340,707	17,838	2,326,725	1,918,795	19.1	6,829	5,632
New Hampshire	210,454	14,019	1,672,883	1,536,740	15.0	7,949	7,302
New Jersey	[1]1,309,839	[1]98,395	[1]15,978,406	[1]14,129,045	13.3	12,199	10,787
New Mexico	316,548	20,078	2,242,468	2,045,977	15.8	7,084	6,463
New York	2,940,000	216,000	32,192,310	[2]29,209,562	13.6	10,950	9,935
North Carolina	[3]1,265,810	[3]80,390	[2]8,953,084	7,630,436	15.7	7,073	6,028
North Dakota	[3]105,635	[2]7,713	818,234	809,204	13.7	7,746	7,660
Ohio	1,821,200	113,000	15,700,000	12,400,000	16.1	8,621	6,809
Oklahoma	625,577	42,120	3,991,733	3,717,980	14.9	6,381	5,943
Oregon	547,200	27,900	4,254,000	4,026,000	19.6	7,774	7,357
Pennsylvania	1,811,030	114,700	17,293,000	15,070,000	15.8	9,549	8,321
Rhode Island	[2]158,141	[1]11,272	[1]1,470,525	1,504,648	14.0	9,299	9,515
South Carolina	647,400	44,449	4,960,421	4,263,599	14.6	7,662	6,586
South Dakota	128,133	9,296	902,339	783,489	13.8	7,042	6,115
Tennessee	[3]905,100	56,971	[1]5,626,692	[1]5,189,243	15.9	6,217	5,733
Texas	4,033,697	274,345	28,467,028	25,753,029	14.7	7,057	6,384
Utah	[3]475,269	21,500	2,687,402	2,077,668	22.1	5,654	4,372
Vermont	104,001	8,710	1,015,963	886,771	11.9	9,769	8,527
Virginia	[1]1,144,054	[1]82,616	[1]9,276,821	[1]7,721,950	13.8	8,109	6,750
Washington	[1]1,009,407	[1]51,164	[1]7,955,993	[1]6,557,294	19.7	7,882	6,496
West Virginia	285,169	20,337	2,250,464	2,157,163	14.0	7,892	7,565
Wisconsin	876,243	[2]61,285	8,119,049	7,327,962	14.3	9,266	8,363
Wyoming	[3]89,553	6,895	780,000	710,000	13.0	8,710	7,928
Outlying areas							
American Samoa	[1]15,583	[1]815	[1]63,761	[1]37,822	19.1	4,092	4,092
Guam	[1]33,696	[1]1,869	[1]202,992	[1]202,155	18.0	6,024	6,024
Northern Marianas	[3]10,004	[2]521	51,686	54,558	19.2	5,167	5,167
Puerto Rico	[1]612,177	[1]41,708	[1]2,307,278	[1]2,146,574	14.7	3,769	3,769
Virgin Islands	20,757	1,520	[1]167,401	[1]154,107	13.7	8,065	8,065

[1]Data imputed by NCES based on previous year's data.

[2]Early estimate number reported by state, adjusted by NCES.

[3]Actual count/amount reported by state.

NOTE: All estimated data are state estimates, except where noted. Estimates are as of December 2000. Details may not sum to totals due to rounding.

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Monitoring School Quality: An Indicators Report

Daniel P. Mayer, John E. Mullens, and Mary T. Moore

This article was originally published as the Executive Summary of the Statistical Analysis Report of the same name. The numerous data sources are listed at the end of this article.

This report explores why some schools may be better than others at helping students learn. It responds to a recommendation made by the congressionally mandated Special Study Panel on Education Indicators that the National Center for Education Statistics (NCES) produce reports identifying and discussing indicators of the health of the nation's educational system (Special Study Panel on Education Indicators 1991). This report is designed for policymakers, researchers, and others interested in assessing the strength of our schools. While it is relevant for those interested in standards or accountability, it is not about test scores and is not a guide for education reform movements.

More specifically, the report's primary goals are to

- review the literature on school quality to help policymakers and researchers understand what is known about the characteristics of schools that are most likely related to student learning;
- identify where national indicator data are currently available and reliable; and
- assess the current status of our schools by examining and critiquing these national indicator data.

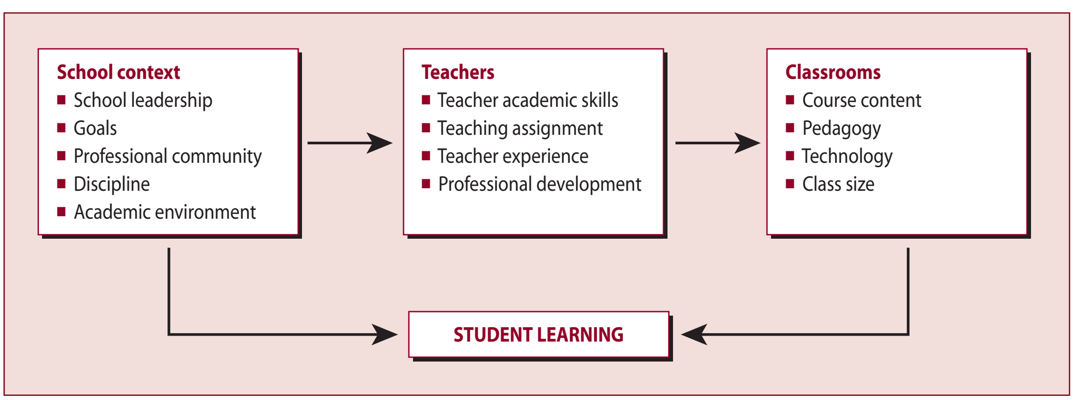
School Characteristics Related to Student Learning

The research described in this report indicates that school quality affects student learning through the training and talent of the teaching force, what goes on in the classrooms, and the overall culture and atmosphere of the school. Within these three areas, this report identifies 13 indicators of school quality that recent research suggests are related to student learning and reviews the national data showing the current status of our schools. These indicators are summarized in figure A. The figure illustrates that these school quality factors can affect student learning *both directly and indirectly*. For example, school context characteristics like school leadership can have an impact on teachers and what they are able to accomplish in the classroom, and this in turn may influence student learning. In addition, various teacher-level attributes can affect the quality of the classroom and, in turn, student learning. Traits at each of these levels can also directly affect student learning.

Teachers

Substantial research suggests that school quality is enhanced when teachers have high academic skills, teach in the field in which they are trained, have more than a few years of experience, and participate in high-quality induction and professional development programs. Students learn more from teachers with strong academic skills and classroom teaching experience than they do from teachers with weak academic skills and less experience. Teachers are less effective in terms of student outcomes when they teach courses they were not trained to teach. Teachers are thought to be more effective when they have participated in quality professional development activities, but there is no statistical evidence to evaluate this relationship.

Figure A.—School quality indicators and their relationship to student learning



SOURCE: Originally published as figure ES.1 on p. ii of the complete report from which this article is excerpted.

Classrooms

To understand the effectiveness of classrooms, research suggests that it is necessary to understand the content of the curriculum; the pedagogy, materials, and equipment used; and the conditions under which the curriculum is implemented. Students appear to benefit when course content is focused and has a high level of intellectual rigor and cognitive challenge. Younger students, especially disadvantaged and minority students, appear to learn better in smaller classes. Nationally representative data on the process of schooling, now becoming available for the first time, will further our understanding of the role of these factors in determining school quality.

School context

How schools approach educational leadership and school goals, develop a professional community, and establish a climate that minimizes discipline problems and encourages academic excellence clearly affects school quality and student learning. For three reasons, however, the effect of school-level characteristics is more difficult to ascertain than the effect of teachers and classrooms. First, even though they are integral to a school, these characteristics are difficult to define and measure. Second, their effect on student learning is likely to be exerted indirectly through teachers and classrooms, compounding the measurement problem. And last, with some exceptions, reliable school-representative information about these indicators of quality is minimal. These difficulties should not overshadow the importance of collecting such data to learn more about how these characteristics operate and affect student learning through teachers and classrooms. The preponderance of national, regional, and local efforts to develop quality schools heightens the benefits that would be derived from additional refined and reliable school-representative measures of school characteristics.

Availability and Quality of Indicator Data

The quality of existing data on these three types of indicators varies (table A). Where the dimension being measured is straightforward, or if it has been measured for an extended period of time, the data are high quality. Where there is little information about a particular important facet of an indicator, the data quality is moderated in some aspect. And where the indicator is more complex than the data, the quality is poor. For a few indicators, concrete statistical evidence of an association with learning is thin, even though experts agree that these indicators should show changes in student learning.

The indicators of teaching assignment, teacher experience, and class size each represent straightforward concepts and are easy to measure, and the data on these indicators are high quality. In addition, data on teacher experience and class size have been collected over several decades, further ensuring their quality. Data on teacher academic skills are also high quality, albeit less straightforward. While the academic skills of teachers are only one aspect of teaching ability, standardized tests that measure the academic skills of future teachers are quite advanced and have consistently shown links to student learning.

Data on indicators of professional development, course content, technology, discipline, and academic environment are moderate in quality. National data collection efforts pertaining to these indicators are relatively new, and these dimensions of schools are more complex than the data currently collected. Consequently, data on professional development are limited and provide little insight into important principles of successful professional development programs. National data on indicators of course content and academic environment are based primarily on course titles and are consequently too vague to be high quality. Current

Table A.—Quality of national school quality indicator data

High quality	Moderate quality	Poor quality
Teaching assignment	Professional development	Pedagogy
Teacher experience	Technology	Goals
Teacher academic skills	Course content	School leadership
Class size	Discipline	Professional community
	Academic environment	

SOURCE: Originally published as table ES.1 on p. iii of the complete report from which this article is excerpted.

data on technology primarily measure the availability of hardware and access to the Internet and provide too little information on the instructional role of technology in the classroom. Nationally representative data on school discipline incidents and on school discipline policies are well defined, but administrators may underreport their discipline problems. In addition, there are limited data documenting a link to student learning, the implementation of discipline policies, and their perceived fairness.

Only poor-quality data are available on teachers' pedagogy, school leadership, school goals, and professional community. These indicators are complex and therefore more difficult to measure, and historically they have not been prominent in national data collection efforts. It is difficult to isolate and measure critical elements of pedagogy because the teaching process consists of a complex set of interactions between students, the teacher, and the curriculum. Measuring human actions, incentives, and opinions to estimate the effects of school-level attributes such as leadership, goals, and professional community is an equally complex task.

As a group, the teacher-focused measures of school quality are less complex and have been collected for some time. School-level attributes of quality are nearly the opposite. We have more reliable information on indicators with high-quality data, while indicators with lower quality data provide an incentive and direction for improved national data collection. Nine indicators have high- or moderate-quality data and describe the current status of school quality.

Current Status of School Quality

The academic skills of teachers

Students learn more from teachers with strong academic skills (Ballou 1996; Ehrenberg and Brewer 1994, 1995; Ferguson 1991; Ferguson and Ladd 1996; Mosteller and Moynihan 1972), but graduates whose college entrance examination scores are in the top quartile are *half* as likely as those in the bottom quartile to prepare to teach (9 vs. 18 percent) (Henke, Chen, and Geis 2000). Teachers in the top quartile are more than *twice* as likely as teachers in the bottom quartile to teach in private schools (26 vs. 10 percent) and are less than *one-third* as likely as teachers in the bottom quartile to teach in high-poverty schools (10 vs. 31 percent). Furthermore, graduates in the top quartile who teach are *twice* as likely as those in the bottom quartile to leave the profession within less than 4 years (32 vs. 16 percent) (Henke, Chen, and Geis 2000).

Teaching assignment

Middle and high school students learn more from teachers who hold a bachelor's or master's degree in the subject they are teaching (Darling-Hammond 2000; Goldhaber and Brewer 1997; Monk and King 1994), but out-of-field teaching occurs with regularity (Bobbitt and McMillen 1994; Henke et al. 1997; Ingersoll 1999; Lewis et al. 1999).

Teacher experience

Studies suggest that students learn more from experienced teachers than they do from less experienced teachers (Darling-Hammond 2000; Murnane and Phillips 1981; Rivkin, Hanushek, and Kain 1998). As of 1998, the highest poverty schools and schools with the highest concentration of minority students had about *double* the proportion of inexperienced teachers (those with 3 or fewer years of experience) than schools with the lowest poverty (20 vs. 11 percent) and lowest concentration of minority students (21 vs. 10 percent).

Professional development

Experts agree that high-quality professional development should enhance student learning (Choy and Ross 1998; Mullens et al. 1996; U.S. Department of Education 1999), but data permitting an analysis of the relationship are not yet available. In 1998, 99 percent of the nation's public school teachers had participated in some type of professional development program within the past 12 months (U.S. Department of Education 1999). However, most teachers participated in these activities for only 1 to 8 hours, or for no more than 1 day. Teachers with 3 or fewer years of experience were more likely (Lewis et al. 1999) to have reported participating in an induction program in 1998–99 than in 1993–94 (65 vs. 59 percent).

Course content

Research shows that as students take higher level academic courses they learn more (Raizen and Jones 1985; Sebring 1987). From 1982 to 1998, there was an increase in the percentage of students enrolling in higher level mathematics and science courses (National Center for Education Statistics 2000). High school graduates in 1998 were more likely than their 1982 counterparts to take more advanced mathematics courses, such as algebra II, trigonometry, precalculus, and calculus. In science, the trend is similar. High school graduates in 1998 were more likely to take chemistry II or physics II and physics I and chemistry I (National Center for Education Statistics 2000). Despite these encouraging signs, the experience is not reflected equally among racial/ethnic and income groups. In 1998, white and Asian/Pacific Islander high school graduates were usually more likely than black, Hispanic, and American Indian/Alaska Native students to complete advanced academic level mathematics and the highest level science courses (National Center for Education Statistics 2000). Students from low-income families were less likely than students from higher income families to be enrolled in a college preparatory track through which they would be more likely to take such courses (Green et al. 1995).

Technology

Research suggests that student learning is enhanced by computers when the computers are used to teach discrete skills (President's Committee of Advisors on Science and Technology, Panel on Educational Technology 1997). Computer availability and usage are increasing in schools (Anderson and Ronnkvist 1999). In 1999, there was an average of 6 students for each computer, up from a 125 to 1 ratio in 1983 (Coley, Cradler, and Engel 1997; Williams 2000). Internet access existed at 95 percent of public schools in 1999, up from 35 percent in 1994 (Williams 2000). Internet access is likely to be used most if the computers are in instructional rooms. Over half (63 percent) of all instructional rooms (classrooms, computer or other labs, and library media centers) had access to the Internet in 1999, up from 3 percent 5 years before (Williams 2000). For schools with high concentrations of poverty (more than 70 percent eligible for free or reduced-price lunch), 39 percent of all instructional rooms had Internet access compared with 62 to 74 percent for schools with lower concentrations of poverty (Williams 2000).

Class size

Researchers have found that greater gains in student achievement occur in classes with 13 to 20 students compared with larger classes, especially for primary-grade disadvantaged and minority students (Krueger 1998; Mosteller, Light, and Sachs 1996; Robinson and Wittebols 1986). In 1998, the average public elementary school class had 23 students (Lewis et al. 1999). Large-scale efforts to reduce class size may result in negative consequences if, as was the case recently in California, large numbers of unqualified teachers are hired because there are not enough qualified teachers available to staff the smaller classes (Bohrnstedt and Stecher 1999).

Discipline

Researchers have found that a positive disciplinary climate is directly linked to student learning (Barton, Coley, and Wenglinsky 1998; Bryk, Lee, and Holland 1993; Chubb and Moe 1990). Research also suggests that the most effective policies to reduce the incidence of offenses in a school vary according to the targeted behavior. To reduce serious incidents, including drug offenses, only a policy of severe punishment seems to be effective (Barton, Coley, and Wenglinsky 1998). Serious violent crime incidents occurred in 10 percent of all public schools in 1996–97 (Kaufman et al. 1999). The level of school-related criminal behavior changed little between 1976 and 1997, and no differences in victimization rates were found between white and black high school seniors in 1997 (National Center for Education Statistics 1999). However, the percentage of middle and high school students who fear attack or other bodily harm while at school has been on the rise. In each year from 1989 to 1995, a larger proportion of black and Hispanic students than white students feared attacks at school, and the percentage of black students who feared for their safety nearly doubled between 1989 and 1995 (Kaufman et al. 1999).

Academic environment

Students learn more in schools that emphasize high academic expectations (Bryk, Lee, and Holland 1993; Chubb and Moe 1990), and academic expectations have been on the rise (National Center for Education Statistics 1998). The percentage of public school districts with graduation requirements that meet or exceed the National Commission on Excellence in Education (NCEE) recommendations (4 years of English, 3 years of mathematics, 3 years of science, 3 years of social studies, and a half year of computer science) increased from 12 to 20 percent between 1987–88 and 1993–94 (National Center for Education Statistics 1998). A common criticism of the NCEE recommendations is that they only specify the number of courses to be taken, not their rigor. But there is evidence that increasing numbers of students have been enrolling in more difficult courses. From 1982 to 1998, there was an increase in the percentage of students enrolling in higher level mathematics and science courses (National Center for Education Statistics 2000).

Summary

School quality needs to be defined, assessed, and monitored if we are to ensure the existence of quality schools (Special Study Panel on Education Indicators 1991). This report highlights 13 indicators of school quality that recent research suggests may be related to student learning and identifies where and why more precise measures are needed. These indicators fall into three categories: the characteristics of teachers, the characteristics of classrooms, and the characteristics of schools as organizations. Research suggests that students learn more from teachers with high academic skills and teachers who teach subjects related to their undergraduate or graduate training than they do from teachers with low academic skills and teachers who teach subjects unrelated to their training. In addition, students, on average, learn more from teachers with 3 or more years of teaching experience than they do from teachers with less experience. Though the research is less conclusive regarding professional development, experts agree that participation in high-quality professional development should lead to better teaching. At the level of the classroom, research suggests that students benefit from a focused and rigorous curriculum, time spent using computers, and being in smaller classes. We still need to learn more about the relationship between pedagogy and student learning. At the school level, a school's goals, leadership, faculty, discipline policy, and academic environment are all indicators of school quality. Student learning, however, is thought to occur primarily as a result of students' interaction with teachers, other students, and the curriculum, and the link between learning and these factors is not firmly established for all of these indicators.

