

Career and Technical Education in the United States: 1990 to 2005

Statistical Analysis Report



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JULY 2008

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Executive Summary

Career and technical education (CTE) spans secondary, postsecondary, and adult education levels. In high schools, CTE encompasses family and consumer sciences education, general labor market preparation, and occupational education, and may form part of a course of study leading to college, employment, or both. At the postsecondary level, career education is linked to preparation for employment in specific occupations or careers, although postsecondary credentials in career fields may also lead to further education. Adults may participate in formal education and training to acquire, maintain, and upgrade their workforce skills.

The publication represents the fourth volume of *Vocational Education in the United States*, which is produced about every 5 years by NCES to describe the condition of “vocational education” in the nation. This report uses the current term, career and technical education, and updates the previous reports, presenting the most recent data available on trends in the field.

In addition to introduction and summary chapters, the report is organized into three main substantive chapters addressing, where possible, the following key questions at the secondary, postsecondary, and adult levels:

- What institutions provide career and technical education?
- What is offered?
- Who participates and what courses and majors do they select?

- Who teaches career and technical education?
- What are the outcomes associated with participation in career and technical education, including academic attainment, postsecondary education, and employment and earnings?

This report seeks to describe the full range of career and technical education during the period from 1990 through 2005. To capture this diverse enterprise, the report analyzed data from 11 different National Center for Education Statistics (NCES) surveys.¹ The report presents mainly simple bivariate comparisons of estimates among different groups. These comparisons of estimates were tested using Student’s *t* statistic, at the .05 level of significance. Adjustments were not made for multiple comparisons. Significance test results are reported when determined to be both statistically different and substantively different, the latter defined as a difference of at least 3 percentage points or the equivalent. Statistically significant differences of a magnitude smaller than 3 percentage points or the equivalent are generally not reported. Some comparisons are based on data from

¹ The Common Core of Data (CCD), the Education Longitudinal Study of 2002 (ELS:2002), the High School Transcript Study (HSTS:1990, HSTS:2000, HSTS:2005), the National Education Longitudinal Study of 1988 (NELS:88), the Schools and Staffing Survey (SASS), the Beginning Postsecondary Students Longitudinal Study (BPS:96/01), the Integrated Postsecondary Education Data System (IPEDS), the National Postsecondary Student Aid Study (NPSAS:90, NPSAS:2000, NPSAS:04), the National Study of Postsecondary Faculty (NSOPF:93, NSOPF:99, NSOPF:04), and the National Household Education Survey program’s 2003 Adult Education for Work-Related Reasons Survey (AEWR-NHES:2003) and 2005 Adult Education Survey (AE-NHES:2005).

universe surveys (i.e., surveys of the full population of interest rather than a sample); in those cases significance testing was not conducted.

A Note on Terminology

In this report, CTE at the high school level and career education at the postsecondary level encompass the fields of study shown in exhibits 1.1 and 1.2, respectively. Although the fields are very similar, the high school occupational programs differ somewhat in both terminology and scope from the postsecondary career fields. For example, the “business services,” “business management,” and “marketing” programs at the high school level are classified as “business and marketing” at the postsecondary level. In addition, while the relevant program at the high school level is “communications technology,” the corresponding field at the postsecondary level is “communications,” which includes but is not limited to related technologies. Differences in the high school and postsecondary classifications reflect differences in survey categories and in the size and nature of the various fields at the two education levels. Generally, these differences are only relevant when comparing findings across the education levels.

Highlights From the Report

This section highlights selected findings from across the three education levels described in the report, focusing on common and consistent patterns, but also indicating where these patterns differ. The measures that were available for describing career and technical education at the different education levels varied somewhat. Participation in high school was generally measured in terms of credits earned in occupational education, for example, while participation at the postsecondary level was measured in terms of students

majoring in career fields. While these measures are not directly comparable, they both indicate the prevalence of participation in career-related education versus other curricula and majors, as well as indicate changes in the extent of this participation over time. In addition, the available data sometimes described different years. For example, trends in high school student participation covered the period from 1990 to 2005, while trends in postsecondary student participation covered the period from 1990 to 2004, and trends for postsecondary faculty covered the period from 1992 to 2003. Differences in the timing or content of datasets used for the different analyses in the report are noted in the text and tables.

A Note on Collinearity and Causality

The report describes various characteristics of career and technical education participants, including sex, race/ethnicity, and prior academic achievement, among others. It should be remembered that, while each of these characteristics is examined separately, there may be collinearity among them. For example, participation patterns for the different racial/ethnic groups may be related to their differing prior academic achievement. The report does not attempt to determine which characteristics are most strongly related to participation in career and technical education or to isolate the independent contribution of different characteristics to participation patterns.

It is important when reading NCES reports to remember that they are descriptive in nature. That is, they are limited to describing some aspect of the condition of education and may suggest ideas to be further examined. Readers are cautioned against making unwarranted causal inferences from simple cross tabulations. It is never the case that a simple cross tabulation of any variable with a measure of educational achievement is proof

that differences in the variable are a cause of differential educational achievement or any other outcome.

Institutional Providers

The majority of public high schools in 2002 and undergraduate postsecondary institutions in 2005 offered career and technical education (88 and 90 percent, respectively) (tables 2.2 and 3.1). At the high school level, CTE was provided in three main settings, including approximately 17,000 comprehensive high schools that offered occupational programs either on or off site (8,200 comprehensive high schools served by an area CTE school and 8,900 not served by an area CTE school), 900 full-time CTE high schools, and 1,200 area CTE schools (tables 2.1 and 2.5).² High school students may also have taken CTE at postsecondary institutions or other locations. At the postsecondary education level, about 5,700 institutions offered career education to undergraduates in 2005, with public 4-year institutions followed by public 2-year institutions awarding the largest numbers of undergraduate credentials in career fields in this year (587,000 and 562,000 credentials, respectively) (tables 3.1 and 3.4). Postsecondary institutions also figured in the provision of adult work-related coursetaking, with about 16 percent of adult participants in 2004–05 reporting a postsecondary institution as the instructional provider for at least one of their work-related learning courses, although employers were the most common provider for these activities (45 percent), followed by business or industry (25 percent) (table 4.6).

² Comprehensive high schools typically have an academic focus, but also offer CTE either on or off site, the latter often at an area CTE school. Full-time CTE high schools emphasize CTE, but also offer academic coursework; students typically spend their entire school day at the school. Area CTE schools provide CTE part time to students who receive all or most of their academic instruction at their home high school.

The Scope of Participation

Student participation in career and technical education was relatively common at all three education levels: secondary, postsecondary, and adult. Just over 90 percent of public high school graduates from the class of 2005 took at least one occupational course during high school (table 2.16) and these graduates earned more credits on average in occupational education than they earned in fine arts and foreign language (3.0 vs. 2.0–2.1 credits) (table 2.17). In addition, about one in five of the 2005 graduates concentrated in occupational education (21 percent) (table 2.18), earning 3.0 or more credits in at least one of the 18 high school occupational programs examined in the report. At the postsecondary level, a higher proportion of undergraduates in 2004 majored in career fields than in academic areas at each credential level (certificate, associate’s degree, and bachelor’s degree) (60–81 percent vs. 6–30 percent) (table 3.8). With regard to adult education, 37 percent of labor force members participated in work-related courses in 2004–05 (table 4.1).

Trends in student participation at the secondary level showed no measurable changes over the period studied in overall participation in occupational education. For example, no measurable changes were detected between 1990 and 2005 in the average numbers of total CTE credits and occupational credits that public high school graduates earned (4.0–4.2 total CTE credits and 2.9–3.0 occupational credits) (table 2.17). In contrast, between 1990 and 2004, the number of credential-seeking undergraduates majoring in career fields increased by about one-half million students, although proportionately they made up a smaller portion of the overall credential-seeking undergraduate population in 2004 compared with 1990 (63 vs. 67 percent) (table 3.8). At both education levels, participation in academic education in-

creased. Both the average numbers of total academic credits and core academic credits earned by public high school graduates increased between 1990 and 2005 (increases of 2.8 and 1.8 credits, respectively) (table 2.17), as did the number of undergraduates majoring in academic fields between 1990 and 2004 (an increase of 449,000 students) (table 3.8).

Common Occupational Programs

Business, health care, and computer science were among the most common occupational programs. Specifically, business and computer technology were the most common occupational programs offered by public high schools in 2002 (94–97 vs. 26–82 percent) (table 2.9), and the 2005 public high school graduates earned more credits in business services and in computer technology than in any other occupational program area (0.4–0.5 vs. 0.0–0.2 credit) (table 2.17). At the postsecondary level, more credential-seeking undergraduates majored in business and marketing and in health care than in any other career field in 2004 (22–28 vs. 1–12 percent) (table 3.10). In addition, a larger proportion of undergraduate credentials were awarded in health care and in business and marketing than in other career fields in 2005 (24–26 vs. 1–9 percent) (table 3.35). At the adult education level, business, health, and computer science were the topics studied most frequently by work-related coursetakers in 2004–05 (15–35 percent vs. 6–10 percent studying other topics) (table 4.5).

Between 1990 and the mid-2000s, shifts in participation were detected among the different occupational program areas. At both the secondary and postsecondary education levels, student participation (including coursetaking at the high school level and majors at the postsecondary level) increased in health care (by 0.1 credit on average

and 639,000 majors) and computer science (by 0.2 credits on average and 265,000 majors) and decreased in business (by 0.3 credits in business services on average and 484,000 majors) (tables 2.17 and 3.10). However, despite a net increase in participation at the postsecondary level over the entire timespan, the number of computer science majors was lower in 2004 than in 2000 (by 338,000 majors).

Characteristics of Participants

This summary presents selected comparisons between participants and nonparticipants in career and technical education overall, while the body of the report also compares participants in different occupational and career programs. At the high school level, a greater percentage of students with a CTE focus than their peers without this focus were male. Specifically, among public high school graduates in 2005, the majority of occupational concentrators were male (59 percent), while the majority of nonconcentrators were female (54 percent) (table 2.21). At the postsecondary level, the majority of both credential-seeking undergraduates with career majors and those with academic majors were female in 2004 (58 percent each) (table 3.12). Higher rates of participation in work-related coursetaking were also observed for female than for male adult labor force members in 2004–05 (44 vs. 31 percent) (table 4.1).

At both the high school and postsecondary levels, career and technical education participants had less advantaged educational backgrounds than nonparticipants. For example, among the public high school class of 2005, a greater percentage of occupational concentrators took lower levels of 9th-grade mathematics courses compared with nonconcentrators (15 vs. 11 percent) (table 2.21). At the postsecondary level in 2004, a smaller percentage of undergraduate career majors had par-

ents with a bachelor's or higher degree compared with academic majors (37 vs. 48 percent) (table 3.13). In contrast, adults with higher educational levels participated in work-related courses in 2004–05 more often than those with lower educational levels (table 4.1).

Among bachelor's degree seekers in 2004, a larger percentage of career majors than academic majors worked full time while enrolled (28 vs. 18 percent) and considered themselves to be an employee who studies (21 vs. 10 percent) rather than a student who works (table 3.15). A work-study linkage was also found among adult learners, where higher rates of participation in work-related coursetaking were observed for employed than for unemployed labor force members in 2004–05 (39 vs. 14 percent) (table 4.1).

Between 1990 and the mid-2000s, changes in the characteristics of students with a career and technical education focus were found at both the high school and postsecondary levels. Specifically, a larger percentage of the 2005 public high school graduates who took high-level 9th-grade mathematics courses completed an occupational concentration compared with their 1990 peers (an increase of 8 percentage points), while a smaller percentage of 2005 graduates who took low-level 9th-grade mathematics courses completed an occupational concentration compared with their 1990 peers (a decrease of 9 percentage points) (table 2.22). At the postsecondary level, undergraduate career majors in 2004 appeared to have better educated parents than their counterparts who were enrolled earlier (for example, 37 percent in 2004 vs. 23–34 percent in 1990 and 2000 had at least one parent with a bachelor's degree) (table 3.13), and the percentage of career majors who had themselves previously earned a bachelor's degree increased (by 3 percentage points) (table 3.14).

Faculty

Data on career education faculty were available at the postsecondary level.³ Just over one-half million faculty members taught in career fields at 2- and 4-year not-for-profit degree-granting postsecondary institutions in fall 2003 (table 3.22). Teaching faculty were classified as career, academic, or “other” based on their principal teaching field (as indicated in exhibit 1.2). The largest group of career education faculty taught in public 4-year institutions (39 percent), followed by public 2-year institutions (34 percent) and private not-for-profit 4-year institutions (26 percent), and trailed by private not-for-profit 2-year institutions (1 percent) (table 3.23).

The majority of postsecondary teaching faculty in career fields in fall 2003 held a graduate degree, although the percentage who held a graduate degree was lower than that among academic teaching faculty (81 vs. 92 percent) (table 3.28). Larger percentages of career education teaching faculty than their academic colleagues possessed a bachelor's degree as their highest degree (12 vs. 7 percent) or had less than a bachelor's degree as their highest degree (7 vs. 1 percent). Career education faculty with less than a bachelor's degree were concentrated in the trade and industry (58 percent) and protective services (29 percent) teaching fields.

Between fall 1992 and fall 2003, the number of postsecondary faculty who taught in career fields increased by about 125,000 members (table 3.22). This change generally coincided with an increase in the number of undergraduates seeking credentials in career fields, as noted above (an increase of 534,000 majors) (table 3.8).

³ These data exclude faculty at for-profit and less-than-2-year institutions.

Changes between the early 1990s and mid-2000s in the size of the postsecondary student body and teaching force varied by career field. Increases in the number of both student majors and teaching faculty occurred in the fields of health care, education, communications, computer science, and protective services (increases of 172,000–639,000 majors and 5,000–37,000 faculty) (tables 3.10 and 3.22). In contrast, while the number of student majors declined in business, engineering and architectural sciences, and personal and consumer services (decreases of 182,000–484,000 majors), the number of faculty increased measurably in these fields (increases of 8,000–75,000 faculty).

Academic Attainment

Between 1990 and 2005, the core academic coursetaking (including English, mathematics, science, and social studies coursework) of public high school graduates who participated in the occupational curriculum increased (increases of 1.4–2.6 credits for graduates earning any occupational credits) (table 2.23). There were also increases in the percentage of CTE participants who met the New Basics core academic standards⁴ (increases of 17–42 percentage points) and who completed 4-year college-preparatory coursework⁵ (increases of 14–27 percentage points) (table 2.25). Moreover, the more occupational credits graduates earned in high school, the greater their academic coursetaking gains between 1990 and 2005.

⁴ New Basics core academic standards include 4 years of English and 3 years each of mathematics, science, and social studies.

⁵ Four-year college-preparatory coursework is defined in this report as earning 4.0 or more credits in English; 3.0 or more credits in mathematics at the algebra 1 or higher level; 2.0 or more credits in biology, chemistry, or physics; 2.0 or more credits in social studies with at least 1.0 credit in U.S. or world history; and 2.0 or more credits in a single foreign language.

At the postsecondary level, a larger percentage of undergraduate career majors in 2004 reported earning high postsecondary grade point averages (GPAs of 3.5 or higher) compared with their counterparts 14 years earlier (an increase of 5 percentage points), and this pattern was detectable at all three credential levels (certificate, associate's degree, and bachelor's degree) (increases of 3–9 percentage points) (table 3.14).

Postsecondary Education Outcomes

The more occupational credits that the 1992 public high school graduates earned in high school, the more often they were in general to have subbaccalaureate postsecondary plans (including no college, a postsecondary certificate, or an associate's degree) (table 2.27). Consistent with these aspirations, the more occupational credits that graduates earned in high school, the less often they were to enroll in postsecondary education within 8 years of graduating (table 2.29). Among those who enrolled, the more occupational credits high school graduates earned, the more often they attained a subbaccalaureate credential (in particular an associate's degree) and the less often they attained a bachelor's or higher degree by 2000 (table 2.32). Nevertheless, among high school occupational coursetakers taking the most occupational credits (4.00 or more credits), more graduates aspired to a bachelor's degree than any other postsecondary goal (36 vs. 14–18 percent) (table 2.27); 70 percent of these occupational coursetakers enrolled in postsecondary education by 2000 (table 2.29); and among those who enrolled, more graduates attained a bachelor's or higher degree than either an associate's degree or postsecondary certificate (25 vs. 7–15 percent) (table 2.32).

Turning to a cohort of students who began their postsecondary education in 1995–96, the majority

of this cohort who were credential-seeking undergraduates with career majors had attained a degree or were still enrolled 6 years later (table 3.42). Specifically, by 2001, 82 percent of career majors seeking a bachelor's degree and 60 percent of those seeking a subbaccalaureate credential had attained a degree or were still enrolled. A greater percentage of career majors seeking certificates than those seeking subbaccalaureate degrees possessed characteristics shown in research to be associated with lower rates of postsecondary persistence and attainment, such as having parents who do not have a college degree (70 vs. 50 percent) and having themselves earned a GED rather than a regular high school diploma (18 vs. 9 percent) (table 3.41) (Horn and Berger 2004; Hoachlander, Sikora, and Horn 2003; Horn 1996; Berkner, Cuccaro-Alamin, and McCormick 1996). Nevertheless, a larger percentage of career majors seeking certificates attained a postsecondary credential within 6 years compared with career majors seeking subbaccalaureate degrees (62 vs. 42 percent) (table 3.42).

Employment and Earnings Outcomes

The more occupational credits that male graduates of the class of 1992 earned in high school, the more often they worked full time in 2000 (table 2.38). No systematic relationship was detected, however, between the occupational credits that male graduates earned in high school and their full-time earnings in 1999 (table 2.39). Male graduates who were employed full time earned about \$31,000–\$33,000 in this year, regardless of their occupational coursetaking in high school. In contrast, the more occupational credits that male graduates earned in high school, the higher their part-time earnings were in 1999.

The employment and earnings experiences of female graduates who took occupational coursework in high school were somewhat different: no systematic relationship was detected between the occupational credits that female graduates earned in high school and their rate of working full time in 2000 (table 2.38). In addition, the more occupational credits that female graduates earned in high school, the lower their full-time earnings were in 1999, with female graduates who accumulated 4.00 or more occupational credits in high school earning about \$5,000 less in 1999 than their female classmates who took no occupational coursework in high school (table 2.39). In contrast, no systematic relationship was detected between the occupational credits that female graduates earned in high school and their part-time earnings as of this year.

Thus, the only measurable associations between 1999 earnings and occupational coursetaking in high school were among part-time male employees (a positive association) and full-time female employees (a negative association). It was not possible to determine from the available data whether these differences in earnings were due to differing hourly wages or to differing amounts of time that full- or part-time graduates worked during 1999.

Among beginning postsecondary students in 1995–96, most subbaccalaureate career completers were employed full time by 2001 (86 percent) (table 3.46). Those who completed certificates in career fields were more often employed compared with those who attempted but did not complete career certificates (87 vs. 74 percent) (figure 3.3 and table 3.45).

Foreword

In 1987, the National Center for Education Statistics (NCES) instituted a new approach to collecting and reporting data on career and technical education (CTE) (then called “vocational” education). Under the new approach, CTE data are collected primarily through general-purpose surveys rather than separate questionnaires or studies on CTE. Separate reports on CTE issues are also produced. This data collection and reporting system constitutes the NCES Career/Technical Education Statistics (CTES) program.

The 2006 Carl D. Perkins Career and Technical Education Improvement Act mandates that “as a regular part of its assessments, the National Center for Education Statistics shall collect and report information on career and technical education for a nationally representative sample of students.” To meet this requirement, NCES uses the CTES program. The CTES provides data on career/technical education from students, faculty, and schools at the secondary and postsecondary levels, as well as on adults seeking work-related education and training.

This report is the fourth in a series published by NCES. The first three reports, *Vocational Education in the United States: 1969–1990* (Hoachlander, Kaufman, and Levesque 1992), *Vocational Education in the United States: The Early 1990s* (Levesque et al. 1995), and *Vocational Education in the United States: Toward the Year 2000* (Levesque et al. 2000), were published in 1992, 1995, and 2000, respectively. Each report describes CTE in America, updating key trends based on available data and focusing on selected issues relevant to current policy discussions.

Information on the NCES CTES program and publications may be found at the following website: <http://nces.ed.gov/surveys/ctes>. Your comments about CTES publications are welcome and may be sent to Lisa Hudson, NCES, 1990 K Street, NW, Suite 900, Washington, DC 20006 or lisa.hudson@ed.gov.

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Contents

	Page
Executive Summary	iii
Foreword	x
Acknowledgments	xi
List of Tables	xv
List of Exhibits	xxiv
List of Figures	xxv
1. Introduction	1
2. Career and Technical Education at the High School Level	7
A. What Institutions Provide CTE?	8
B. What Programs Are Offered?.....	15
C. Who Participates and What Courses Do They Take?	25
D. What Is Accomplished?	43
E. Summary of Findings	71
3. Career Education at the Postsecondary Level	75
A. What Institutions Provide Career Education?	76
B. What Programs and Credentials Are Offered?.....	86
C. Who Participates and in Which Fields Do They Major?.....	90
D. Who Teaches Career Education?	133
E. What Is Accomplished?.....	161
F. Summary of Findings.....	189
4. Adult Work-Related Coursetaking	191
A. Who Participates in Work-Related Courses and What Do They Study?	197
B. Who Are the Providers of Work-Related Courses for Adults?	204
C. To What Extent Do Work-Related Courses Involve Employer Requirements or Educational or Occupational Credentialing?	206
D. To What Extent Is Work-Related Coursetaking Supported by Employers?	207
E. What Are the Outcomes of Participation in Work-Related Courses?	208
F. Summary of Findings.....	214
5. Summary	217

	Page
References	225
Appendix A—Technical Notes and Methodology	A-1
Appendix B—Glossary	B-1

List of Tables

Table	Page
Chapter 2. Career and Technical Education at the High School Level	
2.1	Number and percentage distribution of public and private schools with a 10th grade, by school type and sector: 2002 9
2.2	Percentage of public and private schools with a 10th grade offering occupational programs, by program location, school sector, and type: 2002 9
2.3	Percentage distribution of each type of public school with a 10th grade, by selected school characteristics: 2002 11
2.4	Percentage distribution of public school 10th-graders, by school type: 2002..... 12
2.5	Number of area career and technical education (CTE) schools, by state: 2002..... 13
2.6	Percentage distribution of area career and technical education (CTE) schools, public schools with a 10th grade, and public 10th-grade students, by region: 2002 14
2.7	Average number of occupational programs offered in public high schools, by program location, school sector, and type: 2002 16
2.8	Percentage of public and private schools with a 10th grade that offered occupational programs, by program type offered and school sector: 2002 17
2.9	Percentage of public schools with a 10th grade that offered occupational programs, by program type offered, school type, and program location: 2002 18
2.10	Percentage of 10th-graders in public schools offering occupational programs and the average number of occupational programs offered to public school 10th-graders, by program location and school type: 2002 19
2.11	Percentage of 10th-graders in public schools that offered occupational programs, by program type offered and school type: 2002..... 21
2.12	Percentage of public schools with a 10th grade offering occupational programs and the average number of occupational programs offered, by program location and selected school characteristics: 2002 22

Table	Page
2.13 Percentage distribution of public schools with a 10th grade offering selected career-related activities, by extent of activity and school type: 2002	24
2.14 Percentage of public schools with a 10th grade offering selected work-based learning experiences to their 10th-graders, by school type: 2002	24
2.15 Percentage and number of public schools with a 12th grade that offered career academies, by selected school characteristics: 2004	25
2.16 Percentage of public high school graduates taking different types of career and technical education (CTE) coursework and average credits earned in CTE curricula during high school: 2005	27
2.17 Average credits earned during high school by public high school graduates, by curricular area: 1990, 2000, and 2005.....	28
2.18 Percentage of public high school graduates taking different types of career and technical education (CTE) coursework and concentrating in various occupational programs during high school: 1990, 2000, and 2005.....	29
2.19 Percentage of public high school graduates taking different types of occupational coursework and average credits earned in occupational education by public high school graduates, by selected student characteristics: 2005.....	31
2.20 Average credits earned in each occupational program area by public high school graduates, by selected student characteristics: 1990, 2000, and 2005	33
2.21 Percentage distribution of public high school graduates who were occupational concentrators and nonconcentrators, by selected student characteristics: 2005.....	41
2.22 Average credits earned in occupational education by public high school graduates and percentage of graduates completing an occupational concentration in high school, by selected student characteristics: 1990, 2000, and 2005	42
2.23 Average credits earned by public high school graduates in core academic subjects, by number of occupational education credits earned in high school: 1990, 2000, and 2005.....	45
2.24 Gap in average credits earned in core academic subjects between public high school graduates who took no occupational coursework and those who accumulated 4.00 or more occupational credits in high school, by core academic subject: 1990, 2000, and 2005.....	46
2.25 Percentage of public high school graduates meeting selected academic coursetaking benchmarks, by occupational credits earned in high school: 1990, 2000, and 2005	49

Table	Page
2.26 Percentage of public high school graduates completing 4-year college-preparatory coursework, by subject and occupational credits earned in high school: 2005.....	50
2.27 Percentage distribution of 1992 public high school graduates, by highest postsecondary attainment planned as of their senior year in high school and occupational credits earned in high school	51
2.28 Percentage of 1992 public high school graduates who enrolled in postsecondary education within 12 months of graduating from high school, and average number of months until graduates enrolled, by occupational credits earned in high school	52
2.29 Percentage of 1992 public high school graduates who enrolled in postsecondary education by 2000 and percentage distribution of these enrollees, by first postsecondary institution type and occupational credits earned in high school.....	54
2.30 Percentage distribution of 1992 public high school graduates who enrolled in postsecondary education by 2000 with each number of occupational credits, occupational concentrator status, and program concentration, by their undergraduate major	55
2.31 Average number of postsecondary remedial courses taken by 1992 public high school graduates who enrolled in postsecondary education by 2000 and percentage distribution of these graduates according to their 8th-grade composite test quartile, by occupational credits earned in high school	57
2.32 Percentage distribution of 1992 public high school graduates who enrolled in postsecondary education, according to their highest postsecondary credential attained as of 2000, by occupational credits earned in high school and aspirations as of their senior year of high school	58
2.33 Percentage of male and female 1992 public high school graduates enrolling in postsecondary education by 2000, and among these enrollees, the percentage who attained a postsecondary credential by 2000, by their highest postsecondary credential attained and occupational credits earned in high school.....	61
2.34 Percentage of 1992 public high school graduates who worked without also enrolling in postsecondary education during the first 12 months after graduating from high school and the percentage of these workers who enrolled in postsecondary education by 2000, by occupational credits earned in high school	62
2.35 Percentage of 1992 public high school graduates who earned a professional license between 1994 and 2000, by field of license, occupational credits earned in high school, occupational concentrator status, and program of concentration	64

Table	Page
2.36 Percentage distribution of 1992 public high school graduates who were employed during 2000 with each number of occupational credits earned in high school, by occupation of current or most recent job	66
2.37 Percentage of 1992 public high school graduates who were employed and average hours worked per week among those employed during 2000, by occupational credits earned in high school	67
2.38 Percentage of male and female 1992 public high school graduates who worked for pay during 2000, by employment status and occupational credits earned in high school	68
2.39 Average 1999 earnings for male and female 1992 public high school graduates who were employed in 1999, by employment status and occupational credits earned in high school	69
2.40 Average 1999 earnings of male and female 1992 public high school graduates who enrolled in postsecondary education by 2000 and were employed during 1999, by their postsecondary attainment in 2000, employment status in 1999, and occupational credits earned in high school.....	70

Chapter 3. Career Education at the Postsecondary Level

3.1 Number and percentage of Title IV eligible postsecondary institutions that offer career education and percentage distribution of institutions that offer career education, by level of institution and sector: 2004–05.....	77
3.2 Number of Title IV eligible postsecondary institutions that offer career education programs, by level of institution, sector, and state: 2004–05.....	79
3.3 Percentage distribution of Title IV eligible postsecondary institutions in each state that offer career education programs, by level of institution and sector: 2004–05	82
3.4 Number and percentage distribution of institutions offering career education and credentials awarded by Title IV eligible postsecondary institutions and percentage distribution of credentials in career fields, by level of institution and sector: 2004–05 ..	85
3.5 Number of Title IV eligible postsecondary institutions that offer career education, by level of institution, sector, and field of study: 2004–05.....	87
3.6 Percentage of Title IV eligible postsecondary institutions that offer career education, by level of institution, sector, and field of study: 2004–05.....	88
3.7 Number and percentage of Title IV eligible postsecondary institutions conferring career education awards, by award level: 2004–05.....	89

Table	Page
3.8 Number and percentage distribution of credential-seeking undergraduates, by major field and credential sought: 1990, 2000, and 2004	90
3.9 Percentage distribution of undergraduates, by current credential goal: 2004	91
3.10 Number and percentage distribution of credential-seeking undergraduates, by career education major and credential sought: 1990, 2000, and 2004.....	92
3.11 Percentage distribution of credential-seeking undergraduates in each major field and career major, by level of credential sought: 1990, 2000, and 2004	95
3.12 Percentage distribution of credential-seeking undergraduates with each major field and level of credential sought, by sex, race/ethnicity, and age: 1990, 2000, and 2004 ...	96
3.13 Percentage distribution of credential-seeking undergraduates with each major field and level of credential sought, by disability status, parents' highest education level, and marital status: 1990, 2000, and 2004	99
3.14 Percentage distribution of credential-seeking undergraduates with each major field and level of credential sought, by dependency status, financial aid status, previous bachelor's degree, and postsecondary GPA: 1990, 2000, and 2004	103
3.15 Percentage distribution of credential-seeking undergraduates with each major field and level of credential sought, by work experience while enrolled, work orientation, and attendance status: 1990, 2000, and 2004.....	106
3.16 Summary of selected comparisons between credential-seeking undergraduates with career and academic majors, by level of credential sought: 2004.....	110
3.17 Percentage distribution of credential-seeking undergraduates in career fields with each career major, by sex, race/ethnicity, and age: 1990, 2000, and 2004.....	112
3.18 Percentage distribution of credential-seeking undergraduates in career fields with each career major, by disability status, parents' highest education level, and marital status: 1990, 2000, and 2004.....	115
3.19 Percentage distribution of credential-seeking undergraduates in career fields with each career major, by dependency status, financial aid status, previous bachelor's degree, and postsecondary GPA: 1990, 2000, and 2004	119
3.20 Percentage distribution of credential-seeking undergraduates in career fields with each career major, by work experience while enrolled, work orientation, and attendance status: 1990, 2000, and 2004.....	123

Table	Page
3.21 Summary of selected characteristics of credential-seeking undergraduates with specific career majors: 2004	127
3.22 Number of teaching faculty, by level of institution and sector, principal teaching field, and specific career field: Fall 1992, 1998, and 2003	135
3.23 Percentage distribution of teaching faculty in each principal teaching field and specific career field, by level of institution and sector: Fall 1992, 1998, and 2003.....	137
3.24 Percentage distribution of teaching faculty in various principal and career fields and institution types, by employment status, and among part-time faculty, by reason for part-time employment: Fall 1992, 1998, and 2003	139
3.25 Percentage of teaching faculty with selected employment characteristics, by principal teaching field, type of institution, career teaching faculty, and specific career field: Fall 1998 and 2003.....	142
3.26 Percentage of teaching faculty who were either somewhat or very satisfied with selected aspects of their jobs, by principal teaching field, career teaching faculty by type of institution, and specific career field: Fall 1992, 1998, and 2003	144
3.27 Average age of teaching faculty and their average number of years teaching in higher education and employed in current job, by principal teaching field, career teaching faculty by type of institution, and specific career field: Fall 1992, 1998, and 2003	147
3.28 Percentage distribution of teaching faculty in various principal and career fields and institution types, by highest degree earned: Fall 1992, 1998, and 2003	150
3.29 Percentage distribution of teaching faculty in various principal and career fields and institution types, by sex: Fall 1992, 1998, and 2003.....	153
3.30 Percentage distribution of teaching faculty in various principal and career fields and institution types, by race/ethnicity: Fall 1992, 1998, and 2003	154
3.31 Summary of selected comparisons of teaching faculty, by principal teaching field and institution type: Fall 2003	157
3.32 Summary of selected characteristics of teaching faculty in specific career fields: Fall 2003.....	158
3.33 Number of undergraduate credentials awarded in career fields by Title IV eligible postsecondary institutions, by career field and type of credential: 2004–05	162
3.34 Percentage distribution of undergraduate credentials awarded by Title IV eligible postsecondary institutions in each career field, by type of credential: 2004–05.....	163

Table	Page
3.35 Number and percentage distribution of undergraduate credentials awarded in career fields by Title IV eligible postsecondary institutions at each level and sector, by type of credential: 2004–05	164
3.36 Percentage distribution of undergraduate credentials awarded in career fields by Title IV eligible postsecondary institutions for each type of credential, by career field: 2004–05.....	167
3.37 Number of undergraduate credentials awarded in career fields by Title IV eligible postsecondary institutions, by career field, level of institution, and sector: 2004–05	169
3.38 Percentage distribution of undergraduate credentials awarded by Title IV eligible postsecondary institutions in each career field, by level of institution and sector: 2004–05.....	170
3.39 Percentage distribution of undergraduate credentials awarded in career fields by Title IV eligible postsecondary institutions at each institution level and sector, by career field: 2004–05	171
3.40 Number and percentage distribution of credential-seeking beginning postsecondary students, by initial credential goal and major field: 1995–96	173
3.41 Average age and percentage of beginning postsecondary students with various demographic and enrollment characteristics and summary of comparisons, by initial credential goal and major field: 1995–96	175
3.42 Percentage of credential-seeking 1995–96 beginning postsecondary students who attained a credential or were still enrolled by June 2001, and percentage distribution of these students in terms of their attainment and enrollment status in 2001, by initial credential goal and major field.....	178
3.43 Percentage of credential-seeking 1995–96 beginning postsecondary students who had left and had not returned to postsecondary education by 2001, by reason for leaving and initial credential goal and major field	181
3.44 Percentage distribution of credential-seeking 1995–96 beginning postsecondary students who had, by 2001, obtained each credential as their highest credential, by credential type and major field: 2001.....	182
3.45 Percentage of subbaccalaureate credential-seeking 1995–96 beginning postsecondary students with selected labor force participation characteristics as of 2001, by attainment status, type of subbaccalaureate credential attained or sought, and major field	184

Table	Page
3.46 Percentage of subbaccalaureate credential-seeking 1995–96 beginning postsecondary students with part- and full-time employment status during 2001, by attainment status, type of subbaccalaureate credential attained or sought, and major field.....	186
3.47 Annual salary of subbaccalaureate credential-seeking 1995–96 beginning postsecondary students, by employment status, attainment status, type of subbaccalaureate credential attained or sought, and major field: 2001	187
3.48 Percentage of working subbaccalaureate credential-seeking 1995–96 beginning postsecondary students whose employment was related to their credential program, by attainment status, type of subbaccalaureate credential attained or sought, and major field	188

Chapter 4. Adult Work-Related Coursetaking

4.1 Number of adults and labor force members, and percentage of adults and labor force members who participated in work-related courses, by selected adult characteristics: 2004–05.....	195
4.2 Average and median number of work-related courses taken by participants in the past 12 months and percentage distribution of the number of such courses: 2004–05	197
4.3 Average and median number of hours participants spent in work-related courses in the past 12 months and percentage distribution of the number of hours: 2004–05	197
4.4 Average number of work-related courses taken by participants in the past 12 months and percentage distribution of the number of such courses, by selected adult characteristics: 2004–05.....	200
4.5 Percentage of participants in work-related courses who studied each topic of instruction, by selected adult characteristics: 2004–05	203
4.6 Percentage of participants in work-related courses who reported each type of instructional provider, by selected adult and course characteristics: 2004–05	205
4.7 Percentage of participants in work-related courses who reported each inducement for participation, by selected adult characteristics: 2004–05.....	207
4.8 Percentage of employed participants in work-related courses who reported each type of employer financial support for their participation, by selected adult and course characteristics: 2004–05.....	209
4.9 Percentage of participants in work-related courses who reported each level of usefulness of the skills and knowledge learned for their job, by selected adult and course characteristics: 2004–05	211

Table	Page
4.10 Percentage of participants in work-related courses who reported each result from their participation, by selected adult characteristics: 2002–03.....	212
4.11 Percentage of adults who reported having each view about participation in work-related training or courses, by selected adult characteristics: 2002–03	213
Appendix A	
A-1 Classification of majors as academic, career, or other: 1990, 2000, and 2004.....	A-7
A-2 Classification of teaching fields as academic, career, or other: 1993, 1999, and 2004	A-12

List of Exhibits

Exhibit	Page
1.1 Classification of secondary education curricula used in the report.....	4
1.2 Classification of postsecondary programs, majors, and teaching fields used in the report.....	5

List of Figures

Figure	Page
2.1 Average credits earned in each high school curriculum by 2005 public high school graduates, by occupational credits earned in high school	48
3.1 Percentage of subbaccalaureate credential-seeking 1995–96 beginning postsecondary students with various levels of attainment as of 2001, by initial credential goal.....	179
3.2 Percentage distribution of 1995–96 credential-seeking beginning postsecondary students who had attained a credential by 2001, by type of credential	183
3.3 Percentage of credential-seeking 1995–96 beginning postsecondary students who were employed in 2001, by attainment status and type of major	185

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1. Introduction

Career and technical education (CTE) provides technical knowledge and skills aligned with academic standards that are needed to prepare for further education and careers in current or emerging professions (2006 Carl D. Perkins Career and Technical Education Improvement Act, P.L. 109-270). CTE spans secondary, postsecondary, and adult education levels. In high schools, CTE encompasses family and consumer sciences education, general labor market preparation, and occupational education, and may form part of a course of study leading to college, employment, or both. At the postsecondary level, CTE is linked to preparation for employment in specific occupations or careers. Postsecondary credentials in career fields may also lead to further education. In turn, adults participate in formal education and training to acquire, maintain, and upgrade their workforce skills.

