

STATS IN BRIEF

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Learning at a Distance

Undergraduate Enrollment in Distance Education Courses and Degree Programs

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Statistics in Brief publications present descriptive data in tabular formats to provide useful information to a broad audience, including members of the general public. They address simple and topical issues and questions. They do not investigate more complex hypotheses, account for inter-relationships among variables, or support causal inferences. We encourage readers who are interested in more complex questions and in-depth analysis to explore other NCES resources, including publications, online data tools, and public- and restricted-use datasets. See nces.ed.gov and references noted in the body of this document for more information.

In 2008 the United States

ranked fifth out of 36 Organisation for Economic Co-operation and Development (OECD) member and partner countries in the proportion of 25- to 64-year-olds with a postsecondary degree (OECD 2010, table A1.3a). Some have proposed that one way to improve Americans' educational attainment overall may be to bring a broader base of Americans into postsecondary education (Hebel 2010; Jaschik 2009). It has been suggested that the flexibility of distance education courses and programs may be particularly helpful in encouraging Americans with family and work obligations to pursue and complete postsecondary credentials (Kolowich 2010).

This Statistics in Brief investigates participation in distance education using the most current nationally representative student-reported data collected by the National Center for Education Statistics (NCES). Specifically, the data come from the three most recent administrations of the National Postsecondary Student Aid Study, which were conducted during the 1999–2000, 2003–04, and 2007–08 academic years (NPSAS:2000, NPSAS:04, and NPSAS:08).¹ This report complements a

¹ It is important to keep in mind that the distance education participation results discussed in this report are based on self-reported data from students. Self-reported data were used instead of transcript data because transcripts generally do not indicate whether a course or degree program was taught through distance learning.

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recent NCES report (Parsad and Lewis 2008), which focused on institutions' distance education offerings and enrollments using institution-level data. This Statistics in Brief's use of student-reported data allows for exploration of how participation in these courses varies with student characteristics.

In this analysis, undergraduates enrolled in 2007–08 are defined as having participated in a distance education class if they reported that they took a course for credit during the academic year that was not a correspondence course but was primarily

delivered using live, interactive audio or videoconferencing, pre-recorded instructional videos, webcasts, CD-ROM or DVD, or computer-based systems delivered over the Internet. Undergraduates enrolled in 2007–08 are defined as having participated in a distance education degree program if they reported that their entire degree program was taught through such courses. Participation was defined similarly for 1999–2000 and 2003–04 undergraduates. (See complete descriptions of the distance education variables used in the Technical Notes.) Distance education enrollment was examined by selected enrollment

characteristics in order to see if participation was more common in certain fields, programs, and institution types. Use of distance education was also explored by age, marital and dependent status, employment, and student disability status to investigate if non-traditional students were more apt than others to take part in these types of courses.

All comparisons of estimates were tested for statistical significance using the Student's *t*-statistic, and all differences cited are statistically significant at the $p < .05$ level.²

² While *z*-tests could have been used, the results of *z*-tests and *t*-tests converge with larger cell sizes, making *t*-tests an appropriate choice. No adjustments for multiple comparisons were made, which increases the probability that some of the differences between estimates may occur due to chance and not because of differences between population values. The standard errors for the estimates can be found at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2012154>.

STUDY QUESTIONS

1 What percentage of 2007–08 undergraduates reported enrollment in a distance education course and a distance education degree program and have these percentages changed over time?

2 Did 2007–08 undergraduates' reported participation in a distance education course or degree program vary by field of study, degree sought, or type of institution?

3 Did 2007–08 undergraduates' reported participation in a distance education course or degree program differ by age, dependents, marital status, work responsibilities, or student disability status?

KEY FINDINGS

- From 2000 to 2008, the percentage of undergraduates enrolled in at least one distance education class expanded from 8 percent to 20 percent, and the percentage enrolled in a distance education degree program increased from 2 percent to 4 percent.
- Compared with all students, students studying computer science and those studying business enrolled at higher rates in both distance education classes (27 percent and 24 percent, respectively, vs. 20 percent) and distance education degree programs (8 percent and 6 percent, respectively, vs. 4 percent).
- Participation in a distance education course was most common among undergraduates attending public 2-year colleges; 22 percent were so enrolled. Participation in a distance education degree program was most common among undergraduates attending for-profit institutions; 12 percent were so enrolled.
- Older undergraduates and those with a dependent, a spouse, or full-time employment participated in both distance education classes and degree programs relatively more often than their counterparts.
- Students with mobility disabilities enrolled in a distance education course more often than students with no disabilities (26 percent compared with 20 percent), but no other statistically significant difference between students with and without disabilities was detected.

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What percentage of 2007–08 undergraduates reported enrollment in a distance education course and a distance education degree program and have these percentages changed over time?

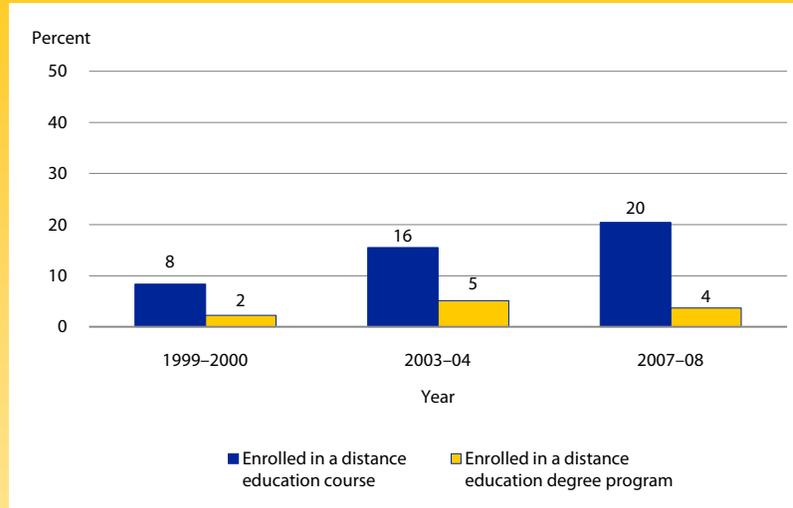
During the 2007–08 academic year, 20 percent of all undergraduates had taken at least one class via distance education (figure 1). This percentage exceeded those observed among undergraduates in 1999–2000 (8 percent) and 2003–04 (16 percent).

The percentage of undergraduates enrolled in a degree program taught entirely through distance education increased from 2 percent in 1999–2000 to 5 percent in 2003–04. It then decreased slightly to 4 percent in 2007–08.

FIGURE 1.