Better measures are needed to accurately monitor the status of school quality, especially for indicators of pedagogy, school leadership, goals, and professional community. Furthermore, certain important facets of professional development, course content, technology, academic environment, and discipline are missing. Finally, even when quality data are available, they lose their value if they are not appropriately defined and kept up to date. Moreover, even though experts would agree that certain indicators should show changes in student learning, there is not always concrete statistical evidence to support their supposition; improving the data collected on the dimensions of schools thought to be associated with school quality should help us better understand the relationship of these indicators to student learning.

The findings documented in this report, like all research, are time sensitive and part of an iterative process. The status of schools as identified by indicators with high-quality data is changing rapidly and will need to be continually updated. As research on school effectiveness proceeds, indicators with only poor-quality data will need to be improved to understand the complete picture of school quality as recommended by the Special Study Panel on Education Indicators for NCES.

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Advanced Telecommunications in U.S. Private Schools: 1998–99

Basmat Parsad, Rebecca Skinner, and Elizabeth Farris

This article was originally published as the Executive Summary of the Statistical Analysis Report of the same name. The sample survey data come primarily from the "Survey on Advanced Telecommunications in U.S. Private Schools: 1998–99," conducted through the NCES Fast Response Survey System (FRSS). Other data sources are listed at the end of this article.

Background

Throughout the past decade, there have been a number of federal, state, and private initiatives to expand computer and Internet use in schools. These initiatives have been rooted in the national technology goals to make computers accessible to every student, connect every classroom to the Internet, integrate educational software into the curriculum, and train teachers to integrate technology into the classroom (U.S. Department of Education 1998). In 1994, the National Center for Education Statistics (NCES) launched a series of annual surveys to track changes in the availability of computers and Internet access in public schools.

In fall 1995, NCES also conducted a survey of advanced telecommunications in private schools to provide baseline data on computer and Internet availability, and allow for comparisons with public schools (Heaviside and Farris 1997). To revisit the issue of computer and Internet availability in private schools and measure changes since 1995, NCES, through its Fast Response Survey System (FRSS), administered a second nationally representative survey of advanced telecommunications in private schools during the 1998–99 school year.

Specifically, the 1998–99 survey focused on (1) computer and Internet availability, including the extent to which those resources were available for instruction; (2) selected issues in the use of computers and the Internet, including instructional use of those resources, provision of teacher training, technical support for advanced telecommunications use, and barriers to the acquisition and use of advanced telecommunications; and (3) the Education-rate discount (E-rate) program and other external support for advanced telecommunications in schools.

Computer and Internet Availability in Private Schools

Making available sufficient and adequate hardware is a critical first step toward ensuring student access to computers. In the 1998–99 school year, private schools reported six students per computer (including computers used for administrative purposes), a lower level of availability than the four to five students per computer recommended by some technology experts (President's Committee of Advisors on Science and Technology 1997). Considering availability for instructional purposes, there were 8 students per *instructional* computer in private schools. Among private schools with Internet access, there were 15 students per *Internet-connected* instructional computer.

Private schools have made considerable strides in computer and Internet availability since 1995. Examples include the following:

- The number of students per computer (including computers used for administrative purposes) fell from nine in fall 1995 to six in the 1998–99 school year.
- The proportion of private schools connected to the Internet increased from 25 percent in 1995 to 67 percent in 1998–99. An additional 13 percent of private schools indicated they had plans for Internet connection by the end of 2000; if these plans are realized, then about 80 percent of all private schools are currently connected or will have Internet connections by the end of 2000. However, 19 percent of private schools reported not being connected to the Internet and having no plans to be connected.

Availability of the Internet for instruction

School-level access to the Internet does not reflect the extent to which that resource might be available for instruction. Therefore, private schools also reported on the number of instructional rooms with Internet connections, types of connection, and the extent to which the World Wide Web (WWW) and electronic mail (e-mail) were available to various members of the school community. Findings from the 1998–99 survey indicate the following:

- Twenty-five percent of all instructional rooms in private schools were connected to the Internet in the 1998–99 school year, compared with 5 percent in fall 1995.
- Although dial-up connections were the most common means of connecting to the Internet in 1998–99 (65 percent of private schools with Internet access

reported using such connections), private schools have increased the availability of higher speed connections using dedicated lines.

- About two-thirds of private schools reported having e-mail or WWW availability. However, e-mail was more likely to be available to administrators than teachers and least likely to be available to students.

Differences in computer and Internet availability by school characteristics

Comparisons on the availability and use of computers and the Internet were focused mainly on differences by religious affiliation and instructional level of the school. The results of the 1998–99 survey indicate the following:

- Nonsectarian schools had fewer students (six) per *instructional* computer than Catholic (eight) or other religious schools (nine). While Catholic schools were more likely than nonsectarian or other religious schools to be connected to the Internet (figure A) and to report having e-mail and WWW availability, nonsectarian schools reported a higher proportion of instructional rooms with Internet access.
- Secondary schools were more likely than elementary or combined schools to be connected to the Internet and to report the availability of high-speed connections using dedicated lines. They were also more likely to report that e-mail and the WWW were available to students. Among schools with Internet access, moreover, the ratio of students per instructional computer with Internet access was lower at secondary and combined schools than at elementary schools (figure B).

Use of and School Support for Advanced Telecommunications in Private Schools

Issues in advanced telecommunications that have become increasingly important within recent years relate to whether teachers and students are making use of available advanced telecommunications, and the extent to which schools have support mechanisms in place to encourage effective use of those resources.

Use of advanced telecommunications by students and staff

The results of the 1998–99 survey indicate the following:

- Forty-five percent of all private school teachers in the 1998–99 school year regularly used computers and/or advanced telecommunications for teaching.
- Among private schools with Internet access, virtually all reported some use of e-mail and the WWW by students, teachers, and administrative staff. However, relatively fewer schools reported that these Internet capabilities were used to a large extent; for example, 31 percent reported that students used the WWW to a large extent and 24 percent indicated that teachers used this resource to a large extent.

School support for computer and Internet use

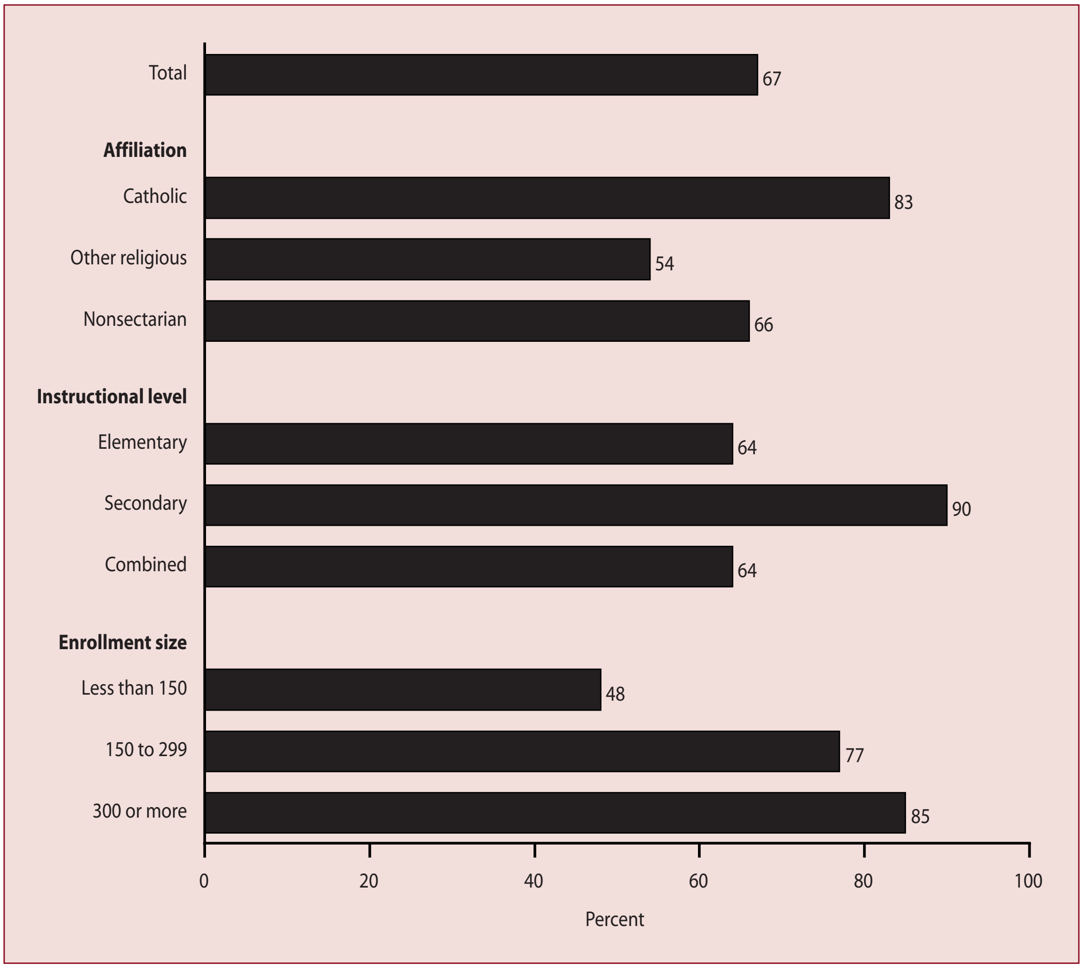
To explore the issue of school support for computer and Internet use, the survey asked whether schools (1) offered or participated in various types of advanced telecommunications training for teachers, (2) used various approaches to encourage teacher participation in technology training, and (3) provided technical support for advanced telecommunications use. The 1998–99 survey data indicate the following:

- Sixty-four percent of private schools offered or participated in some type of advanced telecommunications training for teachers, with the most common type of training being in the use of computers. About half of the schools offered or participated in training on the integration of technology into the curriculum, and 43 percent provided training on the use of the Internet.
- Of the schools that offered or participated in some type of technology training, 55 percent left it up to teachers to initiate the training, while fewer schools either mandated the training (16 percent) or actively encouraged teacher participation through incentives (22 percent).
- Most private schools (80 percent) indicated that one or more individuals were primarily responsible for supporting advanced telecommunications in the school. Of these schools, 41 percent indicated that the technology coordinator or other technical staff helped teachers to integrate technology into the curriculum to a large or moderate extent, and 42 percent reported that network technical support was provided to a large or moderate extent.

E-rate and Other External Support for Advanced Telecommunications in Private Schools

Expanding the use of advanced telecommunications comes with high costs, and private and public schools often have to rely on a range of support (including federal and private sources) to address their technology needs. Therefore,

Figure A.—Percent of private schools with Internet access, by selected school characteristics: School year 1998–99



SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Survey on Advanced Telecommunications in U.S. Private Schools: 1998–99," FRSS 68, 1999.

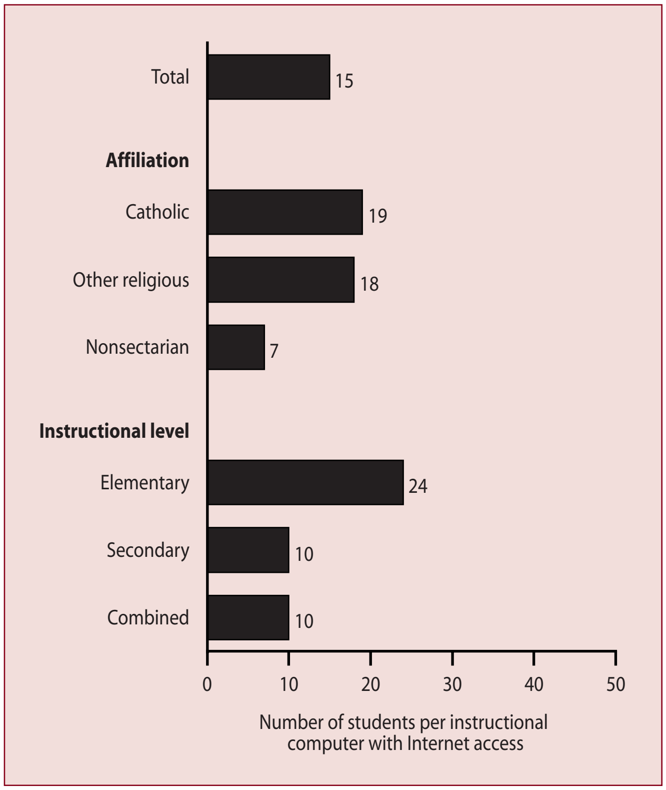
schools were asked about the support for advanced telecommunications from various sources during the 1998–99 school year. Results include the following:

- Private schools indicated that they received support from several sources for advanced telecommunications in the school, including various federal programs (ranging from 2 to 15 percent of private schools) and business or industry (22 percent of private schools).
- The most frequently cited source of support was parents or other community members (57 percent of private schools), although the survey did not collect data on the extent of such support. Relatively few private schools (13 percent) reported support for advanced telecommunications from the E-rate program.

The E-rate program is designed to make telecommunications services more affordable to all eligible schools and libraries. The program provides discounts (ranging from 20 to 90 percent) that can be used for internal connections, telecommunications services, and Internet access (Bare and Meek 1998). The 1998–99 survey findings indicate the following:

- About one-fourth (24 percent) of all private schools applied for the 1998 E-rate program. Catholic schools were more likely than other religious and nonsectarian schools to apply for the 1998 program; elementary and secondary schools were more likely to apply than combined schools; and schools with Internet access were more likely to apply than those without access.

Figure B.—Among private schools with Internet access, ratio of students to instructional computers with Internet access, by selected school characteristics: School year 1998–99



NOTE: Data presented in this table are based on the number of schools with Internet access—67 percent of private schools.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Survey on Advanced Telecommunications in U.S. Private Schools: 1998–99," FRSS 68, 1999.

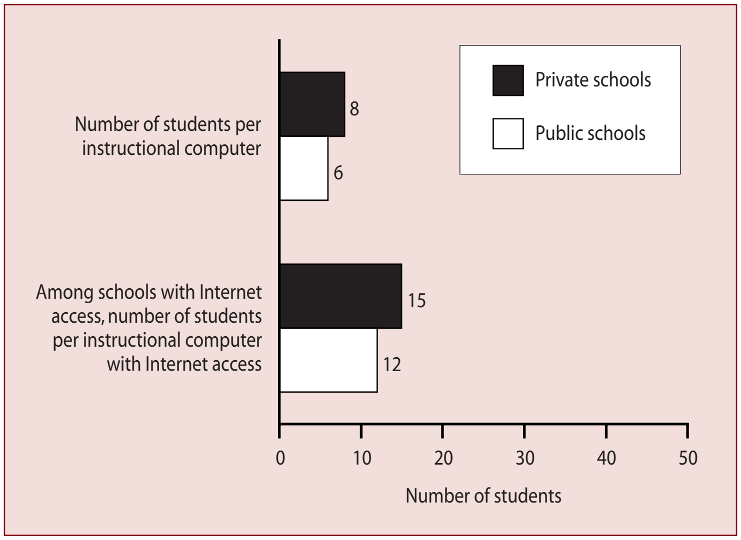
- When asked if they intended to apply or had already applied for the 1999–2000 E-rate program, 39 percent of all private schools indicated that they did, while 57 percent reported that they would not apply.

Selected Comparisons With Public Schools

Some of the gains made by private schools since 1995 have been comparable to those made by public schools. For example, the percentage point increase in private schools with Internet access between fall 1995 and the 1998–99 school year (42 percentage points) is comparable to increases for public schools (39 percentage points) during this period. Nevertheless, in the 1998–99 school year, private schools continued to be outpaced by public schools on some important indicators of the availability of advanced telecommunications—ratio of students to instructional computer, the proportion of Internet-connected schools, the proportion of instructional rooms with Internet access, and types of Internet connection. Examples include the following:

- Compared with public schools, private schools reported more students per *instructional* computer (8 vs. 6) and, among schools with Internet access, more students per instructional computer with Internet access (15 vs. 12 students) (figure C).
- Private schools (67 percent) were considerably less likely than public schools (89 percent) to be connected to the Internet, and they also reported proportionately fewer instructional rooms with Internet access (25 vs. 51 percent).
- Private schools were less likely than public schools to report higher speed Internet connections; for example, among schools with Internet access, 21 percent of private schools compared with 65 percent of public schools were connected to the Internet using dedicated lines (figure D).

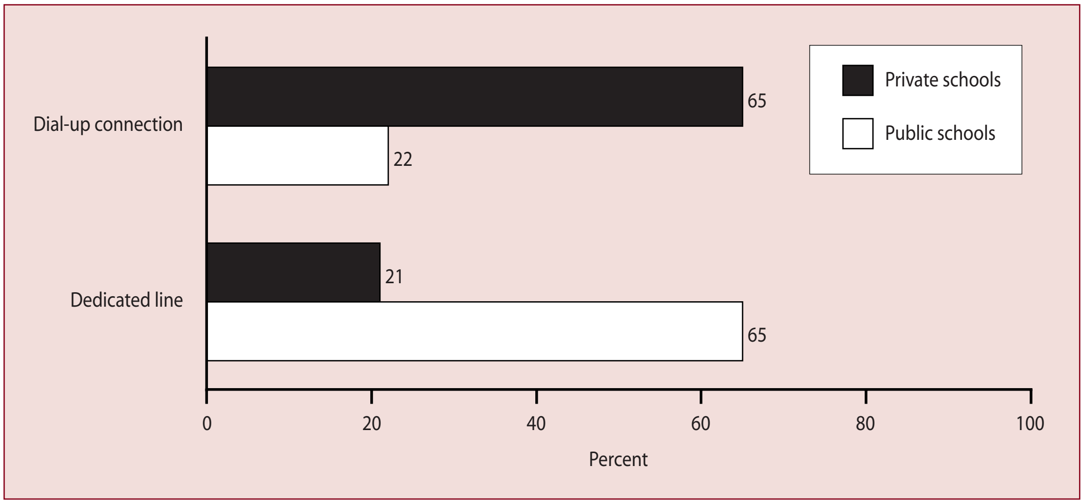
Figure C.—Ratio of students to instructional computer and ratio of students to instructional computer with Internet access, by school sector: Fall 1998 and school year 1998–99



NOTE: Private schools were surveyed during school year 1998–99. Public schools were surveyed in fall 1998.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System: "Survey on Advanced Telecommunications in U.S. Private Schools: 1998–99," FRSS 68, 1999; and "Survey on Internet Access in U.S. Public Schools, Fall 1998," FRSS 69, 1998.