This report seeks to describe the full range of CTE during the period from 1990 through 2005. To capture this diverse enterprise, the report analyzed data from 11 different National Center for Education Statistics (NCES) surveys.¹ The publication represents the fourth edition of *Vocational Education in the United States*, which is produced about every 5 years by NCES to describe the condition of “vocational education”—now widely called CTE²—in the nation. This report presents the most recent data available on CTE trends and updates findings on many of the analyses performed in previous editions. Although this report uses the term “career and technical education” rather than “vocational education,” with one exception, what is included in the term has not changed from the previous editions of *Vocational Education in the United States*. For example, the taxonomies used to classify courses have always identified accounting and business management courses as CTE, along with traditional business support courses (such as bookkeeping and word processing). The one exception is the inclusion here of career programs leading to a

¹ The Common Core of Data (CCD), the Education Longitudinal Study of 2002 (ELS:2002), the High School Transcript Study (HSTS:1990, HSTS:2000, HSTS:2005), the National Education Longitudinal Study of 1988 (NELS:88), the Schools and Staffing Survey (SASS:2003–04), the Beginning Postsecondary Students Longitudinal Study (BPS:96/01), the Integrated Postsecondary Education Data System (IPEDS), the National Postsecondary Student Aid Study (NPSAS:90, NPSAS:2000, NPSAS:04), the National Study of Postsecondary Faculty (NSOPF:93, NSOPF:99, NSOPF:04), and the National Household Education Survey program’s 2003 Adult Education for Work-Related Reasons Survey (AEWR-NHES:2003) and 2005 Adult Education Survey (AE-NHES:2005).

² The 2006 reauthorization of the Carl D. Perkins Act switched from the term “Vocational Education” to “Career and Technical Education” (2006 Carl D. Perkins Career and Technical Education Improvement Act, P.L. 109-270). Additionally, several leading organizations in the field have changed their names to include some form of the term “career/technical education,” including, for example, the National Association of State Directors of Career Technical Education Consortium (see <http://www.careertech.org>), the Association for Career and Technical Education (see <http://www.acteonline.org>), and the National Centers for Career and Technical Education (see <http://www.nccte.org>).

bachelor's degree. These programs were included to reflect the evolution of CTE to include preparation for 4-year programs in career fields; this shift is reflected in the 2006 Perkins Act, which allows for at least some funds to be spent on baccalaureate programs.³ Baccalaureate programs were also included, because a substantial purpose of higher education—including bachelor's degree programs—is now occupational preparation (Grubb and Lazerson 2004; Grubb 2006; National Science Foundation 2008).

Organization of the Report

The report is organized into three main chapters addressing, where possible, the following key questions related to CTE at the secondary, postsecondary, and adult levels:

- What institutions provide CTE?
- What is offered?
- Who participates and what courses and majors do they select?
- Who teaches CTE?
- What are the outcomes associated with CTE participation, including academic attainment, postsecondary education, and employment and earnings?

A summary chapter provides selected findings from the report, and compares key characteristics across the three education levels. Finally, appendix A describes the datasets and statistical procedures used in the report, and appendix B contains a glossary.

Two types of statistical procedures were used in this report: testing differences between means (or percentages) and testing linear trends. Differences between means (or percentages) were tested using Student's *t* statistic, at the .05 level of significance. Adjustments were not made for multiple comparisons. Comparisons across categories of an ordered independent variable used a test for a linear trend across all categories, rather than a series of tests between pairs of categories. In this report, when differences among percentages of a dependent variable were examined relative to an ordered independent variable, an Analysis of Variance (ANOVA) was used to test for a linear relationship between the two variables (also at the .05 level of significance). Some of the data presented are from universe surveys⁴ and in those cases significance testing was not conducted. Significance test results are reported when determined to be both statistically dif-

³ Section 203 of the 2006 Perkins Act, for example, allows Tech-Prep programs to include 2-year or 4-year postsecondary components. However, the Act's definition of CTE (Section 3) does not explicitly include programs leading to a bachelor's degree. To maintain flexibility on this issue, the postsecondary education tables in this report typically list subbaccalaureate and baccalaureate institutions, credentials, and students separately, so that readers can examine career fields with baccalaureate programs included or excluded, as they prefer. Additional detail is also provided on the Career/Technical Education Statistics (CTES) web site (<http://nces.ed.gov/surveys/ctes/>).

⁴ Universe surveys contain data on the full population of interest, as opposed to a sample of the population.

ferent and substantively different, the latter defined as a difference of at least 3 percentage points or the equivalent. Statistically significant differences of a magnitude smaller than 3 percentage points or the equivalent are generally not reported. Appendix A contains more detail about the statistical procedures used in this report. Standard error tables for the estimates in this report can be found on the NCES website at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

CTE at the High School Level

At the high school level, CTE encompasses the fields of study shown in exhibit 1.1. Chapter 2 focuses primarily, although not exclusively, on occupational education in public high schools.⁵ It describes the types of schools that delivered occupational education to high school students in 2002, and the occupational programs and other related offerings these schools provided. In addition, data are presented on the occupational coursetaking patterns of high school graduates from the class of 2005, as well as changes between 1990 and 2005 in these patterns, and compares the characteristics of graduates who took different amounts of occupational coursework in both years. It also describes the academic coursetaking and achievement of high school graduates who took varying amounts of occupational coursework from 1990 through 2005, as well as on the postsecondary education and labor market outcomes of graduates from the class of 1992 some 8 years later in 2000.

Career Education at the Postsecondary Level

Chapter 3 is more inclusive than previous editions of *Vocational Education in the United States* (Hoachlander, Kaufman, and Levesque 1992; Levesque et al. 1995; Levesque et al. 2000), describing career-related programs at the certificate, associate's degree, and bachelor's degree levels, which this chapter refers to as "career education." Earlier publications focused on career-related programs at the subbaccalaureate level, which constitutes traditional "career and technical education (CTE)." Bachelor's degree programs are included here, because of the evolution of CTE to include preparation for 4-year programs in career fields (2006 Carl D. Perkins Career and Technical Education Improvement Act, P.L. 109-270), and because a substantial purpose of bachelor's degree programs is now occupational preparation (Grubb and Lazerson 2004; Grubb 2006; National Science Foundation 2008). For purposes of this report, career education at the postsecondary level consists of the fields of study listed in exhibit 1.2.

⁵ CTE at the secondary level encompasses family and consumer sciences education, general labor market preparation, and occupational education. The latter teaches skills required in specific occupations or occupational clusters and is the primary focus of chapter 2.

Exhibit 1.1. Classification of secondary education curricula used in the report

Academic	Career and Technical Education	Enrichment/Other
English Mathematics Science Social studies Fine arts Foreign languages	Family and consumer sciences education General labor market preparation Occupational programs: ¹ Agriculture Business management Business services Marketing Communications technology Computer technology Other technology Construction Mechanics and repair Transportation Materials production Print production Other precision production Health care Childcare and education Protective services Food service and hospitality Personal and other services	General skills Health, physical, and recreational education Religion and theology Military science

¹ Occupational programs were combined into the following 10 broad program areas for some analyses: agriculture, business (comprised of business management and business services), marketing, technology and communications (comprised of communications technology, computer technology, and other technology), trade and industry (composed of construction, mechanics and repair, transportation, materials production, print production, and other precision production), health care, childcare and education, protective services, food service and hospitality, and personal and other services.

The chapter describes the number and types of postsecondary institutions that provided career education in 2005 and the types of career programs and credentials that these institutions offered. Data are also presented on undergraduates majoring in career education in 2004, on changes in the characteristics of these students and their majors between 1990 and 2004, and comparisons between career majors and academic majors on a number of characteristics. The chapter describes postsecondary faculty who taught in career fields in fall 1992, fall 1998, and fall 2003 and compares them with their academic colleagues. Data are also presented on the number and types of postsecondary credentials awarded in career fields in 2005 and examines the educational and labor market outcomes for students 6 years after they began their postsecondary education in 1995–96, including their rates of persistence and credential attainment, employment rates, and salaries.

Exhibit 1.2. Classification of postsecondary programs, majors, and teaching fields used in the report

Academic	Career Education	Other
English and literature Fine and performing arts General and liberal studies Humanities Mathematics Science Social science	Agriculture and natural resources Business and marketing Communications Computer sciences Design ¹ Education Engineering and architectural sciences Health care Personal and consumer services Protective services Public, social, human, and legal services Trade and industry	Basic skills English as a second language Interdisciplinary studies ² Other unspecified fields Undeclared majors

¹ For analysis of student majors, design was included with fine and performing arts under “academic,” due to data limitations.

² In the Beginning Postsecondary Students analysis in Chapter 3, interdisciplinary studies was included under “academic.”

NOTE: For some analyses, the above categories were combined or subdivided further. See appendix A for detail.

Adult Work-Related Education

Chapter 4 examines all courses (including postsecondary courses taken independently of a postsecondary credential program) taken for work-related reasons by adults age 16 or older who are no longer in high school. It describes adult participants in work-related courses in 2005, what they studied, and the providers of this work-related education. The chapter also presents data on the extent to which work-related courses involve employer requirements or educational or occupational credentialing, and how participants’ employers supported their work-related coursetaking. Finally, chapter 4 describes the outcomes of participation in work-related courses.

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2. Career and Technical Education at the High School Level

At the high school level, career and technical education (CTE) encompasses the fields of study shown in exhibit 1.1. Family and consumer sciences education prepares students for roles outside the paid labor market. General labor market preparation teaches general employment skills such as word processing and introductory technology skills, among others. The occupational programs teach skills required in specific occupations or occupational clusters. This chapter focuses primarily on the occupational programs shown in exhibit 1.1.⁶

The chapter describes the types of institutions that offer CTE at the high school level, the types of CTE programs offered to high school students, the CTE courses that secondary students take, and academic coursetaking and achievement of high school CTE participants. This report does not present information on those who teach CTE to high school students. It was determined during preparation of this report that the Schools and Staffing Survey (SASS), which is a primary source of national data on K–12 teachers and schools, undercounted area CTE schools serving high school students. The 1999–2000 SASS described only 43 percent of the universe of area CTE schools, while the 2003–04 SASS described only 64 percent of this universe. The magnitude of the undercount of high school CTE teachers—due to the undercount of area CTE schools—is not known. Because of the undercount, the Technical Review Panel for Career/Technical Education Statistics recommended in 2006 that NCES not present data on high school CTE teachers based on existing SASS surveys. Steps are being taken to improve the coverage of area CTE schools—and thus high school CTE teachers—in the 2007–08 SASS survey.

This chapter presents findings on differences between relevant groups that were statistically significant (sometimes referred to as measurably different)⁷ and also substantively different, the latter defined as a difference of at least 3 percentage points or the equivalent.⁸ Statistically significant differences of a magnitude smaller than 3 percentage points or the equivalent are generally not reported. Some of the data presented about institutions that provide CTE come from the

⁶ More detail on the classification system in exhibit 1.1 is provided in appendix A.

⁷ The statistical significance of a difference was determined using a Student's *t* test and an alpha level of .05, as described in appendix A. Adjustments were not made for multiple comparisons.

⁸ On a scale that ranged from 0 to 10 credits, for example, the equivalent substantive difference would be 0.3 credits.

Common Core of Data (CCD), which is a universe survey;⁹ significance testing was not conducted on these data.

A. WHAT INSTITUTIONS PROVIDE CTE?

At the high school level, CTE is provided in three main settings: comprehensive high schools, full-time CTE high schools, and area or regional CTE schools serving multiple high schools (Silverberg et al. 2004).¹⁰ Comprehensive high schools typically have an academic focus, but also offer CTE either on or off site, the latter often at an area CTE school. Full-time CTE high schools emphasize CTE, but also offer academic coursework; students typically spend their entire school day at the school. Area CTE schools provide CTE part time to students who receive all or most of their academic instruction at their home high school. These schools may also serve postsecondary and adult students.

Information on this diverse set of institutions providing CTE was obtained from several sources. The Education Longitudinal Study of 2002 (ELS:2002) described U.S. schools serving 10th-graders full time in 2002, including comprehensive high schools and full-time CTE high schools. ELS:2002 also indicated whether these full-time high schools were served by area CTE schools. An independent tally of area CTE schools for 2001–02 was obtained from the CCD and the Integrated Postsecondary Education Data System (IPEDS), including a review of these schools by the state directors of career and technical education. For consistency, all of these data collections are referred to as describing the year 2002. Additional information on these datasets can be found in appendix A.

High School Providers of CTE

There were approximately 18,000 public high schools in the United States in 2002 (table 2.1).¹¹ Of these, 5 percent were full-time CTE high schools (about 900 such schools). An additional 46 percent were comprehensive high schools served by area CTE schools (about 8,000 schools), and the remaining 49 percent were comprehensive high schools *not* served by area CTE schools (about 9,000 schools). The majority (88 percent) of public high schools offered at least one occupational program in 2002, either on or off site (table 2.2). In addition to all full-time CTE high schools offering such programs, 91 percent of comprehensive high schools served by

⁹ Universe surveys contain data on the full population of interest, as opposed to a sample of the population.

¹⁰ Silverberg et al. (2004) used the term “vocational” instead of CTE.

¹¹ The sample included all schools with a 10th grade, referred to in this report as high schools.

area CTE schools and 84 percent of comprehensive high schools not served by area CTE schools reported offering occupational programs either on or off site in 2002.

Table 2.1. Number and percentage distribution of public and private schools with a 10th grade, by school type and sector: 2002

School sector	Total	School type		
		Full-time CTE high school	Comprehensive high school served by an area CTE school	Comprehensive high school not served by an area CTE school
Public				
Number	18,000	900	8,200	8,900
Percentage	100.0	5.2	45.6	49.2
Private				
Number	6,300	‡	‡	6,000
Percentage	100.0	0.2 !	4.1 !	95.7

! Interpret data with caution.

‡ Reporting standards not met. (Too few cases for a reliable estimate.)

NOTE: CTE is career and technical education. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Education Longitudinal Study of 2002 (ELS:2002), "School Administrator Questionnaire Base Year."

Table 2.2. Percentage of public and private schools with a 10th grade offering occupational programs, by program location, school sector, and type: 2002

School sector and type	Total	On site	Off site ¹
All public schools	88.1	82.9	53.1
Full-time CTE high school	100.0	100.0	44.1
Comprehensive high school served by an area CTE school ¹	90.8	86.4	77.0
Comprehensive high school not served by an area CTE school	84.2	77.7	31.3
All private schools	29.2	25.4	10.9 !
Full-time CTE high school	‡	‡	‡
Comprehensive high school served by an area CTE school	‡	‡	‡
Comprehensive high school not served by an area CTE school	29.3	25.6	10.2 !

! Interpret data with caution.

‡ Reporting standards not met. (Too few cases for a reliable estimate.)

¹ Off-site locations may include area CTE schools, postsecondary institutions, other full-time high schools, and other locations.

NOTE: CTE is career and technical education. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Education Longitudinal Study of 2002 (ELS:2002), "School Administrator Questionnaire Base Year."

There were approximately 6,000 private high schools in the United States in 2002, the vast majority (96 percent) of which were private comprehensive high schools not served by area CTE schools (table 2.1). About 29 percent of these latter private comprehensive high schools offered at least one occupational program either on or off site (table 2.2). Because of the lower incidence of CTE in private high schools and the federal interest in CTE in public schools, the rest of this section focuses on CTE in public high schools.¹²

It should be noted that because of the relatively small number of public full-time CTE high schools in the ELS:2002 sample (47 such schools), some apparent differences between full-time CTE schools and other schools are not measurably different.

Public High School Characteristics

In comparison with comprehensive high schools, full-time CTE high schools were larger. Specifically, a larger percentage of full-time CTE high schools than of both types of comprehensive high schools enrolled 600 or more students (82 vs. 41–45 percent) (table 2.3). Because full-time CTE high schools tended to be larger than comprehensive high schools, they represented a larger percentage of students than of schools. That is, while full-time CTE high schools represented 5 percent of all public high schools in 2002 (table 2.1), they enrolled 9 percent of all public 10th-graders in this year (table 2.4). In 2002, comprehensive high schools served by area CTE schools enrolled 42 percent of 10th-graders, and stand-alone comprehensive high schools enrolled 49 percent of 10th-graders.

In addition, a larger percentage of full-time CTE high schools than comprehensive high schools reported moderately high levels of poverty (defined as having between 31 and 50 percent of students eligible for the National School Lunch Program [NSLP]) (table 2.3). Specifically, about half of full-time CTE high schools (52 percent) had this level of student poverty, while 19–21 percent of comprehensive high schools did.

A larger percentage of full-time CTE high schools than comprehensive high schools served by area CTE schools (51 vs. 27 percent) reported that between 1 and 10 percent of their students were limited English proficient (LEP), while a larger percentage of comprehensive high schools served by area CTE schools than full-time CTE high schools enrolled no limited-English-proficient students (69 vs. 41 percent) (table 2.3). Comprehensive high schools not served by area CTE schools were more often located in the West than both other types of high schools (31

¹² At the secondary education level, the Carl D. Perkins Career and Technical Education Improvement Act of 2006 provides annual grants to local educational agencies to support their CTE programs; funds are generally not provided to private secondary schools (P.L. 109-270, section 131).

Table 2.3. Percentage distribution of each type of public school with a 10th grade, by selected school characteristics: 2002

School characteristic	Total	School type		
		Full-time CTE high school	Comprehensive high school served by an area CTE school	Comprehensive high school not served by an area CTE school
School size				
1–599 students	55.2	18.1 !	55.3	59.1
600–1,199 students	25.6	51.0	28.3	20.4
1,200–1,999 students	13.3	24.7	11.9	13.5
2,000 or more students	5.8	6.2 !	4.5	7.0
Served by an area CTE school				
Yes	48.0	43.3	100.0	†
No	52.0	56.7	†	100.0
District type				
Multiple high school district	45.4	52.3	46.2	44.0
Single high school district	54.6	47.7	53.8	56.0
Locale				
Urban	15.1	18.9	7.1	22.1
Suburban	41.4	57.8	46.2	35.3
Rural	43.5	23.2 !	46.7	42.6
Region				
Northeast	14.7	28.5	15.9	12.3
Midwest	28.4	28.5	35.9	21.5
South	36.1	33.6	37.3	35.4
West	20.7	9.4 !	11.0	30.9
School Title I status				
All students eligible	16.1	20.0 !	17.5	14.4
Some students eligible	16.3	9.4 !	24.4	9.6
Not a Title I school	67.6	70.6	58.1	76.0
Percent of students eligible for NSLP				
0–10 percent	20.2	15.9 !	25.4	16.2
11–30 percent	38.8	22.6	38.5	40.8
31–50 percent	21.6	52.1	18.6	20.9
More than 50 percent	19.4	9.4 !	17.5	22.1

See notes at end of table.

2. Career and Technical Education at the High School Level

Table 2.3. Percentage distribution of each type of public school with a 10th grade, by selected school characteristics: 2002—Continued

School characteristic	Total	School type		
		Full-time CTE high school	Comprehensive high school served by an area CTE school	Comprehensive high school not served by an area CTE school
Percent of students with an IEP				
0–5 percent	28.4	15.9 †	29.5	28.8
6–10 percent	29.8	36.2	29.8	29.1
11–15 percent	23.2	30.7	24.4	21.2
More than 15 percent	18.5	17.3 †	16.3	20.8
Percent of students who were LEP				
0 percent	60.4	41.2	69.5	53.8
1–10 percent	33.8	51.2	26.8	38.6
More than 10 percent	5.8	7.6 †	3.7	7.6
High school exit exam status				
Required	56.1	78.1	50.6	59.0
Not required	43.9	21.9 †	49.4	41.0

† Not applicable.

! Interpret data with caution.

NOTE: CTE is career and technical education. Title I provides federal dollars to help supplement educational opportunities for children who live in high poverty areas. A school is eligible to become a schoolwide program when the poverty level, (determined by free and reduced lunch counts, AFDC, census or Medicaid) is at or above 40 percent of students. NSLP is the National School Lunch Program. IEP is an Individualized Education Plan. LEP is limited English proficient. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Education Longitudinal Study of 2002 (ELS:2002), "School Administrator Questionnaire Base Year."

Table 2.4. Percentage distribution of public school 10th-graders, by school type: 2002

School type	Percent
Full-time CTE high school	8.6
Comprehensive high school served by an area CTE school	42.0
Comprehensive high school not served by an area CTE school	49.4

NOTE: CTE is career and technical education. Detail may not sum to total because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Education Longitudinal Study of 2002 (ELS:2002), "Student Questionnaire Base Year: 10th Grade."

vs. 9–11 percent). Compared with stand-alone comprehensive high schools, comprehensive high schools served by area CTE schools were more often located in the Midwest (36 vs. 22 percent) and less often in urban areas (7 vs. 22 percent).

Area CTE Schools and Other Providers

While the ELS:2002 survey provided a count of high schools served by area CTE schools, it did not provide an accounting of the area CTE schools themselves. Data compiled from the Common Core of Data (CCD), the Integrated Postsecondary Education Data System (IPEDS), and a review by the state directors of career and technical education indicated that there were approximately 1,200 area CTE schools in 41 states as of 2002 (table 2.5). The largest concentration

Table 2.5. Number of area career and technical education (CTE) schools, by state: 2002

State	Total	State	Total
All states	1,191		
Alabama	61	Montana	0
Alaska	2	Nebraska	0
Arizona	11	Nevada	0
Arkansas	23	New Hampshire	27
California	59	New Jersey	55
Colorado	11	New Mexico	5
Connecticut	0	New York	38
Delaware	0	North Carolina	9
District of Columbia	0	North Dakota	7
Florida	37	Ohio	59
Georgia	0	Oklahoma	54
Hawaii	0	Oregon	2
Idaho	10	Pennsylvania	81
Illinois	26	Rhode Island	11
Indiana	29	South Carolina	40
Iowa	0	South Dakota	5
Kansas	1	Tennessee	24
Kentucky	68	Texas	14
Louisiana	11	Utah	10
Maine	27	Vermont	17
Maryland	15	Virginia	49
Massachusetts	1	Washington	10
Michigan	62	West Virginia	31
Minnesota	29	Wisconsin	14
Mississippi	90	Wyoming	0
Missouri	56		

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), 2001–02 and Integrated Postsecondary Education Data System (IPEDS), 2001–02; and a review by the state directors of career and technical education.

of area CTE schools was in the South (with 44 percent of these schools), followed by the Midwest (24 percent), Northeast (22 percent), and West (10 percent) (table 2.6). Compared with the distributions of public high schools and public high school students by region of the country, area CTE schools were more often located in the South and Northeast and less often located in the West. That is, relative to the number of high schools and students in these regions, area CTE schools were overrepresented in the South and Northeast and underrepresented in the West (44 percent of area CTE schools vs. 34–36 percent of public schools and students in the South; 22 percent vs. 15–18 percent in the Northeast; and 10 percent vs. 21–23 percent in the West).

Table 2.6. Percentage distribution of area career and technical education (CTE) schools, public schools with a 10th grade, and public 10th-grade students, by region: 2002

Schools and students	Total	Northeast	Midwest	South	West
Area CTE schools	100.0	21.6	24.2	44.2	10.1
Public schools with a 10th grade	100.0	14.7	28.4	36.1	20.7
Public 10th-grade students	100.0	17.8	24.5	34.2	23.4

NOTE: Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), 2001–02; Integrated Postsecondary Education Data System (IPEDS), 2001–02; and Education Longitudinal Study of 2002 (ELS:2002), “School Administrator Questionnaire Base Year” and “Student Questionnaire Base Year: 10th Grade”; and a review by the state directors of career and technical education.

While the primary providers of CTE at the secondary education level include full-time CTE high schools, comprehensive high schools, and area CTE schools, high school students may also take CTE coursework at postsecondary institutions or other locations (Karp et al. 2007). For example, Waits, Setzer, and Lewis (2005) found that 46 percent of public high schools in 2003 offered dual-credit CTE courses that were taught on a postsecondary institution campus. Additionally, in some states (such as Michigan) students enrolled at one comprehensive high school may take CTE courses at another comprehensive high school, and in other states, private school students may take CTE coursework at public schools.¹³ These variations in institutions providing CTE may be captured in the “off site” column in table 2.2. Thus, the 31 percent of public comprehensive high schools and 10 percent of private comprehensive high schools *not* served by area CTE schools that reported offering occupational programs off site may have offered these programs at postsecondary institutions, other full-time high schools, or other locations.

¹³ Information was obtained from the state directors of career and technical education during their review of the tally of area CTE schools obtained from the Common Core of Data (CCD) and the Integrated Postsecondary Education Data System (IPEDS), as described earlier in this chapter.

B. WHAT PROGRAMS ARE OFFERED?

Information on high school CTE offerings was obtained from the Education Longitudinal Study of 2002 (ELS:2002), which surveyed U.S. schools enrolling 10th-graders in 2002. ELS:2002 also provided information on the career-related activities and work-based learning experiences offered by these schools. Information on high schools offering career academies¹⁴ was obtained from the 2003–04 Schools and Staffing Survey (SASS:2004), which described U.S. schools enrolling 12th-graders in 2004.¹⁵ For simplicity's sake, these schools serving 10th- or 12th-graders are referred to in this report as high schools. Additional information on these datasets can be found in appendix A.

Occupational Program Offerings

As noted previously, the majority (88 percent) of public high schools offered occupational programs either on or off site in 2002 (table 2.2). On average, public high schools offered nine such programs¹⁶ (table 2.7), the most common of which were business and computer technology, with 97 and 94 percent of public high schools with occupational programs offering these two programs, respectively (table 2.8).

In contrast, a minority (29 percent) of private high schools offered occupational programs in 2002 (table 2.2), and private high schools offered two such programs on average (table 2.7). The two most common private school programs were the same as those in public schools: computer technology and business, with 80 and 67 percent of private high schools with occupational programs offering these two programs, respectively (table 2.8).¹⁷ Because of the lower incidence of occupational program offerings in private high schools and the federal interest in CTE in public schools, the rest of this section focuses on public high schools.

As noted in the previous section, the relatively small number of public full-time CTE high schools in the ELS:2002 sample (47 such schools) may contribute to some apparent differences between public full-time CTE high schools and other schools not being measurable.

¹⁴ A career academy is a multiyear high school program in which the curriculum integrates academic and CTE courses, organized around one or more broad career themes.

¹⁵ A recent study (Stone, Kowske, and Alfeld 2004) used data from the National Longitudinal Survey of Youth 1997 to examine CTE program offerings during the 1990s, concluding that CTE programs were strengthened and new programs created during this decade.

¹⁶ The average number of programs is based on all schools, including those that offered no programs.

¹⁷ Possibly due to the small number of private high schools offering occupational programs in ELS:2002 (39 such schools), the percentage of private high schools offering business was only measurably larger than the percentage offering protective services, trade and industry/transportation, and other technology, and the percentage of private high schools offering computer technology was only measurably larger than the percentage offering these same three programs as well as agriculture and miscellaneous other occupational programs. Other apparent differences were not statistically significant.

Table 2.7. Average number of occupational programs offered in public high schools, by program location, school sector, and type: 2002

School sector and type	Total	On site	Off site ¹
All public schools	8.57	5.00	3.57
Full-time CTE high school	10.11	7.75	2.35
Comprehensive high school served by an area CTE school	9.83	4.11	5.72
Comprehensive high school not served by an area CTE school	7.20	5.57	1.64 !
All private schools	2.26 !	1.49 !	0.77 !
Full-time CTE high school	‡	‡	‡
Comprehensive high school served by an area CTE school	‡	‡	‡
Comprehensive high school not served by an area CTE school	2.20 !	1.50 !	0.70 !

! Interpret data with caution.

‡ Reporting standards not met. (Too few cases for a reliable estimate.)

¹ Off-site locations may include area CTE schools, postsecondary institutions, other full-time high schools, and other locations.

NOTE: The average number of programs is based on all public schools, including those that offered no programs. CTE is career and technical education. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Education Longitudinal Study of 2002 (ELS:2002), "School Administrator Questionnaire Base Year."

Location of Program Offerings

The majority (83 percent) of public high schools offered occupational programs on site, while about half (53 percent) offered programs off site, as described in the previous section on institutions that provide high school CTE (table 2.2). On average, public high schools offered five on-site occupational programs and four off-site ones (table 2.7). In keeping with the overall pattern for offerings, the most common on-site occupational programs were business and computer technology, with 81 and 77 percent of occupational program providers offering these two programs, respectively, on site (table 2.9). In contrast, the most common off-site programs included mechanics and repair (45 percent), construction (41 percent), health care (40 percent), and personal and other services (35 percent).¹⁸

Full-time CTE high schools and comprehensive high schools served by area CTE schools offered a larger number of occupational programs on average than did comprehensive high schools not served by area CTE schools (10 programs each vs. 7 programs) (table 2.7). Full-time

¹⁸ Differences between these four programs and the category "other occupational" programs were generally not measurable.

Table 2.8. Percentage of public and private schools with a 10th grade that offered occupational programs, by program type offered and school sector: 2002

School sector	Agriculture	Business	Marketing	Communications technology	Computer technology	Other technology	Construction	Mechanics and repair	Trade and industry/transportation	Precision production	Health care	Child care and education	Protective services	Food service and hospitality	Personal and other services	Other occupational program
All public schools	62.4	96.5	57.9	53.6	94.4	58.3	73.5	81.9	28.8	78.9	64.9	68.3	25.8	57.4	48.0	48.2
All private schools	28.7 !	67.1	40.6 !	42.4	80.0	12.5 !	55.8	51.2	13.4 !	48.0	52.5	58.5	1.9 !	51.3	54.8	30.7 !

! Interpret data with caution.

NOTE: Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Education Longitudinal Study of 2002 (ELS:2002), "School Administrator Questionnaire Base Year."

Table 2.9. Percentage of public schools with a 10th grade that offered occupational programs, by program type offered, school type, and program location: 2002

School type and program location	Agriculture	Business	Marketing	Communications technology	Computer technology	Other technology	Construction	Trade and industry/Me- chanics and repair	Transportation	Precision production	Health care	Child care and education	Protective services	Food service and hospitality	Personal and other services	Other occupational program
All schools	62.4	96.5	57.9	53.6	94.4	58.3	73.5	81.9	28.8	78.9	64.9	68.3	25.8	57.4	48.0	48.2
Full-time CTE high school	60.7	91.0	68.5	56.1	100.0	57.8	84.6	81.9	33.5	89.5	62.7	73.4	40.0	65.0	59.5	35.6
Comprehensive high school served by an area CTE school	70.0	98.1	60.5	56.5	96.0	61.7	86.9	89.4	32.9	88.1	81.3	74.7	30.6	66.4	59.3	57.5
Comprehensive high school not served by an area CTE school	54.8	95.6	54.0	50.2	92.1	54.9	58.3	74.3	23.9	68.4	48.2	61.1	19.0	46.7	34.8	39.9
All schools offering on-site program	49.9	80.8	43.4	38.6	77.5	33.5	32.5	36.9	11.3	51.5	25.1	45.0	6.2	26.5	12.7	12.5
Full-time CTE high school	50.5	86.0	63.1	48.3	88.3	40.9	53.3	53.3	23.8 !	80.3	44.4	58.6	20.1 !	47.1	37.9	16.9 !
Comprehensive high school served by an area CTE school	54.9	76.9	38.1	33.2	66.8	23.1	23.4	17.7	5.9	37.8	14.9	39.5	1.4 !	21.2	6.5 !	5.0
Comprehensive high school not served by an area CTE school	44.6	84.1	46.5	42.9	86.5	43.4	39.4	54.3	15.5	61.8	33.1	48.9	9.6 !	29.5	16.2	19.9
All schools offering off-site program ¹	12.5	15.7	14.5	15.0	16.9	24.9	41.0	45.1	17.5	27.4	39.8	23.3	19.6	31.0	35.3	35.7
Full-time CTE high school	10.2 !	5.0 !	5.3 !	7.8 !	11.7 !	16.9 !	31.2	28.6	9.7 !	9.2 !	18.3	14.8 !	20.0 !	18.0 !	21.6 !	18.7 !
Comprehensive high school served by an area CTE school	15.1	21.2	22.3	23.3	29.2	38.6	63.4	71.7	27.0	50.3	66.5	35.2	29.2	45.2	52.8	52.6
Comprehensive high school not served by an area CTE school	10.1 !	11.5 !	7.5 !	7.3 !	5.6 !	11.5	19.0	20.0	8.4 !	6.6 !	15.0	12.2	9.4 !	17.2	18.6	20.0

! Interpret data with caution.

¹ Off-site locations may include area CTE schools, postsecondary institutions, other full-time high schools, and other locations.

NOTE: CTE is career and technical education. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Education Longitudinal Study of 2002 (ELS:2002), "School Administrator Questionnaire Base Year."

CTE high schools offered the largest number of on-site occupational programs (8 vs. 4–6 programs), while comprehensive high schools served by area CTE schools offered the largest number of off-site programs (6 vs. 2 programs each).

Among those schools that offered occupational programs, a smaller percentage of comprehensive high schools not served by area CTE schools than both other school types offered programs in construction (58 vs. 85–87 percent), precision production (68 vs. 88–89 percent), and personal and other services (35 vs. 59 percent each) (table 2.9).

Occupational Programs Available to Students

Because students were distributed unevenly among schools (as seen in the previous section on the institutions that deliver high school CTE), the pattern of students with occupational programs available to them differed somewhat from the pattern of schools offering these programs. For example, while public high schools offered on average 9 occupational programs (table 2.7), public high school students had on average 10 such programs available to them in 2002 (table 2.10). Students in full-time CTE high schools and in comprehensive high schools served by area CTE schools had a larger number of occupational programs available to them than did their peers in comprehensive high schools not served by area CTE schools (10–11 vs. 9 programs).

Table 2.10. Percentage of 10th-graders in public schools offering occupational programs and the average number of occupational programs offered to public school 10th-graders, by program location and school type: 2002

School type	Percent of students in schools offering program			Average number of programs offered		
	All			All		
	locations	On site	Off site ¹	locations	On site	Off site ¹
All schools	92.6	90.2	58.4	9.9	6.3	3.6
Full-time CTE high school	100.0	100.0	47.3	11.0	8.5	2.5
Comprehensive high school served by an area CTE school	91.8	89.0	74.6	10.3	5.1	5.2
Comprehensive high school not served by an area CTE school	92.0	89.6	44.9	9.2	7.0	2.2

¹ Off-site locations may include area CTE schools, postsecondary institutions, other full-time high schools, and other locations.

NOTE: The average number of programs is based on all public schools, including those that offered no programs. CTE is career and technical education. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Education Longitudinal Study of 2002 (ELS:2002), "Student Questionnaire Base Year: 10th Grade" and "School Administrator Questionnaire Base Year."

Similar to the pattern of school offerings described above, a larger percentage of students in schools offering occupational programs had business and computer technology programs available to them than any other occupational program (96–97 vs. 87 percent or less) (table 2.11). A smaller percentage of students in comprehensive high schools not served by area CTE schools than their peers in the two other high school types were offered programs in construction (65 vs. 83–93 percent) and agriculture (44 vs. 59–62 percent).

Characteristics of Schools Offering Occupational Programs

The largest public high schools (those enrolling 2,000 or more students) offered occupational programs more often than smaller public high schools (99 vs. 86–91 percent), and the largest schools offered the greatest number of occupational programs (11 vs. 8–10 programs) in 2002 (table 2.12). A higher percentage of rural high schools than either urban or suburban high schools offered occupational programs (95 vs. 71–86 percent), although suburban schools offered a larger number of such programs than did urban schools (9 vs. 7 programs). A higher percentage of public high schools located in the Midwest than those in the Northeast offered occupational programs (95 vs. 71 percent), and the schools in the Midwest offered more such programs than schools in either the Northeast or West (10 vs. 7–8 programs). A higher percentage of high schools in which more than 10 percent of students were limited English proficient than schools with fewer or no limited-English-proficient students offered occupational programs (100 vs. 86–90 percent); schools with no limited-English-proficient students offered fewer programs than schools with at least some limited-English-proficient students (8 vs. 10 programs each). No measurable differences were found in the percentage of high schools offering occupational programs or in the average number of such programs offered by high schools based on their Title I status, percentage of students who participated in the National School Lunch Program (NSLP), percentage of students with an individualized education program (IEP), district type, or whether the school had a high school exit exam.

Other Related Offerings

Career Plans, Career Majors, Work-Based Learning, and Career Academies

As of 2002, most public high schools reported that at least some of their students had developed a career plan¹⁹ (90 percent) or had selected a career major or pathway²⁰ (86 percent) dur-

¹⁹ A career plan is a written plan of study based on the student's career interests.

²⁰ A career major or pathway specifies the academic and CTE courses to be taken by a student.