PARTICIPATION

Percentage of undergraduates enrolled in a distance education course or degree program, by year: 1999–2000, 2003–04, and 2007–08



NOTE: In 2007–08 a distance education class was defined as a course taken for credit during the academic year that was not a correspondence course but was primarily delivered using live, interactive audio or videoconferencing, pre-recorded instructional videos, webcasts, CD-ROM or DVD, or computer-based systems delivered over the Internet. A distance education degree program was defined as a program taught entirely through distance education classes. Participation was defined similarly for 1999–2000 and 2003–04 undergraduates. (See complete descriptions of the distance education variables used in the Technical Notes.) Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states, the District of Columbia, and Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2012154>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1999–2000, 2003–04, and 2007–08 National Postsecondary Student Aid Study (NPSAS:2000, NPSAS:04, and NPSAS:08).

This growth in distance education since 1999–2000 cannot simply be attributed to an increase in the proportion of undergraduates more likely to enroll in distance education. As figures in section 3 will show, while students who were age 30 or older, had dependents, were married, or worked full time participated in distance education at higher rates than their peers, each of these groups made up a smaller portion of the 2007–08 undergraduate population than of the 1999–2000 undergraduate population (table 1).

TABLE 1.

ENROLLMENT
Percentage distribution of enrollment in postsecondary education, by age, family obligations, and work obligations: 1999–2000 and 2007–08

	1999–2000	2007–08
Total	100.0	100.0
Age		
23 or younger	57.7	59.7
24–29	16.7	17.3
30 or older	25.6	23.0
Dependent(s)		
No dependents	73.3	74.6
One or more dependents	26.7	25.4
Marital status		
Married	21.4	18.0
Unmarried or separated	78.6	82.0
Employment status		
Not employed	19.3	21.0
Employed part time	41.3	45.0
Employed full time	39.3	33.9

NOTE: In 2007–08 a distance education class was defined as a course taken for credit during the academic year that was not a correspondence course but was primarily delivered using live, interactive audio or videoconferencing, pre-recorded instructional videos, webcasts, CD-ROM or DVD, or computer-based systems delivered over the Internet. A distance education degree program was defined as a program taught entirely through distance education classes. Participation was defined similarly for 1999–2000 undergraduates. (See complete descriptions of the distance education variables used in the Technical Notes.) Detail may not sum to totals because of rounding. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states, the District of Columbia, and Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2012154>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1999–2000 and 2007–08 National Postsecondary Student Aid Study (NPSAS:2000 and NPSAS:08).

2 Did 2007–08 undergraduates' reported participation in a distance education course or degree program vary by field of study, degree sought, or type of institution?

FIELDS OF STUDY

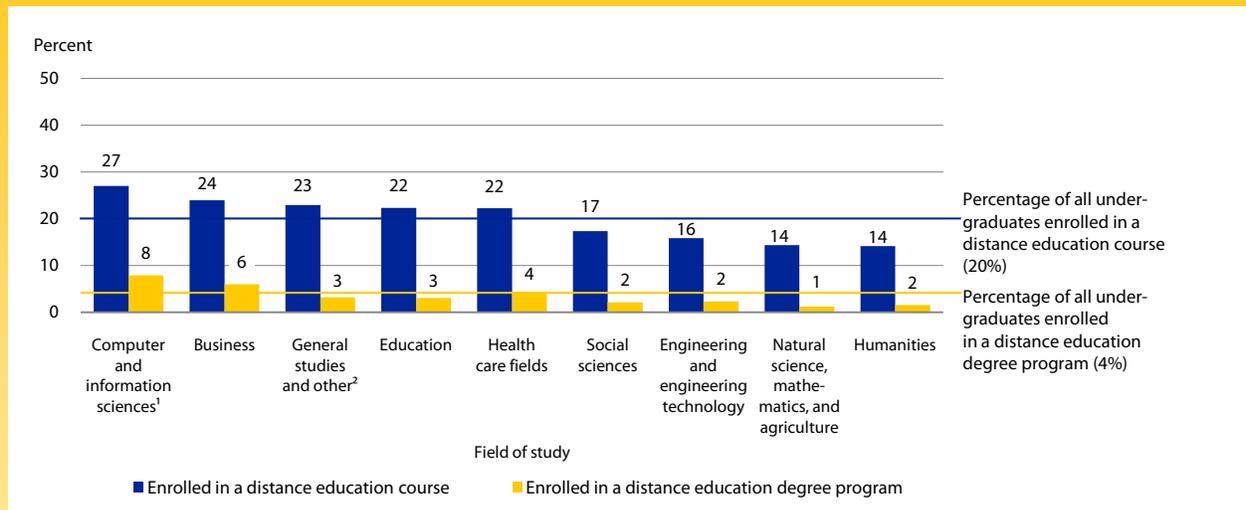
Compared with the 20 percent of all students who participated in a distance education class, students studying computer and information sciences (27 percent), business (24 percent), general studies (23 percent), education (22 percent), or health care (22 percent) participated at a higher rate (figure 2-A).

Computer and information sciences students and business students also enrolled in distance education degree programs at a higher rate than all students (8 percent and 6 percent, respectively, vs. 4 percent). On the other hand, students in social sciences; engineering and engineering technology; natural science, mathematics,

and agriculture; and humanities enrolled in both distance education courses (17 percent, 16 percent, 14 percent, and 14 percent, respectively) and degree programs (2 percent, 2 percent, 1 percent, and 2 percent, respectively) at lower rates than all undergraduates (20 percent and 4 percent, respectively).

FIGURE 2-A.

SELECTED FIELDS OF STUDY
Percentage of undergraduates enrolled in a distance education course or degree program, by selected fields of study: 2007–08



¹ Does not include library science.

² Includes liberal arts and sciences; multi/interdisciplinary studies, other unspecified; basic skills; citizenship activities; health-related knowledge and skills; interpersonal and social skills; leisure and recreational activities; personal awareness and self-improvement; and high school/secondary diplomas and certificates.

NOTE: In 2007–08 a distance education class was defined as a course taken for credit during the academic year that was not a correspondence course but was primarily delivered using live, interactive audio or videoconferencing, pre-recorded instructional videos, webcasts, CD-ROM or DVD, or computer-based systems delivered over the Internet. A distance education degree program was defined as a program taught entirely through distance education classes. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states, the District of Columbia, and Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2012154>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2007–08 National Postsecondary Student Aid Study (NPSAS:08).