Figure D.—Among schools with Internet access, percent by type of Internet connection and school sector: Fall 1998 and school year 1998–99



NOTE: Private schools were surveyed during school year 1998–99. Public schools were surveyed in fall 1998.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System: "Survey on Advanced Telecommunications in U.S. Private Schools: 1998–99," FRSS 68, 1999; and "Survey on Internet Access in U.S. Public Schools, Fall 1998," FRSS 69, 1998.

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Data sources:

NCES Fast Response Survey System: "Survey on Advanced Telecommunications in U.S. Private Schools: 1998–99," FRSS 68, 1999; "Survey on Advanced Telecommunications in U.S. Private Schools: K–12," FRSS 56, 1995; "Survey on Internet Access in U.S. Public Schools: Fall 1998," FRSS 69, 1998; "Survey on Internet Access in U.S. Public Schools: Fall 1997," FRSS 64, 1997; "Survey on Advanced Telecommunications in U.S. Public Schools: Fall 1996," FRSS 61, 1996; "Survey on Advanced Telecommunications in U.S. Public Schools, K–12," FRSS 57, 1995; "Survey on Advanced Telecommunications in U.S. Public Schools, K–12," FRSS 51, 1994.

Other NCES: Private School Survey, 1997–98; Common Core of Data (CCD), "Public Elementary/Secondary School Universe Survey," 1997–98.

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Cost Adjustments

A Primer for Making Cost Adjustments in Education

William J. Fowler, Jr., and David H. Monk

This article was originally published as the Executive Summary of the Research and Development Report of the same name.

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;
- 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.

Most people intuitively recognize geographic differences in costs and in measuring inflation. Efforts to compare the costs of exactly the same things in different geographic regions involve comparisons of the same "market basket" of goods in two geographic areas. The difference in the prices of the same market basket of goods is designed to reveal the differences in the cost of living in different geographic regions. Measuring cost differences in education, however, is difficult, since most of the costs are in personnel, rather than in supplies. This report attempts to explain the differences between education costs and expenditures, explain the differences in the "unit price" of teachers in different regions and differences over time in the level of inflation, examine existing indices that can be used to make judgments for these differences in costs, and outline a future plan of action to derive a precise, stable, and accurate index for school administrators and policymakers to use.

The Difference Between Cost and Expenditure

The cost of education can be defined as the minimum of what must be given up to accomplish some result. "Expenditure" is different from "cost" in that expenditures are not tied to results or outcomes and can exceed the minimum of what must be given up.

Education costs can be organized according to an allocation hierarchy where the lowest level is the unit cost of various inputs like teachers' time, space, and supplies. At the next level, there are costs that occur as the individual inputs are combined to form education services within classrooms and schools. Finally, at the uppermost level are the actual outcomes of schooling, where costs occur because of the presence of students with specialized needs of various kinds. Resource allocation decisions are made at each of these levels, and it is useful to keep them distinct because this can allow us to determine the relative magnitude of each source of cost.

Geographically Based Cost Adjustments

The purpose of a geographically based teacher price index is to determine the relative cost of engaging the services of comparable teachers. Some of the necessary components include teacher characteristics (level of experience, training, minority status, and gender), cost-of-living adjustments, regional amenities, employment amenities, nonteaching wages and employment opportunities in the region, union and collective bargaining, and demand for teacher quality. Several scholars have attempted to define a geographically based index. The Teacher Attribute Model is the result of Stephen Barro's (1994) approach. Barro did not strive to include all of the components outlined above in order to minimize the number of assumptions based on incomplete data. His estimate focuses on interstate comparisons and estimates what each state's average teacher's salary would be if the state employed teachers with the same average experience and training as that found in the nation as a whole.

Another approach has been characterized by McMahon and Chang (1991) as the "market-basket" approach. This approach does not focus on school personnel but rather on costs that are outside of the school's control, such as wages in other sectors of the economy and geographically based differences in the cost of living. One reason for this focus is to prevent a feedback loop rewarding schools that increase salaries. The basic components of this model include the value of housing, per capita income, the percent change in population for the preceding decade, and variables representing regions of the country. It can generate cost-of-living indices at several levels of aggregation.

The hedonic model (Chambers 1998) is a more ambitious approach that deals explicitly with each of the influences addressed by the models discussed above. The model is called "hedonic" because it is sensitive to whatever it is that teachers find attractive or unattractive about a given career opportunity. The Teacher Cost Index (TCI) (Chambers and Fowler 1995) is an example of this approach. Using Schools and Staffing Survey (SASS) data, it includes teacher characteristics (ethnicity, gender, education, and experience), working conditions (class size), and salary information. Other data sources, such as FBI crime statistics and U.S. Weather Bureau climate statistics, were used to assess regional amenities. Cost influences that the school has control over were statistically controlled while other influences were allowed to vary. The Geographic Cost-of-Education Index (Chambers 1998) is a more recent application of this approach. In this model, the index was broadened to include other types of inputs (school administrators and noncertified school personnel), and the range of data sources was widened. Both approaches run the risk of relying too much on potentially questionable data sources and assumptions.

The production function (PF) models are perhaps the most ambitious because they focus on the costs associated with actually realizing gains in educational performance. Unfortunately, a lack of adequate data and complete theoretical specifications for these PF models have hindered widespread practical use. However, in recent years these models have been applied to several states. For an example, see the application to New York in Duncombe, Ruggiero, and Yinger (1996). There also have been applications to Wisconsin and Texas.

A comparison of the three main models for geographically based cost adjustments (the Teacher Attribute, market-basket, and TCI models) demonstrates that the indices are highly correlated, at over .70. Also, the more adjustments that are made, the more the degree of variation drops. Despite the high correspondence between these indices, there are certain geographic regions where there is disagreement between the indices. A comparison between the hedonic and cost-of-living (market-basket) models might indicate, for example, that this discrepancy is due to the region's attractiveness (such as San Francisco) or unattractiveness (such as nonmetropolitan Connecticut) to most teachers.

Cost Adjustments Over Time

Adjusting for regional cost-of-living differences is only one of the challenges to producing a cost-of-education index. The other major challenge involves adjusting for cost-of-living differences over time. Different deflators can lead researchers to different conclusions.

The most common way of measuring inflation is the market-basket approach used by the Consumer Price Index (CPI), where the cost of commonly purchased items is tracked over time. The School Price Index (Halstead 1998) is one example of this approach that uses the Urban component of the CPI, the CPI-U. Unfortunately, this index can only be used at the national level. There are many problems with applying the CPI approach to education, especially the change of relevant products over time (item substitution) and the uneven growth of inflation for different occupational areas. Education is one of those occupations that has been strongly influenced by changes in technology. This makes it difficult to track inflation since the supplies bought today (such as the computer or VCR) are not really comparable to the supplies of a few decades ago (such as the typewriter or projector). The second problem is that some occupational areas (such as medicine) have seen strong inflation, while other areas have not. Rothstein and Mishel (1997) argue that factors such as the increase in quality due to smaller teacher/student ratios have made inflation greater for education. Their solution is to use the Net Services Index (NSI), which measures inflation by focusing on labor-intensive components of the CPI similar to education. However, they acknowledge that while the NSI is an improvement, it still produces an underestimate.

A second approach, the Inflationary Cost-of-Education Index, modifies the hedonic TCI to include school administrators and noncertified staff. However, given data limitations, this only provides a 6-year inflation index during the years SASS was administered.

The Employment Cost Index also avoids the market-basket approach by measuring the rate of change in employee compensation, which includes wages, salaries, and employers' costs for employees' benefits. It covers all occupations with the exception of federal government workers and is used extensively by the Federal Reserve Board as a measure of inflation. It has an education subscale and has separate data on salaries as well as fringe benefits. Of all of the indices, this one is the most attractive because it avoids the pitfalls of item substitution found in the market-basket approach and has a large time frame (1981 to 1996) available.

Using Geographic and Inflation Deflators

Both geographic and inflation cost adjustments suffer from many flaws. Overall, there is correspondence between different geographic indices; however, for a particular geographic area the results can be dramatically different. Given the political nature of these adjustments, such discrepancies can be as problematic as they are informative. While the addition of more adjustments leads to a reduction of variability and arguably greater accuracy, policymakers' reluctance to use adjustments is understandable.

Lessons to Learn and Directions for Future Work

There are two primary goals for the future of geographic cost adjustments: improve the indices of cost variations and educate the public and policymakers about any progress that is made. The basic challenges are to make the indices generalizable across different levels (local, state, and regional), separate and distinguish influences that are controllable by the school, be careful of double counting when adding new adjustments, and address any political considerations.

The following are some guiding principles for policymakers to consider as they seek to take advantage of what has been learned about variations in the costs of education:

- Keep the indices as simple and understandable as possible.
- Strive to reach consensus about the extent to which you wish to make cost adjustments in full knowledge of the flaws that remain in the available tools.
- Keep in mind that not all adjustments are beneficial to all parties. Be particularly wary of flawed adjustments that benefit one set of political interests over others.
- Provide for gradual phase-ins. Consider "quasi-leveling up" strategies and take advantage of inflation, which includes annual natural increases.
- Place primary emphasis on supporting the further improvement of the available indices.

A more sophisticated index will allow policymakers to more accurately identify what costs are the results of regional differences and what changes in costs over time are the result of different decisions and factors. This will allow a more efficient allocation of education resources. Both the public and policymakers need to be informed of progress made in this area so the index can be better utilized and a consensus can be reached on the appropriate approach to measuring geographic and inflationary differences in education costs.

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Higher Sticker Prices

Undergraduates Enrolled With Higher Sticker Prices

John B. Lee

This article was originally published as the Executive Summary of the Statistical Analysis Report of the same name. The sample survey data are from the NCES National Postsecondary Student Aid Study (NPSAS).

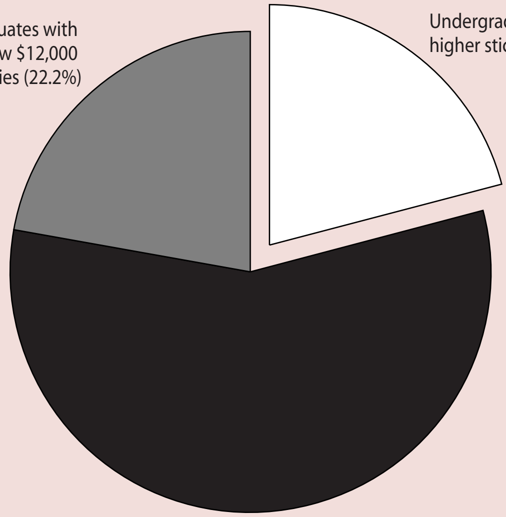
Introduction

This report investigates the reasons full-time, first-year undergraduates gave for choosing to enroll at higher sticker prices, how they paid their expenses, and the educational experiences associated with attendance. It also reviews how satisfied they were with their choice, how they rated their educational experience, how they paid for their education, and their first-year persistence.

For the purposes of this report, full-time, first-year undergraduates attending 4-year institutions are divided into three groups. First, "undergraduates with higher sticker prices" are those who faced at least $12,000 in tuition and required fees before any tuition remission, discounts, or financial aid award in the 1995–96 academic year, regardless of institution control or Carnegie classification. Second, undergraduates with sticker prices below $12,000 in the 1995–96 academic year attending public universities with the Carnegie classifications of Research Universities I or Research Universities II are the "undergraduates in public research universities." Third, undergraduates with sticker prices below $12,000 in the 1995–96 academic year attending all other institutions are the "undergraduates in other 4-year institutions."

The tables provide data on full-time, first-year undergraduates with higher sticker prices. Comparisons are made with undergraduates attending public research universities with sticker prices below $12,000. Undergraduates in public research universities with sticker prices below $12,000 were

Figure A.—Percentage distribution of full-time, first-year undergraduates in 4-year institutions, by sticker price and Carnegie classification: 1995–96



NOTE: The variable for sticker price and Carnegie classification groups undergraduates attending 4-year institutions into one of three unique categories. First, "undergraduates with higher sticker prices" are full-time, first-year undergraduates who faced at least $12,000 in tuition and required fees before any tuition remission, discounts, or financial aid award in the 1995–96 academic year, regardless of institution control or Carnegie classification. Second, undergraduates with sticker prices below $12,000 in the 1995–96 academic year attending public universities with the Carnegie classifications of Research Universities I or Research Universities II are the "undergraduates in public research universities." Third, undergraduates with sticker prices below $12,000 in the 1995–96 academic year attending all other institutions are the "undergraduates in other 4-year institutions."

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1995–96 National Postsecondary Student Aid Study (NPSAS:96), Undergraduate Data Analysis System.

chosen as a comparison group because many of these students show signs of being financially able to enroll at higher sticker prices. The third group of undergraduates—those attending other 4-year public institutions and private institutions with sticker prices below $12,000—is included in the tables, but not in the analysis.

Most of the undergraduates with higher sticker prices attended private, not-for-profit institutions, but some attended public institutions as out-of-state students. Twenty-one percent of all full-time, first-year undergraduates who attended 4-year institutions faced higher sticker prices (figure A).

Twenty-two percent of the full-time, first-year undergraduates who attended 4-year institutions enrolled in public research universities with sticker prices below $12,000. In many states, public research universities with sticker prices below $12,000 represent the most prestigious institutional choice available.

The source of data for this analysis was the 1995–96 National Postsecondary Student Aid Study (NPSAS:96). This data set provides a nationally representative sample of undergraduates enrolled in accredited postsecondary institutions. NPSAS:96 provides information about expenses and financial aid along with characteristics that distinguish undergraduates with higher sticker prices from those with sticker prices below $12,000 in public research universities.

In addition, the report provides information from NPSAS:96 about student characteristics associated with full-time undergraduate persistence in the first year of enrollment. Persistence is defined as attending full time at the same campus for at least 8 months during the year.

Student Characteristics

Nearly all of the full-time, first-year undergraduates who faced higher sticker prices or sticker prices below $12,000 in public research universities can be classified as traditional. Characteristics of traditional students include being single, younger than 24, and financially dependent on their parents. Also, the family incomes of the undergraduates attending institutions in the two institutional groups did not differ statistically (table A).

The percent of full-time, first-year undergraduates attending college out of state and the percent living on campus differentiated those who enrolled with higher sticker prices from those enrolling with sticker prices below $12,000 in public research universities. Fifty-five percent of full-time, first-year undergraduates with higher sticker prices enrolled in institutions out of state compared with 19 percent of those with sticker prices below $12,000 in public research universities. Further, 92 percent of the full-time, first-year undergraduates with higher sticker prices lived on campus compared with 74 percent of those with sticker prices below $12,000 in public research universities.

Finances

Financial aid, work, and parental support are the three major sources of financial support for undergraduates in both groups. Financial aid was received by 79 percent of the full-time, first-year undergraduates with higher sticker prices compared with 69 percent of those with sticker prices below $12,000 in public research universities (table B). Part of the difference can be accounted for by the difference in probability of receiving federally provided financial aid. Sixty-one percent of the full-time, first-year undergraduates with higher sticker prices received federal financial aid compared with 48 percent of those with sticker prices below $12,000 in public research universities.

Full-time, first-year undergraduates with higher sticker prices were more likely to have received grants, loans, or work-study than were those with sticker prices below $12,000 in public research universities. The most striking difference was noted for college work-study, which was received by one-third of the full-time, first-year undergraduates with higher sticker prices, compared with 7 percent of those with sticker prices below $12,000 in public research universities.

The majority of full-time, first-year undergraduates in both groups worked while they attended school. Full-time, first-year undergraduates with higher sticker prices were more likely to work 1 to 14 hours a week, whereas those with sticker prices below $12,000 in public research universities were more likely to work 15 hours or more per week. Thirty-seven percent of those with higher sticker prices worked between 1 and 14 hours per week during the school year compared with 18 percent of those with sticker prices below $12,000 in public research universities. One-quarter of the full-time, first-year undergraduates with sticker prices below $12,000 in public research universities worked 15 to 29 hours compared with 16 percent of those with higher sticker prices. Ten percent of the full-time, first-year undergraduates with sticker prices below $12,000 in public research universities worked 30 hours or more compared with 7 percent of those with higher sticker prices.

Parents also provided financial support. Ninety-two percent of the full-time, first-year undergraduates with higher sticker prices received parental help compared with 80 percent of those with sticker prices below $12,000 in public research universities.

Influences

Four influences differentiated full-time, first-year undergraduates with higher sticker prices from those with sticker prices below $12,000 in public research universities (table C). First, one-half of the full-time, first-year undergraduates with higher sticker prices indicated that institutional reputation was a reason for enrolling compared with 41 percent of those with sticker prices below $12,000 in public research universities. The second factor was receiving more financial aid. Twelve percent of full-time, first-year undergraduates with higher sticker prices indicated that the receipt of more financial aid was a reason for enrolling compared with 6 percent of those with sticker prices below $12,000 in public research universities. Third, faculty reputation was identified as an influence by 7 percent of the full-time, first-year undergraduates with higher sticker prices compared with 2 percent of those with sticker prices below $12,000 in public research universities. The fourth influence was the job placement rate. Five percent of the full-time, first-year undergraduates with higher sticker prices said job placement was an important consideration compared with 1 percent of those with sticker prices below $12,000 in public research universities.

Four influences differentiated full-time, first-year undergraduates with sticker prices below $12,000 in public research universities from those with higher sticker prices. First, 31 percent of full-time, first-year undergraduates with sticker prices below $12,000 in public research universities

Table A.—Percentage distribution of full-time, first-year undergraduates in 4-year institutions according to selected student characteristics, by sticker price and Carnegie classification: 1995–96

	Sticker price $12,000 or more*	Sticker price below $12,000	
	Undergraduates with higher sticker prices	Undergraduates in public research universities	Undergraduates in other 4-year institutions
Total	100.0	100.0	100.0
Marital status			
Not married	99.9	99.8	97.1
Married	0.1	0.2	2.6
Separated	(#)	(#)	0.3
Age			
23 or younger	99.7	99.0	95.2
24–30	0.2	0.6	3.1
31–39	0.1	0.2	1.2
40 or older	(#)	0.2	0.5
Dependency status			
Dependent	98.4	98.2	91.1
Independent	1.6	1.8	8.9
Income and dependency status			
Dependent			
Less than $20,000	9.6	14.0	17.7
$20,000–$39,999	15.9	17.4	22.6
$40,000–$59,999	21.5	22.1	21.2
$60,000–$79,999	18.9	17.1	14.8
$80,000 or more	32.5	27.6	14.8
Independent			
Less than $5,000	1.1	0.7	3.2
$5,000–$9,999	0.1	0.8	2.4
$10,000–$19,999	0.3	0.3	1.8
$20,000 or more	0.1	0.1	1.6
Student attended institution in state of legal residence			
Student attended institution in state	44.8	80.8	81.1
Student attended institution out of state	55.2	19.2	18.9
Student housing status, 1995–96			
On campus	92.4	73.6	55.7
Off campus	2.2	14.4	15.3
With parents or relatives	5.4	12.0	29.0
First-generation student			
Student was first generation	18.8	24.3	39.8
Student was not first generation	81.2	75.7	60.2

*The variable for sticker price and Carnegie classification groups undergraduates attending 4-year institutions into one of three unique categories. First, "undergraduates with higher sticker prices" are full-time, first-year undergraduates who faced at least $12,000 in tuition and required fees before any tuition remission, discounts, or financial aid award in the 1995–96 academic year, regardless of institution control or Carnegie classification. Second, undergraduates with sticker prices below $12,000 in the 1995–96 academic year attending public universities with the Carnegie classifications of Research Universities I or Research Universities II are the "undergraduates in public research universities." Third, undergraduates with sticker prices below $12,000 in the 1995–96 academic year attending all other institutions are the "undergraduates in other 4-year institutions."