Table 2.11. Percentage of 10th-graders in public schools that offered occupational programs, by program type offered and school type: 2002

School type	Agriculture	Business	Marketing	Communications technology	Computer technology	Other technology	Construction	Trade and industry			Health care	Child care and education	Protective services	Food service and hospitality	Personal and other services	Other occupational program
								Mechanics and repair	Transportation	Precision production						
All schools	52.6	96.2	73.9	67.3	97.1	66.0	75.6	80.6	34.6	86.8	75.0	78.2	31.6	70.3	62.3	61.8
Full-time CTE high school	62.1	94.5	85.8	71.5	100.0	63.7	93.4	78.8	35.7	89.2	79.3	83.6	44.0	73.8	66.3	49.9
Comprehensive high school served by an area CTE school	59.5	97.8	75.8	68.5	96.7	67.6	83.0	87.3	36.2	89.7	81.5	77.3	32.7	74.9	69.3	65.1
Comprehensive high school not served by an area CTE school	44.0	94.9	69.8	65.4	96.8	64.8	65.1	74.5	32.7	83.7	67.9	77.9	28.0	65.0	54.6	60.8

NOTE: CTE is career and technical education. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Education Longitudinal Study of 2002 (ELS:2002), "Student Questionnaire Base Year: 10th Grade" and "School Administrator Questionnaire Base Year."

2. Career and Technical Education at the High School Level

Table 2.12. Percentage of public schools with a 10th grade offering occupational programs and the average number of occupational programs offered, by program location and selected school characteristics: 2002

School characteristic	Percent offering programs			Average number of programs		
	Total	On site	Off site ¹	Total	On site	Off site ¹
All schools	88.1	82.9	53.1	8.57	5.00	3.57
School size						
1–599 students	86.3	80.5	50.0	7.60	4.24	3.36
600–1,199 students	86.8	80.3	54.6	9.26	5.34	3.91
1,200–1,999 students	90.8	89.8	53.7	9.72	6.42	3.30
2,000 or more students	99.4	98.0	68.7	11.41	7.35	4.06
Locale						
Urban	71.5	70.2	43.2	6.86	4.16	2.70
Suburban	86.1	81.2	55.3	9.39	5.65	3.74
Rural	95.1	88.4	54.3	8.36	4.68	3.68
Region						
Northeast	70.6	68.1	53.0	7.04	3.26	3.79
Midwest	94.6	90.8	61.9	10.02	5.58	4.43
South	88.8	84.3	50.5	8.53	4.86	3.67
West	89.6	79.4	45.7	7.67	5.66	2.00
Title I status						
All students eligible	81.3	70.9	48.9	7.43	3.14	4.29
Some students eligible	93.0	91.5	61.3	8.50	4.86	3.65
Not a Title I school	87.1	82.8	52.4	8.66	5.39	3.27
Percent of students eligible for NSLP						
0–10 percent	81.2	80.5	62.1	9.00	4.50	4.50
11–30 percent	90.9	87.0	47.2	8.98	5.98	3.00
31–50 percent	93.9	83.3	56.4	7.89	4.38	3.51
More than 50 percent	83.1	81.6	39.2	7.16	4.73	2.42
Percent of students with an IEP						
0–5 percent	87.2	81.4	51.8	8.38	4.28	4.10
6–10 percent	86.2	84.6	49.9	8.94	5.79	3.14
11–15 percent	96.0	82.9	60.9	8.65	4.92	3.73
More than 15 percent	87.3	86.0	54.2	8.60	5.00	3.60
Percent of students who were LEP						
0 percent	85.9	78.3	52.3	7.74	4.23	3.51
1–10 percent	90.1	88.4	54.8	9.98	6.10	3.88
More than 10 percent	100.0	99.0	57.2	9.77	6.95	2.82

See notes at end of table.

Table 2.12. Percentage of public schools with a 10th grade offering occupational programs and the average number of occupational programs offered, by program location and selected school characteristics: 2002—Continued

School characteristic	Percent offering programs			Average number of programs		
	Total	On site	Off site ¹	Total	On site	Off site ¹
District type						
Multiple high schools	87.6	83.6	58.8	9.24	5.28	3.97
Single high school	88.4	82.4	48.7	8.05	4.79	3.26
Exit exam						
Required	85.7	81.2	51.0	8.31	5.06	3.25
Not required	91.0	84.9	56.0	8.88	4.90	3.98

¹ Off-site locations may include area CTE schools, postsecondary institutions, other full-time high schools, and other locations.

NOTE: The average number of programs is based on all public schools, including those that offered no programs. CTE is career and technical education. Title I provides federal dollars to help supplement educational opportunities for children who live in high poverty areas. A school is eligible to become a schoolwide program when the poverty level, (determined by free and reduced lunch counts, AFDC, census or Medicaid) is at or above 40 percent of students. NSLP is the National School Lunch Program. IEP is an Individualized Education Program designed for students with disabilities. LEP is limited English proficient. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Education Longitudinal Study of 2002 (ELS:2002), "School Administrator Questionnaire Base Year."

ing high school (table 2.13). A larger percentage of full-time CTE high schools than comprehensive high schools not served by area CTE schools reported that at least some of their students had selected a career major or pathway (95 vs. 82 percent). In the same year, most public high schools (85 percent) offered some type of work-based learning²¹ to 10th-graders (table 2.14), most commonly job shadowing²² and community service (52–57 vs. 25–27 percent for all other learning experiences). A higher percentage of full-time CTE high schools than comprehensive high schools served by area CTE schools offered internships to 10th-graders (44 vs. 22 percent), while a higher percentage of comprehensive high schools served by area CTE schools than stand-alone comprehensive high schools offered job shadowing to these students (65 vs. 49 percent).

As of 2004, 21 percent of public schools with a 12th grade offered career academies²³ (table 2.15). The percentage offering career academies increased as school size increased and as the percentage of minority students in a school increased. Career academies were more common in urban public high schools than in rural public high schools (29 vs. 15 percent).

²¹ Work-based learning provides supervised learning activities for students that occur in paid or unpaid workplace assignments, and for which course credit is awarded.

²² Job shadowing teaches students about a job by having students follow the schedule of a person who holds that job.

²³ A career academy is a multiyear high school program in which the curriculum integrates academic and CTE courses, organized around one or more broad career themes. These data on offerings in public schools with a 12th grade were obtained from SASS:04.

2. Career and Technical Education at the High School Level

Table 2.13. Percentage distribution of public schools with a 10th grade offering selected career-related activities, by extent of activity and school type: 2002

School type	Career plan			Career major or pathway		
	No students develop	Some students develop	All students develop	No students select	Some students select	All students select
All schools	9.8	33.2	57.0	14.5	44.7	40.9
Full-time CTE high school	8.5 !	26.5 !	65.0	4.5 !	43.7	51.8
Comprehensive high school served by an area CTE school	11.7	26.0	62.3	11.6	48.0	40.5
Comprehensive high school not served by an area CTE school	8.2 !	40.8	51.0	18.3	41.6	40.1

! Interpret data with caution.

NOTE: CTE is career and technical education. A career plan is a written plan of study based on the student's career interests. A career major or pathway specifies the academic and career and technical education courses to be taken by a student. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Education Longitudinal Study of 2002 (ELS:2002), "School Administrator Questionnaire Base Year."

Table 2.14. Percentage of public schools with a 10th grade offering selected work-based learning experiences to their 10th-graders, by school type: 2002

School type	Any work-based learning	Job shadowing	Community service	Cooperative education	School-based enterprise	Internship	Mentoring
All schools	85.3	56.8	52.1	26.9	25.5	25.2	25.0
Full-time CTE high school	76.9	60.5	52.1	40.4	28.8	43.6	41.9
Comprehensive high school served by an area CTE school	86.7	64.5	45.0	23.9	22.1	21.6	23.2
Comprehensive high school not served by an area CTE school	84.8	49.0	58.9	28.4	28.5	26.7	25.1

NOTE: CTE is career and technical education. Job shadowing teaches students about a job by having students follow the schedule of a person who holds that job. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Education Longitudinal Study of 2002 (ELS:2002), "School Administrator Questionnaire Base Year."

Table 2.15. Percentage and number of public schools with a 12th grade that offered career academies, by selected school characteristics: 2004

School characteristic	Percent	Number
All schools	21.5	4,800
School size		
1–599 students	13.7	1,800
600–1,199 students	25.5	1,200
1,200–1,999 students	39.5	1,200
2,000 or more students	45.4	600
Locale		
Urban	29.2	1,300
Suburban	23.8	2,200
Rural	15.2	1,300
Percent minority students		
1–10 percent	17.1	—
11–30 percent	21.2	—
31–50 percent	28.2	—
More than 50 percent	26.6	—

— Not available due to some schools having missing data for the percentage of minority students.

NOTE: Area CTE schools were not fully included in the data collection and thus are not included in this table. Career academy is a multi-year high school program in which the curriculum integrates academic and career and technical education courses, organized around one or more broad career themes. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey (SASS), "Public School Questionnaire," 2003–04.

C. WHO PARTICIPATES AND WHAT COURSES DO THEY TAKE?

Information on the coursetaking patterns of high school students was obtained from the High School Transcript Studies (HSTS) of 1990, 2000, and 2005, which collected transcripts for a nationally representative sample of high school graduates from the classes of 1990, 2000, and 2005.²⁴ The sample was further restricted for this analysis to graduates with complete transcripts who earned either a regular or honors high school diploma.²⁵ The transcripts contained information on the courses students took during high school and the credits they earned in those courses. Analysts translated the various credits reported on transcripts into standard Carnegie units, where one Carnegie unit is awarded for a class that meets one period per day for the entire school year,

²⁴ A recent study (Stone and Aliaga 2003) used student interview data from the National Longitudinal Survey of Youth 1997 to examine high school student participation in CTE programs during the late 1990s.

²⁵ The diploma restriction excluded students who completed high school with either a certificate of attendance or general educational development (GED) credential.

or the equivalent instructional time.²⁶ For simplicity's sake, the term "credits" is used in this report in place of "Carnegie units." Courses were classified as academic, career and technical education (CTE), or enrichment/other (as shown in exhibit 1.1) based on the Secondary School Taxonomy (SST) developed by the National Center for Education Statistics (NCES) (Bradby and Hoachlander 1999).²⁷ CTE courses were then subdivided into the three areas of family and consumer sciences education, general labor market preparation, and occupational programs. This section focuses primarily on occupational coursetaking as of 2005 and on changes in this coursetaking between 1990 and 2005. Coursetaking in 2000 is only discussed when it was substantially different from the overall trend between 1990 and 2005. Additional information on these datasets and the classification used in this section can be found in appendix A.

Occupational Coursetaking as of 2005

Most public high school graduates took occupational coursework: about 92 percent of public high school graduates from the class of 2005 took at least one occupational course (table 2.16). Approximately 1 in 5 public high school graduates (21 percent) completed an occupational concentration, defined as earning 3.0 or more credits within one of the occupational programs shown in exhibit 1.1.²⁸ On average, the 2005 public high school graduates took the equivalent of three year-long occupational courses during high school (3.0 credits) (table 2.17). These graduates earned more credits on average in occupational courses than they earned in either fine arts or foreign languages (3.0 vs. 2.0 credits each).

Consistent with findings presented in the previous section on occupational program offerings, the 2005 public high school graduates earned more credits in computer technology and in business services than in any other occupational program area (0.6 and 0.4 credits, respectively, vs. 0.2 or fewer credits) (table 2.17). Higher percentages of 2005 public high school graduates concentrated (earning 3.0 or more credits) in the areas of computer technology and agriculture than in any other occupational program area (3 vs. 2 percent or less of graduates) (table 2.18). Thus, while graduates earned fewer credits on average in agriculture than in computer technology

²⁶ In each HSTS, analysts translate the various credits reported on transcripts into standard Carnegie units. See Roey et al. (2001) for a description of the procedures used to collect and summarize the 1998 HSTS, procedures that were similar to those used in 1990, 2000, and 2005.

²⁷ The Secondary School Taxonomy (SST) was first developed in 1987, and revised in 1998. It was revised again in 2007 (Bradby 2007), although not in time for the analysis stage of this report. Thus, this report relies on the 1998 version of the SST. The 2007 revision reassigned some occupational courses into different occupational categories, but did not move CTE courses out of the CTE curriculum, nor move non-CTE courses into the CTE curriculum. Therefore, applying the 2007 SST to the data presented in this report would not alter the overall participation rate in CTE (as measured by percentage of students taking a CTE course) nor the average credits earned in CTE.

²⁸ The 1990 estimate for public high school graduates is lower than the estimate previously published in Levesque (2003b) because an occupational concentration was defined in earlier reports as completing 3.0 or more credits within one of 10 broad occupational program areas, rather than the 18 occupational program areas shown in exhibit 1.1.

(0.2 vs. 0.6 credits), there was no measurable difference in the percentage of concentrators in these two areas (3 percent each) (tables 2.17 and 2.18).

Table 2.16. Percentage of public high school graduates taking different types of career and technical education (CTE) coursework and average credits earned in CTE curricula during high school: 2005

CTE coursework	Public school students
Percentage who	
Took any CTE courses	96.6
Took any occupational courses	92.0
Completed an occupational concentration	20.8
Average credits earned in	
CTE total	4.01
Family and consumer sciences education	0.51
General labor market preparation	0.46
Occupational education, total	3.03
Agriculture	0.23
Business management	0.16
Business services	0.44
Marketing	0.15
Communications technology	0.19
Computer technology	0.55
Other technology credits	0.04
Construction	0.10
Mechanics and repair	0.17
Transportation	0.01
Materials production	0.16
Print production	0.24
Other precision production	0.03
Health care	0.15
Child care and education	0.10
Protective services	0.04
Food service and hospitality	0.09
Personal and other services	0.08
Other ¹	0.11

¹ Other includes unspecified occupational education coursework.

NOTE: High school graduates include students who completed high school with regular or honors diploma. The diploma restriction excluded students who completed high school with either a certificate of attendance or general educational development (GED) credential. Completing an occupational concentration is defined as earning 3.0 or more credits in any of the occupational programs shown in exhibit 1.1. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, the 2005 High School Transcript Study (HSTS).

2. Career and Technical Education at the High School Level

Table 2.17. Average credits earned during high school by public high school graduates, by curricular area: 1990, 2000, and 2005

Curricular area	1990	2000	2005
All curricular areas	23.53	25.93	26.67
Academic total	16.66	18.83	19.44
Core academics total	13.57	14.89	15.42
English	4.19	4.38	4.42
Mathematics	3.15	3.50	3.67
Social studies	3.47	3.82	3.98
Science	2.75	3.20	3.34
Fine arts	1.55	2.03	2.05
Foreign languages	1.54	1.91	1.97
Enrichment/other	2.68	2.89	3.23
CTE total	4.19	4.20	4.01
Family and consumer sciences education	0.57	0.49	0.51
General labor market preparation, total	0.73	0.69	0.46
Career preparation/general work experience	0.17	0.28	0.23
Technology education	0.01	0.07	0.08
Miscellaneous other	0.01	0.01	0.02
Industrial arts	0.10	0.08	0.04
Basic keyboarding/typewriting	0.45	0.26	0.09
Occupational education, total	2.89	3.03	3.03
Agriculture	0.20	0.25	0.23
Business management	0.16	0.16	0.16
Business services	0.72	0.58	0.44
Marketing	0.16	0.16	0.15
Communications technology	0.09	0.15	0.19
Computer technology	0.30	0.42	0.55
Other technology credits	0.01	0.05	0.04
Construction	0.10	0.11	0.10
Mechanics and repair	0.20	0.19	0.17
Transportation	0.01	0.01	0.01
Materials production	0.23	0.16	0.16
Print production	0.25	0.27	0.24
Other precision production	0.09	0.06	0.03
Health care	0.04	0.13	0.15
Child care and education	0.06	0.09	0.10
Protective services	#	0.03	0.04
Food service and hospitality	0.04	0.05	0.09
Personal and other services	0.10	0.08	0.08
Other ¹	0.13	0.08	0.11

Rounds to zero.

¹ Other includes unspecified occupational education coursework.

NOTE: CTE is career and technical education. Change calculations were based on unrounded numbers. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, the 1990, 2000, and 2005 High School Transcript Studies (HSTS).

Table 2.18. Percentage of public high school graduates taking different types of career and technical education (CTE) coursework and concentrating in various occupational programs during high school: 1990, 2000, and 2005

CTE coursework	1990	2000	2005
Took any CTE courses	98.0	96.6	96.6
Took any occupational courses	90.6	90.9	92.0
Completed an occupational concentration, total	22.8	21.8	20.8
Agriculture	2.9	3.3	3.0
Business management	0.2 !	0.7 !	0.7
Business services	6.7	3.8	1.9
Marketing	2.4	2.0	1.5
Communications technology	0.3	0.6	1.2
Computer technology	0.3	1.6	2.7
Other technology credits	#	0.2 !	0.2
Construction	1.3	1.2	1.1
Mechanics and repair	2.5	2.2	2.1
Transportation	0.1 !	0.1 !	#
Materials production	2.1	1.3	1.5
Print production	2.0	2.0	1.5
Other precision production	0.9	0.4	0.2
Health care	0.6	1.9	2.1
Child care and education	0.3	0.6	0.7
Protective services	#	0.2	0.4
Food service and hospitality	0.5	0.6	0.8
Personal and other services	1.4	0.8	0.7

Rounds to zero.

! Interpret data with caution.

NOTE: Completing an occupational concentration is defined as earning 3.0 or more credits in any of the occupational programs shown in exhibit 1.1. Change calculations were based on unrounded numbers. Detail on occupational concentrations sums to greater than the total because some graduates completed more than one concentration. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, the 1990, 2000, and 2005 High School Transcript Studies (HSTS).

Trends in Occupational Coursetaking

Between 1990 and 2005, no measurable changes were detected in the overall occupational coursetaking patterns of public high school graduates. About 91–92 percent of students in both graduating classes took at least some occupational coursework during high school (table 2.18), and graduates from both classes earned on average 2.9–3.0 occupational credits, the equivalent of about three year-long courses (table 2.17). About 21–23 percent of graduates in each class completed an occupational concentration (table 2.18), earning 3.0 or more credits in at least one of the occupational programs shown in exhibit 1.1.

Some coursetaking shifts were detected, however, among the occupational program areas. In 2005, public high school graduates earned more credits on average and concentrated more of-

ten in five occupational program areas than in 1990: computer technology, health care, communications technology, child care and education, and protective services (0.04–0.25 more credits and 0.4–2.4 increase in percentage of concentrators) (tables 2.17 and 2.18).²⁹ In contrast, 2005 graduates earned fewer credits on average and concentrated less often than 1990 graduates in three occupational program areas: business services, materials production, and other precision production (0.1–0.3 fewer credits and 1–5 decrease in percentage of concentrators).³⁰

Characteristics of Students Who Took Occupational Courses: 2005

This section examines the occupational coursetaking patterns of public high school graduates based on their race/ethnicity, sex, disability status in grade 12, limited English proficiency in grade 12, mathematics coursetaking in grade 9, and the size of the school they attended in grade 12.³¹

Occupational Coursetaking Overall

Occupational coursetaking was common among public high school graduates, regardless of the student characteristics examined.³² As of 2005, 87 percent or more of each student group shown in table 2.19 took some occupational coursework in high school, and about 12 percent or more of each student group concentrated (earned 3.0 or more credits) in at least one of the occupational programs shown in exhibit 1.1 (table 2.19). In addition, each student group earned at least 2.0 occupational credits on average.

Some coursetaking differences among student groups were evident, however. Graduates who were male, were disabled as of grade 12, or graduated from smaller schools generally participated more in the occupational curriculum than their classmates who were female, not disabled, or graduated from larger schools, respectively. Specifically, a larger percentage of male graduates than female graduates of the class of 2005 took any occupational coursework in high school (94 vs. 90 percent) and completed an occupational concentration (25 vs. 17 percent). Male graduates also earned more occupational credits on average (3.5 vs. 2.6 credits) (table 2.19).

²⁹ Graduates also earned more credits on average in food service and hospitality and in other technology areas between 1990 and 2005, and a larger percentage of graduates completed concentrations in business management by 2005.

³⁰ There was also a smaller percentage of graduates completing an occupational concentration in marketing and in personal and other services by 2005 than 1990.

³¹ Grade 9 mathematics is used as a measure of academic achievement prior to most of the occupational courses that students take in high school. For a more detailed explanation of how this measure is used, see Levesque (2003a). Grade 9 mathematics is classified into three categories: geometry or higher-level mathematics, algebra or pre-algebra, and low-level or no mathematics (low-level mathematics includes general, consumer, or functional mathematics).

³² A recent study (DeLuca, Plank, and Estacion 2006) using the National Longitudinal Survey of Youth 1997 also found that the majority of high school students participate in CTE courses. This finding held across demographic subgroups.

Table 2.19. Percentage of public high school graduates taking different types of occupational coursework and average credits earned in occupational education by public high school graduates, by selected student characteristics: 2005

Student characteristic	Percent of graduates who		Average credits earned in occupational education
	Took any occupational coursework	Completed an occupational concentration	
All graduates	92.0	20.8	3.03
Race/ethnicity ¹			
White	92.0	21.8	3.13
Black	93.6	21.2	3.02
Hispanic	93.0	18.2	2.80
Asian/Pacific Islander	87.0	12.6	2.26
American Indian	89.3	19.2	2.91
Other	89.3	15.2	2.30
Sex			
Male	94.4	25.3	3.49
Female	89.8	16.5	2.59
Disability status in grade 12			
Disabled	92.2	25.6	3.47
No reported disability	92.3	20.5	2.99
Limited English proficiency in grade 12			
Limited English proficient	91.3	11.8	2.32
No reported limited English proficiency	92.3	21.3	3.05
Grade 9 mathematics			
Geometry or higher	89.9	16.2	2.62
Prealgebra or algebra	92.6	21.7	3.10
Low-level or no mathematics	93.4	25.0	3.47
Size of 12th-grade school			
1–499 students	96.3	28.4	3.91
500–999 students	94.5	23.8	3.39
1,000–1,499 students	90.8	21.6	3.04
1,500–1,999 students	91.6	19.3	2.84
2,000 or more students	91.0	16.2	2.63

¹ Black includes African American, Hispanic includes Latino, Pacific Islander includes Native Hawaiian, and American Indian includes Alaska Native. Other includes multiple races. Race categories exclude Hispanic origin unless specified.

NOTE: Completing an occupational concentration is defined as earning 3.0 or more credits in any one of the occupational programs shown in exhibit 1.1. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, the 2005 High School Transcript Study (HSTS).

Graduates with disabilities as of grade 12 earned more occupational credits on average (3.5 vs. 3.0 credits) and concentrated in an occupational program area more often (26 vs. 21 percent) than their classmates without disabilities. Additionally, the percentage of graduates taking any occupational coursework or completing an occupational concentration, and the average number of occupational credits that graduates earned in high school, generally increased as school size decreased.

In contrast, graduates who were Asian, had limited English proficiency (LEP) as of grade 12, or took high-level mathematics coursework in grade 9 generally participated less in the occupational curriculum than their classmates who were from other racial/ethnic groups, were non-LEP, or took mid- or low-level grade 9 mathematics, respectively. Specifically, the 2005 public high school graduates who were Asian earned fewer occupational credits on average (2.3 vs. 2.8–3.1 credits) and completed an occupational concentration less often (13 vs. 18–22 percent) than their classmates from other racial/ethnic groups (table 2.19).³³ Additionally, a smaller percentage of Asian graduates took any occupational coursework than Black, White, or Hispanic graduates (87 vs. 92–94 percent). Graduates with LEP as of grade 12 earned fewer occupational credits on average (2.3 vs. 3.1 credits) and completed an occupational concentration less often (12 vs. 21 percent) than their classmates who were non-LEP. Finally, comparing graduates who took geometry or higher-level mathematics in grade 9 with those who took algebra or lower-level mathematics in grade 9, a lower percentage of graduates in the “geometry or higher” group took any occupational coursework (90 vs. 93 percent each) and completed an occupational concentration (16 vs. 22–25 percent), and they earned fewer occupational credits on average during high school (2.6 vs. 3.1–3.5 credits).

Participation by Occupational Program Area

Student participation patterns also varied among the different occupational program areas. With regard to race/ethnicity, Asian graduates earned below-average numbers of credits in comparison with the 2005 graduating class as a whole in seven occupational program areas: business services, agriculture, mechanics and repair, materials production, communications technology, construction, and child care (table 2.20). Black graduates earned below-average numbers of credits in four areas: agriculture, mechanics and repair, materials production, and print production. Hispanic graduates earned below-average numbers of credits in agriculture, business management, and communications technology. In only two instances did a student group earn numbers of credits that were measurably above the average for all 2005 graduates, with Black graduates

³³ There was no measurable difference in occupational concentration rates between Asian graduates and graduates of “other” race/ethnicity.

Table 2.20. Average credits earned in each occupational program area by public high school graduates, by selected student characteristics: 1990, 2000, and 2005

Student characteristic	Agriculture	Business management	Business services	Marketing	Communications technology	Computer technology	Other technology credits	Construction	Mechanics and repair
1990									
All graduates	0.20	0.16	0.72	0.16	0.09	0.30	0.01	0.10	0.20
Race/ethnicity ¹									
White	0.24	0.16	0.69	0.16	0.10	0.30	0.01	0.10	0.22
Black	0.06	0.16	0.89	0.17	0.06	0.33	#	0.12	0.11
Hispanic	0.15	0.12	0.81	0.19	0.10	0.30	0.02 !	0.04	0.21
Asian/Pacific Islander	0.04 !	0.13	0.52	0.05	0.08	0.38	0.03 !	0.04 !	0.17
American Indian	0.36	0.18	0.77	0.15 !	0.14	0.31	#	0.14 !	0.14 !
Other	0.14 !	0.29	0.50	0.02 !	0.10 !	0.41 !	0.02 !	#	0.12 !
Sex									
Male	0.31	0.14	0.43	0.14	0.08	0.33	0.02	0.20	0.39
Female	0.09	0.17	0.99	0.18	0.11	0.28	#	0.01	0.02
Disability status in grade 12									
Disabled	0.53	0.09	0.27	0.15	0.02	0.13	#	0.31	0.49
No reported disability	0.19	0.16	0.73	0.16	0.09	0.31	0.01	0.09	0.19
Limited English proficiency in grade 12									
Limited English proficient	0.08 !	0.08 !	0.57 !	0.09 !	0.04 !	0.23	#	0.06 !	0.12 !
No reported limited English proficiency	0.20	0.16	0.72	0.16	0.09	0.30	0.01	0.10	0.20
Grade 9 mathematics									
Geometry or higher	0.05	0.09	0.49	0.07	0.12	0.44	#	0.02 !	0.06
Prealgebra or algebra	0.17	0.16	0.77	0.16	0.10	0.32	0.01	0.07	0.15
Low-level or no mathematics	0.33	0.17	0.70	0.19	0.07	0.22	0.01	0.20	0.34
Size of 12th-grade school									
0–499 students	0.48	0.12	0.72	0.04	0.06	0.40	#	0.10	0.19
500–999 students	0.28	0.17	0.78	0.17	0.09	0.29	0.02	0.14	0.23
1,000–1,499 students	0.11	0.20	0.76	0.20	0.11	0.27	#	0.08	0.18
1,500–1,999 students	0.12	0.13	0.63	0.16	0.09	0.28	0.01 !	0.11	0.25
2,000 or more students	0.04	0.12	0.65	0.19	0.10	0.31	0.01	0.05	0.14

See notes at end of table.

Table 2.20. Average credits earned in each occupational program area by public high school graduates, by selected student characteristics: 1990, 2000, and 2005—Continued

Student characteristic	Trans- portation	Materials production	Print production	Other precision production	Health care	Child care and education	Protective services	Food service and hospitality	Personal and other services
1990									
All graduates	0.01	0.23	0.25	0.09	0.04	0.06	#	0.04	0.10
Race/ethnicity ¹									
White	0.02	0.25	0.23	0.09	0.04	0.06	#	0.03	0.09
Black	#	0.16	0.16	0.09	0.04 !	0.07	#	0.08	0.16
Hispanic	#	0.20	0.05 !	0.07	0.02 !	0.05	#	0.05	0.18
Asian/Pacific Islander	0.01 !	0.14	0.28	0.08 !	0.01 !	0.02 !	#	0.02 !	0.03 !
American Indian	#	0.26	0.30 !	0.11 !	0.02 !	0.02 !	#	0.05 !	0.02 !
Other	0.03 !	0.03 !	0.27	0.05 !	0.33 !	0.19 !	#	0.05 !	0.06 !
Sex									
Male	0.03	0.44	0.41	0.12	0.02	0.03	#	0.04	0.02
Female	#	0.03	0.11	0.05 !	0.06	0.09	#	0.04	0.17
Disability status in grade 12									
Disabled	0.04 !	0.48	0.22	0.15 !	0.09 !	0.12 !	#	0.19 !	0.16
No reported disability	0.01	0.22	0.25	0.08	0.04	0.06	#	0.03	0.10
Limited English proficiency in grade 12									
Limited English proficient	#	0.12 !	0.14 !	0.03 !	#	0.02 !	#	0.01 !	0.20 !
No reported limited English proficiency	0.01	0.23	0.25	0.09	0.04	0.06	#	0.04	0.10
Grade 9 mathematics									
Geometry or higher	0.01 !	0.09	0.22	0.05	0.02 !	0.03	#	0.01 !	0.03
Prealgebra or algebra	0.01	0.18	0.26	0.08	0.04	0.05	#	0.02	0.08
Low-level or no mathematics	0.02	0.38	0.24	0.12	0.05	0.09	#	0.08	0.17
Size of 12th-grade school									
0–499 students	0.03 !	0.26	0.19	0.03 !	0.04 !	0.06	#	0.02 !	0.10
500–999 students	0.01 !	0.30	0.30	0.09 !	0.06	0.08	#	0.05	0.11
1,000–1,499 students	#	0.22	0.26	0.09	0.03	0.04	#	0.03 !	0.08
1,500–1,999 students	0.01 !	0.14	0.26	0.13	0.05 !	0.07	#	0.06 !	0.08
2,000 or more students	0.01 !	0.18	0.23	0.09	0.03	0.05	0.01 !	0.04	0.13

See notes at end of table.

Table 2.20. Average credits earned in each occupational program area by public high school graduates, by selected student characteristics: 1990, 2000, and 2005—Continued

Student characteristic	Agriculture	Business management	Business services	Marketing	Communications technology	Computer technology	Other technology credits	Construction	Mechanics and repair
2000									
All graduates	0.25 !	0.16 !	0.58 !	0.16 !	0.15 !	0.42 !	0.05 !	0.11 !	0.19 !
Race/ethnicity ¹									
White	0.31 !	0.18 !	0.55 !	0.14 !	0.16 !	0.42 !	0.05 !	0.13 !	0.22 !
Black	0.12 !	0.16 !	0.71 !	0.22 !	0.12 !	0.34 !	0.06 !	0.07 !	0.11 !
Hispanic	0.14 !	0.12 !	0.62 !	0.18 !	0.12 !	0.40 !	0.02 !	0.07 !	0.16 !
Asian/Pacific Islander	0.06 !	0.07 !	0.43 !	0.10 !	0.13 !	0.58 !	0.02 !	0.01 !	0.10 !
American Indian	0.37 !	0.15 !	0.57 !	0.14 !	0.12 !	0.52 !	0.04 !	0.05 !	0.21 !
Other	#	0.16 !	0.77 !	0.02 !	0.10 !	0.46 !	0.07 !	0.12 !	0.10 !
Sex									
Male	0.34 !	0.16 !	0.49 !	0.14 !	0.13 !	0.50 !	0.08 !	0.21 !	0.35 !
Female	0.16 !	0.16 !	0.67 !	0.17 !	0.16 !	0.34 !	0.02 !	0.01 !	0.04 !
Disability status in grade 12									
Disabled	0.50 !	0.11 !	0.40 !	0.16 !	0.11 !	0.37 !	0.05 !	0.24 !	0.42 !
No reported disability	0.24 !	0.16 !	0.59 !	0.16 !	0.15 !	0.42 !	0.05 !	0.10 !	0.18 !
Limited English proficiency in grade 12									
Limited English proficient	0.12 !	0.03 !	0.40 !	0.19 !	0.05 !	0.44 !	0.01 !	0.09 !	0.16 !
No reported limited English proficiency	0.25 !	0.16 !	0.58 !	0.16 !	0.15 !	0.42 !	0.05 !	0.11 !	0.19 !
Grade 9 mathematics									
Geometry or higher	0.13 !	0.15 !	0.52 !	0.12 !	0.18 !	0.48 !	0.05 !	0.03 !	0.06 !
Prealgebra or algebra	0.28 !	0.17 !	0.62 !	0.17 !	0.14 !	0.42 !	0.05 !	0.11 !	0.20 !
Low-level or no mathematics	0.30 !	0.14 !	0.52 !	0.16 !	0.12 !	0.31 !	0.05 !	0.24 !	0.37 !
Size of 12th-grade school									
0–499 students	0.70	0.19	0.75	0.03 !	0.19	0.46	0.08 !	0.29 !	0.33 !
500–999 students	0.38	0.17	0.75	0.18	0.12	0.50	0.04 !	0.15	0.18
1,000–1,499 students	0.18	0.19 !	0.60	0.18	0.16	0.42	0.06	0.10	0.21
1,500–1,999 students	0.10	0.15	0.41	0.17	0.13	0.37	0.04 !	0.04	0.16
2,000 or more students	0.07	0.12	0.47	0.17	0.15	0.36	0.03 !	0.05	0.14

See notes at end of table.

Table 2.20. Average credits earned in each occupational program area by public high school graduates, by selected student characteristics: 1990, 2000, and 2005—Continued

Student characteristic	Trans- portation	Materials production	Print production	Other precision production	Health care	Child care and education	Protective services	Food service and hospitality	Personal and other services
2000									
All graduates	0.01 !	0.16 !	0.27 !	0.06 !	0.13 !	0.09 !	0.03 !	0.05 !	0.08 !
Race/ethnicity ¹									
White	0.01 !	0.19 !	0.29 !	0.06 !	0.12 !	0.10 !	0.03 !	0.05 !	0.07 !
Black	0.01 !	0.08 !	0.20 !	0.04 !	0.15 !	0.07 !	0.02 !	0.08 !	0.16 !
Hispanic	0.01 !	0.10 !	0.25 !	0.07 !	0.23 !	0.10 !	0.04 !	0.05 !	0.07 !
Asian/Pacific Islander	#	0.05 !	0.23 !	0.03 !	0.14 !	0.04 !	0.02 !	0.02 !	0.02 !
American Indian	#	0.43 !	0.26 !	0.03 !	0.07 !	0.09 !	0.01 !	0.13 !	0.07 !
Other	#	0.14 !	0.47 !	0.05 !	0.12 !	0.19 !	0.06 !	#	0.11 !
Sex									
Male	0.01 !	0.30 !	0.41 !	0.09 !	0.06 !	0.04 !	0.04 !	0.04 !	0.02 !
Female	#	0.03 !	0.14 !	0.03 !	0.20 !	0.14 !	0.02 !	0.07 !	0.13 !
Disability status in grade 12									
Disabled	0.01 !	0.33 !	0.21 !	0.07 !	0.11 !	0.11 !	0.05 !	0.09 !	0.12 !
No reported disability	0.01 !	0.15 !	0.27 !	0.05 !	0.14 !	0.09 !	0.03 !	0.05 !	0.08 !
Limited English proficiency in grade 12									
Limited English proficient	0.01 !	0.17 !	0.21 !	0.07 !	0.07 !	0.09 !	0.03 !	0.03 !	0.09 !
No reported limited English proficiency	0.01 !	0.16 !	0.27 !	0.06 !	0.14 !	0.09 !	0.03 !	0.05 !	0.08 !
Grade 9 mathematics									
Geometry or higher	#	0.06 !	0.22 !	0.05 !	0.14 !	0.07 !	0.02 !	0.02 !	0.05 !
Prealgebra or algebra	0.01 !	0.16 !	0.29 !	0.06 !	0.13 !	0.10 !	0.03 !	0.05 !	0.09 !
Low-level or no mathematics	0.01 !	0.30 !	0.28 !	0.07 !	0.17 !	0.11 !	0.03 !	0.11 !	0.08 !
Size of 12th-grade school									
0–499 students	0.01 !	0.35	0.33	0.03 !	0.06 !	0.06	0.03 !	0.04 !	0.10 !
500–999 students	0.01 !	0.14	0.30	0.06 !	0.18 !	0.09	0.03 !	0.06	0.07
1,000–1,499 students	#	0.16	0.28	0.07	0.17	0.09	0.01 !	0.06	0.07
1,500–1,999 students	0.01 !	0.13	0.27	0.04	0.10	0.10	0.04 !	0.04	0.06
2,000 or more students	0.02 !	0.10	0.19	0.07	0.14	0.11	0.03	0.06 !	0.10

See notes at end of table.