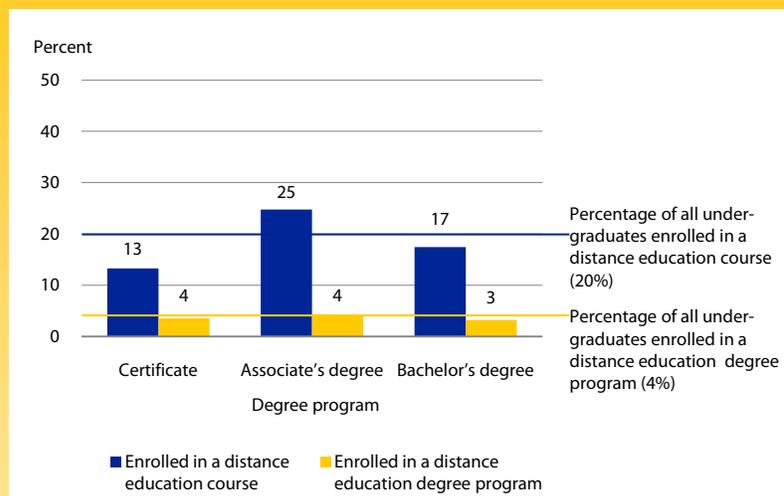
FIRST DEGREE PROGRAM

Participation in a distance education course was relatively more common among associate's degree students (25 percent) than among bachelor's degree (17 percent) or certificate (13 percent) students (figure 2-B). In looking at enrollment in distance education degree programs, however, no statistically significant difference was detected between students at large and students in certificate, associate's degree, or bachelor's degree programs.

FIGURE 2-B.

DEGREE PROGRAM

Percentage of undergraduates enrolled in a distance education course or degree program, by degree program: 2007–08



NOTE: In 2007–08 a distance education class was defined as a course taken for credit during the academic year that was not a correspondence course but was primarily delivered using live, interactive audio or videoconferencing, pre-recorded instructional videos, webcasts, CD-ROM or DVD, or computer-based systems delivered over the Internet. A distance education degree program was defined as a program taught entirely through distance education classes. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states, the District of Columbia, and Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2012154>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2007–08 National Postsecondary Student Aid Study (NPSAS:08).

TYPE OF INSTITUTION

Undergraduates attending public 2-year colleges participated in a distance education class relatively more often than those attending other types of institutions (figure 2-C).³ Twenty-two percent did so, compared with 19

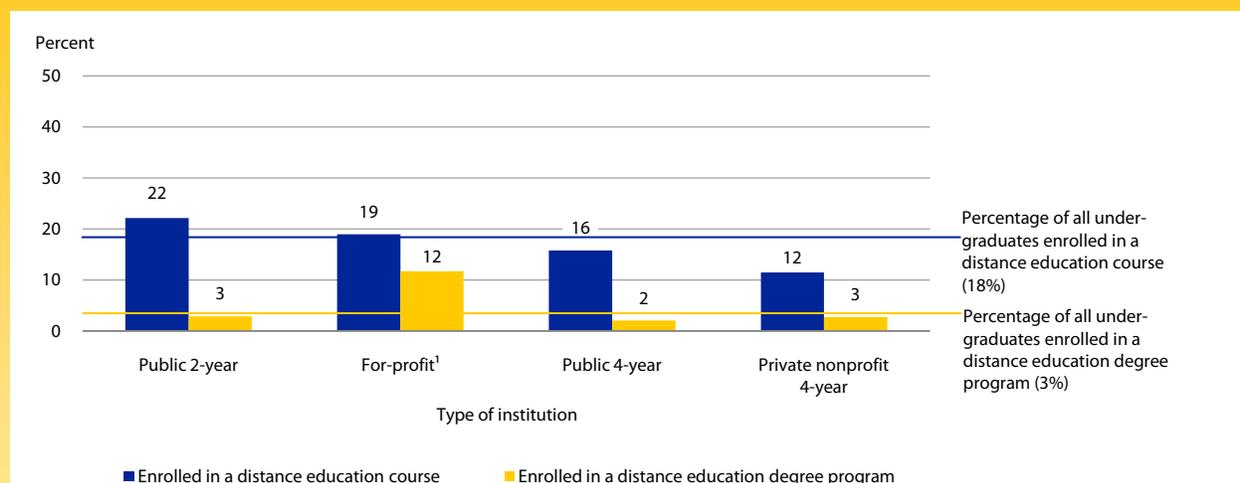
percent of students at for-profit, 16 percent at public 4-year, and 12 percent at private nonprofit 4-year institutions.

Students at for-profit institutions, however, had the highest participation rate

in distance education degree programs among the four institution types examined. Twelve percent of students enrolled at a for-profit institution participated in such programs, compared with 3 percent or fewer students at other types of institutions.

FIGURE 2-C.

TYPE OF INSTITUTION
Percentage of undergraduates enrolled in a distance education course or degree program, by type of institution: 2007–08



¹ For-profit estimates include less-than-2-year, 2-year, and 4-year for-profit institutions.

NOTE: Results presented in this figure are based on undergraduates who participated in distance education through the institution in which they were sampled (i.e., the National Postsecondary Student Aid Study institution). In 2007–08 a distance education class was defined as a course taken for credit during the academic year that was not a correspondence course but was primarily delivered using live, interactive audio or videoconferencing, pre-recorded instructional videos, webcasts, CD-ROM or DVD, or computer-based systems delivered over the Internet. A distance education degree program was defined as a program taught entirely through distance education classes. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states, the District of Columbia, and Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2012154>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2007–08 National Postsecondary Student Aid Study (NPSAS:08).

³ To help ensure that distance education participation is attributed to the appropriate institution type, results by type of institution are limited to undergraduates who participated in distance education through the institution in which they were sampled (i.e., the NPSAS institution) because the type of the sampled institution is known. This distinction is not important for other analyses and so other distance education results presented in this Statistics in Brief are not limited in this way; they include all undergraduates enrolled in distance education, regardless of the institution in which they pursued distance education.

Comparing the types of institutions attended by the entire undergraduate population to the types of institutions attended by the undergraduate population enrolled in distance education programs is also informative. As table 2 reveals, less than 10 percent of *all undergraduates* attended a for-profit institution, but more than 35 percent of *all undergraduates enrolled in a distance education degree program* were enrolled at a for-profit college.

TABLE 2.

DISTRIBUTION BY TYPE OF INSTITUTION
Percentage distribution of enrollment in postsecondary education and in a distance education course or degree program, by type of institution: 2007–08

	Total	Enrolled in a distance education	
		Course	Degree program
Total	100.0	100.0	100.0
Type of institution			
Public 2-year	43.8	53.1	34.7
For-profit ¹	9.9	10.2	35.2
Public 4-year	32.1	27.7	18.4
Private nonprofit 4-year	14.2	9.0	11.6

¹ For-profit estimates include less-than-2-year, 2-year, and 4-year for-profit institutions.