#Estimate too small to report.

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

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1995–96 National Postsecondary Student Aid Study (NPSAS:96), Undergraduate Data Analysis System.

Table B.—Percentage distribution of full-time, first-year undergraduates in 4-year institutions according to type of aid and average hours worked while enrolled, by sticker price and Carnegie classification: 1995–96

	Sticker price $12,000 or more[1]	Sticker price below $12,000	
	Undergraduates with higher sticker prices	Undergraduates in public research universities	Undergraduates in other 4-year institutions
Total	100.0	100.0	100.0
Total aid			
Did receive aid	78.5	68.6	75.2
Did not receive aid	21.5	31.4	24.8
Federal aid (except VA/DOD)[2]			
Did receive federal aid	60.8	48.0	59.2
Did not receive federal aid	39.2	52.0	40.8
Grant aid			
Did receive grant aid	72.1	53.3	61.4
Did not receive grant aid	27.9	46.7	38.6
Loan (except PLUS)[3]			
Did receive loan	58.2	41.6	45.7
Did not receive loan	41.8	58.4	54.3
Work-study			
Did receive work-study	32.9	6.5	11.4
Did not receive work-study	67.1	93.5	88.6
Average hours worked per week while enrolled			
Did not work	40.9	46.4	36.9
Worked 1–14 hours or less while enrolled	36.8	18.3	16.4
Worked 15–29 hours while enrolled	15.8	25.2	29.0
Worked 30 hours or more while enrolled	6.5	10.1	17.7
Parents helped with direct contribution			
Student did receive direct contribution from parent	91.9	79.6	70.8
Student did not receive direct contribution from parent	8.1	20.4	29.2

[1]The variable for sticker price and Carnegie classification groups undergraduates attending 4-year institutions into one of three unique categories. First, "undergraduates with higher sticker prices" are full-time, first-year undergraduates who faced at least $12,000 in tuition and required fees before any tuition remission, discounts, or financial aid award in the 1995–96 academic year, regardless of institution control or Carnegie classification. Second, undergraduates with sticker prices below $12,000 in the 1995–96 academic year attending public universities with the Carnegie classifications of Research Universities I or Research Universities II are the "undergraduates in public research universities." Third, undergraduates with sticker prices below $12,000 in the 1995–96 academic year attending all other institutions are the "undergraduates in other 4-year institutions."

[2]Veterans Administration/Department of Defense.

[3]PLUS loans are unsubsidized variable-interest rate loans awarded to parents of dependent students who are able to meet criteria for creditworthiness.

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

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1995–96 National Postsecondary Student Aid Study (NPSAS:96), Undergraduate Data Analysis System.

indicated that being close to home was an important influence compared with 17 percent of those with higher sticker prices. The second factor was low tuition. Ten percent of the full-time, first-year undergraduates with sticker prices below $12,000 in public research universities indicated that low tuition was important compared with 1 percent of those with higher sticker prices. Third, 8 percent of those with sticker prices below $12,000 in public research universities indicated that friends or a spouse attending the school influenced their decision to enroll compared with 3 percent of those with higher sticker prices. The fourth factor was the option to live at home, which was a reason given by 5 percent of the full-time, first-year undergraduates with sticker prices below $12,000 in public research universities compared with 2 percent of those with higher sticker prices.

Table C.—Percentage distribution of full-time, first-year undergraduates in 4-year institutions according to selected undergraduates' reasons for attendance, by sticker price and Carnegie classification: 1995–96

	Sticker price $12,000 or more[1]	Sticker price below $12,000	
	Undergraduates with higher sticker prices	Undergraduates in public research universities	Undergraduates in other 4-year institutions
Total	100.0	100.0	100.0
Institution has good reputation			
Institution reputation was a reason for attendance	50.4	41.1	28.4
Institution reputation was not a reason for attendance	49.6	58.9	71.6
Received more financial aid			
Received more financial aid was a reason for attendance	12.3	5.5	6.4
Received more financial aid was not a reason for attendance	87.7	94.5	93.6
Faculty reputation			
Faculty reputation was a reason for attendance	7.0	2.2	3.9
Faculty reputation was not a reason for attendance	93.0	97.8	96.1
Institution job placement rate			
Job placement rate was a reason for attendance	4.6	1.2	2.2
Job placement rate was not a reason for attendance	95.4	98.8	97.8
Institution close to home			
Institution close to home was a reason for attendance	17.4	30.8	36.3
Institution close to home was not a reason for attendance	82.6	69.2	63.7
Low tuition[2]			
Low tuition was a reason for attendance	0.8	9.8	5.4
Low tuition was not a reason for attendance	99.2	90.2	94.6
Friends or spouse attend institution			
Friends or spouse attending was a reason for attendance	3.3	7.5	7.0
Friends or spouse attending was not a reason for attendance	96.7	92.5	93.0
Could live at home if attended			
Could live at home was a reason for attendance	1.8	4.5	6.0
Could live at home was not a reason for attendance	98.2	95.5	94.0

[1]The variable for sticker price and Carnegie classification groups undergraduates attending 4-year institutions into one of three unique categories. First, "undergraduates with higher sticker prices" are full-time, first-year undergraduates who faced at least $12,000 in tuition and required fees before any tuition remission, discounts, or financial aid award in the 1995–96 academic year, regardless of institution control or Carnegie classification. Second, undergraduates with sticker prices below $12,000 in the 1995–96 academic year attending public universities with the Carnegie classifications of Research Universities I or Research Universities II are the "undergraduates in public research universities." Third, undergraduates with sticker prices below $12,000 in the 1995–96 academic year attending all other institutions are the "undergraduates in other 4-year institutions."

[2]"Low" as interpreted by the respondent.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1995–96 National Postsecondary Student Aid Study (NPSAS:96), Undergraduate Data Analysis System.

Academic Differences

One measure of academic preparation, having SAT scores of 1,300 or more, differentiated full-time, first-year undergraduates with higher sticker prices from those with sticker prices below $12,000 in public research universities (table D). Seventeen percent of the full-time, first-year undergraduates with higher sticker prices achieved SATs of 1,300 or more compared with 10 percent of those with sticker prices below $12,000 in public research universities. Another difference noted was the distribution of undergraduates by their undergraduate grade-point averages (GPAs). Eighteen percent of the full-time, first-year undergraduates with sticker prices below $12,000 in public research universities achieved GPAs of less than 2.00 compared with 9 percent of those with higher sticker prices. Two other measures of academic preparation, the percent-

Table D.—Percentage distribution of full-time, first-year undergraduates in 4-year institutions according to selected undergraduates' academic differences, by sticker price and Carnegie classification: 1995–96

	Sticker price $12,000 or more*	Sticker price below $12,000	
	Undergraduates with higher sticker prices	Undergraduates in public research universities	Undergraduates in other 4-year institutions
Total	100.0	100.0	100.0
Scholastic Aptitude Test (SAT) score, combined verbal and mathematics			
Less than 1,000	33.0	40.4	73.5
1,000–1,299	50.3	50.1	23.5
1,300–1,600	16.7	9.5	3.0
Grade-point average (GPA)			
Less than 2.00	9.1	17.6	24.9
2.00–3.49	67.6	60.7	62.0
3.50 or higher	23.2	21.7	13.2
Number of Advanced Placement (AP) tests taken			
Student took one or more placement tests	48.0	44.2	18.6
Student took no placement test	52.0	55.8	81.4
Remedial courses			
Did take remedial courses	6.8	9.8	20.8
Did not take remedial courses	93.2	90.2	79.2
Undergraduate field of study			
Humanities, social, behavioral, life sciences	42.2	32.3	33.3
Physical sciences, engineering, computer science, mathematics	12.7	21.1	15.6
Education	7.3	6.4	11.6
Business, management	17.9	15.6	18.5
Health, other	19.8	24.7	21.1
Have social contact with faculty			
Never	33.9	50.1	44.9
Sometimes	49.9	42.2	42.3
Often	16.2	7.7	12.8

*The variable for sticker price and Carnegie classification groups undergraduates attending 4-year institutions into one of three unique categories. First, "undergraduates with higher sticker prices" are full-time, first-year undergraduates who faced at least $12,000 in tuition and required fees before any tuition remission, discounts, or financial aid award in the 1995–96 academic year, regardless of institution control or Carnegie classification. Second, undergraduates with sticker prices below $12,000 in the 1995–96 academic year attending public universities with the Carnegie classifications of Research Universities I or Research Universities II are the "undergraduates in public research universities." Third, undergraduates with sticker prices below $12,000 in the 1995–96 academic year attending all other institutions are the "undergraduates in other 4-year institutions."

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

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1995–96 National Postsecondary Student Aid Study (NPSAS:96), Undergraduate Data Analysis System.

age of full-time, first-year undergraduates taking advanced placement tests or taking remedial classes, were not significantly different between the two groups.

The mix of academic majors chosen by full-time, first-year undergraduates differed between the two undergraduate categories. Forty-two percent of the full-time, first-year undergraduates with higher sticker prices majored in humanities, social, behavioral, and life sciences compared with 32 percent of those with sticker prices below $12,000 in public research universities. Twenty-one percent of full-time, first-year undergraduates with sticker prices below $12,000 in public research universities majored in physical sciences, engineering, computer science, or mathematics

Table E.—Percentage distribution of full-time, first-year undergraduates in 4-year institutions according to selected undergraduates' satisfaction characteristics, by sticker price and Carnegie classification: 1995–96

	Sticker price $12,000 or more[1]	Sticker price below $12,000	
	Undergraduates with higher sticker prices	Undergraduates in public research universities	Undergraduates in other 4-year institutions
Total	100.0	100.0	100.0
Course availability			
Satisfied with course availability	83.2	70.2	75.4
Not satisfied with course availability	16.8	29.8	24.6
Instructors' ability to teach			
Satisfied with instructors' ability to teach	95.2	86.9	88.1
Not satisfied with instructors' ability to teach	4.8	13.1	11.9
Class size			
Satisfied with class size	96.6	78.0	93.5
Not satisfied with class size	3.4	22.0	6.5
Social life			
Satisfied with social life	89.9	93.6	90.4
Not satisfied with social life	10.1	6.4	9.6
Sports and recreational activities[2]			
Satisfied with sports and recreational activities	91.7	96.4	92.7
Not satisfied with sports and recreational activities	8.3	3.6	7.3

[1]The variable for sticker price and Carnegie classification groups undergraduates attending 4-year institutions into one of three unique categories. First, "undergraduates with higher sticker prices" are full-time, first-year undergraduates who faced at least $12,000 in tuition and required fees before any tuition remission, discounts, or financial aid award in the 1995–96 academic year, regardless of institution control or Carnegie classification. Second, undergraduates with sticker prices below $12,000 in the 1995–96 academic year attending public universities with the Carnegie classifications of Research Universities I or Research Universities II are the "undergraduates in public research universities." Third, undergraduates with sticker prices below $12,000 in the 1995–96 academic year attending all other institutions are the "undergraduates in other 4-year institutions."

[2]Includes only respondents who participated in sports and recreational activities.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1995–96 National Postsecondary Student Aid Study (NPSAS:96), Undergraduate Data Analysis System.

compared with 13 percent of those with higher sticker prices.

Full-time, first-year undergraduates with higher sticker prices were also more likely to report that they often had social contact with the faculty than were those with sticker prices below $12,000 in public research universities.

Satisfaction

Nearly all full-time, first-year undergraduates in both groups were satisfied with the social life and the sports and recreational activities on their campus (table E). However, full-time, first-year undergraduates with sticker prices below $12,000 in public research universities were even more likely to be satisfied with the social life and the sports and recreational activities (94 and 96 percent, respectively) than were those with higher sticker prices (90 and 92 percent, respectively). Satisfaction with the academic experience was higher for full-time, first-year undergraduates with higher sticker prices than it was for those with sticker prices below $12,000 in public research universities. Full-time, first-year undergraduates with higher sticker prices were more likely than those with sticker prices below $12,000 in public research universities to be satisfied with availability of courses, instructors' ability, and class size.

Persistence

Multivariate analysis techniques were used to find that full-time, first-year undergraduates with higher sticker prices were more likely to persist in their first year than were those with sticker prices below $12,000 in public research universities. Further, the multivariate statistical techniques found that student characteristics did not explain the difference in persistence. Persistence is defined as attending full time at the same campus for at least 8 months during the year.

Conclusions

Undergraduates attending institutions with sticker prices of $12,000 or more and those with sticker prices below $12,000 in public research universities include a high proportion of younger and academically prepared undergraduates. Differences in family incomes of full-time, first-year undergraduates in the two groups were not significantly different.

Full-time, first-year undergraduates in the two groups had different reasons for attending their institutions. For example, a larger percentage of full-time, first-year undergraduates with higher sticker prices indicated factors such as institutional reputation, financial aid, and job placement as reasons for attending their institution compared with those with sticker prices below $12,000 in public research universities.

Data source: The NCES 1995–96 National Postsecondary Student Aid Study (NPSAS:96).

For technical information, see the complete report:

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Majors & Employment Outcomes

From Bachelor's Degree to Work: Major Field of Study and Employment Outcomes of 1992–93 Bachelor's Degree Recipients Who Did Not Enroll in Graduate Education by 1997

Laura J. Horn and Lisa Zahn

This article was originally published as the Executive Summary of the Statistical Analysis Report of the same name. The sample survey data are from the NCES Baccalaureate and Beyond Longitudinal Study (B&B).

Introduction

The analysis described in this report investigates the relationship between undergraduate major and early employment outcomes among 1992–93 college graduates who did not pursue graduate education within 4 years after earning their bachelor's degree (i.e., as of 1997). The analysis is based on the "Second Follow-up" to the 1992–93 Baccalaureate and Beyond Longitudinal Study (B&B:93/97), which tracks students who received a bachelor's degree in academic year 1992–93. Participants were first sampled and surveyed in their year of graduation as part of the 1993 National Postsecondary Student Aid Study (NPSAS:93). The "First Follow-up" (B&B:93/94) was conducted 1 year later and provided additional information. In 1997 (approximately 4 years after graduation), B&B participants were contacted again, for the "Second Follow-up." In both follow-up surveys, participants reported on many aspects of their employment.

The 1992–93 college graduates who did not pursue graduate education within 4 years after earning their bachelor's degree represented 70 percent of all graduates, and most entered the labor market immediately after finishing their degree. These college graduates entered a labor market in the midst of an economic recovery following a 2-year recession (Mishel and Bernstein 1994, p. 13). By 1997, the economy was strong and jobs were plentiful. Four years after most earned their bachelor's degree, nearly all college graduates who had not enrolled in graduate school were working full time. The findings of this study confirm what has been reported consistently in other studies about earnings: college graduates who major in the applied fields of engineering, business, computer science, nursing, and other health fields earn higher-than-average full-time salaries.

This study also examined other aspects of employment, including job stability, job benefits, and job satisfaction. Taking into account all these aspects along with salary, engineering and computer science stood out as the fields with the most consistent favorable employment outcomes for bachelor's degree recipients. In contrast, education and humanities and arts majors experienced the least favorable outcomes. Graduates of nursing, business, and engineering programs experienced greater-than-average job stability.

Results were mixed for social science and biological science majors. Those in social sciences reported lower-than-average salaries in 1994, but not in 1997. The opposite was true for those majoring in biological/interdisciplinary sciences: they reported average salaries in 1994, but in 1997 their salaries were lower than average. The salaries of mathematics/physical science majors did not differ from those of all graduates in either year, nor did the rate at which their full-time salaries increased between 1994 and 1997.