Table 2.20. Average credits earned in each occupational program area by public high school graduates, by selected student characteristics: 1990, 2000, and 2005—Continued

Student characteristic	Agriculture	Business management	Business services	Marketing	Communications technology	Computer technology	Other technology credits	Construction	Mechanics and repair
2005									
All graduates	0.23	0.16	0.44	0.15	0.19	0.55	0.04	0.10	0.17
Race/ethnicity ¹									
White	0.29	0.16	0.42	0.15	0.21	0.54	0.04	0.11	0.18
Black	0.10	0.20	0.56	0.18	0.16	0.59	0.05	0.10	0.11
Hispanic	0.14	0.10	0.51	0.13	0.12	0.53	0.02	0.09	0.18
Asian/Pacific Islander	0.06	0.14	0.29	0.13	0.12	0.65	0.03	0.02 !	0.08
American Indian	0.45	0.10	0.36	0.08 !	0.20	0.56	0.01 !	0.09 !	0.17 !
Other	0.13 !	0.17	0.31	0.21	0.26	0.51	0.03 !	0.02 !	0.04 !
Sex									
Male	0.32	0.16	0.42	0.15	0.17	0.65	0.06	0.18	0.32
Female	0.15	0.16	0.46	0.15	0.20	0.45	0.01	0.02	0.02
Disability status in grade 12									
Disabled	0.37	0.09	0.36	0.11	0.11	0.47	0.06	0.25	0.33
No reported disability	0.22	0.17	0.46	0.15	0.20	0.56	0.03	0.09	0.15
Limited English proficiency in grade 12									
Limited English proficient	0.12	0.07	0.36	0.09	0.06	0.54	0.03 !	0.07	0.18
No reported limited English proficiency	0.24	0.16	0.45	0.15	0.19	0.55	0.04	0.10	0.17
Grade 9 mathematics									
Geometry or higher	0.15	0.13	0.42	0.13	0.21	0.60	0.03	0.05	0.08
Prealgebra or algebra	0.25	0.17	0.45	0.16	0.20	0.54	0.04	0.10	0.18
Low-level or no mathematics	0.32	0.15	0.43	0.15	0.12	0.48	0.04	0.18	0.30
Size of 12th-grade school									
0–499 students	0.60	0.16	0.68	0.06	0.20	0.71	0.01 !	0.18	0.20
500–999 students	0.42	0.17	0.43	0.13	0.19	0.60	0.03 !	0.13	0.20
1,000–1,499 students	0.16	0.15	0.43	0.18	0.20	0.52	0.05	0.10	0.21
1,500–1,999 students	0.10	0.21	0.39	0.18	0.17	0.53	0.03	0.08	0.15
2,000 or more students	0.10	0.13	0.40	0.16	0.19	0.51	0.04	0.07	0.11

See notes at end of table.

Table 2.20. Average credits earned in each occupational program area by public high school graduates, by selected student characteristics: 1990, 2000, and 2005—Continued

Student characteristic	Trans- portation	Materials production	Print production	Other precision production	Health care	Child care and education	Protective services	Food service and hospitality	Personal and other services
2005									
All graduates	0.01	0.16	0.24	0.03	0.15	0.10	0.04	0.09	0.08
Race/ethnicity ¹									
White	0.01	0.19	0.26	0.03	0.13	0.10	0.04	0.09	0.07
Black	0.01 !	0.05	0.16	0.02	0.24	0.11	0.05 !	0.11	0.10
Hispanic	0.01	0.11	0.22	0.04	0.15	0.11	0.07	0.09	0.09
Asian/Pacific Islander	#	0.06	0.26	0.05 !	0.10	0.06	0.04	0.06	0.05
American Indian	#	0.20	0.11	0.01 !	0.10	0.14	0.05 !	0.04 !	0.11 !
Other	0.02 !	0.07 !	0.14	0.03 !	0.05 !	0.16 !	0.04 !	0.04 !	0.03 !
Sex									
Male	0.02	0.29	0.34	0.04	0.06	0.04	0.04	0.08	0.02
Female	#	0.03	0.14	0.02	0.23	0.16	0.04	0.10	0.13
Disability status in grade 12									
Disabled	0.02 !	0.27	0.22	0.04	0.12	0.09	0.04	0.18	0.11
No reported disability	0.01	0.15	0.24	0.03	0.15	0.10	0.04	0.08	0.07
Limited English proficiency in grade 12									
Limited English proficient	0.01 !	0.11	0.21	0.03	0.12	0.09	0.04	0.05	0.08
No reported limited English proficiency	0.01	0.16	0.24	0.03	0.15	0.10	0.04	0.09	0.08
Grade 9 mathematics									
Geometry or higher	0.01 !	0.08	0.26	0.03	0.12	0.08	0.03	0.07	0.05
Prealgebra or algebra	0.01	0.17	0.24	0.03	0.16	0.10	0.04	0.08	0.08
Low-level or no mathematics	0.01	0.25	0.19	0.04	0.15	0.12	0.05	0.18	0.13
Size of 12th-grade school									
0–499 students	0.01	0.27	0.17	0.03 !	0.15	0.11 !	0.07 !	0.07	0.06
500–999 students	0.01 !	0.24	0.24	0.03 !	0.15	0.09	0.02 !	0.11	0.07
1,000–1,499 students	0.02 !	0.15	0.25	0.02	0.16	0.10	0.02	0.11	0.09
1,500–1,999 students	0.01 !	0.13	0.24	0.05	0.16	0.10	0.05	0.08	0.08
2,000 or more students	0.01	0.08	0.26	0.03	0.13	0.11	0.05	0.08	0.07

Rounds to zero.

! Interpret data with caution.

¹ Black includes African American, Hispanic includes Latino, Pacific Islander includes Native Hawaiian, and American Indian includes Alaska Native. Other includes multiple races. Race categories exclude Hispanic origin unless specified.

NOTE: Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, the 1990, 2000, and 2005 High School Transcript Studies (HSTS).

earning above-average numbers of credits in business services (0.6 vs. an overall average of 0.4 credits) and health care (0.2 vs. an overall average of 0.1 credits).³⁴

As of 2005, male graduates earned more credits on average than their female classmates in computer technology, print production, agriculture, mechanics and repair, materials production, construction, and other technology (0.05–0.30 more credits). In contrast, female graduates earned more credits on average than their male classmates in business services, health care, child care and education, and personal and other services (0.04–0.17 more credits).

Graduates from the class of 2005 who were disabled as of grade 12 earned more credits on average than their nondisabled classmates in agriculture, mechanics and repair, materials production, construction, and food services and hospitality (0.1–0.2 more credits). They earned fewer credits on average in business services, business management, marketing, computer technology, and communications technology (0.05–0.10 fewer credits). Graduates with limited English proficiency in grade 12 earned fewer credits on average than their English-proficient peers in 8 of the 18 occupational program areas: business services, agriculture, business management, materials production, marketing, communications technology, construction, and food service and hospitality (0.04–0.14 fewer credits).

As the level of difficulty of the mathematics course they took in grade 9 decreased, graduates earned on average more occupational credits: this pattern was found in agriculture, mechanics and repair, materials production, construction, food service and hospitality, and personal services. In contrast, the average number of credits that graduates earned in computer technology and in communications technology increased as the level of mathematics they took in grade 9 increased.

The number of credits that graduates earned in several occupational program areas tended to increase as their school size decreased. Specifically, the smaller the school that students attended in 2005, the more credits they earned on average in business services, computer technology, agriculture, mechanics and repair, materials production, and construction. In contrast, students who attended smaller schools generally earned fewer marketing credits on average than their classmates who attended larger schools.

³⁴ These estimates are the equivalent of 60 percent of Black graduates vs. 40 percent of all graduates taking a 1-year course in business services and 20 percent of Black graduates vs. 10 percent of all graduates taking a 1-year course in health care.

Comparison of Occupational Concentrators and Nonconcentrators

Among the 2005 graduates, the majority of both occupational concentrators³⁵ and their nonconcentrating classmates were White (67–71 percent), did not have any disabilities as of grade 12 (89–92 percent), were English proficient as of grade 12 (96–98 percent), and had taken mid-level mathematics in grade 9 (63–67 percent) (table 2.21). Nevertheless, some differences between occupational concentrators and nonconcentrators were evident as of 2005. In particular, the majority of occupational concentrators were male (59 percent), while the majority of nonconcentrators were female (54 percent). In addition, larger percentages of occupational concentrators than nonconcentrators were White (71 vs. 67 percent), took low-level mathematics in grade 9 (15 vs. 11 percent), and attended the smallest schools (enrolling fewer than 500 students) (16 vs. 11 percent). Smaller percentages of occupational concentrators than nonconcentrators took geometry or higher-level mathematics in grade 9 (19 vs. 26 percent) and attended the largest schools (enrolling 2,000 or more students) (19 vs. 26 percent).

Trends in the Characteristics of Occupational Coursetakers

As noted earlier, no measurable changes were detected between 1990 and 2005 in the overall occupational coursetaking patterns of public high school graduates. However, coursetaking changes were detected among some of the student groups examined.

In particular, public high school graduates who attended the smallest schools and those who took high-level mathematics in grade 9 participated to a greater extent in the occupational curriculum by the end of the 15 years studied. Specifically, the 2005 graduates who attended the smallest schools (enrolling fewer than 500 students) earned more occupational credits on average than their 1990 peers (3.9 vs. 3.0 credits) (table 2.22). Compared with those who had graduated in 1990, graduates from the class of 2005 who took geometry or higher in grade 9 earned more occupational credits on average (2.6 vs. 1.8 credits) and concentrated in occupational education at a higher rate (16 vs. 8 percent). Graduates who took pre-algebra or algebra courses in grade 9 also earned more occupational credits on average in 2005 than in 1990 (3.1 vs. 2.7 credits). Declines in the percentage of students completing occupational concentrations between 1990 and 2005 occurred among four groups of graduates: American Indians (31 vs. 19 percent), females (21 vs. 17 percent), disabled students (38 vs. 26 percent), and those who took low-level or no mathematics courses in grade 9 (34 vs. 25 percent).

³⁵ Occupational concentrators are defined as students who earned at least 3.0 credits in one of the occupational program areas shown in exhibit 1.1.

Table 2.21. Percentage distribution of public high school graduates who were occupational concentrators and nonconcentrators, by selected student characteristics: 2005

Student characteristic	Occupational concentrators	Nonconcentrators
All graduates	100.0	100.0
Race/ethnicity ¹		
White	71.3	67.2
Black	13.9	13.6
Hispanic	10.8	12.7
Asian/Pacific Islander	2.7	5.0
American Indian	0.8	0.9
Other	0.4	0.6 !
Sex		
Male	59.2	45.9
Female	40.8	54.1
Disability status in grade 12		
Disabled	10.6	8.1
No reported disability	89.4	91.9
Limited English proficiency in grade 12		
Limited English proficient	1.9	3.7
No reported limited English proficiency	98.1	96.3
Grade 9 mathematics		
Geometry or higher	18.9	25.6
Prealgebra or algebra	66.6	63.0
Low-level or no mathematics	14.5	11.4
Size of 12th-grade school		
0–499 students	15.9	10.6
500–999 students	19.4	16.5
1,000–1,499 students	26.2	25.2
1,500–1,999 students	19.5	21.7
2,000 or more students	19.0	26.1

! Interpret data with caution.

¹ Black includes African American, Hispanic includes Latino, Pacific Islander includes Native Hawaiian, and American Indian includes Alaska Native. Other includes multiple races. Race categories exclude Hispanic origin unless specified.

NOTE: Completing an occupational concentration is defined as earning 3.0 or more credits in any one of the occupational programs shown in exhibit 1.1. Nonconcentrators include all graduates who did not complete an occupational concentration. Detail may not sum to totals because of rounding. Standard error tables are available at

<http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, the 2005 High School Transcript Study (HSTS).

2. Career and Technical Education at the High School Level

Table 2.22. Average credits earned in occupational education by public high school graduates and percentage of graduates completing an occupational concentration in high school, by selected student characteristics: 1990, 2000, and 2005

Student characteristic	Average credits earned in occupational education			Percent completing an occupational concentration		
	1990	2000	2005	1990	2000	2005
All graduates	2.89	3.03	3.03	22.8	21.8	20.8
Race/ethnicity ¹						
White	2.97	3.16	3.13	23.7	22.2	21.8
Black	2.79	2.85	3.02	23.0	22.0	21.2
Hispanic	2.85	2.79	2.80	22.3	21.6	18.2
Asian/Pacific Islander	2.07	2.11	2.26	10.7	13.4	12.6
American Indian	3.16	3.36	2.91	31.4	26.7	19.2
Other	2.42	2.96	2.30	20.3 !	22.7 !	15.2
Sex						
Male	3.28	3.51	3.49	25.0	25.4	25.3
Female	2.53	2.57	2.59	20.9	18.3	16.5
Disability status in grade 12						
Disabled	3.88	3.59	3.47	37.7	30.3	25.6
No reported disability	2.86	3.01	2.99	22.4	21.4	20.5
Limited English proficiency in grade 12						
Limited English proficient	1.82	2.31	2.32	12.4 !	15.3	11.8
No reported limited English proficiency	2.89	3.04	3.05	22.9	21.8	21.3
Grade 9 mathematics						
Geometry or higher	1.85	2.38	2.62	8.0	14.6	16.2
Prealgebra or algebra	2.74	3.16	3.10	20.6	22.8	21.7
Low-level or no mathematics	3.63	3.49	3.47	33.6	28.1	25.0
Size of 12th-grade school						
0–499 students	2.98	4.14	3.91	22.6	29.5	28.4
500–999 students	3.28	3.51	3.39	28.9	26.9	23.8
1,000–1,499 students	2.80	3.12	3.04	22.0	22.2	21.6
1,500–1,999 students	2.66	2.43	2.84	21.5	16.3	19.3
2,000 or more students	2.54	2.42	2.63	16.5	17.4	16.2

! Interpret data with caution.

¹ Black includes African American, Hispanic includes Latino, Pacific Islander includes Native Hawaiian, and American Indian includes Alaska Native. Other includes multiple races. Race categories exclude Hispanic origin unless specified.

NOTE: Completing an occupational concentration is defined as earning 3.0 or more credits in any one of the occupational programs shown in exhibit 1.1. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, the 1990, 2000, and 2005 High School Transcript Studies (HSTS).

As also noted earlier, the 2005 public high school graduates earned more credits on average than their 1990 peers in computer technology, health care, communications technology, food service and hospitality, child care and education, and protective services (0.04–0.25 more credits), while they earned fewer credits in business services, materials production, and other precision production (0.1–0.3 fewer credits) (table 2.17). All of the coursetaking changes that were detected between 1990 and 2005 among the student groups examined in table 2.20 were consistent with these overall findings.

D. WHAT IS ACCOMPLISHED?

This section describes the academic coursetaking and achievement of public high school graduates who took various amounts of occupational coursework in high school, focusing on changes in these measures between 1990 and 2005. The section also describes the postsecondary education and labor market outcomes of 1992 public high school graduates 8 years later in 2000, also based on their level of occupational coursework in high school. The occupational curriculum described in this section encompasses the programs shown in exhibit 1.1.

While this section describes outcomes associated with different amounts of occupational coursework in high school, it does not provide causal evidence that occupational education affects these outcomes. Readers are cautioned against drawing the conclusion that participation in the occupational curriculum caused the various outcomes examined. As shown in section C of this chapter, participation in occupational education varied by student characteristics. For example, public high school graduates from the class of 2005 who were male, were disabled as of grade 12, or graduated from smaller schools generally participated more in the occupational curriculum than their classmates who were female, not disabled, or graduated from larger schools, respectively (table 2.19). Moreover, sex, race/ethnicity, disability status, English proficiency, prior academic achievement, and school size were associated with different patterns of participation in specific occupational programs (table 2.20). Thus, the associations (or lack thereof) between occupational education and educational or labor market outcomes are confounded by the independent associations between these outcomes and the characteristics of participants in occupational education. For example, a lower postsecondary enrollment rate for occupational CTE participants (more of whom were male than female compared with nonparticipants) may be due, at least in part, to the tendency of male graduates to enroll in postsecondary education at lower rates than their female classmates (Peter and Horn 2005). This report did not attempt to isolate the independent contribution of occupational education to the various outcomes examined.

This section presents data showing that changes in the academic coursetaking and achievement of public high school graduates were consistent with school reform efforts during

the period studied, which sought to increase the academic rigor and achievement of high school students in general and CTE participants in particular.³⁶ At the same time gaps persist between CTE participants and nonparticipants in their academic coursetaking and achievement.

Academic Coursetaking Gains

The analysis of changes in academic coursetaking presented in this section used the High School Transcript Studies (HSTS) of 1990, 2000, and 2005, which were also used in section C to describe occupational coursetaking patterns. The analysis focuses on public high school graduates of the classes of 1990 and 2005 and on changes over time in their coursetaking in the core academic subjects (English, mathematics, science, and social studies). The analysis also examines the extent to which graduates met selected academic coursetaking standards over the period. The section compares the academic coursetaking patterns of graduates who earned 0.00 credits, 0.01–1.99 credits, 2.00–3.99 credits, and 4.00 or more credits in occupational coursework in high school. Additional information on the HSTS can be found in appendix A.

Core Academic Coursetaking

In 1990, public high school graduates who accumulated 4.00 or more occupational credits in high school earned about 2.4 fewer credits in core academic courses than their classmates who took no occupational coursework in high school (table 2.23). Between 1990 and 2005, the amount of core academic coursework that public high school graduates took increased by about 1.8 credits on average. Core academic coursetaking increased regardless of graduates' level of occupational coursetaking in high school. In fact, the magnitude of the gains in core academic credits earned between 1990 and 2005 increased as the number of occupational credits that graduates earned in high school increased. For example, graduates from the class of 2005 who accumulated 4.00 or more occupational credits in high school earned 2.6 more core academic credits on average than their 1990 peers, while the 2005 graduates who took no occupational coursework in high school earned 1.3 more core academic credits on average than their 1990 peers.

Despite the greater gains associated with occupational coursetaking, the 2005 graduates who accumulated 4.00 or more occupational credits in high school still earned 1.2 fewer core academic credits on average than their classmates who took no occupational coursework (14.8 vs. 16.0 credits) (table 2.23). This gap between the coursetakers with 4.00 or more occupational

³⁶ These school reform efforts included, among others, state efforts to increase high school graduation requirements and efforts under the Carl D. Perkins Vocational and Applied Technology Act Amendments of 1990 and 1998 to improve the academic achievement of CTE participants (Levesque 2003b).

credits and those who took no occupational coursework in high school had narrowed, however, from the gap in 1990 (table 2.24).

Table 2.23. Average credits earned by public high school graduates in core academic subjects, by number of occupational education credits earned in high school: 1990, 2000, and 2005

Core academic subject and number of occupational credits	1990	2000	2005
Core academics, all graduates	13.57	14.89	15.42
Occupational credits			
None	14.68	15.56	16.00
0.01–1.99 credits	14.42	15.35	15.82
2.00–3.99 credits	13.69	15.01	15.53
4.00 or more credits	12.24	14.13	14.80
English, all graduates	4.19	4.38	4.42
Occupational credits			
None	4.32	4.43	4.48
0.01–1.99 credits	4.31	4.45	4.49
2.00–3.99 credits	4.22	4.42	4.45
4.00 or more credits	4.01	4.25	4.33
Mathematics, all graduates	3.15	3.50	3.67
Occupational credits			
None	3.45	3.71	3.84
0.01–1.99 credits	3.38	3.61	3.76
2.00–3.99 credits	3.19	3.52	3.70
4.00 or more credits	2.79	3.30	3.53
Science, all graduates	2.75	3.20	3.34
Occupational credits			
None	3.21	3.51	3.64
0.01–1.99 credits	3.06	3.38	3.53
2.00–3.99 credits	2.79	3.22	3.36
4.00 or more credits	2.26	2.92	3.07
Social studies, all graduates	3.47	3.82	3.98
Occupational credits			
None	3.69	3.91	4.04
0.01–1.99 credits	3.67	3.91	4.04
2.00–3.99 credits	3.50	3.85	4.02
4.00 or more credits	3.18	3.67	3.86

Note: Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, the 1990, 2000, and 2005 High School Transcript Studies (HSTS).

Table 2.24. Gap in average credits earned in core academic subjects between public high school graduates who took no occupational coursework and those who accumulated 4.00 or more occupational credits in high school, by core academic subject: 1990, 2000, and 2005

Core academic subject	1990 gap	2000 gap	2005 gap
Core academics, total	2.44	1.43	1.21
English, total	0.31	0.18 !	0.15 !
Mathematics, total	0.67	0.41	0.31
Science, total	0.95	0.59	0.57
Social studies, total	0.51	0.24 !	0.18

! Interpret data with caution.

Note: Gaps in average credits earned in core academic subjects was calculated by subtracting the average core academic credits earned by graduates who accumulated 4.00 or more occupational credits from the averaged core academic credits earned by graduates who took no occupational coursework. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, the 1990, 2000, and 2005 High School Transcript Studies (HSTS).

In 1990, public high school graduates who accumulated 4.00 or more occupational credits in high school earned 0.5–1.0 fewer credits in each of the core academic subjects of mathematics, science, and social studies than their classmates who took no occupational coursework in high school (table 2.23). Between 1990 and 2005, the amount of coursework that public high school graduates completed overall increased in all four core academic subjects by 0.2–0.6 credits on average. As with overall core academic coursetaking patterns, the magnitude of the gains that graduates made in mathematics, science, and social studies between 1990 and 2005 generally increased as the number of occupational credits that graduates earned in high school increased. Nevertheless, the 2005 graduates who accumulated 4.00 or more occupational credits in high school still earned fewer mathematics and science credits than their classmates who took no occupational coursework (the gaps ranged from 0.3–0.6 credits). In contrast, no measurable differences between the graduates who took the most occupational coursework and those who took no occupational coursework in high school were detected in the average number of credits earned in English and social studies as of 2005. The gap between graduates who took the most occupational coursework and those who took no occupational coursework in high school declined between 1990 and 2005 in mathematics, science, and social studies (by 0.4 credits in mathematics and science and by 0.3 credits in social studies) (table 2.24).

Coursetaking Trade-Offs

The findings above suggest that there is a trade-off between the number of occupational credits and the number of academic credits that students earn in high school.³⁷ Figure 2.1 shows these coursetaking trade-offs for the 2005 graduates who earned different amounts of occupational credits in high school. As depicted in the figure, the 2005 public high school graduates who accumulated 4.00 or more occupational credits in high school earned more total credits than their classmates who took no occupational coursework (27.6 vs. 26.3 total credits), including 6.0 credits on average in occupational courses. In comparison with graduates who took no occupational coursework, those who took 4.00 or more occupational credits earned 1.2 fewer core academic credits (primarily in mathematics and science), 2.1 fewer fine arts credits, 1.0 fewer foreign language credits, and 0.4 fewer enrichment/other credits.

Meeting Academic Coursetaking Benchmarks

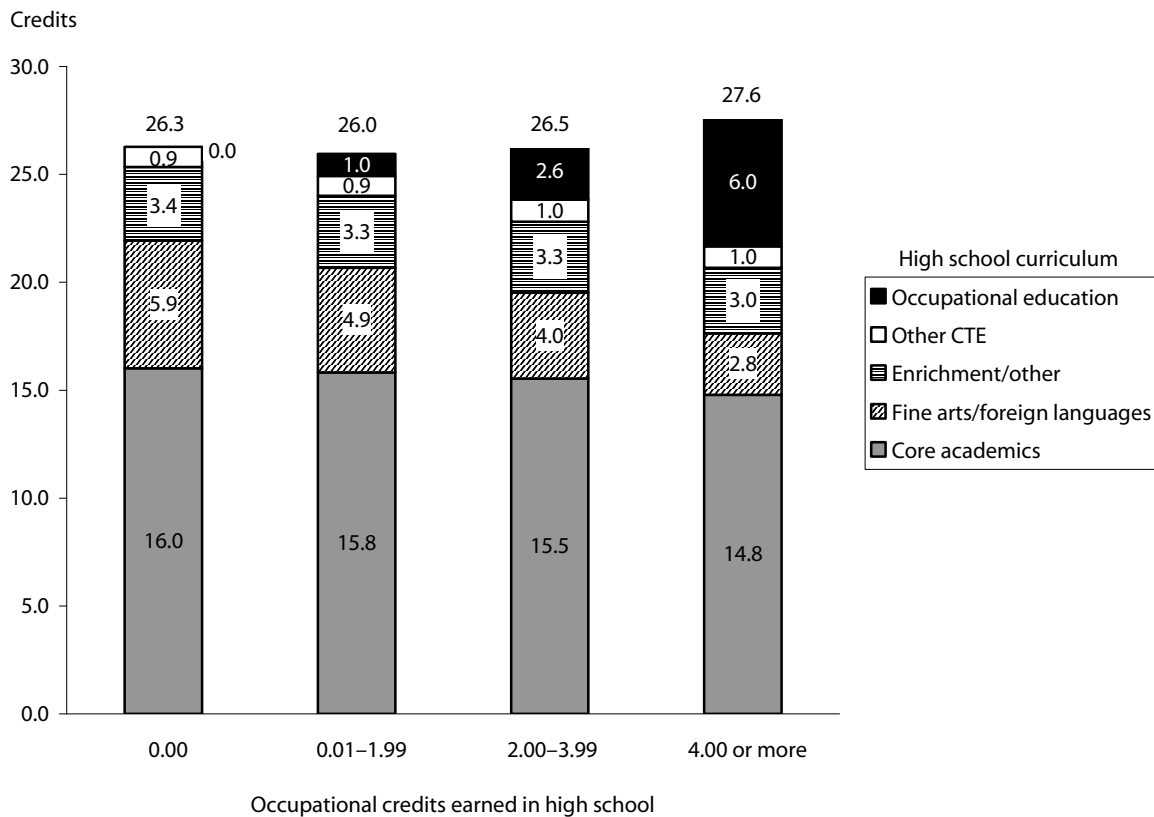
From 1990 to 2005, the percentages of public high school graduates meeting the New Basics core academic standards and completing 4-year college-preparatory coursework in high school increased.³⁸ About two out of three graduates from the class of 2005 (66 percent) met the New Basics standards in comparison with 38 percent of their 1990 peers (table 2.25). Similarly, 48 percent of the 2005 graduates completed 4-year college-preparatory coursework in comparison with 29 percent of their 1990 peers.

In 1990, a lower percentage of public high school graduates who accumulated 4.00 or more occupational credits in high school than their classmates who took no occupational coursework met the New Basics core academic standards (18 vs. 55 percent) and completed 4-year college-preparatory coursework (10 vs. 45 percent) (table 2.25). The percentage of graduates meeting these two coursetaking benchmarks increased between 1990 and 2005 regardless of graduates' level of occupational coursetaking in high school. In fact, the magnitude of the gains in the percentage of graduates meeting these benchmarks over the decade increased as the number of occupational credits earned in high school increased. For example, graduates who accumulated 4.00 or more occupational credits in high school exhibited a 42-percentage-point gain between 1990 and 2005 in meeting the New Basics core academic standards, compared with a gain of 17 per-

³⁷ Recent studies using national longitudinal surveys have examined the relationship between the ratio of CTE to academic coursework students take in high school and various student outcomes, including academic achievement, dropping out, and college attendance (Plank 2001; Plank, DeLuca, and Estacion 2005; DeLuca, Plank, and Estacion 2006).

³⁸ The New Basics core academic standards include 4 years of English and 3 years each of mathematics, science, and social studies (National Commission on Excellence in Education 1983). Four-year college-preparatory coursework is defined as earning 4.0 or more credits in English; 3.0 or more credits in mathematics at the algebra 1 or higher level; 2.0 or more credits in biology, chemistry, or physics; 2.0 or more credits in social studies with at least 1.0 credit in U.S. or world history; and 2.0 or more credits in a single foreign language. These criteria were based on a review of entrance requirements at public 4-year postsecondary institutions in Flanagan (1992) and were first used in Levesque et al. (2000).

Figure 2.1. Average credits earned in each high school curriculum by 2005 public high school graduates, by occupational credits earned in high school



NOTE: CTE is career and technical education. Core academics are English, mathematics, science, and social studies.
 SOURCE: U.S. Department of Education, National Center for Education Statistics, the 2005 High School Transcript Study (HSTS).

centage points among graduates who took no occupational coursework in high school. Similarly, graduates who accumulated 4.00 or more occupational credits in high school exhibited a 27-percentage-point gain between 1990 and 2005 in completing 4-year college-preparatory coursework, compared with a gain of 17 percentage points among graduates who took no occupational coursework in high school.

Despite their greater gains, a lower percentage of 2005 graduates who accumulated 4.00 or more occupational credits in high school than their classmates who took no occupational coursework met the New Basics standards (60 vs. 72 percent) and completed 4-year college-preparatory coursework (37 vs. 62 percent) (table 2.25). Nevertheless, more than half of the 2005 graduates who completed 4.00 or more occupational credits met the New Basics standards, and more than one-third of these graduates had completed 4-year college-preparatory coursework in high school.

Table 2.25. Percentage of public high school graduates meeting selected academic coursetaking benchmarks, by occupational credits earned in high school: 1990, 2000, and 2005

Occupational credits	New Basics core academic standards			4-year college-preparatory coursework		
	1990	2000	2005	1990	2000	2005
All graduates	38.1	57.9	65.9	28.7	41.8	48.1
None	54.6	66.1	71.9	45.4	53.5	62.2
0.01–1.99 credits	52.2	62.5	69.1	41.7	49.8	55.6
2.00–3.99 credits	38.7	59.0	67.3	29.5	43.6	49.4
4.00 or more credits	18.1	50.1	60.2	9.5	29.0	36.6

NOTE: New Basics core academic standards include 4 years of English and 3 years each of mathematics, science, and social studies. Four-year college-preparatory coursework is defined as earning 4.0 or more credits in English; 3.0 or more credits in mathematics at the algebra 1 or higher level; 2.0 or more credits in biology, chemistry, or physics; 2.0 or more credits in social studies with at least 1.0 credit in U.S. or world history; and 2.0 or more credits in a single foreign language. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, the 1990, 2000, and 2005 High School Transcript Studies (HSTS).

As of 2005, the largest percentage of public high school graduates completed 4-year college-preparatory coursework in social studies (96 percent), followed by English (89 percent) and mathematics and science (74–75 percent), while the lowest percentage completed 4-year college-preparatory coursework in foreign languages (67 percent) (table 2.26). Rates of completing 4-year college-preparatory coursework in science, mathematics, and foreign languages decreased as the average number of credits earned in occupational education increased. This pattern was not evident with regard to completing 4-year college-preparatory coursework in English and social studies, however. Thus, while a smaller percentage of the 2005 graduates who accumulated 4.00 or more occupational credits in high school than their classmates who took no occupational coursework completed 4-year college-preparatory coursework in science (66 vs. 82 percent), mathematics (67 vs. 82 percent), and foreign languages (53 vs. 81 percent), there were no measurable differences in the percentages of these two groups completing 4-year college-preparatory coursework in English (87–90 percent each) and social studies (94–96 percent each).

Table 2.26. Percentage of public high school graduates completing 4-year college-preparatory coursework, by subject and occupational credits earned in high school: 2005

Occupational credits	All 4-year college-preparatory coursework	Social studies	English	Science	Mathematics	Foreign languages
All graduates	48.1	95.6	88.6	74.6	73.8	66.9
None	62.2	94.5	89.8	81.9	82.1	80.8
0.01–1.99 credits	55.6	95.8	89.5	80.5	78.3	76.0
2.00–3.99 credits	49.4	96.2	88.8	76.4	74.5	69.7
4.00 or more credits	36.6	94.9	87.2	65.6	67.0	52.5

NOTE: Four-year college-preparatory coursework is defined as earning 4.0 or more credits in English; 3.0 or more credits in mathematics at the algebra 1 or higher level; 2.0 or more credits in biology, chemistry, or physics; 2.0 or more credits in social studies with at least 1.0 credit in U.S. or world history; and 2.0 or more credits in a single foreign language. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, the 2005 High School Transcript Study (HSTS).

Experiences After High School

This section describes the postsecondary education and labor market experiences of 1992 public high school graduates 2 years later in 1994 and again 8 years later in 2000. The analysis used the National Education Longitudinal Study (NELS), which first surveyed 8th-graders in 1987–88 and then conducted follow-ups with these students in spring 1990, 1992, 1994, and 2000. This analysis used data from the NELS High School Transcript Study (HSTS)³⁹ and the NELS Postsecondary Education Transcript Study (PETS),⁴⁰ as well as data from the base-year and all follow-up surveys. The second follow-up in 1992 “freshened” the sample so it was representative of all 12th-graders in that year and collected transcripts for these students. The analysis focuses on public high school graduates from this 1992 class, examining post-high school outcomes based on their level of participation in occupational education in high school. Specifically, the section compares outcomes for graduates who earned 0.00 credits, 0.01–1.99 credits, 2.00–3.99 credits, and 4.00 or more credits in occupational coursework during high school. Data are first presented on postsecondary education and then on labor market experiences, beginning in each section with graduates’ early experiences through spring 1994 and then examining their later experiences through spring 2000. Additional information on these datasets can be found in appendix A.

³⁹ High school transcripts were collected for NELS sampled students in 1992.

⁴⁰ Postsecondary transcripts for NELS sampled students were collected in 2000, some 8 years after NELS students were scheduled to graduate from high school.

Postsecondary Education Experiences and Outcomes

Postsecondary Aspirations and Plans

Before examining postsecondary outcomes, it is important to consider students' plans for their postsecondary education. Among the public high school class of 1992, more graduates aspired to a bachelor's degree than any other type of postsecondary goal (48 vs. 24 percent or less) (table 2.27). The second most common postsecondary aspiration included an advanced degree (24 vs. 12 percent or less). Postsecondary aspirations were related to graduates' occupational coursetaking, however. The more occupational credits that graduates earned in high school, the more often they were in general to plan (1) not to pursue any postsecondary education; (2) to attend a vocational, technical, or business school; or (3) to complete some college (which may include a postsecondary certificate or associate's degree). In contrast, the more occupational credits that graduates earned in high school, the less often they were in general to plan to attain an advanced degree. With regard to bachelor's degree aspirations, no measurable differences were detected in the percentage of graduates with this goal among those who earned 0.00 credits (50 percent), 0.01–1.99 credits (52 percent), or 2.00–3.99 credits (53 percent) in occupational education during high school. However, it was more common for these three groups of graduates than their classmates earning 4.00 or more occupational credits to aspire to a bachelor's degree as their highest level (50–53 vs. 36 percent). Nevertheless, among graduates who completed 4.00 or more occupational credits, more aspired to a bachelor's degree than any other postsecondary goal (36 vs. 18 percent or less).

Table 2.27. Percentage distribution of 1992 public high school graduates, by highest postsecondary attainment planned as of their senior year in high school and occupational credits earned in high school

Occupational credits earned in high school	Total	High school or less	Vocational, trade, or business school	Some college	Bachelor's degree	Advanced degree
All graduates	100.0	7.9	8.2	12.1	47.9	23.9
None	100.0	2.0	1.8	6.9	49.5	39.8
0.01–1.99 credits	100.0	2.8	3.8	9.3	51.9	32.2
2.00–3.99 credits	100.0	7.2	8.5	11.3	53.3	19.7
4.00 or more credits	100.0	16.9	15.1	18.1	35.9	14.1

NOTE: Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

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

Postsecondary Enrollment Immediately Following High School

Among the public high school class of 1992, 70 percent of graduates enrolled in postsecondary education within 12 months of graduating from high school (table 2.28). On average, graduates enrolled about 7 months after graduation. As with postsecondary aspirations, these enrollment patterns were related to graduates' occupational coursetaking. The more occupational credits that graduates earned in high school, the less often they were to enroll in postsecondary education within 12 months of graduating and the longer they waited to enroll.⁴¹ For example, 53 percent of graduates who earned 4.00 or more occupational credits in high school enrolled in postsecondary education within 12 months of graduating, compared with 84 percent of graduates who took no occupational coursework in high school. Similarly, graduates who earned 4.00 or more occupational credits waited 10 months on average to enroll, compared with 5 months for graduates who took no occupational coursework. Nevertheless, about half (53 percent) of graduates who completed 4.00 or more occupational credits from the class of 1992 enrolled in postsecondary education within 1 year of graduating from high school.

Table 2.28. Percentage of 1992 public high school graduates who enrolled in postsecondary education within 12 months of graduating from high school, and average number of months until graduates enrolled, by occupational credits earned in high school

Occupational credits earned in high school	Percent enrolled within 12 months	Average number of months until enrollment
All high school graduates	70.2	7.3
None	84.0	5.1
0.01–1.99 credits	78.5	5.9
2.00–3.99 credits	72.4	7.6
4.00 or more credits	53.0	10.0

NOTE: Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

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

⁴¹ A 2006 study by DeLuca, Plank, and Estacion, using the National Longitudinal Survey of Youth 1997, found that higher ratios of CTE-to-academic courses in high school were associated with lower rates of college attendance, even after adjusting for selection characteristics associated with course trajectories.

Long-Term Postsecondary Enrollment and First Institution Types

Among the public high school class of 1992, some 83 percent of graduates enrolled in postsecondary education by 2000 (table 2.29). Repeating earlier patterns, the more occupational credits that graduates earned in high school, the lower were their enrollment rates over this 8-year period. Nevertheless, 70 percent of graduates who earned 4.00 or more occupational credits in high school enrolled in postsecondary education by 2000.

Among those graduates who enrolled by 2000, the more occupational credits they earned in high school, the higher were their rates of enrolling first in a less-than-4-year institution and the less common it was to enroll first in a 4-year institution (table 2.29). For example, among enrollees, rates of enrolling first in less-than-4-year institutions were more than twice as large for graduates earning 4.00 or more occupational credits as for their classmates taking no occupational coursework in high school (62 vs. 24 percent). In contrast, rates of enrolling first in 4-year institutions were half as large for graduates earning 4.00 or more occupational credits as for their classmates taking no occupational coursework in high school (38 vs. 76 percent). These findings are consistent with the data presented earlier on postsecondary aspirations, where the percentage of graduates reporting postsecondary education plans involving less than a bachelor's degree increased as the number of occupational credits graduates earned in high school increased. Nevertheless, 38 percent of graduates who earned 4.00 or more occupational credits in high school and later enrolled in postsecondary education enrolled first in a 4-year institution.