NOTE: Distance education results presented in this figure are based on undergraduates who participated in distance education through the institution in which they were sampled (i.e., the National Postsecondary Student Aid Study institution). In 2007–08 a distance education class was defined as a course taken for credit during the academic year that was not a correspondence course but was primarily delivered using live, interactive audio or videoconferencing, pre-recorded instructional videos, webcasts, CD-ROM or DVD, or computer-based systems delivered over the Internet. A distance education degree program was defined as a program taught entirely through distance education classes. Detail may not sum to totals because of rounding. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states, the District of Columbia, and Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2012154>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2007–08 National Postsecondary Student Aid Study (NPSAS:08).

3

Did 2007–08 undergraduates' reported participation in a distance education course or degree program differ by age, dependents, marital status, work responsibilities, or student disability status?

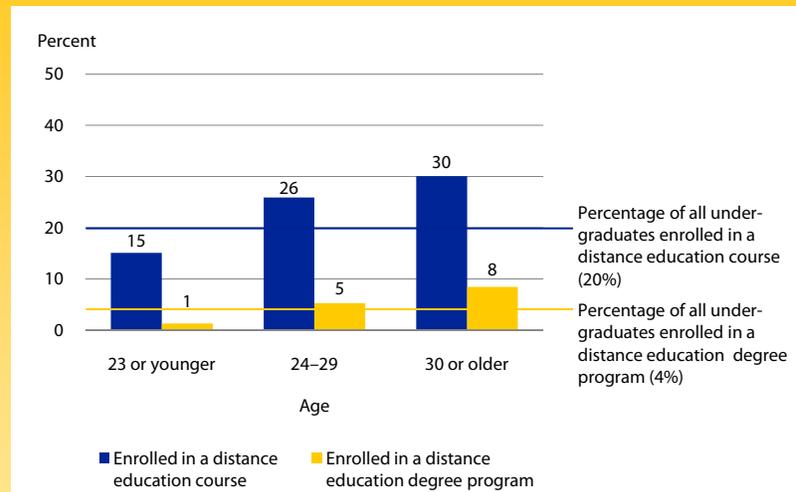
AGE

Older undergraduates enrolled in distance education classes and degree programs at higher rates than did younger students. Fifteen percent of undergraduates age 23 or younger participated in a distance education course, compared with 26 percent of those between ages 24 and 29 and 30 percent of those age 30 or older (figure 3-A).⁴ One percent of students in the youngest age group were enrolled in a distance education degree program, while 5 percent and 8 percent, respectively, of the two older age groups were enrolled.

FIGURE 3-A.

AGE

Percentage of undergraduates enrolled in a distance education course or degree program, by age: 2007–08



NOTE: In 2007–08 a distance education class was defined as a course taken for credit during the academic year that was not a correspondence course but was primarily delivered using live, interactive audio or videoconferencing, pre-recorded instructional videos, webcasts, CD-ROM or DVD, or computer-based systems delivered over the Internet. A distance education degree program was defined as a program taught entirely through distance education classes. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states, the District of Columbia, and Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2012154>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2007–08 National Postsecondary Student Aid Study (NPSAS:08).

⁴ These age categories match those used in many NCES postsecondary reports. The first category was established because students age 23 or younger are generally considered financially dependent on their parents, while those age 24 or older are generally considered financially independent. Students age 24 and older were divided into two groups (those age 24 to 29 and those age 30 or older), to determine whether students in their thirties and above participate in distance education at higher rates.

Table 3 shows how the age composition of undergraduates enrolled in distance education programs differs from the age composition of undergraduates at large. Though 23 percent of all undergraduates were age 30 or older, 53 percent of all undergraduates in a distance education degree program were in this age group.

TABLE 3.

DISTRIBUTION BY SELECTED DEMOGRAPHICS
Percentage distribution of enrollment in postsecondary education and in a distance education course or degree program, by age, family obligations, and work obligations: 2007–08

	Total	Enrolled in a distance education	
		Course	Degree program
Total	100.0	100.0	100.0
Age			
23 or younger	59.7	44.2	22.0
24–29	17.3	21.9	25.0
30 or older	23.0	33.9	53.0
Marital status			
Married	18.0	27.8	40.3
Unmarried or separated	82.0	72.2	59.7
Dependent(s)			
No dependents	74.6	63.9	44.9
One or more dependents	25.4	36.1	55.1
Employment status			
Not employed	21.0	16.6	15.8
Employed part time	45.0	38.0	22.7
Employed full time	33.9	45.4	61.5

NOTE: In 2007–08 a distance education class was defined as a course taken for credit during the academic year that was not a correspondence course but was primarily delivered using live, interactive audio or videoconferencing, pre-recorded instructional videos, webcasts, CD-ROM or DVD, or computer-based systems delivered over the Internet. A distance education degree program was defined as a program taught entirely through distance education classes. Detail may not sum to totals because of rounding. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states, the District of Columbia, and Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2012154>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2007–08 National Postsecondary Student Aid Study (NPSAS:08).

DEPENDENTS AND MARITAL STATUS

Students who had a dependent or were married also participated in distance education classes or degree programs more often than other students (figure 3-B). Twenty-nine percent of students with one or more dependents and 32 percent of married

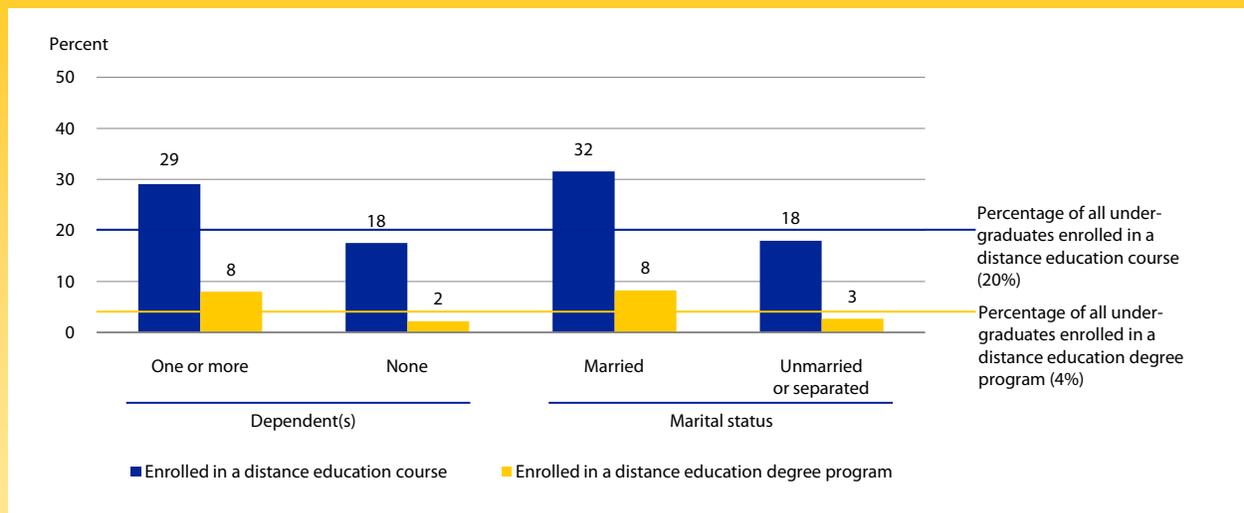
students took a distance education class, in contrast to 18 percent of students without these characteristics. As for distance education degree programs, 8 percent of students who had at least one dependent or were married participated, compared with 2 percent and 3 percent of their respective counterparts.