Field of Study

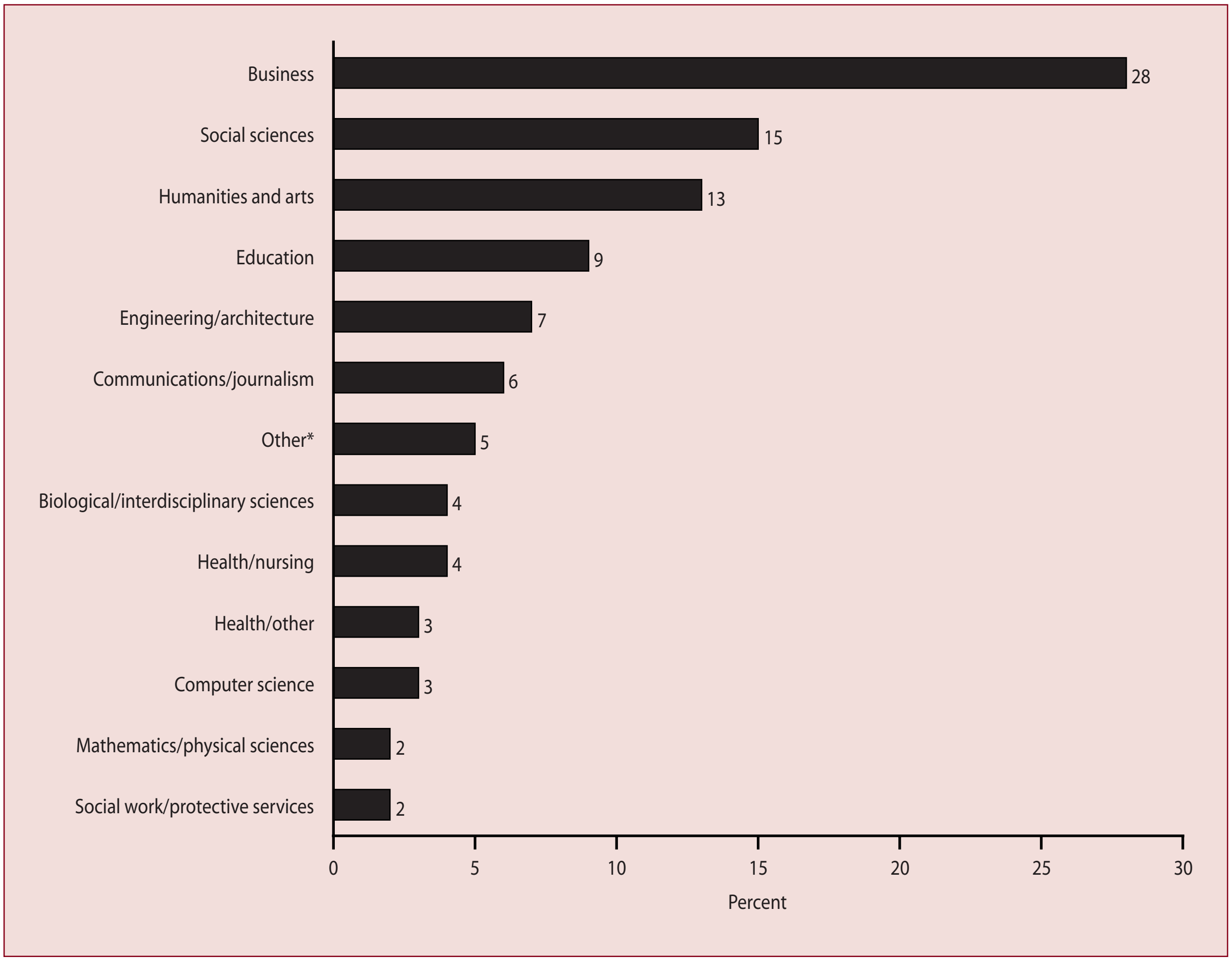
By far, the most popular undergraduate field of study was business. Over one-quarter (28 percent) of 1992–93 college graduates who did not attend graduate school by 1997 had majored in a business-related field (figure A). Following business, 15 and 13 percent, respectively, had majored in social sciences or humanities and arts. Nearly 1 in 10 had majored in education (9 percent), while approximately 7 percent had majored in engineering or architecture.[1]

Consistent with historically gender-dominated fields, men were more likely than women to major in engineering (13 vs. 2 percent), computer science (4 vs. 2 percent), and business (32 vs. 24 percent), while women were more likely than men to major in education (13 vs. 4 percent), nursing (6 vs. 1 percent), and other health fields (4 vs. 2 percent).

Business fields tended to attract older college graduates: more than one-third of graduates age 30 or older when receiving their bachelor's degree had majored in business (35 percent), compared with just over one-quarter (27 percent) of those age 22 or younger. Asian/Pacific Islander college graduates were more likely than black, non-Hispanic graduates to favor engineering as a major. To further illustrate racial/ethnic group differences in undergraduate major,

[1] Nearly all were engineering majors; less than 1 percent of all graduates majored in architecture. Henceforth, they are referred to as "engineering majors."

Figure A.—Percentage distribution of major field of study for 1992–93 bachelor's degree recipients who had not enrolled in graduate education by 1997



*Other includes agriculture, natural resources, forestry, textiles, home economics, law, library science, military science, leisure studies, basic/personal skills, industrial arts, precision production, and transportation.

NOTE: Details may not sum to 100 due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1992–93 Baccalaureate and Beyond Longitudinal Study, "Second Follow-up" (B&B:93/97), Data Analysis System.

a report based on the 1992 Integrated Postsecondary Education Data System "Completions Survey" (IPEDS-C:1992–93) also showed that black, non-Hispanic graduates were more likely than others to complete degrees in business management and less likely to earn degrees in education or health (Morgan and Broyles 1995).

1997 Employment Status and Occupation

Unemployment was not a problem for most 1992–93 college graduates who had not pursued graduate education. In 1997, within 4 years of graduating, just 2 percent were unemployed,[2] while almost all (86 percent) reported working full time. Compared with all graduates, business, engineering, and computer science majors were more likely to be employed full time (over 90 percent), while humanities and arts majors were less likely to work full time (79 percent).

Job stability, as measured by the percentage of graduates with any unemployment spells, the number of jobs worked

[2]As a point of comparison, the overall unemployment rate was 5 percent in 1997 (U.S. Department of Labor 1999, table 56).

Table A.—Among 1992–93 bachelor's degree recipients who had not enrolled in graduate education by 1997, the average number of jobs worked, the percentage with any unemployment, and the average number of months worked at April 1997 job, by major field of study

	Average number of jobs begun since graduation	Percentage with any unemployment since graduation	Number of months worked in April 1997 job[1]
Total	2.3	39.5	27.5
Bachelor's degree major			
Applied fields			
Education	2.6	51.7	28.1
Business	1.9	33.1	29.8
Engineering/architecture	1.8	40.6	32.0
Computer science	1.9	39.4	29.6
Health/nursing	1.6	19.0	32.8
Health/other	1.9	30.0	30.9
Communications/journalism	2.8	47.3	24.3
Social work/protective services	2.2	36.6	29.3
Academic fields			
Humanities and arts	2.9	46.5	23.9
Biological/interdisciplinary sciences	2.5	48.8	25.3
Mathematics/physical sciences	2.5	42.9	27.5
Social sciences	2.5	41.9	25.2
Other[2]	2.3	34.8	25.9

[1]Maximum possible is 52. Dates were bounded between 1/1/93 and 4/30/97.

[2]Other includes agriculture, natural resources, forestry, textiles, home economics, law, library science, military science, leisure studies, basic/personal skills, industrial arts, precision production, and transportation.

NOTE: Compared to all graduates, gray box = higher than average; white box = lower than average (p<0.05).

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1992–93 Baccalaureate and Beyond Longitudinal Study, "Second Follow-up" (B&B:93/97), Data Analysis System.

since bachelor's degree attainment, and the average number of months worked in the April 1997 job, was high for graduates who had majored in nursing, engineering, or business. Graduates in all three fields worked in fewer jobs than all graduates and had worked in their April 1997 job longer (table A). Nursing majors also were much less likely to report any spells of unemployment since earning their bachelor's degree. Conversely, those with majors in communications/journalism or humanities and arts fields worked in more jobs since graduation and fewer months in their April 1997 job than all graduates.

College graduates who had majored in applied fields[3] were very likely to be employed in occupations related to their majors (table B). This was especially true for those majoring in nursing and other health fields, among whom 96 and 68 percent, respectively, were employed as medical professionals. In addition, nearly three-quarters of education majors (74 percent) worked as teachers, and 60 percent of engineering majors as engineers.[4] Similarly, 60 percent of social work/protective service majors were working in social service fields. There was an exception to this pattern, however, for communications/journalism majors, who were more likely than graduates in any other field to be working in service occupations (33 percent).

For academic fields,[5] roughly one-quarter of college graduates with majors in either biological sciences or mathematics/physical sciences were working as teachers, and roughly the same percentage in both fields worked in

[3]Applied fields in this study are education, business, engineering/architecture, computer science, nursing, other health fields, social work/protective services, and communications/journalism.

[4]Consistent with this finding, the National Science Foundation reports that 57 percent of engineering majors work in a job closely related to their degree 1 to 5 years after bachelor's degree attainment (National Science Board 2000, Appendix table 3-1).

[5]Academic fields include humanities and arts, biological sciences, mathematics and physical sciences, and social sciences.

Table B.—Percentage distribution of 1992–93 bachelor's degree recipients who had not enrolled in graduate school by 1997, according to their occupation in April 1997, by major field of study

	Educators	Business or management	Engineering/ software engineers/ architecture	Computer science	Medical professionals	Editors/ writers/ performers	Human/ protective service professionals	Research/ scientists/ technical	Administrative/ clerical/ legal support	Mechanics/ laborers	Service occupations
Total	12.5	29.3	5.4	4.9	7.0	4.9	5.9	4.7	5.5	3.9	14.6
Bachelor's degree major[1]											
Applied fields											
Education	73.9	7.0	0.0	0.3	2.1	1.0	1.4	1.2	4.3	2.8	5.2
Business	3.7	55.8	0.8	5.2	0.5	0.9	2.0	1.8	4.7	3.5	20.3
Engineering	1.4	7.5	59.7	6.1	1.1	1.0	0.5	9.0	1.2	7.5	3.9
Computer science	3.7	12.5	12.9	57.9	1.0	0.0	0.9	3.3	1.3	2.2	3.3
Nursing	0.5	2.8	0.0	0.5	96.2	0.0	0.0	0.0	0.0	0.0	0.0
Health/other	7.3	7.5	0.0	0.9	68.3	0.0	3.3	3.6	2.7	0.5	6.0
Comm./journalism	4.1	22.8	0.3	2.8	0.6	23.0	1.9	3.2	5.6	2.5	33.0
Social work/prot. serv.	6.8	10.5	0.0	0.0	2.0	0.0	59.8	0.9	10.9	1.6	6.7
Academic fields											
Humanities	17.8	23.4	1.0	3.7	2.0	17.0	4.8	4.0	6.3	3.8	15.0
Biological/interdis. sci.	24.6	14.6	1.5	0.8	16.2	1.7	1.5	23.6	2.3	5.2	6.2
Math/phys. sciences	26.2	11.5	9.0	7.3	0.8	0.6	1.7	24.0	5.8	4.0	8.4
Social sciences	8.8	31.9	0.3	1.2	3.1	2.3	16.4	3.5	9.3	3.0	17.7
Other[2]	8.0	32.0	1.2	1.5	3.5	5.6	8.8	5.0	5.4	12.3	15.2

[1]For full labels of major fields, see table A.

[2]Other includes agriculture, natural resources, forestry, textiles, home economics, law, library science, military science, leisure studies, basic/personal skills, industrial arts, precision production, and transportation.

NOTE: Details do not sum to 100 because the "other" occupation group (1.4 percent) is not included. Gray boxes indicate the occupations with the highest percentage of graduates for a given major. If less than 50 percent, then two or more occupations (up to 50 percent) were identified.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1992–93 Baccalaureate and Beyond Longitudinal Study, "Second Follow-up" (B&B:93/97), Data Analysis System.

occupations related to research, science, or technical work. Social science majors, on the other hand, were likely to be employed in business occupations (32 percent), followed by service occupations (18 percent) and human and protective services (16 percent).

Full-Time Salaries

As shown in table C, college graduates with degrees in nursing or other health fields reported higher-than-average full-time salaries for their April 1994 job, compared with all graduates ($34,194 and $35,515, respectively, vs. $26,464).[6] The same applied to those who had majored in either engineering ($32,217) or business ($29,017). In contrast, education majors had lower-than-average 1994 full-time salaries ($20,443),[7] as did those with majors in social work/protective services ($21,328), communications/journalism ($22,170), humanities and arts ($22,359), and social sciences ($23,166).

In 1997, with a few exceptions, similar salary patterns emerged. The exceptions were computer science majors, who earned a substantially higher-than-average 1997 salary ($44,624 vs. $34,310), and biological science majors, who earned a lower-than-average salary ($28,760). In addition, communications/journalism majors no longer earned lower-than-average salaries in 1997. For education majors, graduates not only reported lower-than-average salaries in *both* 1994 and 1997 but also experienced lower rates of salary increase than did all graduates.

Job Benefits and Job Satisfaction

With respect to their job held in April 1997, engineering majors reported very favorable outcomes and were generally very satisfied with their employment. For example,

[6]The 1994 salaries are in 1997 dollars for comparability to 1997 salaries.

[7]It is possible that some of the salaries reported by education majors (73 percent of whom were working as educators) were for a 9-month academic year rather than a 12-month year.

Table C.—Among 1992–93 bachelor's degree recipients who had not enrolled in graduate education by 1997, full-time salaries in 1994 and 1997, and for those employed full time in both 1994 and 1997, the average percent increase in salary between 1994 and 1997, by major field of study

	Full-time 1994 salary in 1997 dollars	Full-time 1997 salary	Percent increase in salary if full time in 1994 and 1997
Total	$26,464	$34,310	24.5
Bachelor's degree major			
Applied fields			
Education	20,443	24,543	18.2
Business	29,017	37,448	25.1
Engineering/architecture	32,217	42,931	25.2
Computer science	29,428	44,624	31.2
Health/nursing	34,194	37,012	10.9
Health/other	35,515	42,066	17.2
Communications/journalism	22,170	32,294	28.7
Social work/protective services	21,328	27,350	21.7
Academic fields			
Humanities and arts	22,359	29,630	25.6
Biological/interdisciplinary sciences	25,380	28,760	22.4
Mathematics/physical sciences	25,958	31,565	23.6
Social sciences	23,166	33,463	26.8
Other*	24,694	33,374	23.4

*Other includes agriculture, natural resources, forestry, textiles, home economics, law, library science, military science, leisure studies, basic/personal skills, industrial arts, precision production, and transportation.

NOTE: Compared to all graduates, gray box = higher than average; white box = lower than average (p<0.05).

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1992–93 Baccalaureate and Beyond Longitudinal Study, "Second Follow-up" (B&B:93/97), Data Analysis System.

engineering was the only field in which graduates were more likely than all graduates to report that their job both required a degree *and* had definite career potential (54 vs. 38 percent). Engineering majors also were more likely than all graduates to report that their jobs provided health insurance, paid vacations, retirement benefits, family leave, and outside job training (table D). Computer science majors also fared well with respect to job benefits: they were more likely than all graduates to report receiving health insurance benefits, paid sick leave, paid vacation, retirement, and family leave benefits. In contrast, humanities and arts majors were less likely than all graduates to report receiving any of the benefits reported in the survey, while education majors were less likely to report working in jobs that provided paid vacations.

Few differences were found across fields of study with respect to measures of job satisfaction in April 1997 (table E). Engineering majors and health (other than nursing) majors were more likely than all graduates to report being very satisfied with pay. Conversely, education and humanities and arts majors were less likely to be very satisfied with pay. Engineering was the only field in which majors were more likely than all graduates to report high satisfaction with coworkers, while computer science was the only field in which majors reported high satisfaction with working conditions more often than all graduates. Finally, education was the only field in which majors were more likely than all graduates to report being very satisfied with the challenge the job offered.

Gender Differences

The findings of the study illustrated substantial gender differences in earnings among 1992–93 bachelor's degree recipients who did not enroll in graduate school by 1997.

Table D.—Among 1992–93 bachelor's degree recipients who had not enrolled in graduate education by 1997, percentage reporting various job benefits offered at their April 1997 job, by major field of study

	Health insurance	Paid sick leave	Paid vacation	Retirement	Family leave	Job training outside the job
Total	85.9	83.0	86.1	78.0	66.1	43.8
Bachelor's degree major						
Applied fields						
Education	81.4	83.3	74.6	77.8	60.3	44.0
Business	90.1	84.5	91.2	81.1	67.3	47.2
Engineering/architecture	93.2	85.0	94.7	85.9	73.9	54.2
Computer science	94.8	91.5	95.4	87.9	79.7	48.2
Health/nursing	87.5	87.7	87.2	86.8	68.9	55.8
Health/other	88.5	84.2	88.1	82.5	73.6	42.1
Communications/journalism	83.7	80.9	84.3	77.1	65.2	38.6
Social work/protective services	83.1	84.7	87.3	76.7	64.6	40.7
Academic fields						
Humanities and arts	78.1	76.7	79.4	67.7	58.5	37.1
Biological/interdisciplinary sciences	79.7	80.7	79.8	71.9	57.3	37.8
Mathematics/physical sciences	89.5	86.5	81.4	80.6	79.8	40.7
Social sciences	85.8	82.9	85.2	76.8	66.8	43.7
Other*	84.0	77.9	80.9	74.0	63.3	42.6

*Other includes agriculture, natural resources, forestry, textiles, home economics, law, library science, military science, leisure studies, basic/personal skills, industrial arts, precision production, and transportation.

NOTE: Compared to all graduates, gray box = more likely than average to report; white box = less likely than average to report (p<0.05).

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1992–93 Baccalaureate and Beyond Longitudinal Study, "Second Follow-up" (B&B:93/97), Data Analysis System.

These differences were more apparent in 1997, 4 years after most graduates had earned their bachelor's degree, than when graduates first entered the labor market. Looking at individual fields of study, in 1994 men with majors in business, computer science, communications/journalism, and social sciences earned higher salaries than women majoring in these fields. By 1997, men earned more than women in all fields of study except engineering, health (other than nursing), and humanities and arts (figure B).

In a multivariate analysis conducted separately for men and women, several factors, including age, race/ethnicity, and work experience, were associated with women's 1997 salaries, but not with men's salaries. Specifically, after controlling for related variables, including major field of study, women age 30 or older when they received their bachelor's degree earned higher salaries than women age 22 or younger at graduation, as did Asian/Pacific Islander women compared with white women, and women who did not work in any overlapping jobs compared with those who did. For men, on the other hand, only major field of study and institution attended (those attending doctoral-granting private not-for-profit institutions earned more than men in comparable public institutions) predicted their 1997 salaries. These results suggest that women may be subjected to greater scrutiny in entering and advancing in the labor market.

Finally, when asked why they took their 1997 jobs, women were more likely to report that they chose their job because it provided interesting work. In contrast, men were more likely to do so for the job's advancement opportunities or income potential.

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Data source: The 1992–93 Baccalaureate and Beyond Longitudinal Study, "Second Follow-up" (B&B:93/97).

For technical information, see the complete report:

Horn, L. J., and Zahn, L. (2001). *From Bachelor's Degree to Work: Major Field of Study and Employment Outcomes of 1992–93 Bachelor's Degree Recipients Who Did Not Enroll in Graduate Education by 1997* (NCES 2001–165).