Postsecondary Majors

Among those public high school graduates from the class of 1992 who enrolled in postsecondary education by 2000, the most common reported majors (other than undeclared majors) were business (13 percent) and education or library science (13 percent) (table 2.30). The more occupational credits that graduates earned in high school, the more often they majored in business, engineering or architecture, or other career major or reported no postsecondary major. In contrast, the more occupational credits that graduates earned in high school, the less often they majored in social sciences, science, arts or applied arts, humanities, communications or journalism, or mathematics. No systematic relationship was detected between occupational credits earned in high school and the extent to which graduates had postsecondary majors in education or library science; health sciences; social work, human services, or protective services; computer-related majors; or other unspecified majors.

Examining the relatedness of occupational concentrators' fields of study in high school to their postsecondary majors was complicated by small sample sizes for some occupational program areas and lack of relevant postsecondary major categories. However, table 2.30 presents

Table 2.29. Percentage of 1992 public high school graduates who enrolled in postsecondary education by 2000 and percentage distribution of these enrollees, by first postsecondary institution type and occupational credits earned in high school

Occupational credits earned in high school	Enrolled by 2000	4-year institution				Less-than-4-year institution						
		Total	Public	Private not-for-profit	For-profit	Total	Public 2-year	Private not-for-profit 2-year	For-profit 2-year	Public less-than-2-year	Private not-for-profit less-than-2-year	For-profit less-than-2-year
All high school graduates	83.2	57.2	38.9	17.0	1.3 !	42.8	38.4	0.9	1.7	0.4	0.1 !	1.3
None	92.0	76.0	44.4	31.4	0.2 !	24.0	22.7	0.4 !	0.5 !	0.2 !	#	0.3 !
0.01–1.99 credits	89.5	67.8	44.7	21.3	1.8 !	32.2	30.0	0.6 !	0.7	0.1 !	#	0.9
2.00–3.99 credits	85.5	53.0	37.5	14.3	1.1 !	47.0	42.1	1.2 !	2.1 !	0.2 !	#	1.3
4.00 or more credits	70.3	37.8	28.9	8.0	0.9	62.2	53.6	1.4	3.3	1.2	0.3 !	2.4 !

Rounds to zero.

! Interpret data with caution.

NOTE: Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

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

Table 2.30. Percentage distribution of 1992 public high school graduates who enrolled in postsecondary education by 2000 with each number of occupational credits, occupational concentrator status, and program concentration, by their undergraduate major

Occupational credits earned in high school, occupational concentrator status, and program	Business	Education or library science	Social sciences	Health sciences	Science	Engineering or architecture	Arts or applied arts	Humanities	Other career/technical major	Social work, human services, or protective services	Communications or journalism	Computer related	Other major	Mathematics	No reported major
All high school graduates	13.5	13.0	10.2	7.3	6.1	4.7	4.1	3.8	3.7	3.4	2.8	2.6	1.2	0.8	22.8
Occupational credits															
None	7.6	16.3	15.3	4.4	6.7	2.5 !	10.4 !	10.0	0.4 !	2.8	4.2	1.9 !	1.6 !	2.1 !	13.7
0.01–1.99 credits	12.0	12.5	12.7	10.1	7.5	3.8	5.6	4.7	1.4	3.3	3.2	2.9 !	0.7 !	0.9	18.7
2.00–3.99 credits	14.5	13.5	9.8	6.8	6.1	5.8	2.5	3.0	4.6 !	3.0	2.8	2.7	1.2	0.6	23.1
4.00 or more credits	17.0	11.7	4.7	4.7	3.6	5.5	1.3	0.9	7.6	4.3	1.3	2.1	1.9 !	0.3 !	33.0
Occupational concentrator status															
Nonconcentrator	12.9	13.2	11.1	7.8	6.7	4.5	4.6	4.2	3.2	3.3	3.0	2.7	1.0	0.9	21.0
Occupational concentrator, total															
Agriculture	19.4	10.9 !	8.3 !	4.1 !	11.9	1.3 !	#	#	13.2	11.1 !	2.1 !	2.3 !	#	#	15.3 !
Business	30.3	15.0	8.3	5.6	5.0 !	2.1	0.2 !	2.1 !	0.8 !	3.0	1.2 !	1.4	2.1 !	0.5 !	22.6
Child care and education	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡
Food service and hospitality	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡
Health care	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡
Marketing and distribution	10.1 !	10.2 !	1.9 !	1.2 !	1.3 !	1.9 !	0.3 !	1.0 !	3.4 !	6.4 !	1.3 !	1.5 !	1.3 !	0.3 !	58.0
Personal and other services	20.5 !	1.5 !	8.5 !	1.9 !	1.2 !	#	#	#	3.0 !	3.0 !	#	0.8 !	#	#	59.6
Public and protective services	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡
Technology and communications	22.0 !	10.3 !	5.9 !	3.9 !	2.3 !	12.7 !	1.9 !	2.5 !	1.9 !	1.9 !	8.9 !	9.4 !	1.1 !	2.2 !	13.1
Trade and industry	6.1	11.6	1.7 !	2.2 !	2.2 !	11.2	2.6	1.1 !	14.8	2.8 !	0.9 !	1.6 !	2.4 !	#	38.9

Rounds to zero.

! Interpret data with caution.

‡ Reporting standards not met. (Too few cases for a reliable estimate.)

NOTE: Completing an occupational concentration is defined as earning 3.0 or more credits in any one of the occupational programs shown in exhibit 1.1. Concentrators may appear in more than one program row if they completed 3.0 or more credits in more than one program area. Nonconcentrators include all graduates who did not complete an occupational concentration. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

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

data on the postsecondary majors for some high school occupational concentrator groups.⁴² The 1992 public high school graduates who completed an occupational concentration in business majored in business at the postsecondary level at a higher than average rate for their class overall (30 vs. 13 percent), and graduates who completed an occupational concentration in trade and industry majored in engineering or architecture at a higher than average rate as well (11 vs. 5 percent). Agriculture concentrators and trade and industry concentrators majored in other unspecified career fields, which may include agriculture and various trade and industry majors, at higher rates than the average for their class (13–15 vs. 4 percent).

Remedial Coursework

The 1992 public high school graduates who enrolled in postsecondary education by 2000 took on average 1.0 remedial course at their postsecondary institutions (table 2.31). As the number of occupational credits that graduates earned in high school increased, the average number of remedial courses they took also increased. For example, graduates who earned 4.00 or more occupational credits in high school took about twice as many remedial courses on average as their classmates who earned no occupational credits (1.4 vs. 0.7 courses).

As discussed earlier in this chapter, however, students with lower prior academic achievement took more occupational coursework in high school than their higher achieving peers. Thus, the finding that greater postsecondary remedial coursework was associated with more occupational coursetaking in high school may be due in part to these differences in prior academic achievement. The bottom half of table 2.31 shows, for example, that among the 1992 public high school graduates who later enrolled in postsecondary education, about twice as many of those who earned 4.00 or more occupational credits in high school as their classmates who took no occupational coursework scored in the lowest 8th-grade composite test quartile (22 vs. 10 percent). In the top half of table 2.31 these differences in initial achievement are controlled for by presenting the number of postsecondary remedial courses taken by graduates according to their 8th-grade composite test quartile. When controlling for 8th-grade test quartile in this way, no systematic relationship was detected for graduates in the bottom two test quartiles between the number of occupational credits they earned in high school and the number of postsecondary remedial courses they took. However, among graduates who scored in the top two 8th-grade test quartiles, the number of remedial courses they took at their postsecondary institutions was still positively related to the number of occupational credits they earned in high school.

⁴² Due to small sample sizes, occupational concentrators were defined for this analysis as graduates who earned 3.0 or more credits in at least one of the following 10 broad occupational program areas: agriculture, business, marketing, health care, protective services, technology and communications, trade and industry, food service and hospitality, child care and education, and personal and other services.

Table 2.31. Average number of postsecondary remedial courses taken by 1992 public high school graduates who enrolled in postsecondary education by 2000 and percentage distribution of these graduates according to their 8th-grade composite test quartile, by occupational credits earned in high school

Occupational credits earned in high school	Total	8th-grade composite test quartile			
		Lowest	Third	Second	Highest
Number of postsecondary remedial courses taken					
All high school graduates	1.01	2.70	1.58	0.85	0.23
Occupational credits					
None	0.68	‡	1.74	0.61	0.16
0.01–1.99 credits	0.82	2.66	1.61	0.76	0.17
2.00–3.99 credits	1.05	2.60	1.70	0.77	0.29
4.00 or more credits	1.39	3.07	1.37	1.15	0.35
Percentage distribution of students					
All high school graduates	100.0	14.7	23.1	28.4	33.7
Occupational CTE credits					
None	100.0	10.2	15.6	23.2	51.0
0.01–1.99 credits	100.0	10.4	19.0	27.4	43.2
2.00–3.99 credits	100.0	13.9	24.8	28.3	33.0
4.00 or more credits	100.0	22.5	28.4	31.4	17.8

‡ Reporting standards not met. (Too few cases for a reliable estimate.)

NOTE: Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

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

Postsecondary Attainment

Among the 83 percent of public high school graduates from the class of 1992 who enrolled in postsecondary education by 2000 (table 2.29), some 61 percent attained a postsecondary credential as of that year (table 2.32).⁴³ The more occupational credits that graduates earned in high school, the lower was their rate of attaining a postsecondary credential. For example, 47 percent of graduates who earned 4.00 or more occupational credits in high school and later attended a postsecondary institution attained a credential by 2000, compared with 73 percent of their peers who earned no occupational credits in high school.

As presented earlier in this section, the more occupational credits that graduates earned in high school, the more often they were to have subbaccalaureate postsecondary goals and the less often they were to aspire to an advanced degree. In addition, graduates who earned 4.00 or more

⁴³ The attainment of a postsecondary credential was determined only for those graduates for whom complete postsecondary transcripts were collected. The PETS did not provide a sample weight that made it possible to determine postsecondary attainment rates for the entire 1992 high school graduating class.

2. Career and Technical Education at the High School Level

Table 2.32. Percentage distribution of 1992 public high school graduates who enrolled in postsecondary education, according to their highest postsecondary credential attained as of 2000, by occupational credits earned in high school and aspirations as of their senior year of high school

Occupational credits earned in high school and postsecondary aspirations	No post-secondary credential earned	Postsecondary credential earned				
		Total	Subbaccalaureate credential		Bachelor's degree or higher	
			Total	Certificate		Associate's degree
All high school graduates	39.3	60.7	15.0	5.7	9.3	45.7
Occupational credits						
None	27.1	72.9	6.7	2.0 !	4.7	66.1
0.01–1.99 credits	34.9	65.1	11.0	5.2 !	5.8	54.1
2.00–3.99 credits	38.8	61.2	17.0	6.2	10.8	44.2
4.00 or more credits	52.6	47.4	22.0	7.4	14.6	25.4
Graduates aspiring to high school or less, total	58.7	41.3	30.6	11.2	19.4	10.7
Occupational credits						
None	‡	‡	‡	‡	‡	‡
0.01–1.99 credits	‡	‡	‡	‡	‡	‡
2.00–3.99 credits	57.3	42.7	23.0 !	10.0 !	12.9 !	19.7
4.00 or more credits	61.6	38.4	33.6	10.3 !	23.3	4.8 !
Graduates aspiring to vocational, trade, or business school, total	44.7	55.3	39.5	19.0	20.5	15.8
Occupational credits						
None	‡	‡	‡	‡	‡	‡
0.01–1.99 credits	46.2	53.8	27.3	12.6	14.6	26.5
2.00–3.99 credits	31.7	68.3	49.4	29.5 !	19.8 !	18.9
4.00 or more credits	52.5	47.5	38.9	14.8	24.1	8.7
Graduates aspiring to some college, total	58.9	41.1	17.9	6.0	11.9 !	23.3
Occupational credits						
None	42.4	57.6	17.9 !	7.6 !	10.3 !	39.7
0.01–1.99 credits	58.3	41.7	11.3 !	3.6 !	7.7 !	30.4
2.00–3.99 credits	49.9	50.1	22.1 !	5.5 !	16.6 !	28.0 !
4.00 or more credits	70.3	29.7	19.6	8.2	11.4	10.1

See notes at end of table.

Table 2.32. Percentage distribution of 1992 public high school graduates who enrolled in postsecondary education, according to their highest postsecondary credential attained as of 2000, by occupational credits earned in high school and aspirations as of their senior year of high school—Continued

Occupational credits earned in high school and postsecondary aspirations	No post-secondary credential earned	Postsecondary credential earned				Bachelor's degree or higher
		Total	Subbaccalaureate credential		Associate's degree	
			Total	Certificate		
All high school graduates aspiring to a bachelor's degree	38.8	61.2	12.0	3.8	8.2	49.2
Occupational credits						
None	32.6	67.4	7.4	2.3 !	5.1 !	60.0
0.01–1.99 credits	37.1	62.9	10.0	3.2	6.8	52.9
2.00–3.99 credits	39.5	60.5	11.8	3.6	8.2	48.7
4.00 or more credits	44.1	55.9	19.5	6.7	12.9	36.4
All high school graduates aspiring to an advanced degree	28.6	71.4	11.1	4.7 !	6.4	60.3
Occupational credits						
None	19.6	80.4	6.4	1.6 !	4.9 !	73.9
0.01–1.99 credits	23.7	76.3	10.9 !	7.4 !	3.5	65.4
2.00–3.99 credits	33.4	66.6	13.2	2.5	10.6	53.4
4.00 or more credits	44.3	55.7	12.4	3.3 !	9.1	43.3

! Interpret data with caution.

‡ Reporting standards not met. (Too few cases for a reliable estimate.)

NOTE: Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

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

occupational credits in high school planned to attain a bachelor's degree less often than their classmates who earned fewer or no occupational credits. Among those graduates who enrolled in postsecondary education, credential attainment was generally consistent with these postsecondary aspirations. The more occupational credits that graduates earned in high school, the higher was their rate of attaining an associate's degree and the lower their rate of attaining a bachelor's or higher degree by 2000 (table 2.32).

Among the 1992 public high school graduates who enrolled in postsecondary education by 2000 and who aspired to less than a bachelor's degree, no systematic relationships were detected between their occupational coursetaking in high school and their attainment of subbaccalaureate credentials (table 2.32). Small sample sizes and large standard errors for these groups (those aspiring to high school or less; vocational, trade, or business school; or some college) may have contributed to these differences not being measurable. In contrast, among those aspiring to a bachelor's or advanced degree, the more occupational credits that graduates earned in high

school, the lower was their rate of attaining a bachelor's or higher degree. Among bachelor's degree aspirants, however, the more occupational credits they earned in high school, the higher was their rate of attaining a subbaccalaureate credential by 2000.

Comparisons of Male and Female Graduates

Before turning to labor market outcomes, it is important to examine the postsecondary education experiences of males and females separately. Labor market outcomes depend in part on postsecondary attainment, and males and females differed in this area. Among the 1992 public high school graduates, a higher percentage of females than males enrolled in postsecondary education by the year 2000 (87 vs. 79 percent) (table 2.33). For both male and female graduates, the more occupational credits that they earned in high school, the lower were their postsecondary enrollment rates.

Among the 1992 public high school graduates who enrolled in postsecondary education by 2000, a higher percentage of females than males attained a postsecondary credential (68 vs. 53 percent) (table 2.33). While occupational coursetaking in high school was measurably related to overall attainment of a postsecondary credential for females, this was not the case for males. Among female graduates who enrolled in postsecondary education, the more occupational credits that they earned in high school, the lower was their rate of attaining a postsecondary credential by 2000. For male graduates who enrolled, however, no systematic relationship was detected between occupational credits earned in high school and their rate of attaining a postsecondary credential by 2000.

The relationship between occupational coursetaking in high school and postsecondary attainment for males and females varied somewhat by type of postsecondary credential, however. For both male and female graduates of the class of 1992 who later enrolled in postsecondary education, the more occupational credits that they earned in high school, the lower were their rates of attaining a bachelor's degree (table 2.33) by 2000. The more occupational credits that male graduates earned in high school, the higher was their rate of attaining a postsecondary certificate, while the more occupational credits that female graduates earned in high school, the higher was their rate of attaining an associate's degree.

Table 2.33. Percentage of male and female 1992 public high school graduates enrolling in postsecondary education by 2000, and among these enrollees, the percentage who attained a postsecondary credential by 2000, by their highest postsecondary credential attained and occupational credits earned in high school

Occupational credits earned in high school	Males					Females				
	Enrolled in post-secondary education by 2000	Among enrollees, highest postsecondary credential attained				Enrolled in post-secondary education by 2000	Among enrollees, highest postsecondary credential attained			
		Any	Certificate	Associate's degree	Bachelor's degree or higher		Any	Certificate	Associate's degree	Bachelor's degree or higher
All high school graduates	79.2	52.8	4.2	8.9	39.7	87.3	67.5	7.0	9.7	50.8
None	90.7	61.3	0.9 !	5.7 !	54.7	92.8	79.7	2.6 !	4.2 !	72.9
0.01–1.99 credits	87.1	51.1	2.1	5.0	44.0	91.3	74.7	7.4 !	6.3	61.0
2.00–3.99 credits	83.6	58.7	4.6	11.2	43.0	87.4	63.8	7.9	10.5	45.5
4.00 or more credits	64.7	43.6	7.3	11.4	24.9	78.1	51.6	7.4	18.3	25.9

! Interpret data with caution.

NOTE: Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

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

Labor Market Experiences and Outcomes

Working Immediately After High School

About 23 percent of the public high school class of 1992 worked during the year after high school without also enrolling in postsecondary education (table 2.34). The more occupational credits that graduates earned in high school, the higher was their rate of going directly to work. For example, the percentage of public high school graduates who earned 4.00 or more occupational credits in high school and went to work without also enrolling during the year after high school graduation was about three and a half times as large as the percentage for their classmates who took no occupational coursework in high school (39 vs. 11 percent).

About 37 percent of the 1992 public high school graduates who worked without also enrolling in postsecondary education during the year after high school graduation eventually enrolled in postsecondary education by 2000 (table 2.34). No systematic relationship was detected between the occupational credits that these graduates earned in high school and their rates of eventual enrollment.

Table 2.34. Percentage of 1992 public high school graduates who worked without also enrolling in postsecondary education during the first 12 months after graduating from high school and the percentage of these workers who enrolled in postsecondary education by 2000, by occupational credits earned in high school

Occupational credits earned in high school	Worked without also enrolling in postsecondary education within 12 months	Workers who enrolled in postsecondary education by 2000
All high school graduates	23.4	37.2
None	11.3	54.2
0.01–1.99 credits	16.1	39.3
2.00–3.99 credits	21.2	42.3
4.00 or more credits	39.1	31.2

NOTE: Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

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

Occupational Licenses

Between 1994 and 2000, 29 percent of the 1992 public high school graduates earned at least one professional license (table 2.35).⁴⁴ No systematic relationship was detected between the occupational credits that graduates earned in high school and their rates of earning a professional license by 2000.

The most common types of licenses were earned in the fields of education (including teacher and principal licenses) (17 percent), medical or dental technology or therapy (13 percent), business (including broker, CPA, and realtor licenses) (12 percent), and other unspecified fields (18 percent) (table 2.35). The more occupational credits that graduates earned in high school, the higher was their rate of earning a license in the fields of commercial operation and transportation, crafts (including electrician, carpenter, and mason licenses), cosmetology, and automotive mechanics and repair. In contrast, the more occupational credits that graduates earned in high school, the lower was their rate of earning a license in the fields of education and in communications or broadcasting. No systematic relationships were detected between the occupational credits that graduates earned in high school and their rates of earning a professional license in any other field between 1994 and 2000.

Occupations

Among the 90 percent of public high school graduates from the class of 1992 who worked during 2000,⁴⁵ the most common self-reported occupations included professional occupations (30 percent), managerial and administrative occupations in construction and other nonsales and non-retail fields (20 percent), and managerial and administrative occupations in sales and retail fields (15 percent) (table 2.36). The more occupational credits that graduates earned in high school, the more often they reported working in managerial, administrative, or owner occupations (regardless of industry) and in farm occupations. In contrast, the more occupational credits that graduates earned in high school, the less often they reported working in professional, protective services, or technical occupations. No systematic relationships were detected between the occupational credits that graduates earned in high school and their rates of working in other occupations in 2000.

⁴⁴ The survey question about professional licenses covered only the period from 1994 to 2000.

⁴⁵ Employment status is summarized in table 2.37. The employment status of public high school graduates is discussed further in the next subsection. This subsection examines graduates' current or most recent occupation as of 2000.

Table 2.35. Percentage of 1992 public high school graduates who earned a professional license between 1994 and 2000, by field of license, occupational credits earned in high school, occupational concentrator status, and program of concentration

Occupational credits earned in high school, occupational concentrator status, and program	Earned a license between 1994 and 2000	Field of license									
		Edu- cation	Medical or dental tech- nology or therapy	Business	Nursing	Public safety or hazardous materials	Com- mercial operation or trans- portation	Personal services	Crafts	Cosme- tology	Nursing or home health aide
All high school graduates	29.1	17.3	13.0	12.3	5.9	5.6	5.1	4.6	3.9	3.7	3.5
Occupational credits											
None	28.8	31.1	10.0	11.4	7.2	1.1 !	4.4 !	3.6 !	1.6 !	0.6 !	1.5 !
0.01–1.99 credits	31.9	20.0	13.2	16.9	8.1 !	4.9 !	2.0	4.0	1.7 !	3.3	3.0
2.00–3.99 credits	27.2	19.0	14.3	9.9	5.9	5.3	5.8	6.5 !	4.2	3.7	3.8
4.00 or more credits	28.1	7.4	12.1	9.2	2.6	8.4	8.8	3.4 !	7.4	5.4	4.4
Occupational concentrator status											
Nonconcentrator	29.3	19.0	13.6	12.7	6.5	4.5	3.7	4.7	2.9	4.0	3.4
Occupational concentrator, total	28.3	9.3	10.2	10.6	3.2	11.0	11.9	3.9 !	8.7	2.5	4.0
Agriculture	34.9	16.4 !	6.5 !	5.1 !	#	8.4 !	25.0	1.1 !	13.7 !	#	1.2 !
Business	24.1	17.1	15.0	16.5	5.8 !	2.5 !	4.0 !	5.3 !	0.4 !	5.2 !	7.8
Child care and education	34.1	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡
Food service and hospitality	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡
Health care	43.4	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡
Marketing and distribution	34.5	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡
Personal and other services	21.3 !	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡
Public and protective services	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡
Technology and communications	30.9	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡
Trade and industry	29.1	1.6 !	4.3 !	4.6 !	#	16.1 !	14.5	4.7 !	12.6 !	2.1 !	0.7 !

See notes at end of table.

Table 2.35. Percentage of 1992 public high school graduates who earned a professional license between 1994 and 2000, by field of license, occupational credits earned in high school, occupational concentrator status, and program of concentration—Continued

Occupational credits earned in high school, occupational concentrator status, and program	Computer programing or systems technology	Counseling or psychology	Law or legal	Child care or teacher aide	Automotive mechanics or repair	Food services	Computer, electronics, or communications technology repair	Professional, engineering or architecture	Communications or broadcasting	Medical	Legal assistant or paralegal	Other
All high school graduates	3.4	2.8 !	2.4	2.2	2.2	2.1	1.2	1.5	1.1	0.9	0.5 !	18.3
Occupational credits												
None	2.8 !	1.8 !	2.2 !	1.3 !	#	1.6 !	0.4 !	1.9 !	2.9 !	0.6 !	0.2 !	21.6
0.01–1.99 credits	2.5	5.6 !	2.7	1.4	0.9 !	1.7 !	1.1 !	1.0 !	1.5 !	1.0 !	0.9 !	14.2
2.00–3.99 credits	3.4	1.3 !	2.3 !	4.3 !	3.1	3.1	0.8 !	2.3	1.0 !	1.4 !	0.2 !	17.5
4.00 or more credits	4.9	0.9 !	2.2	1.1 !	3.7	1.6 !	2.1 !	0.9 !	0.2 !	0.3 !	0.5 !	24.2
Occupational concentrator status												
Nonconcentrator	3.0	3.2 !	2.4	2.3	2.0	2.4	1.2 !	1.6	1.3	1.0	0.5 !	17.6
Occupational concentrator, total	5.5	0.9 !	2.5 !	1.8 !	3.3 !	0.9 !	1.2 !	0.7 !	0.3 !	0.5 !	0.5 !	21.8
Agriculture	1.4 !	1.1 !	4.7 !	#	4.0 !	#	1.5 !	#	#	#	1.2 !	35.5
Business	2.3 !	3.9 !	3.6 !	2.4 !	#	0.5 !	0.9 !	1.5 !	#	#	1.5 !	12.5
Child care and education	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡
Food service and hospitality	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡
Health care	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡
Marketing and distribution	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡
Personal and other services	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡
Public and protective services	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡
Technology and communications	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡
Trade and industry	7.3 !	0.4 !	0.9 !	0.3 !	6.8 !	1.9 !	4.4 !	2.1 !	0.6 !	#	#	31.4

Rounds to zero.

! Interpret data with caution.

‡ Reporting standards not met. (Too few cases for a reliable estimate.)

NOTE: Completing an occupational concentration is defined as earning 3.0 or more credits in any one of the occupational programs shown in exhibit 1.1. Concentrators may appear in more than one program row if they completed 3.0 or more credits in more than one program area. Nonconcentrators include all graduates who did not complete an occupational concentration. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

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

Table 2.36. Percentage distribution of 1992 public high school graduates who were employed during 2000 with each number of occupational credits earned in high school, by occupation of current or most recent job

Occupational credits earned in high school	Occupation													
	Profes- sional	Man- ager, admin- istrator, or owner	Con- struction or other field	Sales and retail	Clerical	Pro- tective service	Sales	Military	Service	Crafts- man	Tech- nical	Farmer or farm manager	Laborer	Skilled oper- ative
All high school graduates	29.6	20.5	14.9	9.1	5.5	4.9	3.6	3.2	3.0	2.3	1.2	1.2	1.2	1.2
None	37.2	12.8	9.8	10.0	9.8	7.1	2.8 !	2.7	1.5 !	2.8	0.8 !	2.0 !	0.6 !	0.6 !
0.01–1.99 credits	35.4	19.7	9.4	7.5	7.4	5.5	2.1	3.9	3.0	3.4	0.4 !	0.8	1.5	1.5
2.00–3.99 credits	27.2	19.3	16.3	10.9	4.9	4.9	4.9	3.5	3.5	2.1	0.7	1.0 !	0.7 !	0.7 !
4.00 or more credits	23.5	25.1	21.1	8.3	2.5	3.5	4.2	2.1	2.8	1.0	2.9	1.6	1.5 !	1.5 !

! Interpret data with caution.

NOTE: Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

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

Employment Status

Among the public high school graduates of the class of 1992, about 90 percent worked, and about 80 percent worked full time in 2000 (table 2.37). Employed graduates worked on average 42 hours per week during this year. The more occupational credits that graduates earned in high school, the more often they were to both work in general and work full time. For example, 85 percent of the graduates who earned 4.00 or more occupational credits in high school worked full time in 2000, compared with 76 percent of their classmates who took no occupational coursework in high school. In addition, the more occupational credits that graduates earned in high school, the more hours they worked per week on average.

Table 2.37. Percentage of 1992 public high school graduates who were employed and average hours worked per week among those employed during 2000, by occupational credits earned in high school

Occupational credits earned in high school	Percent employed			Average hours worked per week among those employed
	Total	Any full time	Any part time	
All high school graduates	90.2	80.4	17.6	42.2
None	85.9	76.4	17.2	41.0
0.01–1.99 credits	89.7	77.9	19.6	41.0
2.00–3.99 credits	91.1	80.3	18.6	42.1
4.00 or more credits	91.1	84.8	13.9	44.0

NOTE: Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

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

Higher percentages of male graduates from the public high school class of 1992 than their female classmates worked in 2000 (94 vs. 87 percent) and worked full time (87 vs. 74 percent) (table 2.38). In contrast, the percentage of male graduates working part time during this year was lower than the corresponding percentage for their female classmates (15 vs. 20 percent). The more occupational credits that male graduates earned in high school, the higher was their rate of working full time in 2000. For example, 92 percent of male graduates who earned 4.00 or more occupational credits in high school worked full time in 2000, compared with 77 percent of their peers who took no occupational coursework in high school. In contrast, no systematic relationship was detected between the occupational credits that female graduates earned in high school and their rate of working full time in 2000. About three-quarters of female graduates worked full time in 2000, regardless of their occupational coursetaking in high school (72–76 percent).

Table 2.38. Percentage of male and female 1992 public high school graduates who worked for pay during 2000, by employment status and occupational credits earned in high school

Occupational credits earned in high school	Males			Females		
	Employed, total	Any full time	Any part time	Employed, total	Any full time	Any part time
All high school graduates	94.0	86.9	15.1	86.6	74.1	20.0
None	87.0	76.7	21.2	85.1	76.2	14.5
0.01–1.99 credits	93.8	85.9	16.8	86.6	71.8	21.8
2.00–3.99 credits	93.8	85.1	14.6	88.2	75.4	22.8
4.00 or more credits	95.7	91.8	12.9	84.7	75.2	15.4

NOTE: Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

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

Earnings

Earnings data were available for the full 1999 calendar year. As of this year, male graduates from the public high school class of 1992 reported higher annual earnings on average than their female classmates (\$29,500 vs. \$21,000) (table 2.39). Moreover, among both full- and part-time employed graduates in 1999, males earned more than females (\$21,700–\$31,800 vs. \$17,700–\$24,900). The relationship between occupational coursetaking in high school and earnings in 1999 differed for males and females, however. No systematic relationship was detected between the occupational credits that male graduates earned in high school and their full-time earnings in 1999. Male graduates who were employed full time earned about \$31,000–\$33,000 in this year. In contrast, the more occupational credits that female graduates earned in high school, the lower their full-time earnings were in 1999. For example, female graduates who earned 4.00 or more occupational credits and worked full time in 1999 earned about \$22,000, while their female classmates who took no occupational coursework in high school and worked full time in 1999 earned about \$27,000 that year. Patterns were different for part-time employees. No systematic relationship was detected between the occupational credits that female graduates earned in high school and their part-time earnings in 1999. Female graduates who were employed part time earned about \$17,000–\$19,000 in this year. In contrast, the more occupational credits that male graduates earned in high school, the higher their part-time earnings were in 1999. For example, male graduates who earned 4.00 or more occupational credits and worked part time in 1999 earned about \$27,000, while their male classmates who took no occupational coursework in high school and worked part time earned about \$17,000 that year. It was not possible to determine from the available data whether these earnings differences were due to differing hourly wages or to differing amounts of time that full- or part-time graduates worked during 1999.

Table 2.39. Average 1999 earnings for male and female 1992 public high school graduates who were employed in 1999, by employment status and occupational credits earned in high school

Occupational credits earned in high school	Males			Females		
	Employed, total	Employed full time	Employed part time	Employed, total	Employed full time	Employed part time
All high school graduates	\$29,500	\$31,800	\$21,700	\$21,000	\$24,900	\$17,700
None	29,200	32,400	16,700	22,800	27,000	18,100
0.01–1.99 credits	28,400	30,700	19,300	21,900	26,000	18,700
2.00–3.99 credits	28,400	31,500	20,900	21,000	25,000	16,600
4.00 or more credits	31,800	33,000	27,200	18,900	22,100	17,600

NOTE: Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

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

These average findings may be due to postsecondary attainment differences between the different groups of high school occupational participants because earnings depend in part on postsecondary attainment (U.S. Department of Education 2007, table 378). For example, male and female graduates with bachelor's or higher degrees as of 2000 earned more during 1999 than their classmates with lower or no postsecondary credentials (\$34,000 vs. \$28,000–\$29,000 for employed males, and \$27,000 vs. \$17,000–\$22,000 for employed females) (table 2.40).⁴⁶ Examining earnings among graduates at the same education level removes the effect of educational attainment on earnings. Among male graduates from the public high school class of 1992 who enrolled in postsecondary education by 2000 but earned no postsecondary credential as of that year,⁴⁷ the more occupational credits they earned in high school, the larger their earnings were in 1999. Similarly, among male graduates who earned an associate's degree by 2000, the more occupational credits they earned in high school, the larger their earnings were in 1999. Among male bachelor's degree (or higher) holders, no systematic relationship was detected between the occupational credits that graduates earned in high school and their 1999 earnings. There were too few male graduates with postsecondary certificates to perform a similar analysis. Among female graduates from the public high school class of 1992 who enrolled in postsecondary education by 2000, no systematic relationship was detected at any postsecondary credential level between the occupational credits they earned in high school and their 1999 earnings. Thus, when accounting for postsecondary attainment, the only measurable associations between occupational coursetak-

⁴⁶ Highest degree attainment was available as of 2000, while annual earnings were available for the 1999 calendar year. Thus, some graduates who earned postsecondary credentials by 2000 may not yet have earned these credentials in 1999. To the extent this occurred, these data may understate the relationship between postsecondary attainment and earnings.

⁴⁷ As noted earlier, attainment of a postsecondary credential was only available for those graduates who enrolled in postsecondary education by 2000, not for the entire 1992 graduating class.

Table 2.40. Average 1999 earnings of male and female 1992 public high school graduates who enrolled in postsecondary education by 2000 and were employed during 1999, by their postsecondary attainment in 2000, employment status in 1999, and occupational credits earned in high school

Employment status and occupational credits earned in high school	Males						Females					
	Total	Highest postsecondary credential					Total	Highest postsecondary credential				
		None	Any	Certif-icate	Asso-ciate's degree	Bachelor's degree or higher		None	Any	Certif-icate	Asso-ciate's degree	Bachelor's degree or higher
All employed high school graduates	\$30,900	\$29,500	\$32,200	\$28,400	\$27,800	\$33,700	\$24,300	\$20,900	\$25,800	\$17,000	\$22,300	\$27,500
Occupational credits												
None	31,200	23,200	37,300	‡	‡	38,500	25,700	20,900	26,900	‡	‡	27,400
0.01–1.99 credits	29,300	27,800	31,100	‡	‡	24,500	25,000	22,800	25,600	16,300	22,200	27,200
2.00–3.99 credits	30,700	29,500	31,300	‡	‡	26,200	24,100	20,000	26,300	15,600 !	23,700	28,200
4.00 or more credits	33,100	32,800	33,700	31,100	32,200	35,100	22,300	19,900	24,100	18,900	21,800	26,800
All high school graduates employed full time	32,600	30,800	34,300	28,700	30,500	35,900	26,000	22,300	27,600	20,300	23,800	28,800
Occupational credits												
None	32,800	24,700	39,100	‡	‡	40,200	26,900	22,200	27,900	‡	‡	28,400
0.01–1.99 credits	31,100	29,200	33,400	‡	‡	26,700	26,800	24,200	27,700	20,100	23,300	28,700
2.00–3.99 credits	33,000	31,500	33,900	‡	‡	29,800	26,400	21,800	28,700	20,700	27,300	29,500
4.00 or more credits	33,900	33,500	34,600	31,300	33,900	35,900	23,300	20,900	25,100	19,300	22,600	28,200
All high school graduates employed part time	20,300	20,500	20,100	‡	‡	18,500	18,300	16,400	19,000	‡	18,100	20,800
Occupational credits												
None	16,500 !	‡	‡	‡	‡	‡	18,800	‡	19,700	‡	‡	19,000
0.01–1.99 credits	18,400	16,200	20,800	‡	‡	20,900	18,800	18,800	18,700	‡	‡	20,600
2.00–3.99 credits	19,300	21,400	16,900	‡	‡	17,400	17,500	15,200	18,500	‡	‡	21,300
4.00 or more credits	26,100	26,800	27,100	‡	‡	‡	18,500	14,600	20,700	‡	‡	21,700

! Interpret data with caution.

‡ Reporting standards not met. (Too few cases for a reliable estimate.)

NOTE: Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>

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

ing in high school and earnings as of 1999 were for male graduates who enrolled in postsecondary education but did not attain a postsecondary credential and for male graduates who earned an associate's degree, and these associations were positive: as the number of occupational courses they took in high school increased, their earnings also increased.

E. SUMMARY OF FINDINGS

This section compares selected findings on CTE at the high school level from across the different sections in this chapter, focusing on common and consistent patterns.

Size and Scope of the High School CTE Enterprise

Occupational education was common in public high schools during the period covered in this chapter. Most public high schools (88 percent) offered occupational programs either on or off site in 2002 (table 2.2), and most public high school graduates from the class of 2005 (92 percent) took at least one occupational course during high school (table 2.16). The 2005 graduates on average took the equivalent of three year-long occupational education courses during high school (3.0 credits), earning more credits in occupational courses on average than they earned in either fine arts or foreign languages (3.0 vs. 2.0–2.1 credits) (table 2.17).

Between 1990 and 2005, no measurable changes were detected in the overall occupational coursetaking patterns of public high school graduates. About 91–92 percent of students in both graduating classes took at least some occupational coursework during high school (table 2.18), and graduates from both classes earned on average 2.9–3.0 occupational credits (table 2.17).

Occupational Program Areas

Business and computer technology were the most common high school occupational programs with regard to school offerings and student coursetaking. Specifically, these two programs were the most common occupational programs offered by public high schools in 2002 (94–97 percent) (table 2.8). In addition, the 2005 public high school graduates earned more credits in business services and in computer technology than in any other occupational program area (0.4–0.5 credits vs. 0.0–0.2 credits) (table 2.17).⁴⁸ Although no measurable changes were detected between 1990 and 2005 in the overall occupational coursetaking of public high school graduates, some coursetaking shifts were detected among the different occupational program areas. Between

⁴⁸ The occupational program of business includes business services as well as business management. The ELS:2002 asked about “business” programs only, while student coursetaking was examined separately for business services and business management.