While 18 percent of all undergraduates were married, 40 percent of all undergraduates in a distance education program were married (table 3). In addition, though 25 percent of all undergraduates had one or more dependents, 55 percent of all undergraduates in a distance education degree program had at least one dependent (table 3).

FIGURE 3-B.

DEPENDENTS AND MARITAL STATUS

Percentage of undergraduates enrolled in a distance education course or degree program, by number of dependents and marital status: 2007–08



NOTE: In 2007–08 a distance education class was defined as a course taken for credit during the academic year that was not a correspondence course but was primarily delivered using live, interactive audio or videoconferencing, pre-recorded instructional videos, webcasts, CD-ROM or DVD, or computer-based systems delivered over the Internet. A distance education degree program was defined as a program taught entirely through distance education classes. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states, the District of Columbia, and Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2012154>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2007–08 National Postsecondary Student Aid Study (NPSAS:08).

WORK OBLIGATIONS

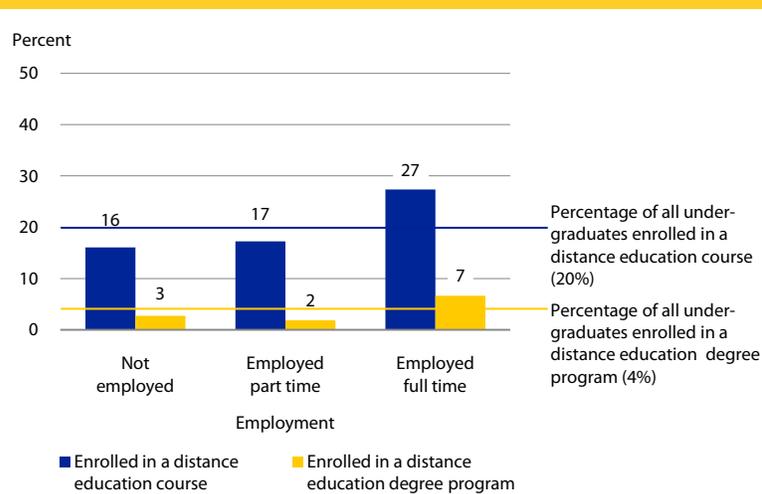
Participation in distance education also varied by undergraduates' work obligations (figure 3-C). Students working full time had a distance education class enrollment rate of 27 percent and a distance education degree program enrollment rate of 7 percent. Respectively, these rates were about 10 and 4 percentage points higher than both students who were not working and students who were working part time.

In addition, 34 percent of all undergraduates were employed full time, but 45 percent of all undergraduates enrolled in a distance education class were employed full time, and 62 percent of all undergraduates enrolled in a distance education degree program were employed full time (table 3).

FIGURE 3-C.

WORK OBLIGATIONS

Percentage of undergraduates enrolled in a distance education course or degree program, by work obligations: 2007–08



NOTE: Students whose sole employment was through work-study or an assistantship were considered employed. For all employed students, full-time status was defined as working 35 or more hours per week and part-time status was defined as working less than 35 hours per week. In 2007–08 a distance education class was defined as a course taken for credit during the academic year that was not a correspondence course but was primarily delivered using live, interactive audio or videoconferencing, pre-recorded instructional videos, webcasts, CD-ROM or DVD, or computer-based systems delivered over the Internet. A distance education degree program was defined as a program taught entirely through distance education classes. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states, the District of Columbia, and Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2012154>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2007–08 National Postsecondary Student Aid Study (NPSAS:08).

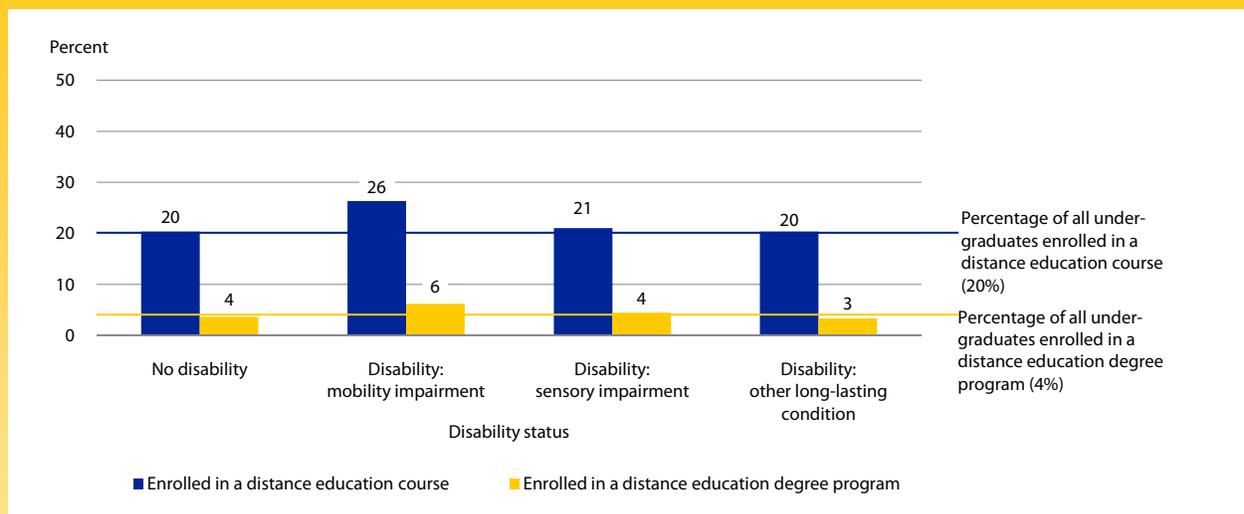
DISABILITY STATUS

Students with a mobility disability enrolled in a distance education course more often than students with no disability (figure 3-D).⁵ No other statistically significant differences in

distance education course or degree program enrollment were detected between students with a disability (mobility, sensory, or other) and students without a disability.

FIGURE 3-D.