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Table E.—Among 1992–93 bachelor's degree recipients who had not enrolled in graduate education by 1997, percentage reporting being very satisfied with various aspects of their April 1997 job, by major field of study

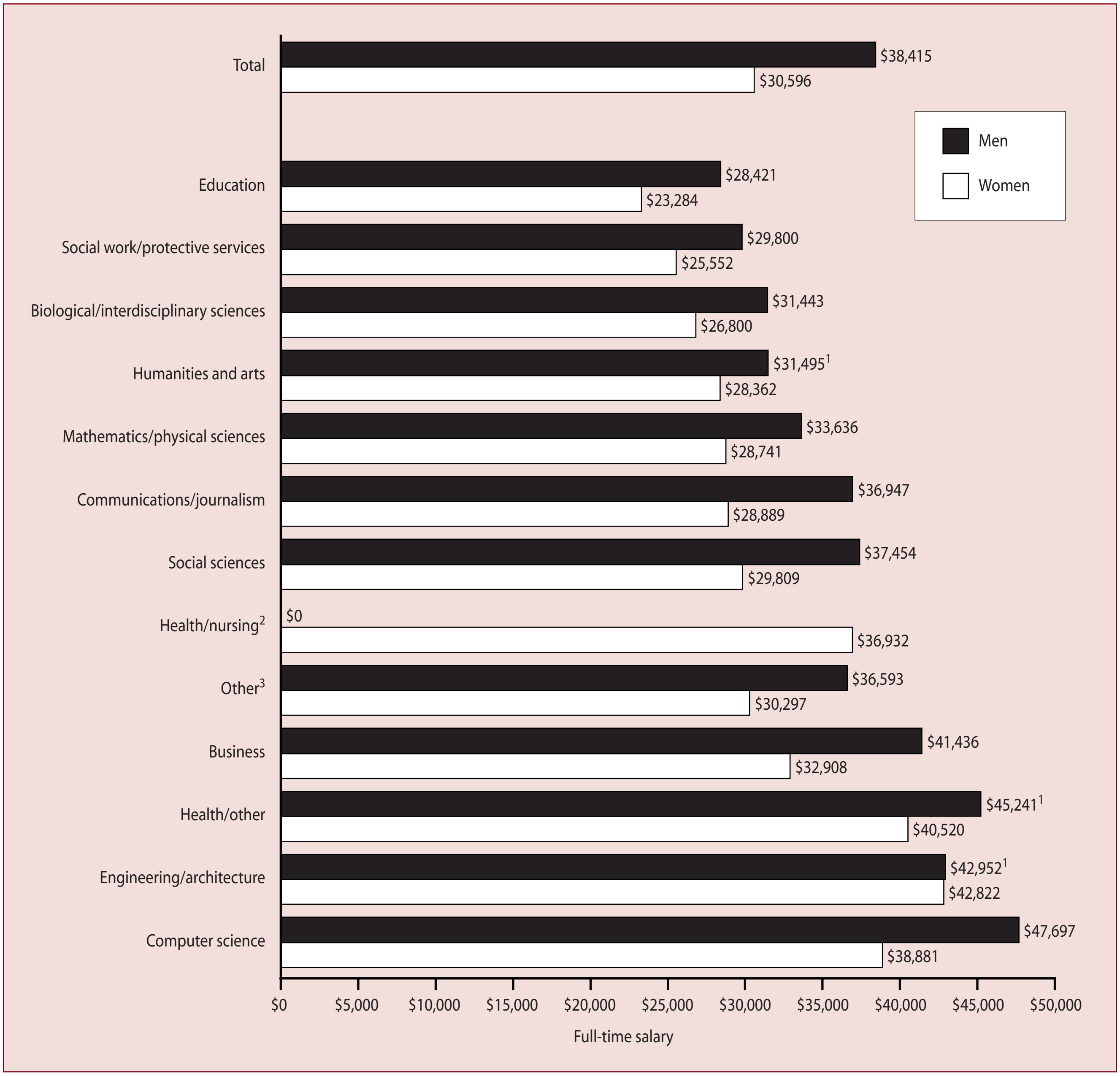
	Very satisfied with						
	Pay	Job security	Job challenge	Fringe benefits	Promotion opportunity	Coworkers	Working conditions
Total	32.6	63.0	55.8	52.8	38.3	79.6	55.6
Bachelor's degree major							
Applied fields							
Education	27.0	64.1	66.3	45.8	31.8	78.7	50.4
Business	34.3	61.5	52.7	54.3	42.1	80.0	58.5
Engineering/architecture	42.0	60.4	60.4	57.6	46.1	85.4	54.4
Computer science	40.7	62.8	59.7	65.9	43.9	78.7	69.4
Health/nursing	38.0	55.8	62.1	48.4	33.5	79.1	41.6
Health/other	48.4	70.4	63.3	54.4	27.3	75.9	51.9
Communications/journalism	30.9	63.3	54.6	60.1	42.3	81.3	56.5
Social work/protective services	33.9	66.9	60.4	53.7	33.6	76.9	48.9
Academic fields							
Humanities and arts	26.6	60.7	53.1	51.0	34.1	79.2	54.9
Biological/interdisciplinary sciences	23.9	57.6	50.8	41.5	28.1	73.4	46.4
Mathematics/physical sciences	38.1	62.5	49.9	51.5	30.5	77.7	52.7
Social sciences	29.3	66.0	52.9	50.8	36.4	79.7	53.7
Other*	34.1	69.0	59.0	50.6	44.2	82.4	59.9

*Other includes agriculture, natural resources, forestry, textiles, home economics, law, library science, military science, leisure studies, basic/personal skills, industrial arts, precision production, and transportation.

NOTE: Compared to all graduates, gray box = more likely than average to report; white box = less likely than average to report (p<0.05).

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1992–93 Baccalaureate and Beyond Longitudinal Study, "Second Follow-up" (B&B:93/97), Data Analysis System.

Figure B.—Average full-time salaries for men and women in 1997 among 1992–93 bachelor's degree recipients who had not enrolled in graduate education by 1997, by major field of study



[1]Male and female salaries not statistically different.

[2]Not enough men for a reliable estimate.

[3]Other includes agriculture, natural resources, forestry, textiles, home economics, law, library science, military science, leisure studies, basic/personal skills, industrial arts, precision production, and transportation.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1992–93 Baccalaureate and Beyond Longitudinal Study, "Second Follow-up" (B&B:93/97), Data Analysis System.

Degrees and Awards Conferred

Degrees and Other Awards Conferred by Title IV Participating, Degree-Granting Institutions: 1997–98

Frank B. Morgan

This article was originally published as the Summary of the E.D. Tabs report of the same name. The universe data are from the NCES Integrated Postsecondary Education Data System "Completions Survey" (IPEDS-C) and "Consolidated Survey" (IPEDS-CN).

Introduction

This report presents data on postsecondary degrees conferred by U.S. institutions during the 1997–98 academic year (July 1, 1997, to June 30, 1998). The data were collected through the U.S. Department of Education's Integrated Postsecondary Education Data System (IPEDS).[1] IPEDS collects, among other data, the number of degrees and awards conferred in each field of study by award level—ranging from postsecondary certificates requiring less than 1 year of study to doctor's and first-professional degrees[2] and certificates—and by race/ethnicity and gender of recipient.

Discipline divisions and fields of study are based on classifications delineated in the 1990 version (Morgan, Hunt, and Carpenter 1991) of the Classification of Instructional Programs (CIP) taxonomy. The CIP, developed and maintained by the National Center for Education Statistics (NCES), is the federally accepted standard for collecting, reporting, and interpreting postsecondary education program data.

This report focuses on institutions that (1) have a Program Participation Agreement (PPA) with the Department of Education and thus are eligible to participate in Title IV programs, (2) grant associate's or higher degrees, and (3) are within the 50 states and the District of Columbia. Title IV of the Higher Education Act of 1965 (as amended) establishes federal financial aid programs (e.g., Pell Grants, Stafford Loans) for students attending postsecondary institutions. Students attending institutions with a PPA may be eligible either to receive Title IV funds or to defer repayment of their loans.

Of the 9,355 postsecondary institutions within the 50 states and the District of Columbia identified by IPEDS, a little less than half (4,455) are categorized as degree granting. Of these, 4,015, or 90.1 percent, are Title IV participating institutions and form the basis for this report.

Degrees Awarded

In the 1997–98 academic year, nearly 2.3 million degrees were awarded by America's Title IV participating, degree-granting institutions. Of the total number of degrees awarded, 24.3 percent were associate's degrees, 51.5 percent were bachelor's degrees, 18.7 percent were master's degrees, 2.0 percent were doctor's degrees, and 3.4 percent were first-professional degrees (table A).

Public institutions awarded the majority of degrees at all degree levels, except for first-professional degrees. Public institutions awarded 81.5 percent of associate's degrees, about two-thirds of bachelor's and doctor's degrees, and 54.8 percent of master's degrees. In contrast, public institutions awarded 39.7 percent of first-professional degrees (table B).

The majority of degrees in 1997–98 at the associate's, bachelor's, and master's levels continued to be awarded to women. Degrees awarded to women at the doctoral level represented 42.0 percent and at the first-professional level 42.9 percent (figure A and table B).

Nearly three-quarters (72.2 percent) of all degrees awarded in 1997–98 were awarded to white students, 19.8 percent were awarded to minority students, and 8.0 percent were awarded to nonresident aliens or individuals whose race/ethnicity was unknown. These percentages, however, varied considerably by level of degree. For example, nonresident aliens received less than 4 percent of all associate's, bachelor's, or first-professional degrees, but they received 12.2 percent of all master's degrees and 24.6 percent of all doctor's degrees (table B).

The proportion of degrees awarded to minority students was highest at the associate's level (23.2 percent) and dropped at each successive degree level (except first-professional) through the doctor's degree; the minority

[1]The "Completions Survey" (IPEDS-C) was sent to all institutions that award associate's or higher level degrees or postbaccalaureate or higher certificates and that have Title IV Program Participation Agreements with the Department of Education. Postsecondary institutions that award only less-than-4-year certificates or diplomas reported completions as part of the "Consolidated Survey" (IPEDS-CN). The "Completions" data file combines data from the two surveys so that a complete picture of the universe of participating postsecondary education institutions in the 50 states, the District of Columbia, and the territories is possible.

[2]First-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., 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 A.—Number and percentage distribution of degrees conferred by Title IV participating, degree-granting institutions, by level of degree, control of institution, gender, and race/ethnicity of recipient: 50 states and the District of Columbia, 1997–98

	Total degrees		Associate's degrees		Bachelor's degrees	
	Number	Percent of total degrees	Number	Percent of total degrees	Number	Percent of total degrees
All institutions	2,297,733	100.0	558,555	24.3	1,184,406	51.5
Control of institution						
Public	1,536,250	100.0	455,084	29.6	784,296	51.1
Private not-for-profit	685,217	100.0	47,625	7.0	386,455	56.4
Private for-profit	76,266	100.0	55,846	73.2	13,655	17.9
Gender of recipient						
Men	993,519	100.0	217,613	21.9	519,956	52.3
Women	1,304,214	100.0	340,942	26.1	664,450	50.9
Race/ethnicity of recipient						
White, non-Hispanic	1,658,509	100.0	403,888	24.4	877,228	52.9
Minority	454,952	100.0	129,433	28.4	237,100	52.1
Black, non-Hispanic	185,500	100.0	54,000	29.1	95,565	51.5
Hispanic	128,995	100.0	44,758	34.7	64,174	49.7
Asian or Pacific Islander	123,993	100.0	24,579	19.8	69,670	56.2
American Indian/Alaska Native	16,464	100.0	6,096	37.0	7,691	46.7
Race/ethnicity unknown	67,180	100.0	12,872	19.2	30,853	45.9
Nonresident alien	117,092	100.0	12,362	10.6	39,225	33.5

	Master's degrees		Doctor's degrees		First-professional degrees*	
	Number	Percent of total degrees	Number	Percent of total degrees	Number	Percent of total degrees
All institutions	430,164	18.7	46,010	2.0	78,598	3.4
Control of institution						
Public	235,922	15.4	29,715	1.9	31,233	2.0
Private not-for-profit	188,175	27.5	15,944	2.3	47,018	6.9
Private for-profit	6,067	8.0	351	0.5	347	0.5
Gender of recipient						
Men	184,375	18.6	26,664	2.7	44,911	4.5
Women	245,789	18.8	19,346	1.5	33,687	2.6
Race/ethnicity of recipient						
White, non-Hispanic	292,093	17.6	27,463	1.7	57,837	3.5
Minority	65,910	14.5	5,606	1.2	16,903	3.7
Black, non-Hispanic	28,599	15.4	1,984	1.1	5,352	2.9
Hispanic	15,393	11.9	1,214	0.9	3,456	2.7
Asian or Pacific Islander	19,967	16.1	2,228	1.8	7,549	6.1
American Indian/Alaska Native	1,951	11.9	180	1.1	546	3.3
Race/ethnicity unknown	19,782	29.4	1,601	2.4	2,072	3.1
Nonresident alien	52,379	44.7	11,340	9.7	1,786	1.5

*First-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., 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: Percentages may not sum to 100 due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1998 Integrated Postsecondary Education Data System, "Completions Survey" (IPEDS-C:97–98) and "Consolidated Survey" (IPEDS-CN:FY98).

Table B.—Number and percentage distribution of degrees conferred by Title IV participating, degree-granting institutions, by level of degree, control of institution, gender, and race/ethnicity of recipient: 50 states and the District of Columbia, 1996–97 and 1997–98

	Associate's degrees					Bachelor's degrees				
	1996–97		1997–98		Percent change[1]	1996–97		1997–98		Percent change[1]
	Number	Percent	Number	Percent		Number	Percent	Number	Percent	
All institutions	571,226	100.0	558,555	100.0	-2.2	1,172,879	100.0	1,184,406	100.0	1.0
Control of institution										
Public	465,494	81.5	455,084	81.5	-2.2	776,677	66.2	784,296	66.2	1.0
Private not-for-profit	49,168	8.6	47,625	8.5	-3.1	384,086	32.7	386,455	32.6	0.6
Private for-profit	56,564	9.9	55,846	10.0	-1.3	12,116	1.0	13,655	1.2	12.7
Gender of recipient										
Men	223,948	39.2	217,613	39.0	-2.8	520,515	44.4	519,956	43.9	-0.1
Women	347,278	60.8	340,942	61.0	-1.8	652,364	55.6	664,450	56.1	1.9
Race/ethnicity of recipient										
White, non-Hispanic	419,994	73.5	403,888	72.3	-3.8	878,460	74.9	877,228	74.1	-0.1
Minority	128,060	22.4	129,433	23.2	1.1	227,216	19.4	237,100	20.0	4.4
Black, non-Hispanic	55,054	9.6	54,000	9.7	-1.9	91,986	7.8	95,565	8.1	3.9
Hispanic	42,568	7.5	44,758	8.0	5.1	60,902	5.2	64,174	5.4	5.4
Asian or Pacific Islander	24,586	4.3	24,579	4.4	0.0	67,086	5.7	69,670	5.9	3.9
American Indian/Alaska Native	5,852	1.0	6,096	1.1	4.2	7,242	0.6	7,691	0.6	6.2
Race/ethnicity unknown	12,408	2.2	12,872	2.3	3.7	28,275	2.4	30,853	2.6	9.1
Nonresident alien	10,764	1.9	12,362	2.2	14.8	38,928	3.3	39,225	3.3	0.8
	Master's degrees					**Doctor's degrees**				
	1996–97		1997–98		Percent change[1]	1996–97		1997–98		Percent change[1]
	Number	Percent	Number	Percent		Number	Percent	Number	Percent	
All institutions	419,401	100.0	430,164	100.0	2.6	45,876	100.0	46,010	100.0	0.3
Control of institution										
Public	233,237	55.6	235,922	54.8	1.2	29,838	65.0	29,715	64.6	-0.4
Private not-for-profit	181,104	43.2	188,175	43.7	3.9	15,694	34.2	15,944	34.7	1.6
Private for-profit	5,060	1.2	6,067	1.4	19.9	344	0.7	351	0.8	2.0
Gender of recipient										
Men	180,947	43.1	184,375	42.9	1.9	27,146	59.2	26,664	58.0	-1.8
Women	238,454	56.9	245,789	57.1	3.1	18,730	40.8	19,346	42.0	3.3
Race/ethnicity of recipient										
White, non-Hispanic	288,552	68.8	292,093	67.9	1.2	27,183	59.3	27,463	59.7	1.0
Minority	61,217	14.6	65,910	15.3	7.7	5,551	12.1	5,606	12.2	1.0
Black, non-Hispanic	26,901	6.4	28,599	6.6	6.3	1,786	3.9	1,984	4.3	11.1
Hispanic	14,574	3.5	15,393	3.6	5.6	1,068	2.3	1,214	2.6	13.7
Asian or Pacific Islander	17,898	4.3	19,967	4.6	11.6	2,528	5.5	2,228	4.8	-11.9
American Indian/Alaska Native	1,844	0.4	1,951	0.5	5.8	169	0.4	180	0.4	6.5
Race/ethnicity unknown	20,080	4.8	19,782	4.6	-1.5	1,689	3.7	1,601	3.5	-5.2
Nonresident alien	49,552	11.8	52,379	12.2	5.7	11,453	25.0	11,340	24.6	-1.0

See footnotes on second page of this table.

Table B.—Number and percentage distribution of degrees conferred by Title IV participating, degree-granting institutions, by level of degree, control of institution, gender, and race/ethnicity of recipient: 50 states and the District of Columbia, 1996–97 and 1997–98—Continued

	First-professional degrees[2]					Total degrees				
	1996–97		1997–98		Percent change[1]	1996–97		1997–98		Percent change[1]
	Number	Percent	Number	Percent		Number	Percent	Number	Percent	
All institutions	78,730	100.0	78,598	100.0	-0.2	2,288,112	100.0	2,297,733	100.0	0.4
Control of institution										
Public	31,243	39.7	31,233	39.7	0.0	1,536,489	67.2	1,536,250	66.9	0.0
Private not-for-profit	47,029	59.7	47,018	59.8	0.0	677,081	29.6	685,217	29.8	1.2
Private for-profit	458	0.6	347	0.4	-24.2	74,542	3.3	76,266	3.3	2.3
Gender of recipient										
Men	45,564	57.9	44,911	57.1	-1.4	998,120	43.6	993,519	43.2	-0.5
Women	33,166	42.1	33,687	42.9	1.6	1,289,992	56.4	1,304,214	56.8	1.1
Race/ethnicity of recipient										
White, non-Hispanic	58,972	74.9	57,837	73.6	-1.9	1,673,161	73.1	1,658,509	72.2	-0.9
Minority	16,442	20.9	16,903	21.5	2.8	438,486	19.2	454,952	19.8	3.8
Black, non-Hispanic	5,184	6.6	5,352	6.8	3.2	180,911	7.9	185,500	8.1	2.5
Hispanic	3,529	4.5	3,456	4.4	-2.1	122,641	5.4	128,995	5.6	5.2
Asian or Pacific Islander	7,226	9.2	7,549	9.6	4.5	119,324	5.2	123,993	5.4	3.9
American Indian/Alaska Native	503	0.6	546	0.7	8.5	15,610	0.7	16,464	0.7	5.5
Race/ethnicity unknown	1,670	2.1	2,072	2.6	24.1	64,122	2.8	67,180	2.9	4.8
Nonresident alien	1,646	2.1	1,786	2.3	8.5	112,343	4.9	117,092	5.1	4.2

[1]Percent change in numbers from 1996–97 to 1997–98.