1990 and 2005, public high school graduates earned more credits on average in computer technology, health care, communications technology, other technology, child care and education, protective services, and food services and hospitality (0.04–0.25 more credits), and they earned fewer credits in business services, materials production, and other precision production (0.1–0.3 fewer credits) (table 2.17).

Characteristics of Students and Schools

Occupational coursetaking was common among public high school graduates, regardless of their background characteristics, although there were some coursetaking differences among student groups. Public high school graduates from the class of 2005 who were male, were disabled as of grade 12, or graduated from smaller schools generally participated more in the occupational curriculum than their classmates who were female, not disabled, or graduated from larger schools, respectively (table 2.19). In contrast, graduates who were Asian, were limited English proficient as of grade 12, or took high-level mathematics coursework in grade 9 generally participated less in the occupational curriculum than their classmates who were from other racial/ethnic groups, were English proficient, or took mid- or low-level grade 9 mathematics, respectively.

These coursetaking patterns were somewhat contrary to some of the findings on program offerings in this chapter. In particular, while graduates from smaller schools in 2005 took more occupational courses than their classmates from larger schools, it was more common for the largest public high schools than for smaller schools to offer occupational programs. For example, the largest schools offered more such programs on average in 2002 (table 2.12). In addition, while the 2005 graduates who had limited English proficiency as of grade 12 generally participated less in the occupational curriculum than their classmates who were English proficient, it was more common for public high schools with larger limited-English-proficient populations to offer occupational programs than for those with smaller populations of these students. The implication is that the greater availability of occupational programs in certain schools did not necessarily translate into greater occupational coursetaking among the students in those schools.

Looking at trends over time, the 2005 public high school graduates who took high- or mid-level mathematics in grade 9 and those who attended the smallest schools participated to a greater extent in the occupational curriculum than their 1990 peers (increases of 0.8 and 0.9 occupational credits earned, respectively) (table 2.22). In contrast, graduates who took low-level or no mathematics courses in grade 9 participated less in the occupational curriculum by the end of the 15-year period (a decline of 9 percentage points in the percentage who concentrated in occu-

pational education). No measurable differences between 1990 and 2005 were detected in the occupational coursetaking of graduates from larger schools.

Academic Coursetaking and Achievement Gains

Between 1990 and 2005, the core academic coursetaking of public high school graduates who participated in the occupational curriculum increased (increases of 1.4–2.6 core academic credits) (table 2.23). There were also increases in the percentages of these students meeting the New Basics core academic standards and completing 4-year college-preparatory coursework (increases of 17–42 percentage points and 14–27 percentage points, respectively) (table 2.25). Moreover, the more occupational credits graduates earned in high school, the greater were their academic coursetaking gains between 1990 and 2005. The higher prior achievement (as measured by 9th-grade mathematics) of participants in the occupational curriculum at the end of the 15 years studied may have contributed to the increased academic coursetaking of occupational participants over this period.

Experiences After High School

The more occupational credits that graduates earned in high school, the more common it was for them to have subbaccalaureate postsecondary plans (including no postsecondary education; vocational, technical, or business school; or some college) (table 2.27). Consistent with these aspirations, the more occupational credits that graduates earned in high school, the lower were their postsecondary enrollment rates within 8 years of graduating (table 2.29), and among those who enrolled, the higher were their rates of attaining a subbaccalaureate credential (in particular an associate's degree) and the lower their rates of attaining a bachelor's or higher degree by 2000 (table 2.32). Nevertheless, among graduates earning 4.00 or more occupational credits, more aspired to a bachelor's degree than any other type of postsecondary goal (36 vs. 18 percent or less) (table 2.27). Among the 70 percent of these coursetakers who enrolled in postsecondary education by 2000 (table 2.29), more attained a bachelor's or higher degree than either an associate's degree or postsecondary certificate (25 vs. 7–15 percent) (table 2.32).

The more occupational credits that male graduates earned in high school, the higher were their rates of working full time in 2000 (table 2.38). No systematic relationship was detected, however, between the occupational credits that male graduates earned in high school and their full-time earnings in 1999 (table 2.39). Male graduates who were employed full time earned about \$31,000–\$33,000 in this year, regardless of their occupational coursetaking in high school. In contrast, the more occupational credits that male graduates earned in high school, the higher

their part-time earnings were in 1999. The employment and earnings experiences of female graduates who took occupational coursework in high school were somewhat different: no systematic relationship was detected between the occupational credits that female graduates earned in high school and their rates of working full time in 2000 (table 2.38). In addition, the more occupational credits that female graduates earned in high school, the lower their full-time earnings were in 1999, with female graduates who accumulated 4.00 or more occupational credits in high school earning about \$5,000 less in 1999 than their female classmates who took no occupational coursework in high school (table 2.39). In contrast, no systematic relationship was detected between the occupational credits that female graduates earned in high school and their part-time earnings as of this year. Thus, the only measurable associations between 1999 earnings and occupational coursetaking in high school were among part-time male employees (a positive association) and full-time female employees (a negative association). It was not possible to determine from the available data whether these differences in earnings were due to differing hourly wages or to differing amounts of time that full- or part-time graduates worked during 1999.

3. Career Education at the Postsecondary Level

This report casts a wider net than previous editions of *Vocational Education in the United States* (Hoachlander, Kaufman, and Levesque 1992; Levesque et al. 1995; Levesque et al. 2000) to describe career-related postsecondary programs at the certificate, associate’s degree, and bachelor’s degree levels, which this chapter refers to as “career education.”⁴⁹ Earlier publications focused on career-related programs at the subbaccalaureate level, which constitutes traditional “career and technical education (CTE).”⁵⁰ Bachelor’s degree programs are included here to reflect the evolution of CTE to include preparation for 4-year programs in career fields; this shift is reflected in the 2006 Perkins Act, which allows for at least some funds to be spent on baccalaureate programs.⁵¹ In addition, recent academic literature has described the “vocalionalizing” of higher education, including bachelor’s degree programs, whose substantial purpose is now occupational preparation (Grubb and Lazerson 2004; Grubb 2006). Baccalaureate programs produce the majority of degrees in career fields, although community colleges play an important role by both preparing needed technicians as well as providing a bridge to career majors at 4-year institutions (Grubb and Lazerson 2004; Grubb 2006; National Science Foundation 2008). This chapter describes undergraduate education in career fields, spanning the subbaccalaureate and baccalaureate levels.

Career education at the postsecondary level consists of the fields of study listed in exhibit 1.2 and is defined, for purposes of this report, as formal undergraduate programs designed to impart relevant knowledge and skills that relate to the requirements of specific occupations or careers. In contrast, academic education is defined as formal undergraduate programs designed to impart knowledge and skills that represent the accumulated knowledge base in a subject area. Career education instruction typically involves more application and less theory than what is taught in academic programs, while academic instruction is typically designed to be theoretical and independent of specific labor market requirements. More detail on the classification shown in exhibit 1.2 is provided in appendix A.

⁴⁹ The 2005 Issue Brief, *Trends in Undergraduate Career Education* (Hudson and Carey 2005), also used the term “career education” when examining career fields at both the subbaccalaureate and baccalaureate levels.

⁵⁰ Postsecondary CTE is often referred to as “occupational education” (Hudson, Kienzl, and Diehl 2007; Alfonso, Bailey, and Scott 2004).

⁵¹ Section 203 of the 2006 Perkins Act, for example, allows Tech-Prep programs to include 2-year or 4-year postsecondary components. However, the Act’s definition of CTE (Section 3) does not explicitly include programs leading to a bachelor’s degree. To maintain flexibility on this issue, the postsecondary education tables in this chapter typically list subbaccalaureate and baccalaureate institutions, credentials, and students separately, so that readers can examine career fields with baccalaureate programs included or excluded, as they prefer.

This chapter describes postsecondary institutions that provide career education, the career programs and credentials offered, who participates in career education at the postsecondary level and what they major in, who teaches career education at the postsecondary level, and what is accomplished by career majors (for example, their persistence, attainment, and labor market outcomes). The chapter generally presents findings on differences between relevant groups that were statistically significant (sometimes referred to as measurably different) and also substantively different, the latter defined as a difference of at least 3 percentage points or the equivalent.⁵² Statistically significant differences of a magnitude smaller than 3 percentage points or the equivalent are generally not reported. Exceptions are noted. Some of the data presented in this chapter come from the Integrated Postsecondary Education Data System (IPEDS), for which significance testing was not conducted because IPEDS is a universe survey rather than a sample survey.

A. WHAT INSTITUTIONS PROVIDE CAREER EDUCATION?

Career programs are offered at undergraduate institutions across all levels and sectors—i.e., at 4-year, 2-year, and less-than-2-year institutions in the public, private not-for-profit, and private for-profit sectors. Information on these different types of undergraduate institutions was obtained primarily from the Integrated Postsecondary Education Data System (IPEDS), a universe survey that collects data annually from postsecondary institutions nationwide on program completions in various fields, among other types of information. Career education providers were defined as any institution awarding at least one undergraduate credential in a career field during academic year 2004–05, referred to as 2005.⁵³ IPEDS:2005 was restricted to Title IV eligible postsecondary institutions.⁵⁴ Additional information on IPEDS can be found in appendix A.

Postsecondary Career Education Providers

Overall, about 5,700 postsecondary institutions—90 percent of all Title IV eligible postsecondary institutions nationwide—offered career education in 2005 (table 3.1), including programs that led to postsecondary certificates, associate’s degrees, and bachelor’s degrees in

⁵² On a scale that ranged from 0 to 10 million students, for example, the equivalent substantive difference would be 300,000 students.

⁵³ This definition may produce a slight undercount of career education providers because some institutions may not award credentials in career fields every academic year. This definition was used, however, because self-reported data on whether an institution offered “occupational education” produced a severe undercount of career education providers.

⁵⁴ The IPEDS universe includes 4-year, 2-year, and less-than-2-year institutions in the public, private not-for-profit, and private for-profit sectors that offer postsecondary education, including formal instructional programs for students beyond the compulsory age for high school and excluding avocational and adult basic education programs. The Higher Education Act of 1992 mandated an IPEDS data collection for all institutions that apply for participation in a federal student financial assistance program under Title IV of the Higher Education Act of 1965, as amended (20 U.S.C. § 1094(a)(17)).

Table 3.1. Number and percentage of Title IV eligible postsecondary institutions that offer career education and percentage distribution of institutions that offer career education, by level of institution and sector: 2004–05

Educational offering	Total	4-year			2-year				Less-than-2-year				
		Total	Public	Private not-for-profit	Private for-profit	Total	Public	Private not-for-profit	Private for-profit	Total	Public	Private not-for-profit	Private for-profit
Total number of postsecondary institutions	6,383	2,553	640	1,543	370	2,161	1,143	225	793	1,669	244	107	1,318
Number of institutions offering career education	5,730	2,045	604	1,119	322	2,064	1,121	194	749	1,621	241	95	1,285
Percentage of institutions of each type that offer career education	89.8	80.1	94.4	72.5	87.0	95.5	98.1	86.2	94.5	97.1	98.8	88.8	97.5
Percentage distribution of institutions that offer career education	100.0	35.7	10.5	19.5	5.6	36.0	19.6	3.4	13.1	28.3	4.2	1.7	22.4

NOTE: Detail may not sum to totals because of rounding. An institution was counted as offering career education if it awarded a postsecondary credential in a career-related field of study.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Completions and Institutional Characteristics data file, 2004–05.

career fields. Less-than-2-year private for-profit institutions were the most common providers (about 1,300 institutions), followed by 2-year public institutions and 4-year private not-for-profit institutions (with about 1,100 institutions each). Combining the public and private sectors, 2-year and 4-year postsecondary institutions represented the largest percentage of career education providers (36 percent each), followed by less-than-2-year institutions (28 percent).

The number of postsecondary institutions offering career education in 2005 varied widely by state (table 3.2). The states with the largest number of such institutions included California (about 550 institutions), followed by Pennsylvania, Texas, and New York (about 350 institutions each). Three of these states (California, New York, and Texas) also had the largest populations in the country as of April 1, 2005 (U.S. Department of Education 2006, table 17).

Most states delivered career education through a fairly balanced mix of 4-year, 2-year, and less-than-2-year postsecondary institutions, with 36 out of the 50 states and the District of Columbia tallying less than 50 percent of career education providers at any one of these institution types (table 3.3). In five states (Vermont, Alaska, South Dakota, Nebraska, and Wisconsin) and the District of Columbia, however, the majority (between 53 and 74 percent) of career education providers were 4-year postsecondary institutions. In nine states (Wyoming, Kentucky, Montana, Idaho, Iowa, Oregon, Washington, West Virginia, and North Dakota), half or more (between 50 and 82 percent) of career education providers were 2-year postsecondary institutions.

The Distribution of Career Education Students Among Providers

Because institutions vary in the size of their student populations, institution and credential counts provide different pictures of the way career education is delivered at the postsecondary education level. Table 3.4 compares selected institutional data from table 3.1 to data on the number and distribution of undergraduate credentials awarded by these institutions. As shown in table 3.4, while less-than-2-year private for-profit institutions represented 22 percent of the postsecondary institutions offering career education in 2005, these institutions awarded 10 percent of undergraduate credentials conferred in career fields. In contrast, while 4-year public institutions represented 11 percent of the postsecondary institutions offering career education in 2005, these institutions awarded 31 percent of the undergraduate credentials conferred in career fields. In addition, while 2-year public institutions represented 20 percent of the postsecondary institutions offering career education in 2005, they awarded 29 percent of the undergraduate credentials conferred in career fields that year.

Table 3.2. Number of Title IV eligible postsecondary institutions that offer career education programs, by level of institution, sector, and state: 2004–05

State	Total institutions offering career education	4-year				2-year				Less-than-2-year			
		Total	Public	Private not-for-profit	Private for-profit	Total	Public	Private not-for-profit	Private for-profit	Total	Public	Private not-for-profit	Private for-profit
All states	5,730	2,045	604	1,119	322	2,064	1,121	194	749	1,621	241	95	1,285
Alabama	69	33	14	13	6	29	25	1	3	7	0	1	6
Alaska	10	6	3	2	1	2	2	0	0	2	1	0	1
Arizona	101	32	5	12	15	39	20	1	18	30	3	0	27
Arkansas	77	23	11	10	2	26	22	3	1	28	3	0	25
California	536	149	33	73	43	181	112	12	57	206	6	25	175
Colorado	94	39	13	9	17	36	15	1	20	19	4	0	15
Connecticut	70	23	7	14	2	18	12	5	1	29	0	1	28
Delaware	16	6	2	4	0	5	3	2	0	5	0	0	5
District of Columbia	17	12	1	9	2	0	0	0	0	5	0	1	4
Florida	268	96	14	43	39	94	53	2	39	78	8	6	64
Georgia	161	58	21	24	13	66	54	2	10	37	0	0	37
Hawaii	23	8	3	3	2	10	7	1	2	5	0	1	4
Idaho	24	9	4	3	2	13	3	0	10	2	0	0	2
Illinois	228	85	12	60	13	68	48	8	12	75	2	7	66
Indiana	119	53	14	33	6	42	16	3	23	24	2	0	22
Iowa	87	42	3	32	7	45	16	4	25	0	0	0	0
Kansas	82	30	9	20	1	33	28	1	4	19	2	2	15
Kentucky	98	32	8	21	3	61	23	0	38	5	0	1	4
Louisiana	138	27	16	8	3	68	47	2	19	43	1	0	42
Maine	36	17	8	9	0	13	7	3	3	6	0	1	5

See notes at end of table.

Table 3.2. Number of Title IV eligible postsecondary institutions that offer career education programs, by level of institution, sector, and state: 2004–05
—Continued

State	Total institutions offering career education	4-year				2-year				Less-than-2-year			
		Total	Public	Private not-for-profit	Private for-profit	Total	Public	Private not-for-profit	Private for-profit	Total	Public	Private not-for-profit	Private for-profit
Maryland	75	30	14	14	2	22	16	0	6	23	0	0	23
Massachusetts	153	75	14	58	3	29	16	6	7	49	5	0	44
Michigan	152	55	15	38	2	42	31	3	8	55	1	1	53
Minnesota	112	52	12	23	17	41	30	2	9	19	1	4	14
Mississippi	53	17	9	8	0	24	15	0	9	12	0	0	12
Missouri	158	61	13	34	14	51	23	4	24	46	21	1	24
Montana	31	10	6	4	0	17	12	2	3	4	0	0	4
Nebraska	46	26	7	15	4	19	8	4	7	1	0	0	1
Nevada	27	11	5	1	5	11	2	0	9	5	0	1	4
New Hampshire	34	16	5	10	1	6	4	1	1	12	0	2	10
New Jersey	139	33	14	16	3	33	20	7	6	73	4	1	68
New Mexico	41	15	7	4	4	19	18	0	1	7	0	0	7
New York	343	138	42	87	9	99	36	29	34	106	31	14	61
North Carolina	151	56	15	39	2	69	60	3	6	26	0	1	25
North Dakota	26	12	7	5	0	13	7	1	5	1	0	0	1
Ohio	292	83	22	55	6	131	37	12	82	78	47	5	26
Oklahoma	128	33	15	15	3	38	32	0	6	57	26	0	31
Oregon	76	30	9	16	5	39	16	1	22	7	0	0	7
Pennsylvania	353	123	41	75	7	128	17	36	75	102	29	4	69
Rhode Island	22	10	2	8	0	4	1	2	1	8	0	0	8
South Carolina	74	35	13	20	2	22	17	2	3	17	0	0	17
South Dakota	29	17	7	6	4	12	5	4	3	0	0	0	0
Tennessee	138	51	9	34	8	36	14	4	18	51	25	1	25
Texas	349	87	41	39	7	113	67	4	42	149	1	3	145
Utah	49	16	7	3	6	23	7	1	15	10	1	0	9

See notes at end of table.

Table 3.2. Number of Title IV eligible postsecondary institutions that offer career education programs, by level of institution, sector, and state: 2004–05
—Continued

State	Total institutions offering career education	4-year				2-year				Less-than-2-year			
		Total	Public	Private not-for-profit	Private for-profit	Total	Public	Private not-for-profit	Private for-profit	Total	Public	Private not-for-profit	Private for-profit
Vermont	27	20	5	14	1	4	1	2	1	3	1	0	2
Virginia	137	59	15	29	15	43	24	5	14	35	6	3	26
Washington	104	31	7	15	9	53	35	3	15	20	1	1	18
West Virginia	67	20	11	9	0	34	13	1	20	13	8	5	0
Wisconsin	79	42	13	23	6	31	17	4	10	6	0	2	4
Wyoming	11	1	1	0	0	9	7	0	2	1	1	0	0

NOTE: An institution was counted as offering career education if it awarded an undergraduate credential in a career-related field of study.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Completions and Institutional Characteristics data file, 2004–05.

Table 3.3. Percentage distribution of Title IV eligible postsecondary institutions in each state that offer career education programs, by level of institution and sector: 2004–05

State	Total institutions offering career education	4-year				2-year				Less-than-2-year			
		Total	Public	Private not-for-profit	Private for-profit	Total	Public	Private not-for-profit	Private for-profit	Total	Public	Private not-for-profit	Private for-profit
All states	100.0	35.7	10.5	19.5	5.6	36.0	19.6	3.4	13.1	28.3	4.2	1.7	22.4
Alabama	100.0	47.8	20.3	18.8	8.7	42.0	36.2	1.4	4.3	10.1	0.0	1.4	8.7
Alaska	100.0	60.0	30.0	20.0	10.0	20.0	20.0	0.0	0.0	20.0	10.0	0.0	10.0
Arizona	100.0	31.7	5.0	11.9	14.9	38.6	19.8	1.0	17.8	29.7	3.0	0.0	26.7
Arkansas	100.0	29.9	14.3	13.0	2.6	33.8	28.6	3.9	1.3	36.4	3.9	0.0	32.5
California	100.0	27.8	6.2	13.6	8.0	33.8	20.9	2.2	10.6	38.4	1.1	4.7	32.6
Colorado	100.0	41.5	13.8	9.6	18.1	38.3	16.0	1.1	21.3	20.2	4.3	0.0	16.0
Connecticut	100.0	32.9	10.0	20.0	2.9	25.7	17.1	7.1	1.4	41.4	0.0	1.4	40.0
Delaware	100.0	37.5	12.5	25.0	0.0	31.3	18.8	12.5	0.0	31.3	0.0	0.0	31.3
District of Columbia	100.0	70.6	5.9	52.9	11.8	0.0	0.0	0.0	0.0	29.4	0.0	5.9	23.5
Florida	100.0	35.8	5.2	16.0	14.6	35.1	19.8	0.7	14.6	29.1	3.0	2.2	23.9
Georgia	100.0	36.0	13.0	14.9	8.1	41.0	33.5	1.2	6.2	23.0	0.0	0.0	23.0
Hawaii	100.0	34.8	13.0	13.0	8.7	43.5	30.4	4.3	8.7	21.7	0.0	4.3	17.4
Idaho	100.0	37.5	16.7	12.5	8.3	54.2	12.5	0.0	41.7	8.3	0.0	0.0	8.3
Illinois	100.0	37.3	5.3	26.3	5.7	29.8	21.1	3.5	5.3	32.9	0.9	3.1	28.9
Indiana	100.0	44.5	11.8	27.7	5.0	35.3	13.4	2.5	19.3	20.2	1.7	0.0	18.5
Iowa	100.0	48.3	3.4	36.8	8.0	51.7	18.4	4.6	28.7	0.0	0.0	0.0	0.0
Kansas	100.0	36.6	11.0	24.4	1.2	40.2	34.1	1.2	4.9	23.2	2.4	2.4	18.3
Kentucky	100.0	32.7	8.2	21.4	3.1	62.2	23.5	0.0	38.8	5.1	0.0	1.0	4.1
Louisiana	100.0	19.6	11.6	5.8	2.2	49.3	34.1	1.4	13.8	31.2	0.7	0.0	30.4
Maine	100.0	47.2	22.2	25.0	0.0	36.1	19.4	8.3	8.3	16.7	0.0	2.8	13.9

See notes at end of table.

Table 3.3. Percentage distribution of Title IV eligible postsecondary institutions in each state that offer career education programs, by level of institution and sector: 2004–05—Continued

State	Total institutions offering career education	4-year				2-year				Less-than-2-year			
		Total	Public	Private not-for-profit	Private for-profit	Total	Public	Private not-for-profit	Private for-profit	Total	Public	Private not-for-profit	Private for-profit
Maryland	100.0	40.0	18.7	18.7	2.7	29.3	21.3	0.0	8.0	30.7	0.0	0.0	30.7
Massachusetts	100.0	49.0	9.2	37.9	2.0	19.0	10.5	3.9	4.6	32.0	3.3	0.0	28.8
Michigan	100.0	36.2	9.9	25.0	1.3	27.6	20.4	2.0	5.3	36.2	0.7	0.7	34.9
Minnesota	100.0	46.4	10.7	20.5	15.2	36.6	26.8	1.8	8.0	17.0	0.9	3.6	12.5
Mississippi	100.0	32.1	17.0	15.1	0.0	45.3	28.3	0.0	17.0	22.6	0.0	0.0	22.6
Missouri	100.0	38.6	8.2	21.5	8.9	32.3	14.6	2.5	15.2	29.1	13.3	0.6	15.2
Montana	100.0	32.3	19.4	12.9	0.0	54.8	38.7	6.5	9.7	12.9	0.0	0.0	12.9
Nebraska	100.0	56.5	15.2	32.6	8.7	41.3	17.4	8.7	15.2	2.2	0.0	0.0	2.2
Nevada	100.0	40.7	18.5	3.7	18.5	40.7	7.4	0.0	33.3	18.5	0.0	3.7	14.8
New Hampshire	100.0	47.1	14.7	29.4	2.9	17.6	11.8	2.9	2.9	35.3	0.0	5.9	29.4
New Jersey	100.0	23.7	10.1	11.5	2.2	23.7	14.4	5.0	4.3	52.5	2.9	0.7	48.9
New Mexico	100.0	36.6	17.1	9.8	9.8	46.3	43.9	0.0	2.4	17.1	0.0	0.0	17.1
New York	100.0	40.2	12.2	25.4	2.6	28.9	10.5	8.5	9.9	30.9	9.0	4.1	17.8
North Carolina	100.0	37.1	9.9	25.8	1.3	45.7	39.7	2.0	4.0	17.2	0.0	0.7	16.6
North Dakota	100.0	46.2	26.9	19.2	0.0	50.0	26.9	3.8	19.2	3.8	0.0	0.0	3.8
Ohio	100.0	28.4	7.5	18.8	2.1	44.9	12.7	4.1	28.1	26.7	16.1	1.7	8.9
Oklahoma	100.0	25.8	11.7	11.7	2.3	29.7	25.0	0.0	4.7	44.5	20.3	0.0	24.2
Oregon	100.0	39.5	11.8	21.1	6.6	51.3	21.1	1.3	28.9	9.2	0.0	0.0	9.2
Pennsylvania	100.0	34.8	11.6	21.2	2.0	36.3	4.8	10.2	21.2	28.9	8.2	1.1	19.5
Rhode Island	100.0	45.5	9.1	36.4	0.0	18.2	4.5	9.1	4.5	36.4	0.0	0.0	36.4
South Carolina	100.0	47.3	17.6	27.0	2.7	29.7	23.0	2.7	4.1	23.0	0.0	0.0	23.0
South Dakota	100.0	58.6	24.1	20.7	13.8	41.4	17.2	13.8	10.3	0.0	0.0	0.0	0.0
Tennessee	100.0	37.0	6.5	24.6	5.8	26.1	10.1	2.9	13.0	37.0	18.1	0.7	18.1
Texas	100.0	24.9	11.7	11.2	2.0	32.4	19.2	1.1	12.0	42.7	0.3	0.9	41.5
Utah	100.0	32.7	14.3	6.1	12.2	46.9	14.3	2.0	30.6	20.4	2.0	0.0	18.4

See notes at end of table.

Table 3.3. Percentage distribution of Title IV eligible postsecondary institutions in each state that offer career education programs, by level of institution and sector: 2004–05—Continued

State	Total institutions offering career education	4-year				2-year				Less-than-2-year			
		Total	Public	Private not-for-profit	Private for-profit	Total	Public	Private not-for-profit	Private for-profit	Total	Public	Private not-for-profit	Private for-profit
Vermont	100.0	74.1	18.5	51.9	3.7	14.8	3.7	7.4	3.7	11.1	3.7	0.0	7.4
Virginia	100.0	43.1	10.9	21.2	10.9	31.4	17.5	3.6	10.2	25.5	4.4	2.2	19.0
Washington	100.0	29.8	6.7	14.4	8.7	51.0	33.7	2.9	14.4	19.2	1.0	1.0	17.3
West Virginia	100.0	29.9	16.4	13.4	0.0	50.7	19.4	1.5	29.9	19.4	11.9	7.5	0.0
Wisconsin	100.0	53.2	16.5	29.1	7.6	39.2	21.5	5.1	12.7	7.6	0.0	2.5	5.1
Wyoming	100.0	9.1	9.1	0.0	0.0	81.8	63.6	0.0	18.2	9.1	9.1	0.0	0.0

NOTE: Detail may not sum to totals because of rounding. An institution was counted as offering career education if it awarded an undergraduate credential in a career-related field of study.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Completions and Institutional Characteristics data file, 2004–05.

Table 3.4. Number and percentage distribution of institutions offering career education and credentials awarded by Title IV eligible postsecondary institutions and percentage distribution of credentials in career fields, by level of institution and sector: 2004–05

Educational offering	Total	4-year				2-year				Less-than-2-year			
		Total	Public	Private not-for-profit	Private for-profit	Total	Public	Private not-for-profit	Private for-profit	Total	Public	Private not-for-profit	Private for-profit
Number of institutions offering career education	5,730	2,045	604	1,119	322	2,064	1,121	194	749	1,621	241	95	1,285
Number of credentials awarded in career fields	1,923,400	952,952	586,908	286,915	79,129	728,110	561,863	19,001	147,246	242,338	38,644	11,172	192,522
Percentage distribution of institutions that offer career education	100.0	35.7	10.5	19.5	5.6	36.0	19.6	3.4	13.1	28.3	4.2	1.7	22.4
Percentage distribution of credentials in career fields	100.0	49.5	30.5	14.9	4.1	37.9	29.2	1.0	7.7	12.6	2.0	0.6	10.0

NOTE: Detail may not sum to totals because of rounding. An institution was counted as offering career education if it awarded a postsecondary credential in a career-related field of study.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Completions and Institutional Characteristics data file, 2004–05.

B. WHAT PROGRAMS AND CREDENTIALS ARE OFFERED?

Information on postsecondary career education offerings was also obtained from 2005 IPEDS data, again restricted to Title IV eligible institutions.

Postsecondary Offerings in Career Fields

In 2005, more postsecondary institutions offered programs in health care than in any other career program area: about 3,700 institutions, or 58 percent of all Title IV eligible postsecondary institutions, offered programs in this area (tables 3.5 and 3.6). Business and marketing was the second-most-common field, with 3,500 institutions, or 55 percent of all Title IV eligible postsecondary institutions, offering programs in this area. Business and marketing was the most common career program area at 4-year institutions, with 69 percent of these institutions offering programs in this area (table 3.6). Health care was the most common career program area at 2-year institutions (76 percent offered these programs). At less-than-2-year institutions, personal and consumer services programs were the most prevalent (with 52 percent offering these programs).

More postsecondary institutions offered certificates that took at least 1 year but less than 2 years to complete (1-year certificates)⁵⁵ than offered any other type of postsecondary credential in a career field in 2005 (table 3.7). In that year, about 3,200 postsecondary institutions—56 percent of all postsecondary career education providers—awarded career certificates that lasted this long. Associate’s degrees and less-than-1-year certificates were the next most widely available credentials, with about 2,500–2,600 institutions (44–46 percent of career education providers) awarding each of these credential types in career fields in 2005.

The types of credentials awarded in career fields varied by type of institution, with most institutions offering a mix of credentials. Almost all 4-year institutions that offered career education awarded bachelor’s degrees in career fields in 2005 (98 percent) (table 3.7).⁵⁶ In addition, 44 percent of 4-year career education providers awarded associate’s degrees in career fields in this year. The majority of 2-year career education providers awarded associate’s degrees in career fields (78 percent), as well as 1-year certificates (79 percent) and less-than-1-year certificates (58 percent). The majority of less-than-2-year career education providers awarded 1-year career certificates (79 percent) as well as less-than-1-year career certificates (73 percent).

⁵⁵ For convenience, the term “1-year certificate” will hereafter be used to refer to certificates that took at least 1 year but less than 2 years to complete.

⁵⁶ Some 4-year institutions may not award bachelor’s degrees in career fields every academic year. Some 4-year institutions may also award only subbaccalaureate credentials in career fields.

Table 3.5. Number of Title IV eligible postsecondary institutions that offer career education, by level of institution, sector, and field of study: 2004–05

Career field of study	Total	4-year				2-year				Less-than-2-year			
		Total	Public	Private not-for-profit	Private for-profit	Total	Public	Private not-for-profit	Private for-profit	Total	Public	Private not-for-profit	Private for-profit
All fields of study	5,730	2,045	604	1,119	322	2,064	1,121	194	749	1,621	241	95	1,285
Agricultural and natural resources	1,207	655	296	359	0	522	513	7	2	30	27	1	2
Business and marketing	3,540	1,761	564	926	271	1,438	1,093	52	293	341	136	45	160
Communications	1,773	1,181	439	660	82	540	507	11	22	52	33	3	16
Computer sciences	3,081	1,562	525	766	271	1,277	948	47	282	242	63	25	154
Education	1,982	1,244	446	792	6	633	598	19	16	105	2	3	100
Engineering and architectural sciences	2,156	832	403	292	137	1,155	963	37	155	169	80	11	78
Health care	3,715	1,323	513	684	126	1,639	1,074	155	410	753	231	51	471
Legal services	1,075	307	87	162	58	698	490	20	188	70	11	59	0
Personal and consumer services	2,924	923	399	492	32	1,138	883	20	235	863	84	10	769
Protective services	1,755	785	328	335	122	937	819	14	104	33	28	0	5
Public, social, and human services	1,102	770	329	422	19	331	322	8	1	1	0	1	0
Trade and industry	1,490	201	110	60	31	1,023	911	19	93	266	141	34	91

NOTE: An institution was counted as offering career education if it awarded a postsecondary credential in a career-related field of study.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Completions and Institutional Characteristics data file, 2004–05.

Table 3.6. Percentage of Title IV eligible postsecondary institutions that offer career education, by level of institution, sector, and field of study: 2004–05

Career field of study	Total	4-year				2-year				Less-than-2-year			
		Total	Public	Private not-for-profit	Private for-profit	Total	Public	Private not-for-profit	Private for-profit	Total	Public	Private not-for-profit	Private for-profit
All fields of study	89.8	80.1	94.4	72.5	87.0	95.5	98.1	86.2	94.5	97.1	98.8	88.8	97.5
Agricultural and natural resources	18.9	25.7	46.3	23.3	0.0	24.2	44.9	3.1	0.3	1.8	11.1	0.9	0.2
Business and marketing	55.5	69.0	88.1	60.0	73.2	66.5	95.6	23.1	36.9	20.4	55.7	42.1	12.1
Communications	27.8	46.3	68.6	42.8	22.2	25.0	44.4	4.9	2.8	3.1	13.5	2.8	1.2
Computer sciences	48.3	61.2	82.0	49.6	73.2	59.1	82.9	20.9	35.6	14.5	25.8	23.4	11.7
Education	31.1	48.7	69.7	51.3	1.6	29.3	52.3	8.4	2.0	6.3	0.8	2.8	7.6
Engineering and architectural sciences	33.8	32.6	63.0	18.9	37.0	53.4	84.3	16.4	19.5	10.1	32.8	10.3	5.9
Health care	58.2	51.8	80.2	44.3	34.1	75.8	94.0	68.9	51.7	45.1	94.7	47.7	35.7
Legal services	16.8	12.0	13.6	10.5	15.7	32.3	42.9	8.9	23.7	4.2	4.5	55.1	0.0
Personal and consumer services	45.8	36.2	62.3	31.9	8.6	52.7	77.3	8.9	29.6	51.7	34.4	9.3	58.3
Protective services	27.5	30.7	51.3	21.7	33.0	43.4	71.7	6.2	13.1	2.0	11.5	0.0	0.4
Public, social, and human services	17.3	30.2	51.4	27.3	5.1	15.3	28.2	3.6	0.1	0.1	0.0	0.9	0.0
Trade and industry	23.3	7.9	17.2	3.9	8.4	47.3	79.7	8.4	11.7	15.9	57.8	31.8	6.9

NOTE: Detail may not sum to totals because of rounding. An institution was counted as offering career education if it awarded a postsecondary credential in a career-related field of study.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Completions and Institutional Characteristics data file, 2004–05.

Table 3.7. Number and percentage of Title IV eligible postsecondary institutions conferring career education awards, by award level: 2004–05

Level and sector of institution	Total institutions that award credentials in career fields	Certificate			Degrees	
		Less than 1 year	At least 1 but less than 2 years	2 or more years	Associate's degree	Bachelor's degree and above
Number of institutions that awarded credentials in career fields						
Total	5,730	2,613	3,236	639	2,517	2,009
4-year total	2,045	224	332	58	896	1,995
Public	604	60	109	25	230	596
Private not-for-profit	1,119	93	137	28	412	1,100
Private for-profit	322	71	86	5	254	299
2-year total	2,064	1,201	1,626	568	1,607	14
Public	1,121	780	1,056	239	1,044	5
Private not-for-profit	194	37	69	101	94	0
Private for-profit	749	384	501	228	469	9
Less-than-2-year total	1,621	1,188	1,278	13	14	0
Public	241	121	218	7	0	0
Private not-for-profit	95	62	66	0	3	0
Private for-profit	1,285	1,005	994	6	11	0
Percentage of institutions that awarded credentials in career fields						
Total	100.0	45.6	56.5	11.2	43.9	35.1
4-year total	100.0	11.0	16.2	2.8	43.8	97.6
Public	100.0	9.9	18.0	4.1	38.1	98.7
Private not-for-profit	100.0	8.3	12.2	2.5	36.8	98.3
Private for-profit	100.0	22.0	26.7	1.6	78.9	92.9
2-year total	100.0	58.2	78.8	27.5	77.9	0.7
Public	100.0	69.6	94.2	21.3	93.1	0.4
Private not-for-profit	100.0	19.1	35.6	52.1	48.5	0.0
Private for-profit	100.0	51.3	66.9	30.4	62.6	1.2
Less-than-2-year total	100.0	73.3	78.8	0.8	0.9	0.0
Public	100.0	50.2	90.5	2.9	0.0	0.0
Private not-for-profit	100.0	65.3	69.5	0.0	3.2	0.0
Private for-profit	100.0	78.2	77.4	0.5	0.9	0.0

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

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Completions and Institutional Characteristics data file, 2004–05.

While 4-year institutions were the most common providers of bachelor's degrees in career fields in 2005, a larger number of 2-year institutions than either 4-year or less-than-2-year institutions awarded each type of subbaccalaureate career credential in this year.