DISABILITY STATUS
Percentage of undergraduates enrolled in a distance education course or degree program, by disability status: 2007–08



NOTE: Students were considered to have a mobility disability if they reported having an impairment that has substantially limited one or more basic physical activities, such as walking, climbing stairs, reaching, lifting, or carrying for 6 months or more. Students were considered to have a sensory disability if they reported having blindness, deafness, or a severe vision or hearing impairment that has lasted for 6 months or more. Students were considered to have another long-lasting disability if they had a different physical, mental, emotional, or learning condition for 6 months or more that limited their ability to learn, remember, or concentrate; dress, bathe, or get around the house; or get to school, around campus, or to work. Students were considered not to have a disability if they reported that they did not have any of these types of disabilities. In 2007–08 a distance education class was defined as a course taken for credit during the academic year that was not a correspondence course but was primarily delivered using live, interactive audio or videoconferencing, pre-recorded instructional videos, webcasts, CD-ROM or DVD, or computer-based systems delivered over the Internet. A distance education degree program was defined as a program taught entirely through distance education classes. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states, the District of Columbia, and Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2012154>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2007–08 National Postsecondary Student Aid Study (NPSAS:08).

⁵ For more information on how disability was defined, see the notes in figure 3-D.

FIND OUT MORE

For questions about content or to order additional copies of this Statistics in Brief or view this report online, go to:

<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2012154>

More detailed information on undergraduate students can be found in Web Tables produced by the National Center for Education Statistics (NCES) using data from the 2007–08 National Postsecondary Student Aid Study (NPSAS:08). These Web Tables include estimates of undergraduates' demographic, enrollment, and employment characteristics. Web Tables containing this information on 1999–2000 and 2003–04 undergraduates can be found in the second set of Web Tables listed below.

Web Tables—Profile of Undergraduate Students: 2007–08 (NCES 2010-205).

<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2010205>

Web Tables—Profile of Undergraduate Students: Trends From Selected Years, 1995–96 to 2007–08

(NCES 2010-220).

<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2010220>

Readers may also be interested in the following NCES products related to the topic of this Statistics in Brief:

A Profile of Participation in Distance Education: 1999–2000 (NCES 2003-154).

<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2003154>

Distance Education at Degree-Granting Postsecondary Institutions: 2006–07 (NCES 2009-044).

<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2009044>

Distance Education at Degree-Granting Postsecondary Institutions: 2000–2001 (NCES 2003-017).

<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2003017>

Distance Education Instruction by Postsecondary Faculty and Staff: Fall 1998 (NCES 2002-155).

<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2002155>

TECHNICAL NOTES

Survey Methodology

The estimates provided in this Statistics in Brief are based on data collected through the 1999–2000, 2003–04, and 2007–08 National Postsecondary Student Aid Studies (NPSAS:2000, NPSAS:04, and NPSAS:08). NPSAS covers broad topics concerning student enrollment in postsecondary education and how students and their families finance their education. In 2000, students provided data through instruments administered over the telephone, and in 2004 and 2008, through instruments administered over the Internet or by telephone. In

addition to student responses, data were collected from the institutions that sampled students attended and from other relevant databases, including U.S. Department of Education records on student loan and grant programs and student financial aid applications.

NPSAS has been conducted every 3 to 4 years since 1986–87. The NPSAS:2000, NPSAS:04, and NPSAS:08 target population includes students enrolled in postsecondary institutions in the United States and Puerto Rico at any time between July 1st and June 30th of the survey year.⁶ In NPSAS:2000, NPSAS:04, and NPSAS:08

the population was also limited to students enrolled in Title IV institutions.⁷ Table A-1 provides the sizes of the undergraduate and graduate components of the target population.

Table A-1 also lists the institution sampling frames for NPSAS:2000, NPSAS:04, and NPSAS:08, which were constructed from contemporary Institutional Characteristics, Fall Enrollment, and Completions files of the Integrated Postsecondary Education Data System (IPEDS). The sampling design consisted of first selecting eligible institutions, then selecting students from these institutions. Institutions were selected with probabilities

TABLE A-1. Target populations, number of participating institutions, and unweighted number of study members: NPSAS:2000 to NPSAS:08

NPSAS year	Sampling frame	Target undergraduate population (in millions)	Target graduate student population (in millions)	Participating Institutions	Number of undergraduate study members	Number of graduate study members
NPSAS:2000	1998–99 IPEDS ¹	16.6	2.7	1,000	49,900	11,800
NPSAS:04	2000–01 IPEDS	19.1	2.8	1,400	79,900	10,900
NPSAS:08	2004–05 IPEDS	20.9	3.5	1,700	113,500	14,200

¹ Supplemented by 1996–97 IPEDS Completions file because NPSAS:2000 served as a base year for Baccalaureate and Beyond Longitudinal Study (B&B).

⁶ The target population of students was limited to those enrolled in an academic program, at least one course for credit that could be applied toward an academic degree, or an occupational or vocational program requiring at least 3 months or 300 clock hours of instruction to receive a degree, certificate, or other formal award. The target population excluded students who were also enrolled in high school or a high school completion (e.g., GED preparation) program.

⁷ “Title IV institutions” refers to institutions eligible to participate in federal financial aid programs under Title IV of the Higher Education Act.

proportional to a composite measure of size based on expected enrollment during the survey year. Table A-1 includes the approximate number of institutions participating in each of the survey years, and the corresponding weighted institution unit response rates. In NPSAS:08, eligible sampled students were defined as study respondents if at least 11 key data elements were available from any data source. Similar definitions of study respondents were developed for each of the earlier NPSAS administrations. See the methodology reports listed at the end of this section for detailed descriptions of these definitions. The approximate number of undergraduates and graduate students who were study respondents in each survey year is also reported in table A-1.

Table A-2 provides a summary of weighted response rates across NPSAS administrations. There are several types of participation/coverage rates in NPSAS. For the student record abstraction phase of the study (referred to as computer-assisted data entry or CADE), institution completion rates vary across different types of institutions and depend on the method of data submission (field-CADE, self-CADE, and data-CADE). Overall student-level CADE completion rates (i.e., the percentage of NPSAS-eligible sample members for whom a completed CADE record was obtained) are reported in table A-2 as “Student survey (analysis file).” This table also contains weighted response rates for the student interview (i.e., the proportion of students

TABLE A-2. Weighted response rates for NPSAS surveys: NPSAS:2000 to NPSAS:08

Component	Institution list participation rate	Student response rate	Overall ¹
NPSAS:2000			
Student survey (analysis file ²)	91	97	89
Student survey (student interview)	91	72	66
NPSAS:04			
Student survey (analysis file ²)	80	91	72
Student survey (student interview)	80	71	56
NPSAS:08			
Student survey (analysis file ²)	90	96	86
Student survey (student interview)	90	71	64

¹ Institution list participation rate times student response rate.

² NPSAS analysis file contains analytic variables derived from all NPSAS data sources (including institutional records and external data sources) as well as selected direct student interview variables.