[2]First-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., 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: Percentages may not sum to 100 due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1997 and 1998 Integrated Postsecondary Education Data System, "Completions Survey" (IPEDS-C:96–97 and IPEDS-C:97–98) and "Consolidated Survey" (IPEDS-CN:FY97 and IPEDS-CN:FY98).

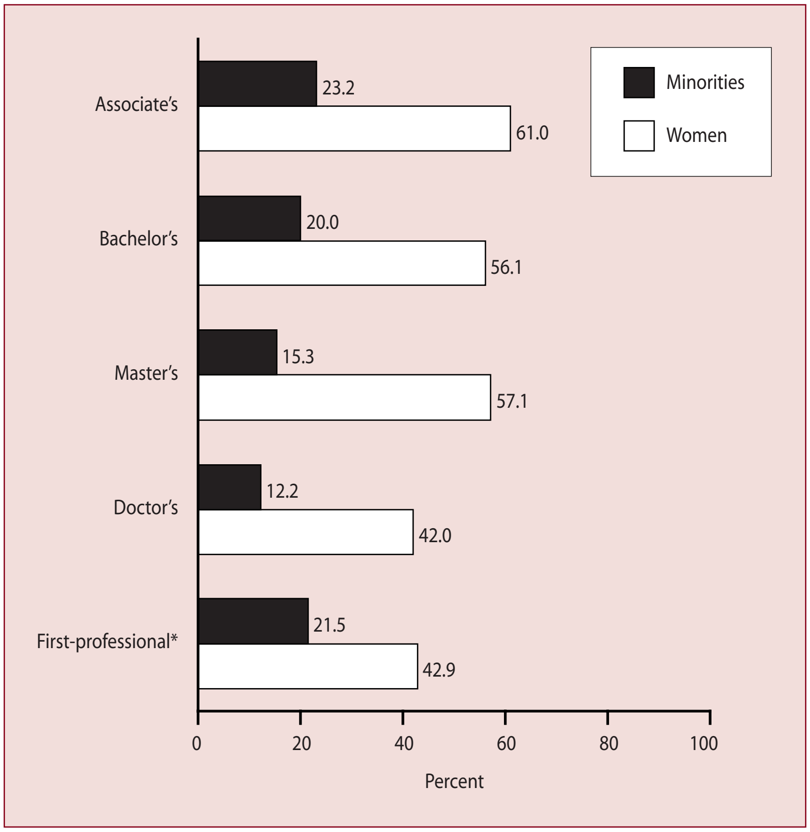
shares were 20.0 percent of bachelor's degrees, 15.3 percent of master's degrees, and 12.2 percent of doctor's degrees. (One-fifth [21.5 percent] of first-professional degrees went to minorities.) The drop was even more precipitous when blacks, Hispanics, and American Indians/Alaska Natives are examined separately from Asians/Pacific Islanders. Blacks, Hispanics, and American Indians/Alaska Natives received 18.8 percent of all associate's degrees in 1997–98, 14.1 percent of bachelor's degrees, 10.7 percent of master's degrees, 7.3 percent of doctor's degrees, and 11.9 percent of first-professional degrees (figure A and table B).

Degree Fields

In 1997–98, approximately 85 percent of all associate's degrees were awarded by 2-year institutions, with the remainder awarded by 4-year institutions. Over one-third of all associate's degrees at 2-year institutions were awarded in liberal/general studies and humanities, a field that generally permits transfers to 4-year institutions. Another one-third were awarded in two occupational fields, business management and administrative services (16.0 percent) and the health professions and related sciences (16.1 percent). In 4-year institutions, 19.4 percent of associate's degrees awarded were in liberal/general studies and humanities, while 18.7 percent and 18.5 percent of associate's degrees were in the health professions and related sciences and in business management and administrative services, respectively. The percentages of associate's degrees conferred by 2-year and 4-year institutions were similar across all fields of study (table C).

Nearly one-fifth (19.3 percent) of all bachelor's degrees were awarded in business management and administrative services. Another 10.6 percent were awarded in the social sciences and history, while 8.9 percent were awarded in education. Bachelor's degrees in mathematics and the physical sciences comprised only 2.6 percent of all bachelor's degrees awarded (table D).

Figure A.—Percentage of degrees awarded to women and minorities, by level of degree: 50 states and the District of Columbia, 1997–98



*First-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., 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.).

Source: U.S. Department of Education, National Center for Education Statistics, 1998 Integrated Postsecondary Education Data System, "Completions Survey" (IPEDS-C:97–98) and "Consolidated Survey" (IPEDS-CN:FY98).

About one-half (50.3 percent) of the master's degrees awarded were in two areas: education (26.7 percent) and business management and administrative services (23.6 percent). Awards in the health professions and related sciences and in engineering constituted the next highest number of master's degrees conferred (9.1 percent and 6.0 percent, respectively) (table D).

At the doctor's degree level, the highest percentage of degrees awarded in 1997–98 was in education (14.6 percent), followed by engineering (13.0 percent). The biological sciences/life sciences and the physical sciences accounted for 10.8 and 9.9 percent, respectively, closely followed by the social sciences and history (9.0 percent) and psychology (8.9 percent) (table D).

Reference

Morgan, R.L., Hunt, E.S., and Carpenter, J.M. (1991). *Classification of Instructional Programs: 1990 Edition* (NCES 91–396). U.S. Department of Education. Washington, DC: U.S. Government Printing Office.

Data source: The NCES Integrated Postsecondary Education Data System "Completions Survey" (IPEDS-C:96–97 and IPEDS-C:97–98) and "Consolidated Survey" (IPEDS-CN:FY97 and IPEDS-CN:FY98).

For technical information, see the complete report:

Morgan, F.B. (2001). *Degrees and Other Awards Conferred by Title IV Participating, Degree-Granting Institutions: 1997–98* (NCES 2001–177).

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To obtain the complete report (NCES 2001–177), call the toll-free ED Pubs number (877–433–7827), visit the NCES Web Site (*http://nces.ed.gov*), or contact GPO (202–512–1800).

Table C.—Number and percentage distribution of associate's degrees conferred by Title IV participating, degree-granting institutions, by level of institution and field of study: 50 states and the District of Columbia, 1997–98

Field of study[1]	Total	Two-year Total	Two-year Percent	Four-year Total	Four-year Percent
Total, all fields	558,555	474,312 [2](84.9%)	100	84,243 [2](15.1%)	100
Agricultural business & production	4,247	3,560	0.8	687	0.8
Agricultural sciences	959	713	0.2	246	0.3
Architecture and related programs	265	163	0	102	0.1
Area, ethnic and cultural studies	104	76	0	28	0
Biological sciences/life sciences	2,113	2,065	0.4	48	0.1
Business management & admin. services	91,399	75,784	16	15,615	18.5
Communications	2,368	1,974	0.4	394	0.5
Communications technologies	1,602	1,432	0.3	170	0.2
Computer & information sciences	13,870	11,233	2.4	2,637	3.1
Conservation & renew. natural resources	1,467	1,110	0.2	357	0.4
Construction trades	2,172	1,906	0.4	266	0.3
Education	9,278	8,273	1.7	1,005	1.2
Engineering	2,149	1,717	0.4	432	0.5
Engineering-related technologies	32,748	23,280	4.9	9,468	11.2
English language & literature/letters	1,609	1,561	0.3	48	0.1
Foreign languages & literatures	543	538	0.1	5	0
Health professions & related sciences	92,031	76,290	16.1	15,741	18.7
Home economics	1,036	766	0.2	270	0.3
Law & legal studies	7,797	6,528	1.4	1,269	1.5
Liberal/general studies & humanities	186,248	169,936	35.8	16,312	19.4
Library science	96	85	0	11	0
Marketing opers./market. & distribution	5,516	4,365	0.9	1,151	1.4
Mathematics	844	815	0.2	29	0
Mechanics & repairers	10,616	9,428	2	1,188	1.4
Military technologies	22	22	0	0	0
Multi/interdisciplinary studies	9,401	9,029	1.9	372	0.4
Parks, recreation, leisure & fitness	895	814	0.2	81	0.1
Personal & miscellaneous services	7,744	4,126	0.9	3,618	4.3
Philosophy & religion	94	47	0	47	0.1
Physical sciences	1,584	1,533	0.3	51	0.1
Precision production trades	11,085	8,230	1.7	2,855	3.4
Protective services	19,002	15,954	3.4	3,048	3.6
Psychology	1,765	1,669	0.4	96	0.1
Public administration & services	4,156	3,482	0.7	674	0.8
Science technologies	702	574	0.1	128	0.2
Social sciences & history	4,196	3,910	0.8	286	0.3
Theological studies/religious vocations	570	32	0	538	0.6
Transportation & material moving workers	1,009	710	0.1	299	0.4
Visual & performing arts	14,980	10,972	2.3	4,008	4.8
Vocational home economics	7,256	6,719	1.4	537	0.6
Undesignated fields[3]	3,017	2,891	0.6	126	0.1

[1]Degrees by field of study are aggregated to the 2-digit CIP level as defined in the 1990 version of the Classification of Instructional Programs (see Morgan, Hunt, and Carpenter [NCES 91–396]).

[2]Percents of total associate's degrees.

[3]Includes degrees reported for fields with no CIP code, schools reporting only total degrees by award level and gender, and nonrespondents for which field of study could not be imputed.

NOTE: Data represent programs, not organizational units within institutions. Percentages may not sum to 100 due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1998 Integrated Postsecondary Education Data System, "Completions Survey" (IPEDS–C:97-98) and "Consolidated Survey" (IPEDS-CN:FY98).

Table D.—Number and percentage distribution of degrees conferred by Title IV participating, degree-granting institutions, by level of degree and field of study: 50 states and the District of Columbia, 1997–98

Field of study[1]	Bachelor's degrees		Master's degrees		Doctor's degrees	
	Total	Percent	Total	Percent	Total	Percent
Total, all fields	1,184,406	100.0	430,164	100.0	46,010	100.0
Agricultural business & production	5,192	0.4	627	0.1	224	0.5
Agricultural sciences	8,219	0.7	1,475	0.3	700	1.5
Architecture and related programs	7,652	0.6	4,347	1.0	131	0.3
Area, ethnic and cultural studies	6,153	0.5	1,617	0.4	181	0.4
Biological sciences/life sciences	65,868	5.6	6,261	1.5	4,961	10.8
Business management & admin. services	228,476	19.3	101,609	23.6	1,288	2.8
Communications	49,385	4.2	5,611	1.3	354	0.8
Communications technologies	729	0.1	564	0.1	5	0.0
Computer & information sciences	26,852	2.3	11,246	2.6	858	1.9
Conservation & renew. natural resources	9,873	0.8	2,373	0.6	378	0.8
Construction trades	182	0.0	16	0.0	0	0.0
Education	105,968	8.9	114,691	26.7	6,729	14.6
Engineering	59,910	5.1	25,936	6.0	5,980	13.0
Engineering-related technologies	13,727	1.2	1,136	0.3	14	0.0
English language & literature/letters	49,708	4.2	7,795	1.8	1,639	3.6
Foreign languages & literatures	14,451	1.2	2,927	0.7	959	2.1
Health professions & related sciences	84,379	7.1	39,260	9.1	2,484	5.4
Home economics	16,866	1.4	2,888	0.7	424	0.9
Law & legal studies	2,017	0.2	3,228	0.8	66	0.1
Liberal/general studies & humanities	33,202	2.8	2,801	0.7	87	0.2
Library science	73	0.0	4,871	1.1	48	0.1
Marketing opers./market. & distribution	4,381	0.4	562	0.1	2	0.0
Mathematics	12,328	1.0	3,643	0.8	1,259	2.7
Mechanics & repairers	91	0.0	0	0.0	0	0.0
Military technologies	3	0.0	0	0.0	0	0.0
Multi/interdisciplinary studies	26,163	2.2	2,677	0.6	508	1.1
Parks, recreation, leisure & fitness	16,781	1.4	2,024	0.5	129	0.3
Personal & miscellaneous services	262	0.0	0	0.0	0	0.0
Philosophy & religion	8,207	0.7	1,307	0.3	585	1.3
Physical sciences	19,276	1.6	5,332	1.2	4,569	9.9
Precision production trades	407	0.0	15	0.0	0	0.0
Protective services	25,076	2.1	2,000	0.5	39	0.1
Psychology	73,972	6.2	13,747	3.2	4,073	8.9
Public administration & services	20,408	1.7	25,144	5.8	499	1.1
Science technologies	140	0.0	29	0.0	2	0.0
Social sciences & history	125,040	10.6	14,938	3.5	4,127	9.0
Theological studies/religious vocations	5,903	0.5	4,692	1.1	1,460	3.2
Transportation & material moving workers	3,206	0.3	736	0.2	0	0.0
Visual & performing arts	52,077	4.4	11,145	2.6	1,163	2.5
Vocational home economics	430	0.0	26	0.0	0	0.0
Undesignated fields[2]	1,373	0.1	868	0.2	85	0.2

[1]Degrees by field of study are aggregated to the 2-digit CIP level as defined in the 1990 version of the Classification of Instructional Programs (see Morgan, Hunt, and Carpenter [NCES 91–396]).

[2]Includes degrees reported for fields with no CIP code, schools reporting only total degrees by award level and gender, and nonrespondents for which field of study could not be imputed.

NOTE: Data represent programs, not organizational units within institutions. Percentages may not sum to 100 due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1998 Integrated Postsecondary Education Data System, "Completions Survey" (IPEDS-C:97–98) and "Consolidated Survey" (IPEDS-CN:FY98).

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Digest

Digest of Education Statistics: 2000

Thomas D. Snyder and Charlene M. Hoffman

This article was excerpted from the Foreword and Introduction to the Compendium of the same name. The sample survey and universe data are from numerous sources, both government and private, and draw especially on the results of surveys and activities carried out by NCES.

The 2000 edition of the *Digest of Education Statistics*, produced by the National Center for Education Statistics (NCES), is the 36th in a series of publications initiated in 1962. (The *Digest* has been issued annually except for combined editions for the years 1977–78, 1983–84, and 1985–86.) Its primary purpose is to provide a compilation of statistical information covering the broad field of American education from kindergarten through graduate school.

The publication contains information on a variety of subjects in the field of education statistics, including the number of schools and colleges, teachers, enrollments, and graduates, in addition to educational attainment, finances, federal funds for education, employment and income of graduates, libraries, and international education. Supplemental information on population trends, attitudes on education, education characteristics of the labor force, government finances, and economic trends provide background for evaluating education data.

In addition to updating many of the statistics that have appeared in previous years, this edition contains a significant amount of new material, including

- public school building deficiencies and renovation plans;
- distribution of high school completers, by selected characteristics;
- percent of high school dropouts, by income level, labor force status, and educational attainment;
- average proficiency in reading for eighth-graders, by selected characteristics and state;
- states with assessment programs in language arts, reading, and writing;
- enrollment and degrees conferred in women's colleges, by institution;
- total revenue of private not-for-profit degree-granting institutions, by source of funds and type of institution; and
- total expenses of private not-for-profit degree-granting institutions, by purpose and type of institution.

Participation in Formal Education

In the fall of 2000, about 68.0 million persons were enrolled in American schools and colleges (table A). About 4.0 million were employed as elementary and secondary school teachers and as college faculty. Other professional, administrative, and support staff of educational institutions numbered 4.4 million. Thus, about 76.4 million people were involved, directly or indirectly, in providing or receiving formal education. In a nation with a population of about 275 million, more than 1 out of every 4 persons participated in formal education.

Table A.—Estimated number of participants in elementary and secondary education and in degree-granting institutions: Fall 2000

(In millions)

Participants	All levels (elementary, secondary, and higher education)	Elementary and secondary schools			Degree-granting institutions		
		Total	Public	Private	Total	Public	Private
Total	76.4	59.1	52.5	6.6	17.3	13.1	4.2
Enrollment[1]	68.0	53.0	47.0	6.0	15.0	11.6	3.5
Teachers and faculty[2]	4.0	3.3	2.9	0.4	0.7	0.5	0.2
Other professional, administrative, and support staff[2]	4.4	2.9	2.6	0.2	1.5	1.0	0.5

[1]Enrollment figures include students in local public school systems and in most private schools (religiously affiliated and nonsectarian). Elementary and secondary enrollment includes most kindergarten and some nursery school enrollment, but excludes preprimary enrollment in schools that do not offer first grade or above. Enrollment figures for degree-granting institutions comprise full-time and part-time students enrolled in degree-credit and nondegree-credit programs in universities, other 4-year colleges, and 2-year colleges that participated in Title IV federal financial aid programs.

[2]Data for teachers and other staff in public and private elementary and secondary schools and colleges and universities are reported in terms of full-time equivalents.

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

SOURCE: U.S. Department of Education, National Center for Education Statistics, unpublished projections and estimates. (This table was prepared in August 2000.) (Originally published as table 1 on p. 11 of the complete report from which this article is excerpted.)

Elementary/Secondary Education

Enrollment

Since the enrollment rates of kindergarten and elementary school-age children have not changed much in recent years, increases in elementary school enrollment have been driven primarily by increases in the number of young people. Enrollment in public elementary and secondary schools rose 19 percent between 1985 and 2000.* The fastest public school growth occurred in the elementary grades, where enrollment rose 24 percent over the same period, from 27.0 million to a record high of 33.5 million in 2000. Secondary enrollments in public schools declined 8 percent from 1985 to 1990, but then rose by 19 percent from 1990 to 2000, for a net increase of 9 percent. Enrollment in private elementary and secondary schools grew more slowly than enrollment in public schools over this period, rising 7 percent, from 5.6 million in 1985 to 6.0 million in 2000. As a result, the percentage of students enrolled in private schools declined slightly, from 12 percent in 1985 to 11 percent in 2000.

NCES forecasts record levels of enrollment for the next several years. The fall 2000 public school enrollment marks a new record, and new records are expected every year through the early 2000s. Public elementary enrollment is projected to grow slowly through 2001 and then decline slightly, so that the fall 2010 projection is slightly lower than the 2000 enrollment. In contrast, public secondary school enrollment is expected to have an increase of 4 percent between 2000 and 2010.

*The 2000 enrollment data are based on projections.