C. WHO PARTICIPATES AND IN WHICH FIELDS DO THEY MAJOR?

About 17 million undergraduates were working toward postsecondary credentials during academic year 2003–04 (table 3.8). This section describes the extent to which these students participated in career education as well as changes in participation patterns over time—focusing on changes between the 1989–90 and 2003–04 academic years—and compares the characteristics of career and academic majors as well as majors in various career fields. Interim data from academic year 1999–2000 are also included. For simplicity's sake, these academic years are referred to here as 1990, 2000, and 2004. Information for this section was obtained from the

Table 3.8. Number and percentage distribution of credential-seeking undergraduates, by major field and credential sought: 1990, 2000, and 2004

Major field and credential sought	Number			Percentage distribution		
	1990	2000	2004	1990	2000	2004
All undergraduates, total	15,076,000	15,814,000	16,821,000	100.0	100.0	100.0
Career education	10,115,000	10,193,000	10,649,000	67.1	64.5	63.3
Academic	3,560,000	4,285,000	4,009,000	23.6	27.1	23.8
Other	1,401,000	1,337,000	2,163,000	9.3	8.5	12.9
Bachelor's degree, total	7,198,000	7,289,000	8,756,000	100.0	100.0	100.0
Career education	4,250,000	4,257,000	5,251,000	59.0	58.4	60.0
Academic	2,203,000	2,470,000	2,634,000	30.6	33.9	30.1
Other	745,000	562,000	871,000	10.4	7.7	10.0
Associate's degree, total	5,487,000	6,197,000	6,835,000	100.0	100.0	100.0
Career education	3,793,000	3,995,000	4,401,000	69.1	64.5	64.4
Academic	1,161,000	1,602,000	1,305,000	21.2	25.9	19.1
Other	533,000	599,000	1,128,000	9.7	9.7	16.5
Certificate total	2,391,000	2,329,000	1,231,000	100.0	100.0	100.0
Career education	2,072,000	1,940,000	998,000	86.7	83.3	81.1
Academic	196,000	213,000	70,000	8.2	9.1	5.7
Other	123,000	176,000	163,000	5.1	7.6	13.3

NOTE: "Other" major fields include interdisciplinary studies, basic skills, other unspecified majors, and undeclared majors. See appendix A for detail on how majors were classified. Estimates include students from the 50 states, DC, and Puerto Rico. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.
SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90, 1999–2000, and 2003–04 National Postsecondary Student Aid Studies (NPSAS:90, NPSAS:2000, and NPSAS:04).

1990, 2000, and 2004 National Postsecondary Student Aid Study (NPSAS), a nationally representative survey of all postsecondary students in the United States who attended less-than-2-year, 2-year, or 4-year Title IV eligible institutions. The analysis focuses on credential-seeking undergraduates—those students seeking a postsecondary certificate, associate’s degree, or bachelor’s degree. In 2004, credential-seeking undergraduates represented 90 percent of all undergraduate students (table 3.9).⁵⁷ Additional information on NPSAS and the classification used in this section can be found in appendix A.

Table 3.9. Percentage distribution of undergraduates, by current credential goal: 2004

Current credential goal	Percent
Total	100.0
Certificate	6.6
Associate’s	36.6
Bachelor’s	46.6
No credential	10.3

NOTE: See appendix A for detail on how majors were classified. Estimates include students from the 50 states, DC, and Puerto Rico. Detail may not sum to total because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>. SOURCE: U.S. Department of Education, National Center for Education Statistics, 2003–04 National Postsecondary Student Aid Study (NPSAS:04).

Undergraduates Majoring in Career Education: 2004

Prevalence of Career Majors

Most undergraduates seeking a credential majored in career fields in 2004: 81 percent of students in certificate programs, 64 percent of students in associate’s degree programs, and 60 percent of students seeking bachelor’s degrees reported having career majors in this year (table 3.8). This translates into about 1.0 million certificate seekers, 4.4 million associate’s degree seekers, and 5.3 million bachelor’s degree seekers with career majors. Undergraduates who chose academic or other majors were in the minority at each credential level (6–30 percent).⁵⁸

Overall, business and marketing was the most common career field in which students majored in 2004, with 28 percent of credential-seeking undergraduates reporting a major in this field (table 3.10). Another 22 percent majored in health care fields and 12 percent majored in education.

⁵⁷ Information on noncredential-seeking postsecondary students can be found in chapter 4 on adult participation in work-related courses.

⁵⁸ “Other” includes interdisciplinary studies, basic skills, other unspecified majors, and undeclared majors.

3. Career Education at the Postsecondary Level

Table 3.10. Number and percentage distribution of credential-seeking undergraduates, by career education major and credential sought: 1990, 2000, and 2004

Career major and credential sought	Number			Percentage distribution		
	1990	2000	2004	1990	2000	2004
All undergraduates in career fields	10,115,000	10,193,000	10,649,000	100.0	100.0	100.0
Agriculture and natural resources	85,000	122,000	134,000	0.8	1.2	1.3
Business and marketing	3,432,000	2,792,000	2,948,000	33.9	27.4	27.7
Communications	230,000	461,000	509,000	2.3	4.5	4.8
Computer sciences	656,000	1,260,000	921,000	6.5	12.4	8.6
Education	938,000	1,211,000	1,259,000	9.3	11.9	11.8
Engineering and architectural sciences	1,183,000	838,000	911,000	11.7	8.2	8.6
Health care	1,682,000	1,837,000	2,321,000	16.6	18.0	21.8
Legal services	257,000	131,000	119,000	2.5	1.3	1.1
Personal and consumer services	660,000	357,000	478,000	6.5	3.5	4.5
Protective services	342,000	436,000	514,000	3.4	4.3	4.8
Public, social, and human services	103,000	208,000	192,000	1.0	2.0	1.8
Trade and industry	547,000	540,000	344,000	5.4	5.3	3.2
Bachelor's degree total	4,250,000	4,257,000	5,251,000	100.0	100.0	100.0
Agriculture and natural resources	53,000	76,000	86,000	1.2	1.8	1.6
Business and marketing	1,561,000	1,387,000	1,753,000	36.7	32.6	33.4
Communications	139,000	313,000	391,000	3.3	7.4	7.4
Computer sciences	235,000	383,000	450,000	5.5	9.0	8.6
Education	570,000	644,000	777,000	13.4	15.1	14.8
Engineering and architectural sciences	603,000	476,000	573,000	14.2	11.2	10.9
Health care	613,000	570,000	609,000	14.4	13.4	11.6
Legal services	33,000	32,000	32,000	0.8	0.8	0.6
Personal and consumer services	217,000	98,000	166,000	5.1	2.3	3.2
Protective services	101,000	133,000	234,000	2.4	3.1	4.5
Public, social, and human services	76,000	100,000	125,000	1.8	2.3	2.4
Trade and industry	48,000	46,000	54,000	1.1	1.1	1.0
Associate's degree total	3,793,000	3,995,000	4,401,000	100.0	100.0	100.0
Agriculture and natural resources	28,000	39,000	42,000	0.7	1.0	1.0
Business and marketing	1,356,000	1,114,000	1,080,000	35.8	27.9	24.5
Communications	54,000	123,000	108,000	1.4	3.1	2.5
Computer sciences	262,000	559,000	416,000	6.9	14.0	9.5
Education	255,000	405,000	449,000	6.7	10.1	10.2
Engineering and architectural sciences	463,000	272,000	300,000	12.2	6.8	6.8
Health care	717,000	816,000	1,311,000	18.9	20.4	29.8
Legal services	147,000	79,000	77,000	3.9	2.0	1.8
Personal and consumer services	173,000	84,000	153,000	4.5	2.1	3.5
Protective services	159,000	235,000	245,000	4.2	5.9	5.6
Public, social, and human services	‡	90,000	62,000	0.5	2.2	1.4
Trade and industry	159,000	180,000	157,000	4.2	4.5	3.6

See notes at end of table.

Table 3.10. Number and percentage distribution of credential-seeking undergraduates, by career education major and credential sought: 1990, 2000, and 2004—Continued

Career major and credential sought	Number			Percentage distribution		
	1990	2000	2004	1990	2000	2004
Certificate total	2,072,000	1,940,000	998,000	100.0	100.0	100.0
Agriculture and natural resources	‡	‡	‡	0.2	0.4 !	0.5 !
Business and marketing	514,000	291,000	115,000	24.8	15.0	11.5
Communications	37,000	25,000	10,000	1.8	1.3	1.0
Computer sciences	158,000	318,000	55,000	7.6	16.4	5.5
Education	113,000	162,000	33,000	5.5	8.3	3.3
Engineering and architectural sciences	117,000	90,000	38,000	5.6	4.7	3.8
Health care	352,000	450,000	401,000	17.0	23.2	40.2
Legal services	77,000	‡	9,000	3.7	1.0	0.9
Personal and consumer services	270,000	175,000	158,000	13.0	9.0	15.9
Protective services	82,000	68,000	35,000	4.0	3.5	3.5
Public, social, and human services	‡	‡	4,000 !	0.4	1.0 !	0.4 !
Trade and industry	340,000	314,000	134,000	16.4	16.2	13.4

! Interpret data with caution.

‡ Reporting standards not met. (Too few cases for a reliable estimate.)

NOTE: Estimates include students from the 50 states, DC, and Puerto Rico. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90, 1999–2000, and 2003–04 National Postsecondary Student Aid Studies (NPSAS:90, NPSAS:2000, and NPSAS:04).

The most common career major fields in 2004 varied somewhat depending on the credential students sought. Among bachelor's degree seekers, business and marketing was the most common major field (33 percent), followed by education, health care, and engineering and architectural sciences (11–15 percent) (table 3.10). In contrast, health care was the most common major field among students in associate's degree programs (30 percent), followed by business and marketing (25 percent), education (10 percent), and computer sciences (9 percent). Health care was also the most common field (40 percent) among certificate seekers, followed by personal and consumer services (16 percent), trade and industry (13 percent), and business and marketing (11 percent).

Characteristics of Career and Academic Majors

What are the characteristics of students majoring in career education? This section focuses on comparisons of credential-seeking undergraduates with career and academic majors in 2004. The section first provides a comparison of students' demographic and background characteristics (sex, race/ethnicity, disability status, age, marital status, financial independence, and parents' education levels), and then a comparison in terms of their postsecondary enrollment characteristics (prior degrees, grade point average (GPA), and employment and enrollment status). Although

the majority of credential-seeking undergraduates at each credential level were majoring in career fields in 2004 (60–81 percent) (table 3.8), the percentage of career majors seeking a bachelor's degree was smaller than the percentage of academic majors seeking a bachelor's degree (49 vs. 66 percent) (table 3.11). In contrast, the percentage of career majors seeking an associate's degree was larger than the percentage of academic majors seeking an associate's degree (41 vs. 33 percent), as was the percentage of career majors seeking a postsecondary certificate (9 vs. 2 percent). Overall, 49 percent of career majors sought a bachelor's degree, 41 percent sought an associate's degree, and 9 percent sought a certificate in 2004.

Sex, Race/Ethnicity, and Disability Status

In 2004, the percentage of credential-seeking undergraduates with career majors who were male was not measurably different than the percentage of academic majors who were male (42 percent each) (table 3.12). However, a larger percentage of bachelor's degree-seeking career majors than academic majors were male (47 vs. 42 percent), while a smaller percentage of associate's degree-seeking career majors than academic majors were male (38 vs. 41 percent). The reverse was true for females: a smaller percentage of bachelor's degree-seeking career majors than academic majors were female (53 vs. 58 percent), while a larger percentage of associate's degree-seeking career majors than academic majors were female (62 vs. 59 percent). The percentage of career majors who were Black was larger than that of academic majors (17 vs. 11 percent). This difference held at the bachelor's and associate's degree levels (14 vs. 9 percent and 19 vs. 15 percent, respectively). Overall, the percentage of career majors who were White was smaller than the corresponding percentage of academic majors (63 vs. 67 percent), although this overall difference was not measurable at the three credential levels. There were no measurable differences in the percentages of career and academic majors who were disabled (table 3.13).

Age, Marital Status, and Financial Independence

Undergraduates with career majors tended to be older and a greater percentage of them were married and financially independent than their peers who were pursuing academic majors in 2004. Forty-two percent of career majors were age 25 or older compared with 27 percent of academic majors (table 3.12), and 23 percent of career majors were married compared with 14 percent of academic majors (table 3.13). Differences in marital status held at the bachelor's and associate's degree levels (18 vs. 11 percent and 28 vs. 19 percent, respectively), and age differences held at all three credential levels (22 vs. 15 percent among bachelor's seekers, 37 vs. 25 percent among associate's seekers, and 41 vs. 31 percent among certificate seekers). In addition, 54 percent of career majors were financially independent compared with 37 percent of academic

Table 3.11. Percentage distribution of credential-seeking undergraduates in each major field and career major, by level of credential sought: 1990, 2000, and 2004

Major field and specific career major	1990			2000			2004		
	Certif- icate	Associate's degree	Bachelor's degree	Certif- icate	Associate's degree	Bachelor's degree	Certif- icate	Associate's degree	Bachelor's degree
All undergraduates	15.9	36.4	47.7	14.7	39.2	46.1	7.3	40.7	51.9
Career education	20.5	37.5	42.0	19.0	39.2	41.8	9.4	41.3	49.3
Academic	5.5	32.6	61.9	5.0	37.4	57.6	1.7	32.6	65.7
Other	8.8	38.0	53.2	13.2	44.8	42.0	7.5	52.2	40.3
Career major									
Agriculture and natural resources	4.5	33.5	62.0	6.2 !	31.7	62.1	3.7 !	31.7	64.6
Business and marketing	15.0	39.5	45.5	10.4	39.9	49.7	3.9	36.6	59.5
Communications	16.0	23.5	60.5	5.4	26.6	67.9	2.0	21.2	76.8
Computer sciences	24.1	40.0	35.9	25.2	44.4	30.4	6.0	45.2	48.8
Education	12.1	27.2	60.8	13.3	33.5	53.2	2.7	35.6	61.7
Engineering and architectural sciences	9.9	39.1	51.0	10.8	32.4	56.8	4.2	32.9	62.9
Health care	20.9	42.6	36.4	24.5	44.4	31.1	17.3	56.5	26.2
Legal services	29.9	57.3	12.8	15.3	60.4	24.3	8.0	65.0	27.1
Personal and consumer services	40.9	26.2	32.9	49.1	23.5	27.5	33.1	32.1	34.8
Protective services	24.0	46.4	29.6	15.6	54.0	30.5	6.7	47.7	45.5
Public, social, and human services	7.6	18.6	73.8	8.9	43.1	48.0	2.2 !	32.5	65.3
Trade and industry	62.1	29.1	8.8	58.1	33.4	8.5	38.8	45.6	15.5

! Interpret data with caution.

NOTE: "Other" major fields include interdisciplinary studies, basic skills, other miscellaneous majors, and unreported majors. See appendix A for detail on how majors were classified.

Estimates include students from the 50 states, DC, and Puerto Rico. Detail may not sum to totals because of rounding. Standard error tables are available at

<http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90, 1999–2000, and 2003–04 National Postsecondary Student Aid Studies (NPSAS:90, NPSAS:2000, and NPSAS:04).

Table 3.12. Percentage distribution of credential-seeking undergraduates with each major field and level of credential sought, by sex, race/ethnicity, and age: 1990, 2000, and 2004

Major field and level of credential sought	Sex		Race/ethnicity ¹						Age		
	Male	Female	White	Black	Hispanic	Asian/Pacific Islander	American Indian	Other	Younger than 25	25–34	35 or older
1990											
All undergraduates	44.6	55.4	76.2	10.2	8.3	4.5	0.8	†	63.7	21.2	15.1
Career education	44.1	55.9	74.8	11.6	8.5	4.3	0.8	†	59.6	23.8	16.6
Academic	44.9	55.1	80.4	7.4	7.1	4.5	0.7	†	72.2	16.0	11.8
Other	47.5	52.5	75.6	7.8	9.9	5.5	1.1	†	70.7	16.2	13.1
Bachelor's degree total	47.2	52.8	80.1	8.1	6.4	4.9	0.5	†	77.5	14.4	8.1
Career education	47.2	52.8	79.3	8.8	6.5	4.9	0.5	†	74.5	16.6	8.9
Academic	46.0	54.0	82.6	6.7	5.8	4.4	0.4	†	80.9	11.6	7.5
Other	51.0	49.0	77.7	7.8	7.4	6.3	0.9	†	84.5	10.2	5.3
Associate's degree total	42.0	58.0	75.1	10.8	8.7	4.5	1.0	†	54.2	26.1	19.7
Career education	41.8	58.2	74.3	11.9	8.3	4.4	1.0	†	51.8	27.8	20.3
Academic	43.1	56.9	78.1	8.4	8.4	4.3	0.9	†	60.1	22.4	17.6
Other	41.2	58.8	73.6	8.0	12.0	4.9	1.5	†	58.1	21.7	20.2
Certificate total	42.6	57.4	66.7	15.5	13.5	3.3	0.9	†	41.5	31.5	27.0
Career education	41.7	58.3	66.2	16.7	13.2	3.1	0.8	†	41.2	32.1	26.7
Academic	44.3	55.7	69.0	8.6	14.5	5.7	2.2	†	45.2	26.9	27.8
Other	54.0	46.0	71.8	6.6	16.8	3.5	1.3	†	40.3	29.5	30.2

See notes at end of table.

Table 3.12. Percentage distribution of credential-seeking undergraduates with each major field and level of credential sought, by sex, race/ethnicity, and age: 1990, 2000, and 2004—Continued

Major field and level of credential sought	Sex		Race/ethnicity ¹						Age		
	Male	Female	White	Black	Hispanic	Asian/ Pacific Islander	American Indian	Other	Younger than 25	25–34	35 or older
2000											
All undergraduates	43.6	56.4	67.2	12.3	12.1	5.7	0.9	1.8	62.6	20.0	17.4
Career education	44.5	55.5	65.2	14.4	12.4	5.4	0.9	1.7	58.0	22.2	19.8
Academic	41.4	58.6	71.1	8.7	11.2	6.2	0.9	1.9	72.4	15.9	11.7
Other	43.9	56.1	69.9	7.7	13.3	5.7	1.2	2.2	66.9	16.1	17.0
Bachelor's degree total	44.4	55.6	71.1	10.4	9.9	6.4	0.6	1.7	75.8	14.6	9.6
Career education	46.3	53.7	69.9	11.8	9.9	6.4	0.5	1.5	71.9	16.6	11.5
Academic	41.2	58.8	73.3	8.4	8.9	6.9	0.7	1.7	81.6	11.9	6.5
Other	43.5	56.5	70.1	8.4	13.4	4.6	1.1	2.4	79.4	11.8	8.8
Associate's degree total	42.2	57.8	65.9	12.9	13.1	4.9	1.2	2.0	56.4	23.3	20.3
Career education	42.5	57.5	64.2	15.3	12.8	4.5	1.3	1.9	52.8	25.3	21.9
Academic	41.0	59.0	68.4	9.5	14.1	5.0	1.1	2.0	62.3	20.7	17.1
Other	44.1	55.9	71.1	5.8	12.3	7.1	1.3	2.4 !	64.6	17.7	17.7
Certificate total	44.7	55.3	58.4	16.8	16.5	5.5	1.2	1.6	38.2	27.9	33.9
Career education	44.6	55.4	57.0	18.4	16.7	5.2	1.2	1.5	38.1	28.4	33.5
Academic	46.0	54.0	66.6	6.2	15.4	8.2	1.1 !	2.5	42.4	25.9	31.7
Other	44.3	55.7	64.8	11.9	16.2	4.8 !	1.2 !	1.0 !	34.7	24.5	40.8

See notes at end of table.

Table 3.12. Percentage distribution of credential-seeking undergraduates with each major field and level of credential sought, by sex, race/ethnicity, and age: 1990, 2000, and 2004—Continued

Major field and level of credential sought	Sex		Race/ethnicity ¹						Age		
	Male	Female	White	Black	Hispanic	Asian/Pacific Islander	American Indian	Other	Younger than 25	25–34	35 or older
2004											
All undergraduates	42.4	57.6	63.7	14.7	11.5	5.2	0.9	3.9	63.1	20.5	16.4
Career education	42.0	58.0	62.9	16.6	11.1	4.9	0.9	3.7	58.0	23.1	18.9
Academic	41.7	58.3	66.7	11.4	11.1	5.6	0.8	4.4	73.4	15.9	10.7
Other	46.7	53.3	62.0	11.5	14.5	6.4	1.2	4.4	69.0	16.2	14.8
Bachelor's degree total	45.3	54.7	69.0	12.0	8.8	5.7	0.8	3.8	81.0	18.1	0.9
Career education	46.7	53.3	68.5	13.8	8.2	5.4	0.8	3.3	77.6	21.2	1.1
Academic	42.1	57.9	70.5	9.4	9.0	5.9	0.7	4.5	84.6	14.8	0.6
Other	47.4	52.6	67.5	8.6	11.2	7.0	1.3	4.4	89.1	10.2	0.7
Associate's degree total	39.9	60.1	59.3	16.8	13.8	4.8	1.0	4.2	67.5	30.4	2.1
Career education	38.1	61.9	58.9	18.5	12.9	4.5	1.1	4.2	63.1	34.7	2.3
Academic	41.2	58.8	59.9	15.1	15.1	4.9	0.9	4.2	75.0	23.4	1.6
Other	47.0	53.0	60.0	12.3	16.3	5.9	1.1	4.4	74.7	23.4	1.9
Certificate total	35.0	65.0	50.6	22.4	18.3	4.3	1.1	3.3	59.1	38.4	2.5
Career education	34.2	65.8	51.1	22.9	18.1	3.8	1.0	3.1	58.6	39.0	2.5
Academic	36.7	63.3	52.9	18.3	18.4	6.5 !	0.7 !	3.2 !	69.0	29.0	2.0 !
Other	41.2	58.8	46.8	21.0	20.2	6.5	1.3 !	4.3	58.6	38.9	2.5 !

† Not applicable.

! Interpret data with caution.

¹ Black includes African American, Hispanic includes Latino, Pacific Islander includes Native Hawaiian, and American Indian includes Alaska Native. "Other" includes multi-racial students. Race categories exclude Hispanic origin unless specified.

NOTE: "Other" major fields include interdisciplinary studies, basic skills, other miscellaneous majors, and unreported majors. See appendix A for detail on how majors were classified. Estimates include students from the 50 states, DC, and Puerto Rico. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90, 1999–2000, and 2003–04 National Postsecondary Student Aid Studies (NPSAS:90, NPSAS:2000, and NPSAS:04).

Table 3.13. Percentage distribution of credential-seeking undergraduates with each major field and level of credential sought, by disability status, parents' highest education level, and marital status: 1990, 2000, and 2004

Major field and level of credential sought	Disability status		Parents' highest education level					Marital status			
	Does not have disability	Has disability	Less than high school	High school diploma	Some college, including career training	Bachelor's degree or higher	Unknown	Single	Married	Separated	Unknown
1990											
All undergraduates	†	†	6.9	23.4	16.9	26.6	26.2	73.9	24.2	1.9	†
Career education	†	†	7.9	25.3	17.0	23.1	26.8	70.4	27.3	2.3	†
Academic	†	†	4.9	20.9	17.3	35.7	21.2	81.4	17.3	1.3	†
Other	†	†	5.4	16.5	14.9	28.5	34.7	80.7	18.7	0.6	†
Bachelor's degree total	†	†	3.9	20.5	17.2	36.6	21.8	83.9	15.4	0.6	†
Career education	†	†	4.5	23.2	18.0	33.6	20.7	81.1	18.2	0.7	†
Academic	†	†	3.0	17.7	16.3	42.9	20.0	87.2	12.1	0.7	†
Other	†	†	3.1	13.5	14.8	35.2	33.5	90.7	9.1	0.2	†
Associate's degree total	†	†	9.3	27.0	18.4	20.3	25.0	67.4	30.0	2.6	†
Career education	†	†	10.0	28.0	18.4	18.6	25.0	65.2	31.9	2.9	†
Academic	†	†	7.9	26.6	19.8	24.8	20.9	73.3	24.6	2.1	†
Other	†	†	7.3	21.0	15.3	22.8	33.6	70.7	28.2	1.1	†
Certificate total	†	†	10.7	23.9	12.5	10.7	42.2	58.5	37.4	4.2	†
Career education	†	†	11.0	24.5	12.4	9.8	42.4	57.6	38.0	4.4	†
Academic	†	†	7.7	23.3	13.6	18.9	36.6	63.6	32.6	3.8	†
Other	†	†	11.3	15.0	14.0	13.0	46.8	64.4	34.9	0.7	†

See notes at end of table.

Table 3.13. Percentage distribution of credential-seeking undergraduates with each major field and level of credential sought, by disability status, parents' highest education level, and marital status: 1990, 2000, and 2004—Continued

Major field and level of credential sought	Disability status		Parents' highest education level					Marital status			
	Does not have disability	Has disability	Less than high school	High school diploma	Some college, including career training	Bachelor's degree or higher	Unknown	Single	Married	Separated	Unknown
2000											
All undergraduates	90.8	9.2	7.2	27.5	21.5	37.7	6.1	68.8	22.5	1.3	7.4
Career education	90.9	9.1	8.3	30.1	22.1	34.1	5.4	67.1	25.9	1.6	5.5
Academic	90.1	9.9	5.2	22.0	21.3	47.0	4.6	75.9	16.8	0.8	6.5
Other	91.8	8.2	5.7	24.8	17.7	35.9	15.8	59.1	15.1	0.8	25.0
Bachelor's degree total	92.5	7.5	4.1	22.2	20.4	49.2	4.1	75.8	16.0	0.6	7.7
Career education	93.3	6.7	4.7	24.4	21.4	45.5	3.9	73.4	19.3	0.7	6.6
Academic	90.8	9.2	2.9	18.5	19.6	56.2	2.8	81.7	12.0	0.5	5.8
Other	93.3	6.7	4.8	21.3	16.6	45.7	11.7	67.4	8.0	0.2 !	24.4
Associate's degree total	89.7	10.3	8.3	31.2	24.1	30.1	6.3	65.4	26.4	1.8	6.4
Career education	89.4	10.6	9.1	33.2	24.4	27.8	5.5	65.0	28.7	2.1	4.2
Academic	89.4	10.6	7.6	27.1	24.5	34.7	6.1	69.3	22.5	1.2	7.0
Other	92.5	7.5	5.3	28.7	21.3	32.5	12.2	58.2	21.1	0.8 !	19.8
Certificate total	88.4	11.6	13.9	34.1	18.1	22.4	11.5	55.7	32.6	2.3	9.4
Career education	88.8	11.2	14.3	36.3	19.0	21.9	8.5	57.3	34.3	2.4	6.0
Academic	88.2	11.8	13.1	23.9	17.1	31.9	14.0	58.2	29.6	0.8 !	11.4
Other	84.5	15.5	10.5	23.0	9.3	16.2	41.1	35.3	17.2	2.7 !	44.8

See notes at end of table.

Table 3.13. Percentage distribution of credential-seeking undergraduates with each major field and level of credential sought, by disability status, parents' highest education level, and marital status: 1990, 2000, and 2004—Continued

Major field and level of credential sought	Disability status		Parents' highest education level					Marital status			
	Does not have disability	Has disability	Less than high school	High school diploma	Some college, including career training	Bachelor's degree or higher	Unknown	Single	Married	Separated	Unknown
2004											
All undergraduates	88.8	11.2	6.2	27.1	23.8	40.1	2.8	77.9	20.0	2.0	†
Career education	88.8	11.2	6.6	28.7	24.3	37.5	3.0	74.7	22.8	2.4	†
Academic	88.7	11.3	4.6	23.0	22.3	47.8	2.3	85.4	13.6	1.0	†
Other	88.9	11.1	7.3	27.1	23.5	39.2	2.9	79.8	18.3	1.9	†
Bachelor's degree total	89.9	10.1	4.1	22.6	21.9	49.6	1.9	83.7 !	15.1 !	1.2 !	†
Career education	90.1	9.9	4.4	24.3	22.9	46.4	1.9	80.6	18.0	1.5	†
Academic	89.3	10.7	3.4	19.8	20.4	54.8	1.7	88.6	10.7	0.7	†
Other	90.2	9.8	4.4	21.8	19.6	52.4	1.8	88.0	10.7	1.2	†
Associate's degree total	87.9	12.1	8.2	31.4	26.7	30.4	3.3	72.4	24.9	2.6	†
Career education	87.8	12.2	8.4	32.5	26.6	29.1	3.4	69.3	27.7	3.0	†
Academic	88.0	12.0	6.8	29.0	26.0	34.8	3.4	79.8	18.6	1.6	†
Other	88.1	11.9	8.8	30.0	27.2	31.0	3.0	75.8	22.0	2.2	†
Certificate total	86.8	13.2	10.4	34.9	20.7	27.2	6.8	67.3	28.2	4.5	†
Career education	87.0	13.0	10.1	35.0	20.7	27.6	6.6	68.2	27.2	4.7	†
Academic	81.3	18.7	9.4	32.7	24.5	26.7	6.7	68.7	28.2	3.0 !	†
Other	87.4	12.6	12.7	35.3	19.1	25.4	7.6	62.6	33.7	3.7	†

† Not applicable.

! Interpret data with caution.

NOTE: "Other" major fields include interdisciplinary studies, basic skills, other miscellaneous majors, and unreported majors. See appendix A for detail on how majors were classified. Estimates include students from the 50 states, DC, and Puerto Rico. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90, 1999–2000, and 2003–04 National Postsecondary Student Aid Studies (NPSAS:90, NPSAS:2000, and NPSAS:04).

majors, and this difference in financial independence held at all three credential levels (42 vs. 30 percent among bachelor's seekers, 65 vs. 50 percent among associate's seekers, and 73 vs. 63 percent among certificate seekers) (table 3.14). Fifty-nine percent of students seeking associate's degrees in career fields received financial aid in 2004 compared with 51 percent of their peers with academic majors (table 3.14).

Parental Education

Overall, a higher percentage of credential-seeking undergraduates majoring in career fields had parents with lower levels of education than their peers who were pursuing academic majors in 2004. Twenty-nine percent of career majors had parents whose highest degree was a high school diploma compared with 23 percent of academic majors (table 3.13). In contrast, 37 percent of undergraduates majoring in career fields had parents whose highest degree was a bachelor's degree compared with 48 percent of academic majors. This lower level of parental education among career majors held at the bachelor's and associate's degree levels (46 vs. 55 percent and 29 vs. 35 percent, respectively).

Prior Degrees and Postsecondary GPA

The vast majority of both career and academic majors in 2004 had not previously earned a bachelor's degree (94–96 percent) (table 3.14). There were also few measurable differences in the postsecondary GPAs of career and academic majors, although a larger percentage of associate's degree-seeking career majors had GPAs of 3.5 or higher than their peers pursuing an academic major (29 vs. 25 percent).

Employment and Enrollment Status

Differences were evident in the employment and enrollment status of career and academic majors at the bachelor's degree level in 2004. Not only did a greater percentage of career majors than academic majors seeking bachelor's degrees work while enrolled (73 vs. 69 percent) but a greater percentage also worked full time (28 vs. 18 percent), and a larger percentage identified themselves as employees who were enrolled in school (as opposed to students who were working) (21 vs. 10 percent) (table 3.15). Additionally, a smaller percentage of bachelor's degree-seeking career majors were enrolled full time throughout the academic year than were bachelor's degree-seeking academic majors (58 vs. 63 percent). Among associate's degree seekers, a larger percentage of career majors than academic majors worked full time (41 vs. 35 percent), and a

Table 3.14. Percentage distribution of credential-seeking undergraduates with each major field and level of credential sought, by dependency status, financial aid status, previous bachelor's degree, and postsecondary GPA: 1990, 2000, and 2004

Major field and level of credential sought	Dependency status				Financial aid status		Previous bachelor's degree		Postsecondary GPA		
	Dependent	Independent	Independent, without dependents	Independent, with dependents	Financial aid	No financial aid	Yes	No	Less than 2.0	2.0–3.49	3.5 or higher
1990											
All undergraduates	50.6	50.2	25.1	24.3	43.1	56.9	2.4	97.6	12.4	64.6	23.0
Career education	45.2	55.5	26.5	28.3	44.9	55.1	2.4	97.6	12.1	64.4	23.5
Academic	61.2	39.5	23.5	15.4	40.0	60.0	2.3	97.7	11.4	66.1	22.5
Other	62.6	38.9	19.1	18.3	37.2	62.8	2.7	97.3	17.8	61.4	20.8
Bachelor's degree total	66.6	33.9	20.6	12.8	48.6	51.4	1.4	98.6	11.3	70.7	18.0
Career education	62.6	37.9	22.3	15.2	48.9	51.1	1.3	98.7	10.9	72.0	17.1
Academic	70.8	29.6	19.5	9.7	49.0	51.0	1.4	98.6	10.0	69.9	20.1
Other	77.5	24.2	13.8	8.7	45.5	54.5	1.3	98.7	17.8	65.4	16.8
Associate's degree total	40.1	60.6	28.6	31.3	32.3	67.7	2.0	98.0	15.1	59.6	25.3
Career education	37.0	63.6	28.9	34.1	35.4	64.6	2.0	98.0	14.9	59.7	25.4
Academic	46.7	53.9	29.5	23.8	24.6	75.4	2.0	98.0	14.3	60.3	25.4
Other	48.1	53.2	24.0	27.8	26.5	73.5	2.2	97.8	18.6	57.1	24.3
Certificate total	25.5	75.3	30.9	43.6	51.2	48.8	6.9	93.1	9.4	51.9	38.7
Career education	23.8	76.9	30.7	45.5	54.2	45.8	5.7	94.3	8.8	51.9	39.3
Academic	37.4	64.1	32.7	29.9	30.5	69.5	14.6	85.4	11.4	51.4	37.1
Other	34.9	65.6	30.3	34.8	33.3	66.7	13.0	87.0	13.8	52.2	34.0

See notes at end of table.

Table 3.14. Percentage distribution of credential-seeking undergraduates with each major field and level of credential sought, by dependency status, financial aid status, previous bachelor's degree, and postsecondary GPA: 1990, 2000, and 2004—Continued

Major field and level of credential sought	Dependency status				Financial aid status		Previous bachelor's degree		Postsecondary GPA		
	Dependent	Independent	Independent, without dependents	Independent, with dependents	Financial aid	No financial aid	Yes	No	Less than 2.0	2.0–3.49	3.5 or higher
2000											
All undergraduates	51.9	48.1	21.1	27.0	59.3	40.7	4.8	95.2	9.9	63.1	26.9
Career education	46.2	53.8	21.9	31.8	60.6	39.4	5.1	94.9	9.2	63.5	27.2
Academic	63.1	36.9	19.4	17.5	60.0	40.0	3.8	96.2	10.4	63.1	26.5
Other	59.6	40.4	20.1	20.3	47.8	52.2	6.6	93.4	13.8	60.3	25.8
Bachelor's degree total	66.9	33.1	17.4	15.7	70.4	29.6	2.8	97.2	7.4	68.8	23.8
Career education	62.4	37.6	18.6	19.0	70.5	29.5	3.0	97.0	7.2	70.4	22.4
Academic	73.2	26.8	16.1	10.7	71.5	28.5	2.3	97.7	7.1	66.6	26.3
Other	73.6	26.4	14.2	12.2	64.1	35.9	3.1	96.9	10.9	66.3	22.7
Associate's degree total	44.6	55.4	22.1	33.3	49.3	50.7	4.5	95.5	13.4	60.4	26.2
Career education	40.3	59.7	21.9	37.8	53.4	46.6	4.0	96.0	12.3	61.1	26.7
Academic	51.1	48.9	23.0	25.9	45.0	55.0	4.3	95.7	14.9	59.4	25.7
Other	56.1	43.9	20.9	23.0	34.0	66.0	8.5	91.5	17.8	58.3	23.9
Certificate total	24.5	75.5	29.9	45.6	51.4	48.6	12.3	87.7	8.4	51.8	39.8
Career education	23.0	77.0	29.3	47.7	53.5	46.5	11.8	88.2	7.5	52.6	39.9
Academic	36.1	63.9	30.5	33.4	39.7	60.3	17.8	82.2	15.8	48.7	35.6
Other	26.9	73.1	36.2	36.9	42.6	57.4	12.3 !	87.7	8.9	45.7	45.4

See notes at end of table.

Table 3.14. Percentage distribution of credential-seeking undergraduates with each major field and level of credential sought, by dependency status, financial aid status, previous bachelor's degree, and postsecondary GPA: 1990, 2000, and 2004—Continued

Major field and level of credential sought	Dependency status				Financial aid status		Previous bachelor's degree		Postsecondary GPA			
	Dependent	Independent	Independent, without dependents	Independent, with dependents	Financial aid	No financial aid	Yes	No	Less than		3.5 or higher	
			2.0	2.0–3.49								
2004												
All undergraduates	51.6	48.4	22.1	26.2	66.3	33.7	4.8	95.2	9.4	62.6	28.0	
Career education	46.0	54.0	23.4	30.6	67.8	32.2	5.5	94.5	8.7	62.5	28.8	
Academic	63.2	36.8	20.7	16.0	66.2	33.8	4.0	96.0	8.8	65.0	26.2	
Other	57.6	42.4	18.9	23.4	59.1	40.9	3.0	97.0	13.8	59.0	27.3	
Bachelor's degree total	63.5	36.5	19.5	16.9	74.2	25.8	3.7	96.3	7.5	66.6	25.8	
Career education	58.5	41.5	20.9	20.7	75.2	24.8	4.5 !	95.5 !	6.6	67.4	26.0	
Academic	70.3	29.7	19.0	10.7	74.0	26.0	3.0 !	97.0 !	6.9	66.6	26.4	
Other	73.4	26.6	13.6	13.1	68.6	31.4	1.8 !	98.2 !	14.7	62.1	23.2	
Associate's degree total	40.7	59.3	24.6	34.7	56.1	43.9	5.7	94.3	11.9	60.1	28.0	
Career education	35.4	64.6	25.6	39.1	58.8	41.2	6.3	93.7	11.1	59.8	29.0	
Academic	50.5	49.5	23.9	25.6	50.7	49.3	5.9	94.1	12.5	62.5	25.0	
Other	49.9	50.1	21.8	28.3	51.3	48.7	3.3	96.7	14.1	58.2	27.7	
Certificate total	27.8	72.2	27.1	45.1	67.2	32.8	7.7	92.3	8.7	48.6	42.8	
Career education	27.4	72.6	27.2	45.4	68.4	31.6	7.6	92.4	9.2	48.5	42.3	
Academic	37.5	62.5	25.5	37.1	60.4	39.6	10.7	89.3	8.0	52.1	39.9	
Other	27.0	73.0	28.1	45.0	62.8	37.2	7.6	92.4	6.3	47.5	46.3	

! Interpret data with caution.