NOTE: The student interview response rates for NPSAS:2000 are for telephone interviews only. The response rates for student interviews in NPSAS:04 and NPSAS:08 include all interview modes (self-administered web-based, telephone, and in-person interviews).

SOURCE: Burns, S., Wang, X., and Henning, A. (Eds.). (2011). *NCES Handbook of Survey Methods* (NCES 2011-609). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC.

who completed either a full or partial interview). These rates are indicated in table A-2 as “Student survey (student interview).” Estimates were weighted to adjust for the unequal probability of selection into the sample and for non-response.

Two broad categories of error occur in estimates generated from surveys: sampling and nonsampling errors. Sampling errors occur when observations are based on samples rather than on entire populations. The standard error of a sample statistic is a measure of the variation due to sampling and indicates the precision of the statistic. The complex sampling design used in NPSAS must be taken into account when calculating variance estimates

such as standard errors. NCES’s online PowerStats, which generated the estimates in this report, use the balanced repeated replication (BRR) and Jackknife II (JK2) methods to adjust variance estimation for the complex sample design.

Nonsampling errors can be attributed to several sources: incomplete information about all respondents (e.g., some students or institutions refused to participate, or students participated but answered only certain items); differences among respondents in question interpretation; inability or unwillingness to give correct information; mistakes in recording or coding data; and other errors of collecting,

processing, sampling, and imputing missing data.

For more information on NPSAS:2000, NPSAS:04, and NPSAS:08 methodology, see the following reports:

- *Methodology Report for the 1999–2000 National Postsecondary Student Aid Study*
(<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2002152>)
- *2004 National Postsecondary Student Aid Study (NPSAS:04) Full-scale Methodology Report*
(<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2006180>)
- *2007–08 National Postsecondary Student Aid Study (NPSAS:08) Full-scale Methodology Report*
(<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2011188>).

Description of Distance Education Variable Across Years

This Statistics in Brief analyzes student participation in distance education using student-reported data from three administrations of the National Postsecondary Student Aid Study (NPSAS:2000, NPSAS:04, and NPSAS:08).

VARIABLES USED

All estimates presented in this Statistics in Brief were produced using PowerStats, a web-based software application that allows users to generate tables for many of the postsecondary surveys conducted by NCES. See “Run Your Own Analysis With DataLab” below for more information on PowerStats. The variables used in this Brief are listed below. Visit the NCES DataLab website (<http://nces.ed.gov/datalab>) to view detailed information on how these variables were constructed and their sources. Under *Detailed Information About PowerStats Variables, NPSAS Undergraduates:2008*, click by *subject* or by *variable name*. The program files that generated the statistics presented in this Brief can be found at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2012154>.

Label	Name
2007–08 National Postsecondary Student Aid Study (NPSAS:08) Variables	
Age	AGE
Degree sought	UGDEG
Dependent(s)	DEPANY
Disability: mobility impairment	DISMOBIL
Disability: other long-lasting condition	DISOTHER
Disability: sensory impairment	DISSENSR
Distance education class	DISTEDUC
Distance education degree program	DISTALL
Employment status	JOBENR2
Field of study	MAJORS4Y
Location of distance education class	DISTLOC
Location of distance education degree program	DISTLOC2
Marital status	SMARITAL
No disability	DISABLE
Type of institution	SECTOR9
NPSAS:04 Variables	
Distance education class	DISTEDUC
Distance education degree program	DISTALL
NPSAS:2000 Variables	
Age	AGE
Dependent(s)	ANYDEP
Distance education class	NEDSTED
Distance education degree program	NEENTPGM
Employment status	ENRJOB2
Marital status	SMARITAL

In all three administrations, students were considered to have participated in a distance education degree program if, in response to survey questions, they reported that their entire degree program was taught through distance education classes.

NPSAS:08 defined a distance education class as “primarily delivered using live, interactive audio or videoconferencing, pre-recorded instructional videos, webcasts, CD-ROM, or DVD, or computer-based systems delivered over the Internet. Distance education does not include correspondence courses.”

NPSAS:04 described a distance education class as “primarily delivered off campus using live, interactive TV or audio, pre-recorded TV or video, CD-ROM, or a computer-based system such as the Internet. Distance education does not include correspondence courses.”

NPSAS:2000 classified a distance education class as “delivered off campus using live, interactive TV or audio, pre-recorded TV or video, CD-ROM, or a computer-based system such as the Internet, e-mail, or chat rooms. Distance education does not include correspondence courses.”

Item Response Rates

NCES Statistical Standard 4-4-1 states that “[a]ny survey stage of data collection with a unit or item response rate less than 85 percent must be evaluated for the potential magnitude of nonresponse bias before the data or any analysis using the data may be re-

leased” (U.S. Department of Education 2002). This means that nonresponse bias analysis could be required at any of three levels: (1) institutions, (2) study respondents, or (3) items.

For more information on response rates and nonresponse bias analysis for selected variables from NPSAS:2000 and NPSAS:04, please see the relevant NPSAS methodology reports, listed above. For NPSAS:2000, *National Post-secondary Student Aid Study 1999–2000 (NPSAS:2000)*, *CATI Nonresponse Bias Analysis Report* provides additional information.⁸ Note that for NPSAS:2000, nonresponse bias analysis for computer-assisted telephone interview (CATI) nonresponse was conducted at the student level and not at the item level.

For NPSAS:08, the institution and study respondent response rates were 90 and 96 percent, respectively, and thus nonresponse bias analysis was not required at those levels. The student interview response rate, however, was 71 percent, and therefore nonresponse bias analysis was required for those variables based in whole or in part on student interviews. The following NPSAS:08 variables used in this report required nonresponse bias analysis: DEPANY (69 percent), DISABLE (62 percent), DISMOBIL (62 percent), DISOTHER (62 percent), DISSENSR (62 percent), DISTALL (26 percent), DISTEDUC (63 percent), DISTLOC (26 percent), DISTLOC2 (7 percent), and

⁸ This publication can be retrieved from <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=200203>.

JOBENR2 (58 percent). For each of these variables, nonresponse bias analyses were conducted to determine whether respondents and nonrespondents differed on the following characteristics: institution sector, region, and total enrollment; student type, gender, and age group; whether the student had Free Application for Federal Student Aid (FAFSA) data, was a federal aid recipient, was a Pell Grant recipient, or borrowed a Stafford Loan; and the amount, if any, of a student’s Pell Grant or Stafford Loan. Differences between respondents and nonrespondents on these variables were tested for statistical significance at the 5 percent level. All other NPSAS:08 variables used in this Brief had a pre-imputation response rate of 85 percent or higher.