Teachers

An estimated 3.3 million elementary and secondary school teachers were engaged in classroom instruction in the fall of 2000. This number has risen in recent years, up about 18 percent since 1990. The number of public school teachers in 2000 was 2.9 million, and the number of private school teachers was about 0.4 million. About 2.0 million teachers taught in elementary schools, while about 1.3 million were teaching at the secondary level.

The number of public school teachers has risen slightly faster than the number of students over the past 10 years, resulting in small declines in the pupil/teacher ratio. In the fall of 1999, there were 16.2 public school pupils per teacher, compared with 17.2 public school pupils per teacher 10 years earlier. During the same time period, the pupil/teacher ratio in private schools remained relatively stable. Data from the end of the 1990s suggest a continuation of the historical trend toward lower public school pupil/teacher ratios, which had been stable during the late 1980s and early 1990s.

The salaries of public school teachers, which lost purchasing power to inflation during the 1970s, rose faster than the inflation rate during the 1980s. The rising salaries reflected an interest by state and local education agencies in boosting teacher salary schedules and, to some extent, an increase in teachers' experience and education levels. Since 1990–91, salaries for teachers have generally maintained pace with inflation. The average salary for teachers in 1998–99 was $40,582, about the same in constant dollars as at the beginning of the decade.

Student performance

The national results that follow are based on the National Assessment of Educational Progress (NAEP) Long-Term Trend Assessment component (Campbell, Hombo, and Mazzeo 2000).

Reading. Overall, the reading achievement scores for the country's 9-, 13-, and 17-year-old students are mixed. Reading performance scores for 9- and 13-year-olds were higher in 1999 than they were in 1971. However, the 1999 scores were about the same as the 1984 scores. The reading performance of 17-year-olds was about the same in 1999 as it was in 1971.

Black 9-, 13-, and 17-year-olds exhibited higher reading performance in 1999 than in 1971. However, performance for all three age groups in 1984 was about the same as in 1999. The performance levels of white 9- and 13-year-olds also rose between 1971 and 1999. Separate data for Hispanics were not gathered in 1971, but changes between 1975 and 1999 indicate an increase among 9-, 13-, and 17-year-olds. There was no significant difference between the 1984 and 1999 reading performance of 9-, 13-, and 17-year-old Hispanics.

Mathematics. Results from assessments of mathematics proficiency indicate that 9-, 13-, and 17-year-old students improved their performance between 1973 and 1999. However, there has been no significant change for any of the three age groups since 1994.

White, black, and Hispanic students improved their mathematics performance between 1973 and 1999, among all three age groups. However, mathematics scores for white, black, and Hispanic 9-, 13-, and 17-year-olds did not improve between 1994 and 1999.

Science. Long-term changes in science performance have been mixed, though changes over the past 10 years have been generally positive. In 1999, science performance among 17-year-olds was lower than in 1970, but higher than in 1990. The science performance level of 13-year-olds in 1999 was about the same as the level in 1970 and in 1990. The science performance of 9-year-olds increased between 1970 and 1999, but there was no significant difference between 1990 and 1999.

The science performance of white 9- and 13-year-olds was higher in 1999 than it was in 1970. The performance score for white 17-year-olds was lower in 1999 than in 1970. However, only the 17-year-olds had a higher score in 1999 than in 1990. Black 9- and 13-year-olds had higher science performance in 1999 than in the 1970s. The scores for black 9-, 13-, and 17-year-olds in 1999 were about the same as scores in 1990. The scores for 9-, 13-, and 17-year-old Hispanic children were higher in 1999 than in 1977. Scores for Hispanic 17-year-olds showed an increase between 1990 and 1999.

International comparisons. The results of the 1995 Third International Mathematics and Science Study (TIMSS) show that U.S. fourth- and eighth-graders compare more favorably with students in other countries in science than in mathematics. In mathematics, U.S. eighth-graders scored below the international average, falling below 20 of the 41 countries tested. Fourth-graders performed above the international average, scoring below 7 of the 26 countries tested, including Singapore, Korea, and Japan. Students at both the fourth- and eighth-grade levels scored above the international average in science. Eighth-grade students in the United States were outperformed by those in 9 out of 41 countries. Fourth-grade students once again compared more favorably with their international counterparts than eighth-grade students. Out of 26 countries that participated in the fourth-grade assessment, students in only 1 country outperformed the U.S. students in science.

The international standing of U.S. students was stronger at the 8th grade than at the 12th grade in both mathematics and science among the countries that participated in the assessments at both grade levels. U.S. 12th-graders performed below the international average and among the lowest scoring of the 21 countries on the assessment of mathematics general knowledge. U.S. students were outperformed by those in 14 countries, and outperformed those in 2 countries. U.S. 12th-graders also performed below the international average and among the lowest scoring of the 21 countries on the assessment of science general knowledge. U.S. students were outperformed by students in 11 countries, and they outperformed students in 2 countries. Our students' scores were not significantly different from those of seven countries, including France, Germany, Italy, and the Russian Federation.

Higher Education

Enrollment

College enrollment hit a record level of 14.5 million in fall 1998 and was expected to reach a new high of 15.1 million in 2000. Despite decreases in the traditional college-age population during the 1980s and early 1990s, total enrollment increased because of the high enrollment rate of older women and recent high school graduates. Between 1990 and 1998, the number of full-time students increased by 10 percent compared to no increase in part-time students.

Faculty and staff

During the fall of 1997, there were 990,000 faculty members in degree-granting institutions. Making up this figure were 569,000 full-time and 421,000 part-time faculty. In 1992, full-time instructors generally taught more hours and more students than part-time instructors, with 61 percent of full-time instructors teaching 8 or more hours per week and two-thirds teaching 50 or more students. About 30 percent of part-time instructors taught 8 or more hours per week, and 30 percent taught 50 or more students.

White males constituted a disproportionate share of full-time college faculty in 1997. Overall, about 55 percent of full-time faculty were white males. However, this distribution varied substantially by rank of faculty. Among full professors, the proportion of white males was 72 percent. The proportion was somewhat lower among the lower ranked faculty, with white males making up 39 percent of the lecturers.

Graduates, Degrees, and Attainment

The number of high school graduates in 1999–2000 totaled about 2.8 million. Approximately 2.5 million graduated from public schools, and less than 0.3 million graduated from private schools. The number of high school graduates has declined from its peak in 1976–77, when 3.2 million students earned diplomas. In contrast, the number of GED credentials issued rose from 342,000 in 1975 to 516,000 in 1999. The dropout rate also declined over this period, from 14 percent of all 16- to 24-year-olds in 1977 to 11 percent in 1999. The number of postsecondary degrees conferred during the 1999–2000 school year by degree level has been projected: 559,000 associate's degrees, 1,185,000 bachelor's degrees, 398,000 master's degrees, 78,400 first-professional degrees, and 45,200 doctor's degrees.

The Bureau of the Census has collected annual statistics on the educational attainment of the population in terms of years of school completed. Between 1990 and 1999, the proportion of the adult population 25 years of age and over with 4 years of high school or more rose from 78 percent to 83 percent, and the proportion of adults with at least 4 years of college increased from 21 percent to 25 percent. During the same period, the proportion of young adults (25- to 29-year-olds) with 4 years of high school or more showed a small increase of about 2 percentage points, reaching 88 percent in 1999, and the proportion with at least 4 years of college rose from 23 percent to 28 percent.

Education Expenditures

Expenditures for public and private education, from preprimary through graduate school (excluding postsecondary schools not awarding associate's or higher degrees), are estimated at $647 billion for 1999–2000. The expenditures of elementary and secondary schools are expected to total about $389 billion for 1999–2000, while those of colleges and universities will be about $258 billion. Viewed in another context, the total expenditures for education are expected to amount to about 7.0 percent of the gross domestic product in 1999–2000, about the same percentage as in the recent past.

Summary

The statistical highlights presented here provide a quantitative description of the current American education scene. Clearly, from the large number of participants, the number of years that people spend in school, and the large sums expended by educational institutions, it is evident that the American people have a high regard for education. Assessment data indicate that there have been improvements in the mathematics and science performance of 17-year-olds between 1990 and 1999. A high proportion of high school graduates are going on to college. Yet, wide variations in student proficiency from state to state and mediocre mathematics scores of American students in international assessments pose challenges.

Reference

Campbell, J.R., Hombo, C.M., and Mazzeo, J. (2000). *NAEP 1999 Trends in Academic Progress: Three Decades of Student Performance* (NCES 2000–469). U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.

Data sources: Over 50 sources of data, including most NCES studies.

For technical information, see the complete report:

Snyder, T.D., and Hoffman, C.M. (2001). *Digest of Education Statistics: 2000* (NCES 2001–034).

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For questions about content, contact C.M. Hoffman *(charlene_hoffman@ed.gov).*

To obtain the complete report (NCES 2001–034), call the toll-free ED Pubs number (877–433–7827), visit the NCES Web Site *(http://nces.ed.gov)*, or contact GPO (202–512–1800).

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Data Products

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The 1998 High School Transcript Study Tabulations: Comparative Data on Credits Earned and Demographics for 1998, 1994, 1990, 1987, and 1982 High School Graduates
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Data Products

Data File: CCD National Public Education Financial Survey: School Year 1997–1998

The Common Core of Data (CCD) "National Public Education Financial Survey" provides detailed data on public elementary and secondary education finances for the 50 states, District of Columbia, and five outlying areas. Financial data are audited at the end of each fiscal year and then submitted to NCES by the state education agencies (SEAs) from their administrative records. This file provides data for fiscal year 1998 (school year 1997–98). The data set contains 56 records, one for each reporting state or jurisdiction.

For each state or jurisdiction, the data file includes revenues by source (local, intermediate, state, and federal); local revenues by type (e.g., local property taxes); current expenditures by function (instruction, support, and noninstruction) and by object (e.g., teacher salaries or food service supplies); capital expenditures (e.g., school construction and instructional equipment); average number of students in daily attendance; and total number of students enrolled.

The data can be downloaded from the NCES Web Site either as an Excel file or as a flat file that can be used with statistical processing programs such as SPSS or SAS. Documentation is provided in separate files.

For questions about this data product, contact Frank Johnson *(frank_johnson@ed.gov).*

To obtain this data product (NCES 2000–322), visit the NCES Web Site *(http://nces.ed.gov).*

Other Publications

The 1998 High School Transcript Study Tabulations: Comparative Data on Credits Earned and Demographics for 1998, 1994, 1990, 1987, and 1982 High School Graduates

Eyal Blumstein, Nancy Caldwell, Jacqueline Haynes, Tom Krenzke, Judy Kuhn, Robert Perkins, Stephen Roey, Keith Rust, and Mark Waksberg

This report presents data from the 1998 High School Transcript Study (HSTS)—the latest in a series of transcript studies undertaken by NCES—and from previous studies in the series. In the 1998 HSTS, more than 25,000 transcripts of students who graduated in 1998 from public and nonpublic high schools were collected from a nationally representative sample of schools. The HSTS studies provide the Department of Education and other education policymakers with information about current and past student coursetaking patterns, as well as the relationship of coursetaking patterns to achievement, as measured by the National Assessment of Educational Progress (NAEP).

The tables in this report summarize the coursetaking patterns of students who graduated in 1998; the coursetaking patterns of their counterparts who graduated in 1994, 1990, 1987, and 1982; and the relationship of coursetaking patterns to grade 12 performance on NAEP. Also included in the report are an introduction to the tables; a description of the subject area taxonomy; directions for testing the significance of differences reported in the tables; and descriptions of the 1994, 1990, 1987, and 1982 studies. A companion volume, *The 1998 High School Transcript Study User's Guide and Technical Report* (NCES 2001–477), provides details about how the 1998 HSTS was conducted and about how to use the data files.

Author affiliations: E. Blumstein, N. Caldwell, T. Krenzke, J. Kuhn, R. Perkins, S. Roey, K. Rust, and M. Waksberg, Westat, Inc.; J. Haynes, Intelligent Automation, Inc.

For questions about content, contact Janis Brown *(janis_brown@ed.gov).*

To obtain the complete report (NCES 2001–498), call the toll-free ED Pubs number (877–433–7827), visit the NCES Web Site *(http://nces.ed.gov),* or contact GPO (202–512–1800).

The 1998 High School Transcript Study User's Guide and Technical Report

Eyal Blumstein, Nancy Caldwell, Tom Krenzke, Stan Legum, Judy Kuhn, Stephen Roey, Keith Rust, Mark Waksberg, Laura Coombs, and Jacqueline Haynes

The 1998 High School Transcript Study (HSTS) is the latest in a series of transcript studies undertaken by NCES. In this study, more than 25,000 transcripts of students who graduated in 1998 from public and nonpublic high schools were collected from a nationally representative sample of schools. The study provides the Department of Education and other education policymakers with information regarding current course offerings and student coursetaking patterns, as well as the relationship of coursetaking patterns to achievement, as measured by the National Assessment of Educational Progress (NAEP).

This publication combines information that in previous years had been divided into two publications: the *Data File User's Manual* and the *Technical Report*. It describes the procedures used to collect and summarize the 1998 HSTS data, provides information needed to use all the publicly released data files produced by the study, and discusses how the study is related to NAEP. A companion volume, *The 1998 High School Transcript Study Tabulations* (NCES 2001–498), provides extensive tables of study results.

Author affiliations: E. Blumstein, N. Caldwell, T. Krenzke, S. Legum, J. Kuhn, S. Roey, K. Rust, and M. Waksberg, Westat, Inc.; L. Coombs and J. Haynes, Intelligent Automation, Inc.

For questions about content, contact Janis Brown *(janis_brown@ed.gov).*

To obtain the complete report (NCES 2001–477), call the toll-free ED Pubs number (877–433–7827), visit the NCES Web Site *(http://nces.ed.gov),* or contact GPO (202–512–1800).

Entering Kindergarten: A Portrait of American Children When They Begin School: Findings From *The Condition of Education: 2000*

Nicholas Zill and Jerry West

In the fall of 1998, the Early Childhood Longitudinal Study, Kindergarten Class of 1998–99 (ECLS-K) began collecting data on the knowledge, skills, health, and behavior of a large and nationally representative sample of American kindergartners. In addition to interviews with parents, questionnaires to teachers, and abstracts of school records, the 1998 data collection included standardized, one-on-one assessments of about 19,000 kindergartners attending 940 public and private schools. ECLS-K will follow these children through the 5th grade.

This 30-page essay, originally published in *The Condition of Education: 2000*, summarizes information about the academic skills (reading, mathematics, and general knowledge), social skills and behavior, physical health, and interest in learning of American children at the time they enter kindergarten. It includes discussion of differences in skills, health, and behavior by age, sex, and family risk factors.

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For questions about this publication, contact Jerry West *(jerry_west@ed.gov).*

To obtain this publication (NCES 2001–035), call the toll-free ED Pubs number (877–433–7827), visit the NCES Web Site *(http://nces.ed.gov),* or contact GPO (202–512–1800).

Highlights From the Third International Mathematics and Science Study–Repeat (TIMSS–R)

Patrick Gonzales, Christopher Calsyn, Leslie Jocelyn, Kitty Mak, David Kastberg, Sousan Arafeh, Trevor Williams, and Winnie Tsen

The 1999 Third International Mathematics and Science Study–Repeat (TIMSS–R), a successor to the 1995 TIMSS, focuses on the mathematics and science achievement of eighth-grade students in participating nations. TIMSS–R allows the United States to compare the achievement of its eighth-graders in the 1995 TIMSS to the achievement of its eighth-graders 4 years later. The performance of U.S. fourth-graders relative to those of other nations in 1995 can also be compared to the performance of U.S. eighth-graders relative to those of the same nations 4 years later.

This eight-page brochure summarizes important findings from TIMSS–R. Comparisons of student achievement are made between the 38 nations that participated in TIMSS–R in 1999; between the 23 nations that participated in both TIMSS and TIMSS–R at the eighth-grade level; and between the 17 nations that participated at the fourth-grade level in TIMSS and at the eighth-grade level in TIMSS–R. The brochure also notes differences in eighth-grade teaching and curriculum between the United States and the other TIMSS–R nations.

Author affiliations: P. Gonzales, NCES; C. Calsyn, K. Mak, S. Arafeh, and W. Tsen, Education Statistics Services Institute (ESSI); L. Jocelyn, D. Kastberg, and T. Williams, Westat, Inc.

For questions about this brochure, contact Patrick Gonzales *(patrick_gonzales@ed.gov).*

To obtain this brochure (NCES 2001–027), call the toll-free ED Pubs number (877–433–7827) or visit the NCES Web Site *(http://nces.ed.gov).*

Pocket Projections: Projections of Education Statistics to 2010

William J. Hussar

Each year, NCES publishes this pocket summary of the *Projections of Education Statistics*. The pocket summary provides the reader with key information extracted from the full report. Included are data on enrollment at all education levels, numbers of high school graduates, earned degrees conferred, classroom teachers, and expenditures for public elementary and secondary schools and institutions of higher education. This year's edition of *Pocket Projections* includes 1987–88 data as well as estimates for 1998–89 and projections for 2009–10.

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To obtain this pocket summary (NCES 2001–048), call the toll-free ED Pubs number (877–433–7827) or visit the NCES Web Site *(http://nces.ed.gov).*

Funding Opportunities

The AERA Grants Program

Jointly funded by the National Science Foundation (NSF), NCES, and the Office of Educational Research and Improvement (OERI), this training and research program is administered by the American Educational Research Association (AERA). The program has four major elements: a research grants program, a dissertation grants program, a fellows program, and a training institute. The program is intended to enhance the capability of the U.S. research community to use large-scale data sets, specifically those of the NSF and NCES, to conduct studies that are relevant to educational policy and practice, and to strengthen communications between the educational research community and government staff.

Applications for this program may be submitted at any time. The application review board meets three times per year.

For more information, contact Edith McArthur *(edith_mcarthur@ed.gov)* or visit the AERA Grants Program Web Site *(http://aera.ucsb.edu)*.

The NAEP Secondary Analysis Grant Program

The NAEP Secondary Analysis Grant Program was developed to encourage education researchers to conduct secondary analysis studies using data from the National Assessment of Educational Progress (NAEP) and the NAEP High School Transcript Studies. This program is open to all public or private organizations and consortia of organizations. The program is typically announced annually, in the late fall, in the *Federal Register*. Grants awarded under this program run from 12 to 18 months and awards range from $15,000 to $100,000.

For more information, contact Alex Sedlacek *(alex_sedlacek@ed.gov)*.

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