Nonresponse bias analyses of the variables in this report with response rates less than 85 percent indicated that respondents differed from nonrespondents on 57 percent to 82 percent of the characteristics analyzed, indicating that there may be bias in these estimates. Any bias due to nonresponse, however, is based upon responses prior to stochastic imputation. Missing responses were imputed using a hot-deck procedure, and the potential for bias in these estimates may have been reduced due to imputation. Because imputation procedures are designed specifically to identify donors with similar characteristics to those with missing data, the imputation is assumed to reduce bias. While item-level bias before imputation is measurable, such bias after imputation

is not, so whether the imputation affected the bias cannot be directly evaluated. Therefore, the item estimates before and after imputation were compared to determine whether the imputation changed the biased estimate, thus suggesting a reduction in bias.

For continuous variables, the difference between the mean before imputation and the mean after imputation was estimated. For categorical variables, the estimated difference was computed for each of the categories as the percentage of students in that category before imputation minus the percentage of students in that category after imputation. These estimated differences were tested for statistical significance at the 5 percent level. A significant difference in the item means after imputation implies a reduction in bias due to imputation. A nonsignificant difference suggests that imputation may not have reduced bias, that the sample size was too small to detect a significant difference, or that there was little bias to be reduced. Statistical tests of the differences between the means before and after imputation for DEPANY, DISTLOC, DISTLOC2, and JOBENR2 were significant, indicating that the nonresponse bias was reduced through imputation. The differences between the means before and after imputation for DISABLE, DISMOBIL, DISOTHER, DISSENSR, DISTALL, and DISTEDUC were not significant, indicating that imputation may not have reduced nonresponse bias, that the sample size was too small to detect a

significant difference, or that there was little bias to be reduced. Readers should interpret estimates that may be biased with caution.

For more detailed information on non-response bias analysis and an overview of the survey methodology, see the *2007–08 National Postsecondary Student Aid Study (NPSAS:08) Full-scale Methodology Report* (<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2011188>).

Statistical Procedures

Comparisons of means and proportions were tested using Student's *t* statistic. Differences between estimates were tested against the probability of a Type I error⁹ or significance level. The statistical significance of each comparison was determined by calculating the Student's *t* value for the difference between each pair of means or proportions and comparing the *t* value with published tables of significance levels for two-tailed hypothesis testing. Student's *t* values were computed to test differences between independent estimates using the following formula:

$$t = \frac{E_1 - E_2}{\sqrt{se_1^2 + se_2^2}}$$

where E_1 and E_2 are the estimates to be compared and se_1 and se_2 are their corresponding standard errors.

⁹ A Type I error occurs when one concludes that a difference observed in a sample reflects a true difference in the population from which the sample was drawn, when no such difference is present.

There are hazards in reporting statistical tests for each comparison. First, comparisons based on large *t* statistics may appear to merit special attention. This can be misleading since the magnitude of the *t* statistic is related not only to the observed differences in means or percentages but also to the number of respondents in the specific categories used for comparison. Hence, a small difference compared across a large number of respondents would produce a large (and thus possibly statistically significant) *t* statistic.

A second hazard in reporting statistical tests is the possibility that one can report a "false positive" or Type I error. Statistical tests are designed to limit the risk of this type of error using a value denoted by alpha. The alpha level of .05 was selected for findings in this report and ensures that a difference of a certain magnitude or larger would be produced when there was no actual difference between the quantities in the underlying population no more than 1 time out of 20.¹⁰ When analysts test hypotheses that show alpha values at the .05 level or smaller, they reject the null hypothesis that there is no difference between the two quantities. Failing to reject a null hypothesis, i.e., detect a difference, however, does not imply the values are the same or equivalent.

¹⁰ No adjustments were made for multiple comparisons.

REFERENCES

- Hebel, S. (2010). Lumina Describes How Far States Have to Go to Meet College-Completion Goals. *Chronicle of Higher Education*. Retrieved September 6, 2011, from <http://chronicle.com/article/Lumina-Describes-How-Far/124553/>.
- Jaschik, S. (2009). The Obama Plan. *Inside Higher Ed*. Retrieved September 6, 2011, from <http://www.insidehighered.com/news/2009/07/15/obama>.
- Kolowich, S. (2010). Buying Local, Online. *Inside Higher Ed*. Retrieved September 6, 2011, from <http://www.insidehighered.com/news/2010/07/23/online>.
- Organisation for Economic Co-operation and Development. (2010). *Education at a Glance, 2010*. Paris, France: Author.
- Parsad, B., and Lewis, L. (2008). *Distance Education at Degree-Granting Postsecondary Institutions: 2006–07* (NCES 2009–044). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC.
- U.S. Department of Education, National Center for Education Statistics. (2002). *NCES Statistical Standards* (NCES 2003-601). Washington, DC.

RUN YOUR OWN ANALYSIS WITH DATALAB

You can replicate or expand upon the figures and tables in this report, or even create your own. DataLab has several different tools that allow you to customize and generate output from a variety of different survey datasets. Visit DataLab at:

<http://nces.ed.gov/datalab/>

The screenshot shows the DataLab website interface. At the top, there is a header with the word "DATALAB". Below the header, there are three main sections:

- QuickStats:** Features a logo and a list of bullet points: "Create a simple table quickly", "View your output as a chart or table", "Choose from many datasets each with about one hundred variables", and "Select from recent postsecondary studies". A "GO" button is located at the bottom right of this section.
- PowerStats:** Features a logo with numbers and a list of bullet points: "Produce complex tables", "Run linear and logistic regressions", "Choose from many datasets each with thousands of variables", and "Select from all postsecondary studies". A "GO" button is located at the bottom right of this section.
- What's New?:** Features a yellow exclamation mark icon and the text "What's New?". Below this, it shows a date "07/26/2011" and the heading "Weight selection changed". It contains two numbered items: "1. For datasets that require a weight selection, you will now be asked to choose a weight immediately before running your table or regression instead of picking it when you choose a dataset." and "2. NPSAS 2000 no longer requires a weight selection. PowerStats".

Below these sections, there is a large section titled "Detailed Information About PowerStats Variables". This section is organized into two columns of links, each with a "GO" button at the bottom right. The left column lists links for "Baccalaureate and Beyond Longitudinal Study, B&B:" for years 2008/2009, 1993/2003, 2000/2001, and "Beginning Postsecondary Students, BPS:" for years 2004/2009 and 1996/2001. The right column lists links for "National Postsecondary Student Aid Study, NPSAS:" for years 2008 and 2004. Each link is followed by a list of options: "by subject" and "by variable name", with file sizes and PDF formats indicated.

At the bottom right of the interface, there is a "Help" section with a yellow question mark icon. It includes the text "Need help? Contact: powerstats@ed.gov" and "Need access to restricted data? Learn more in the [Restricted-Use Data Procedures Manual](#)."