NOTE: Dependency status categorizes students based on whether they are dependent from their parents and whether the student had one or more dependents (i.e., children). Dependency status from parents is determined from the student's federal financial aid application; if not available, it was determined according to the federal criteria for independence of age 24 or older on December 31, 2003; a veteran of the U.S. Armed Forces; enrolled in a graduate or professional program beyond a bachelor's degree; married; orphan or ward of the court; or have legal dependents other than a spouse. "Other" major fields include interdisciplinary studies, basic skills, other miscellaneous majors, and unreported majors. See appendix A for detail on how majors were classified. Estimates include students from the 50 states, DC, and Puerto Rico. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90, 1999–2000, and 2003–04 National Postsecondary Student Aid Studies (NPSAS:90, NPSAS:2000, and NPSAS:04).

Table 3.15. Percentage distribution of credential-seeking undergraduates with each major field and level of credential sought, by work experience while enrolled, work orientation, and attendance status: 1990, 2000, and 2004

Major field and level of credential sought	Work experience while enrolled				Work orientation			Attendance status			
	Did not work	Worked, total	Worked part time	Worked full time	Student who works	Employee who studies	Does not work	Full-time/full-year	Full-time/part-year	Part-time/full-year	Part-time/part-year
1990											
All undergraduates	22.6	77.4	38.4	39.0	†	†	†	†	†	†	†
Career education	22.7	77.3	35.6	41.7	†	†	†	†	†	†	†
Academic	22.5	77.5	45.2	32.3	†	†	†	†	†	†	†
Other	22.4	77.6	40.7	37.0	†	†	†	†	†	†	†
Bachelor's degree total	20.8	79.2	47.3	31.9	†	†	†	†	†	†	†
Career education	19.6	80.4	46.0	34.4	†	†	†	†	†	†	†
Academic	22.3	77.7	50.2	27.6	†	†	†	†	†	†	†
Other	23.3	76.7	46.6	30.0	†	†	†	†	†	†	†
Associate's degree total	21.4	78.6	32.7	45.9	†	†	†	†	†	†	†
Career education	21.3	78.7	30.3	48.4	†	†	†	†	†	†	†
Academic	21.8	78.2	38.2	40.0	†	†	†	†	†	†	†
Other	21.3	78.7	37.6	41.1	†	†	†	†	†	†	†
Certificate total	32.5	67.5	23.1	44.4	†	†	†	†	†	†	†
Career education	33.4	66.6	22.5	44.1	†	†	†	†	†	†	†
Academic	30.8	69.2	30.9	38.3	†	†	†	†	†	†	†
Other	21.8	78.2	20.3	58.0	†	†	†	†	†	†	†

See notes at end of table.

Table 3.15. Percentage distribution of credential-seeking undergraduates with each major field and level of credential sought, by work experience while enrolled, work orientation, and attendance status: 1990, 2000, and 2004—Continued

Major field and level of credential sought	Work experience while enrolled				Work orientation			Attendance status			
	Did not work	Worked, total	Worked part time	Worked full time	Student who works	Employee who studies	Does not work	Full-time/full-year	Full-time/part-year	Part-time/full-year	Part-time/part-year
2000											
All undergraduates	20.1	79.9	41.7	38.2	49.8	30.0	20.2	42.0	13.7	22.3	22.0
Career education	19.4	80.6	39.3	41.3	47.5	33.0	19.5	39.4	14.8	23.6	22.2
Academic	20.6	79.4	48.4	31.0	57.1	22.2	20.7	49.2	11.8	19.8	19.2
Other	23.2	76.8	38.7	38.1	44.0	32.7	23.3	38.3	11.6	20.1	29.9
Bachelor's degree total	23.4	76.6	52.7	23.9	61.0	15.5	23.5	61.7	11.5	16.9	10.0
Career education	22.2	77.8	50.1	27.8	58.7	19.0	22.3	58.7	11.8	19.0	10.5
Academic	24.0	76.0	58.2	17.8	66.3	9.5	24.1	66.6	10.8	14.0	8.5
Other	29.8	70.2	48.8	21.4	54.1	16.0	29.9	62.2	11.7	13.5	12.7
Associate's degree total	15.8	84.2	33.9	50.3	44.2	39.8	15.9	27.8	13.0	28.3	31.0
Career education	15.7	84.3	33.2	51.1	44.1	40.1	15.8	28.9	13.1	28.8	29.2
Academic	15.6	84.4	35.6	48.9	45.7	38.7	15.7	26.3	13.4	28.0	32.4
Other	17.0	83.0	34.5	48.6	41.4	41.5	17.0	24.4	11.4	25.2	39.1
Certificate total	21.0	79.0	27.9	51.1	29.4	49.4	21.2	18.1	22.7	23.2	36.0
Career education	20.8	79.2	28.1	51.0	29.5	49.4	21.1	18.7	24.8	22.8	33.6
Academic	19.9	80.1	31.3	48.8	36.4	43.6	20.0	19.5	11.7	25.8	43.0
Other	23.7	76.3	21.1	55.2	20.5	55.7	23.7	9.6	12.4	24.1	53.8

See notes at end of table.

Table 3.15. Percentage distribution of credential-seeking undergraduates with each major field and level of credential sought, by work experience while enrolled, work orientation, and attendance status: 1990, 2000, and 2004—Continued

Major field and level of credential sought	Work experience while enrolled				Work orientation			Attendance status			
	Did not work	Worked, total	Worked part time	Worked full time	Student who works	Employee who studies	Does not work	Full-time/full-year	Full-time/part-year	Part-time/full-year	Part-time/part-year
2004											
All undergraduates	26.1	73.9	42.5	31.4	49.5	24.3	26.1	43.5	14.3	22.6	19.6
Career education	24.8	75.2	41.1	34.1	48.0	27.2	24.8	41.9	14.9	23.5	19.8
Academic	28.2	71.8	48.1	23.7	55.6	16.2	28.2	50.7	12.4	20.4	16.5
Other	28.8	71.2	38.8	32.4	45.6	25.6	28.8	37.9	14.7	22.4	25.0
Bachelor's degree total	29.3	70.7	46.4	24.3	53.5	17.2	29.3	59.3	12.5	16.5	11.6
Career education	26.9	73.1	45.1	28.0	52.3	20.8	26.9	57.6	12.7	17.5	12.2
Academic	31.3	68.7	50.7	17.9	58.2	10.5	31.3	63.3	11.7	15.3	9.8
Other	36.9	63.1	41.6	21.5	46.8	16.3	36.9	57.8	14.4	14.3	13.6
Associate's degree total	21.5	78.5	39.3	39.2	46.7	31.8	21.5	26.9	13.0	31.3	28.8
Career education	21.2	78.8	38.2	40.6	45.3	33.4	21.2	27.4	13.0	31.9	27.7
Academic	21.8	78.2	43.5	34.7	50.9	27.3	21.8	26.3	13.2	31.0	29.6
Other	22.2	77.8	38.3	39.5	46.6	31.1	22.2	24.7	12.5	29.5	33.3
Certificate total	29.5	70.5	32.4	38.1	36.9	33.6	29.5	23.5	33.8	17.4	25.4
Career education	29.0	71.0	32.9	38.1	37.3	33.7	29.0	22.8	34.6	17.7	24.9
Academic	30.2	69.8	35.1	34.8	42.5	27.3	30.2	31.3	27.8	14.9	26.0
Other	31.5	68.5	27.4	41.1	32.0	36.5	31.5	22.6	31.4	17.1	28.9

† Not applicable.

NOTE: "Other" major fields include interdisciplinary studies, basic skills, other miscellaneous majors, and unreported majors. See appendix A for detail on how majors were classified. Estimates include students from the 50 states, DC, and Puerto Rico. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90, 1999–2000, and 2003–04 National Postsecondary Student Aid Studies (NPSAS:90, NPSAS:2000, and NPSAS:04).

larger percentage identified themselves as employees enrolled in school (33 vs. 27 percent). No differences in employment or enrollment patterns were observed between career and academic majors pursuing certificates.

Table 3.16 presents a summary of selected comparisons between credential-seeking undergraduates with career and academic majors, overall and according to their credential level. The only characteristics for which a difference was found between career and academic majors at all three credential levels were age and financial independence. However, several differences were found among both bachelor's and associate's degree seekers, including differences related to sex, race/ethnicity, parents' education, marital status, and employment, although differences in the majority sex of career and academic majors were opposite at the two degree levels. Finally, differences in the postsecondary full-time enrollment status of career and academic majors were observed only at the baccalaureate level.

Student Characteristics by Career Major Field

As mentioned above, 49 percent of credential-seeking undergraduates with career majors sought a bachelor's degree, 41 percent sought an associate's degree, and 9 percent sought a certificate in 2004 (table 3.11). The level of credential that career majors sought varied by major field, however. A majority of career majors in the fields of communications (77 percent), public, social, and human services (65 percent), agriculture (65 percent), engineering and architectural sciences (63 percent), education (62 percent), and business and marketing (59 percent) were seeking a bachelor's degree in 2004, as well as about half of computer sciences majors (49 percent). About half or more of career students in the fields of legal services (65 percent), health care (56 percent), protective services (48 percent), and trade and industry (46 percent) were seeking an associate's degree. In none of the career fields were half or more of majors seeking a certificate in 2004.

The following sections describe the characteristics of all undergraduates majoring in the different career fields. Detail on the characteristics of bachelor's degree, associate's degree, and certificate students majoring in the different career fields can be found on the Career/Technical Education Statistics (CTES) website (<http://nces.ed.gov/surveys/ctes/>).⁵⁹

⁵⁹ Characteristics of undergraduates enrolled in selected majors as of 2004 can also be found on the National Science Foundation website for Women, Minorities, and Persons with Disabilities in Science and Engineering (<http://www.nsf.gov/statistics/wmpd/>) (National Science Foundation 2007). Some tables provide detail at different degree levels.

Table 3.16. Summary of selected comparisons between credential-seeking undergraduates with career and academic majors, by level of credential sought: 2004

Credential sought	Career versus academic majors								
	Male	Black	Parent has a bachelor's or higher degree	Age	Married	Financially independent	Worked full time while enrolled	"Employee who studies"	Enrolled full time for full year
All undergraduates	0	+	-	+	+	+	+	+	-
Bachelor's degree	+	+	-	+	+	+	+	+	-
Associate's degree	-	+	-	+	+	+	+	+	0
Certificate	0	0	0	+	0	+	0	0	0

NOTE: Plus sign means that students with career majors were more likely to have this characteristic or had a higher value on this characteristic than students with academic majors; minus sign means that students with career majors were less likely to have this characteristic or had a lower value on this characteristic than students with academic majors; and zero means that no measurable difference was found between the two student groups.

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

Sex, Race/Ethnicity, and Disability Status

Among undergraduates, the majority of career majors were female (58 percent) and were White (63 percent) in 2004 (table 3.17). Student demographics varied by career major field, however. The fields in which a majority of career majors were female included health care (83 percent), public, social, and human services (80 percent), education (80 percent), legal services (74 percent), personal and consumer services (70 percent), communications (59 percent), and business and marketing (55 percent). Male undergraduates constituted the majority in the career fields of trade and industry (92 percent), engineering and architectural sciences (81 percent), computer sciences (73 percent), and protective services (55 percent).⁶⁰ Students' race/ethnicity varied somewhat by career field of study. The largest concentrations of White undergraduates were found among agriculture and natural resources majors and education majors (83 and 71 percent, respectively, vs. 50–66 percent in other career fields), while the largest concentration of Black undergraduates was found in public, social, and human services (30 percent vs. 4–19 percent in other career fields). One of the largest concentrations of Hispanic undergraduates was found among legal services majors (16 vs. 9–14 percent),⁶¹ while some of the largest concentrations of Asian/Pacific Islander undergraduates were found among students majoring in computer sciences and engineering and architectural sciences (8 and 7 percent, respectively, vs. 1–6 percent in other career fields).⁶² Most career majors (89 percent) reported no disabilities in 2004 (table 3.18). Students with majors in public, social, and human services and in trade and industry had higher disability rates, however, than their peers with majors in most other career fields (15–16 vs. 10–14 percent).⁶³

Age, Marital Status, and Financial Independence

Overall, the majority of credential-seeking undergraduates with career majors (58 percent) were younger than age 25 in 2004, and about one-quarter (23 percent) were married (tables 3.17 and 3.18). As above, however, age and marital status sometimes varied by career field of study. About one-third of credential-seeking undergraduates majoring in public, social, and human

⁶⁰ The percentage of agriculture and natural resources majors who were male was not measurably different from 50 percent.

⁶¹ The percentage of Hispanics majoring in legal services was not measurably different from the percentages majoring in personal and consumer services, protective services, education, and trade and industry.

⁶² The percentages of Asian/Pacific Islanders majoring in computer sciences and in engineering and architectural sciences were not measurably different from the percentages majoring in public, social, and human services and in legal services.

⁶³ Majors in public, social, and human services and in trade and industry did not have measurably higher disability rates than majors in personal services, computer sciences, and legal services.

Table 3.17. Percentage distribution of credential-seeking undergraduates in career fields with each career major, by sex, race/ethnicity, and age: 1990, 2000, and 2004

Career major	Sex		Race/ethnicity ¹						Age		
	Male	Female	White	Black	Hispanic	Asian/ Pacific Islander	American Indian	Other	Younger than 25	25–34	35 or older
1990											
All credential-seeking undergraduates in career fields	44.1	55.9	74.8	11.6	8.5	4.3	0.8	†	59.6	23.8	16.6
Agriculture and natural resources	64.2	35.8	92.0	0.6	2.5	2.6	2.2	†	72.5	18.9	8.5
Business and marketing	43.1	56.9	73.5	12.3	9.0	4.7	0.6	†	61.8	22.1	16.1
Communications	45.8	54.2	74.9	13.7	7.3	4.0	#	†	75.0	18.7	6.4
Computer sciences	51.4	48.6	67.3	14.1	10.5	7.4	0.6	†	48.4	26.2	25.4
Education	20.5	79.5	82.9	6.3	7.9	1.9	1.0	†	59.9	21.5	18.5
Engineering and architectural sciences	79.7	20.3	75.5	6.9	9.1	7.5	1.0	†	68.0	23.7	8.3
Health care	22.5	77.5	77.8	12.7	5.7	2.9	0.9	†	51.9	27.5	20.5
Legal services	18.0	82.0	69.4	16.3	10.2	2.0	2.1	†	57.9	25.2	16.8
Personal and consumer services	24.9	75.1	69.3	17.0	9.2	4.1	0.3	†	64.0	20.9	15.1
Protective services	72.1	27.9	72.1	14.3	12.4	0.9	0.3	†	62.0	21.0	17.0
Public, social, and human services	18.8	81.2	74.3	14.0	10.0	0.9	0.7	†	58.6	21.4	20.0
Trade and industry	89.5	10.5	75.0	10.1	8.9	5.0	0.9	†	49.1	31.9	19.0

See notes at end of table.

Table 3.17. Percentage distribution of credential-seeking undergraduates in career fields with each career major, by sex, race/ethnicity, and age: 1990, 2000, and 2004—Continued

Career major	Sex		Race/ethnicity ¹						Age		
	Male	Female	White	Black	Hispanic	Asian/ Pacific Islander	American Indian	Other	Younger than 25	25–34	35 or older
2000											
All credential-seeking undergraduates in career fields	44.5	55.5	65.2	14.4	12.4	5.4	0.9	1.7	58.0	22.2	19.8
Agriculture and natural resources	60.4	39.6	88.5	1.8 !	6.0	2.5 !	0.9 !	0.2	81.3	10.9	7.8
Business and marketing	43.4	56.6	64.6	13.5	13.1	5.8	1.0	2.1	58.5	21.4	20.2
Communications	45.4	54.6	71.9	12.4	10.3	3.7	0.2 !	1.4	77.5	12.4	10.1
Computer sciences	64.1	35.9	57.9	15.9	10.1	12.1	1.0 !	3.0	47.2	26.9	26.0
Education	22.1	77.9	72.8	12.9	11.4	1.2	0.7	0.9	63.0	18.1	18.8
Engineering and architectural sciences	81.8	18.2	64.6	8.7	13.5	9.7	1.1	2.4 !	68.0	19.4	12.5
Health care	17.9	82.1	65.1	17.9	11.0	3.9	1.1	1.0	53.9	26.2	19.9
Legal services	28.4	71.6	55.3	19.9	19.3	2.5 !	2.9 !	0.1 !	50.5	22.0	27.5
Personal and consumer services	27.8	72.2	58.3	21.6	13.5	4.2	1.0 !	1.5 !	59.2	21.8	19.0
Protective services	64.2	35.8	65.9	15.4	16.5	0.7 !	0.5 !	0.9 !	62.6	23.0	14.4
Public, social, and human services	18.2	81.8	66.6	16.9	12.6	2.4 !	1.3 !	0.2 !	49.7	18.1	32.2
Trade and industry	91.4	8.6	64.4	13.1	16.2	4.4	0.7 !	1.1 !	46.0	28.5	25.6

See notes at end of table.

Table 3.17. Percentage distribution of credential-seeking undergraduates in career fields with each career major, by sex, race/ethnicity, and age: 1990, 2000, and 2004—Continued

Career major	Sex		Race/ethnicity ¹						Age		
	Male	Female	White	Black	Hispanic	Asian/ Pacific Islander	American Indian	Other	Younger than 25	25–34	35 or older
2004											
All credential-seeking undergraduates in career fields	42.0	58.0	62.9	16.6	11.1	4.9	0.9	3.7	58.0	23.1	18.9
Agriculture and natural resources	55.5	44.5	83.4	3.9	8.6	0.9 !	0.8 !	2.4 !	77.6	14.8	7.6
Business and marketing	45.2	54.8	61.5	17.3	10.8	6.0	0.9	3.5	57.0	22.7	20.3
Communications	41.4	58.6	65.7	14.0	10.1	3.8	0.7 !	5.7	82.0	11.5	6.5
Computer sciences	73.1	26.9	58.1	18.7	10.4	7.9	0.7	4.2	50.9	26.9	22.2
Education	19.8	80.2	70.9	12.2	11.1	2.0	0.7	3.1	66.7	17.1	16.2
Engineering and architectural sciences	80.6	19.4	65.4	11.9	10.4	7.5	1.0	3.9	69.8	18.5	11.7
Health care	16.6	83.4	61.1	18.9	11.2	4.3	0.9	3.6	47.3	29.1	23.6
Legal services	26.1	73.9	56.7	17.6	16.0	5.3 !	1.7 !	2.7	45.4	28.9	25.6
Personal and consumer services	29.7	70.3	60.4	17.7	14.0	3.1	1.0 !	3.7	64.1	21.5	14.4
Protective services	54.9	45.1	62.3	17.5	13.5	2.3	1.1	3.4	61.0	25.5	13.5
Public, social, and human services	20.0	80.0	49.8	30.3	9.6	5.7 !	1.7 !	2.9 !	42.6	26.2	31.2
Trade and industry	92.3	7.7	65.4	15.9	10.7	2.6	1.3 !	4.1	51.6	26.1	22.4

† Not applicable.

Rounds to zero.

! Interpret data with caution.

¹ Black includes African American, Hispanic includes Latino, Pacific Islander includes Native Hawaiian, and American Indian includes Alaska Native. "Other" includes multi-racial students. Race categories exclude Hispanic origin unless specified.

NOTE: Estimates include students from the 50 states, DC, and Puerto Rico. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90, 1999–2000, and 2003–04 National Postsecondary Student Aid Studies (NPSAS:90, NPSAS:2000, and NPSAS:04).

Table 3.18. Percentage distribution of credential-seeking undergraduates in career fields with each career major, by disability status, parents' highest education level, and marital status: 1990, 2000, and 2004

Career major	Disability status		Parents' highest education level					Marital status			
	Does not have disability	Has disability	Less than high school	High school diploma	Some college, including career training	Bachelor's degree or higher	Unknown	Single	Married	Separated	Unknown
1990											
All credential-seeking undergraduates in career fields	†	†	7.9	25.3	17.0	23.1	26.8	70.4	27.3	2.3	†
Agriculture and natural resources	†	†	3.1	29.1	17.3	33.8	16.7	83.1	14.4	2.5	†
Business and marketing	†	†	8.1	24.4	16.1	24.4	26.9	73.2	24.7	2.1	†
Communications	†	†	3.5	20.4	22.0	30.9	23.2	85.0	13.2	1.9	†
Computer sciences	†	†	9.1	23.0	16.1	19.4	32.4	64.9	32.5	2.6	†
Education	†	†	7.1	26.6	17.9	25.7	22.8	66.8	32.0	1.2	†
Engineering and architectural sciences	†	†	5.6	25.1	18.6	30.6	20.1	76.1	22.2	1.7	†
Health care	†	†	8.7	26.2	17.6	20.3	27.2	64.4	32.2	3.4	†
Legal services	†	†	11.3	30.4	15.4	11.0	31.9	69.2	24.6	6.2	†
Personal and consumer services	†	†	8.6	22.7	14.8	21.3	32.7	75.5	22.4	2.2	†
Protective services	†	†	7.2	28.4	21.0	17.4	26.1	68.5	29.6	1.9	†
Public, social, and human services	†	†	7.1	23.8	19.7	23.5	25.9	74.3	25.2	0.5	†
Trade and industry	†	†	9.8	29.1	14.4	13.7	32.9	58.4	39.6	1.9	†

See notes at end of table.

Table 3.18. Percentage distribution of credential-seeking undergraduates in career fields with each career major, by disability status, parents' highest education level, and marital status: 1990, 2000, and 2004—Continued

Career major	Disability status		Parents' highest education level					Marital status			
	Does not have disability	Has disability	Less than high school	High school diploma	Some college, including career training	Bachelor's degree or higher	Unknown	Single	Married	Separated	Unknown
2000											
All credential-seeking undergraduates in career fields	90.9	9.1	8.3	30.1	22.1	34.1	5.4	67.1	25.9	1.6	5.5
Agriculture and natural resources	89.6	10.4 !	0.8 !	26.1	22.4	45.2	5.6 !	77.1	15.1	0.5 !	7.4 !
Business and marketing	91.9	8.1	8.2	30.0	21.3	35.6	4.9	68.3	24.2	1.6	5.9
Communications	91.2	8.8	4.3	23.1	22.6	46.8	3.2	82.0	12.5	0.2 !	5.2
Computer sciences	87.9	12.1	10.0	30.7	19.1	33.3	6.8	62.6	29.3	2.7	5.5
Education	90.5	9.5	7.4	29.4	23.6	34.8	4.8	65.0	29.2	1.2	4.6
Engineering and architectural sciences	94.0	6.0	5.1	26.0	19.6	44.1	5.1	74.4	20.1	0.8 !	4.8
Health care	92.0	8.0	9.3	31.6	24.5	29.9	4.8	64.0	29.8	1.7	4.5
Legal services	91.0	9.0	8.4	30.6	29.6	19.4	12.0	52.1	26.1	1.2 !	20.7
Personal and consumer services	86.3	13.7	8.6	31.5	21.1	30.6	8.3	69.1	20.2	1.6 !	9.1
Protective services	92.7	7.3	7.2	32.6	27.3	29.0	3.9	70.0	27.6	1.1 !	1.2 !
Public, social, and human services	88.3	11.7 !	10.8	32.1	25.4	27.4	4.3	63.0	24.0	4.5	8.5
Trade and industry	88.2	11.8	12.8	35.5	18.7	24.4	8.7	61.2	31.1	1.3 !	6.3

See notes at end of table.

Table 3.18. Percentage distribution of credential-seeking undergraduates in career fields with each career major, by disability status, parents' highest education level, and marital status: 1990, 2000, and 2004—Continued

Career major	Disability status		Parents' highest education level					Marital status			
	Does not have disability	Has disability	Less than high school	High school diploma	Some college, including career training	Bachelor's degree or higher	Unknown	Single	Married	Separated	Unknown
2004											
All credential-seeking undergraduates in career fields	88.8	11.2	6.6	28.7	24.3	37.5	3.0	74.7	22.8	2.4	†
Agriculture and natural resources	89.9	10.1	2.8 !	22.8	25.0	48.3	1.1 !	87.9	11.2	0.9 !	†
Business and marketing	89.4	10.6	6.6	28.6	24.0	37.9	2.9	74.5	23.5	2.1	†
Communications	89.3	10.7	3.5	19.3	24.9	50.6	1.7	90.5	8.5	1.0 !	†
Computer sciences	86.9	13.1	6.1	28.2	22.9	39.4	3.5	72.6	25.4	1.9	†
Education	89.6	10.4	6.1	27.5	25.7	38.3	2.4	76.3	21.6	2.1	†
Engineering and architectural sciences	90.4	9.6	4.7	23.4	21.7	47.8	2.3	82.2	16.9	0.9	†
Health care	89.1	10.9	8.3	32.2	25.6	30.5	3.4	67.0	28.9	4.1	†
Legal services	87.2	12.8	10.3	34.3	23.6	27.0	4.7 !	67.2	28.2	4.6	†
Personal and consumer services	86.5	13.5	5.8	28.9	21.8	39.4	4.1	81.3	15.9	2.8	†
Protective services	88.9	11.1	6.9	30.8	26.6	32.7	3.1	78.5	19.5	2.0	†
Public, social, and human services	84.0	16.0	10.5	36.0	19.6	30.2	3.7	69.6	26.8	3.6	†
Trade and industry	85.1	14.9	6.7	32.1	24.2	33.5	3.5	71.7	26.1	2.2	†

† Not applicable.

! Interpret data with caution.

NOTE: Estimates include students from the 50 states, DC, and Puerto Rico. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90, 1999–2000, and 2003–04 National Postsecondary Student Aid Studies (NPSAS:90, NPSAS:2000, and NPSAS:04).

services were age 35 or older in 2004, and a larger percentage of these majors were 35 or older than career majors in all other fields except legal services (31 percent in public, social, and human services vs. 6–24 percent in other fields). With regard to marital status, a smaller percentage of communications majors and agriculture and natural resources majors were married than career majors in all other fields (9 and 11 percent vs. 16–29 percent).⁶⁴ The majority of credential-seeking undergraduates in career fields were financially independent (54 percent) and received financial aid (68 percent) (table 3.19). There were no measurable differences found among career fields in the percentage of majors receiving financial aid.

Parental Education

While a larger concentration of undergraduates with career majors had parents with a bachelor's or higher degree than any other level of education (38 vs. 3–29 percent), parental education also varied by career field of study (table 3.18). A larger percentage of students with majors in communications, in agriculture and natural resources, and in engineering and architectural sciences had at least one parent with a bachelor's degree than students in all other career fields (48–51 vs. 27–39 percent). As seen earlier, the majority of students majoring in these three fields were themselves seeking bachelor's degrees in 2004 (table 3.11). In contrast, a larger percentage of students with majors in public, social, and human services and in legal services than majors in most other career fields indicated that their parents' highest educational attainment was a high school diploma (34–36 vs. 19–32 percent).⁶⁵ As seen earlier, the majority of legal services majors were seeking associate's degrees in 2004 (table 3.11).

Prior Degrees and Postsecondary GPA

The majority of credential-seeking undergraduates with career majors did not have a prior bachelor's degree (94 percent) and had postsecondary grade point averages (GPAs) in the range of 2.0 to 3.49 (corresponding to grades of C to B+) (62 percent) (table 3.19). There was some variation in these educational characteristics across career fields of study. Public, social, and human services majors had higher rates of attaining a bachelor's degree prior to 2004 than under-

⁶⁴ The percentage of agriculture and natural resources majors who were married was not measurably different from the percentage for communications and personal and consumer services.

⁶⁵ No measurable differences were detected between the percentage of legal services majors whose parents' highest educational attainment was a high school diploma and the corresponding percentages of majors in trade and industry and in health care.

Table 3.19. Percentage distribution of credential-seeking undergraduates in career fields with each career major, by dependency status, financial aid status, previous bachelor's degree, and postsecondary GPA: 1990, 2000, and 2004

Career major	Dependency status		Financial aid status		Previous bachelor's degree		Postsecondary GPA		
	Dependent	Independent	Financial aid	No financial aid	Yes	No	Less than 2.0	2.0–3.49	3.5 or higher
1990									
All credential-seeking undergraduates in career fields	45.2	55.5	44.9	55.1	2.4	97.6	12.1	64.4	23.5
Agriculture and natural resources	65.9	34.1	44.7	55.3	3.3	96.7	14.9	64.8	20.3
Business and marketing	46.3	53.5	42.8	57.2	2.2	97.8	13.1	64.8	22.1
Communications	62.1	37.7	37.3	62.7	2.3	97.7	13.9	66.0	20.0
Computer sciences	34.7	65.3	44.8	55.2	4.2	95.8	12.6	55.1	32.4
Education	47.8	52.0	44.9	55.1	3.7	96.3	9.7	65.0	25.4
Engineering and architectural sciences	53.3	46.7	43.1	56.9	2.1	97.9	11.3	69.0	19.7
Health care	37.0	62.9	48.8	51.2	2.2	97.8	11.6	66.2	22.2
Legal services	36.9	63.1	54.6	45.4	1.9	98.1	10.6	58.5	30.9
Personal and consumer services	46.8	52.9	51.2	48.8	1.2	98.8	11.6	62.2	26.2
Protective services	43.8	56.1	39.2	60.8	3.3	96.7	17.4	64.8	17.9
Public, social, and human services	52.2	47.8	46.4	53.6	0.4	99.6	13.4	68.6	18.0
Trade and industry	29.6	70.3	44.8	55.2	1.1	98.9	8.4	57.1	34.5

See notes at end of table.

Table 3.19. Percentage distribution of credential-seeking undergraduates in career fields with each career major, by dependency status, financial aid status, previous bachelor's degree, and postsecondary GPA: 1990, 2000, and 2004—Continued

Career major	Dependency status		Financial aid status		Previous bachelor's degree		Postsecondary GPA		
	Depen- dent	Indepen- dent	Financial aid	No financial aid	Yes	No	Less than 2.0	2.0–3.49	3.5 or higher
2000									
All credential-seeking undergraduates in career fields	46.2	53.8	60.6	39.4	5.1	94.9	9.2	63.5	27.2
Agriculture and natural resources	69.7	30.3	57.4	42.6	3.7 !	96.3	12.3	72.4	15.3
Business and marketing	48.3	51.7	59.8	40.2	2.4	97.6	10.1	64.4	25.5
Communications	69.4	30.6	59.2	40.8	2.2	97.8	7.9	72.6	19.6
Computer sciences	36.8	63.2	61.7	38.3	9.2	90.8	8.7	57.3	33.9
Education	51.3	48.7	60.4	39.6	8.6	91.4	8.3	63.7	28.0
Engineering and architectural sciences	58.5	41.5	60.3	39.7	5.6	94.4	9.6	64.5	25.9
Health care	39.2	60.8	62.8	37.2	5.7	94.3	9.5	64.3	26.1
Legal services	34.4	65.6	63.9	36.1	4.4	95.6	10.6	64.6	24.7
Personal and consumer services	42.6	57.4	62.4	37.6	3.1	96.9	8.1	62.5	29.4
Protective services	47.1	52.9	57.0	43.0	2.5	97.5	9.2	67.1	23.7
Public, social, and human services	38.5	61.5	64.2	35.8	6.6	93.4	7.4 !	59.5	33.1
Trade and industry	33.5	66.5	56.3	43.7	3.8	96.2	8.4	57.2	34.4

See notes at end of table.

Table 3.19. Percentage distribution of credential-seeking undergraduates in career fields with each career major, by dependency status, financial aid status, previous bachelor's degree, and postsecondary GPA: 1990, 2000, and 2004—Continued

Career major	Dependency status		Financial aid status		Previous bachelor's degree		Postsecondary GPA		
	Dependent	Independent	Financial aid	No financial aid	Yes	No	Less than 2.0	2.0–3.49	3.5 or higher
2004									
All credential-seeking undergraduates in career fields	46.0	54.0	67.8	32.2	5.5	94.5	8.7	62.5	28.8
Agriculture and natural resources	66.9	33.1	64.2	35.8	4.8	95.2	11.5	70.3	18.2
Business and marketing	45.3	54.7	66.7	33.3	4.8	95.2	8.6	63.8	27.6
Communications	72.0	28.0	68.6	31.4	2.9	97.1	8.8	70.1	21.1
Computer sciences	40.6	59.4	68.0	32.0	6.1	93.9	9.1	58.5	32.3
Education	55.0	45.0	68.1	31.9	4.3	95.7	7.7	62.8	29.6
Engineering and architectural sciences	60.6	39.4	69.0	31.0	4.5	95.5	8.2	65.2	26.6
Health care	33.0	67.0	68.5	31.5	7.8	92.2	8.0	60.9	31.1
Legal services	29.7	70.3	71.9	28.1	7.9	92.1	10.4	57.8	31.8
Personal and consumer services	50.6	49.4	67.6	32.4	4.7	95.3	9.0	59.7	31.4
Protective services	47.4	52.6	65.9	34.1	3.9	96.1	12.6	63.8	23.6
Public, social, and human services	30.8	69.2	73.6	26.4	10.1	89.9	9.5	60.4	30.1
Trade and industry	41.6	58.4	65.5	34.5	7.0	93.0	10.0	55.4	34.6

! Interpret data with caution.

NOTE: Estimates include students from the 50 states, DC, and Puerto Rico. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90, 1999–2000, and 2003–04 National Postsecondary Student Aid Studies (NPSAS:90, NPSAS:2000, and NPSAS:04).

graduate majors in most other career fields (10 vs. 3–8 percent).⁶⁶ In addition, about one-third of undergraduates majoring in the fields of trade and industry, computer sciences, legal services, personal and consumer services, health care, and in public, social, and human services had GPAs of 3.5 or higher in 2004, while smaller percentages of majors in other career fields attained this GPA level.

Employment and Enrollment Status

The majority (75 percent) of undergraduates seeking a credential in a career field in 2004 worked while they were enrolled (table 3.20). Despite this high employment rate, more career majors considered themselves primarily as “students who work” rather than as “employees who study” (48 vs. 27 percent). In addition, more career majors attended postsecondary education full time for the full 2003–04 academic year than attended either part time, part year, or both (42 vs. 15–23 percent). Nevertheless, there was some variation in employment and enrollment patterns by career field of study. A higher percentage of majors in protective services were employed than their peers in other career major fields (79 vs. 67–76 percent), with the exceptions of legal services (79 percent), business and marketing (77 percent), and computer sciences (77 percent), with which there were no measurable differences. A larger percentage of communications and agriculture and natural resources majors considered themselves primarily as students who work (60–61 vs. 41–56 percent) and attended school full time for the full academic year (56–57 vs. 32–52 percent) than majors in most other career fields (table 3.20).⁶⁷ The majority of students majoring in these two fields were seeking bachelor’s degrees (65–77 percent) (table 3.11). In contrast, a larger percentage of legal services majors—the majority of whom were pursuing associate’s degrees in 2004 (65 percent) (table 3.11)—considered themselves primarily as employees who study than career majors in most other fields (36 vs. 12–33 percent).⁶⁸ Additionally, a smaller percentage of legal services majors were enrolled full time for the full academic year than credential-seeking undergraduates in most other career majors (31 vs. 33–57

⁶⁶ No measurable differences were found between the percentage of majors in public, social, and human services who attained a bachelor’s degree prior to 2004 and the corresponding percentages of those majoring in legal services, health care, and trade and industry.

⁶⁷ No measurable differences were detected in the percentages of agriculture and natural resources and of education majors who considered themselves as students who work or were enrolled full time for the full academic year. In addition, no measurable difference was detected in the percentages of agriculture and natural resources and of engineering majors who were enrolled full time for the full academic year.

⁶⁸ No measurable differences were detected in the percentages of legal services majors and majors in computer sciences, business and marketing, and public, social, and human services who considered themselves as employees who study.

Table 3.20. Percentage distribution of credential-seeking undergraduates in career fields with each career major, by work experience while enrolled, work orientation, and attendance status: 1990, 2000, and 2004

Career major	Work experience while enrolled				Work orientation			Attendance status			
	Did not work	Worked, total	Worked part time	Worked full time	Student who works	Employee who studies	Does not work	Full-time/full-year	Full-time/part-year	Part-time/full-year	Part-time/part-year
1990											
All credential-seeking undergraduates in career fields	22.7	77.3	35.6	41.7	—	—	—	—	—	—	—
Agriculture and natural resources	16.4	83.6	44.5	39.1	—	—	—	—	—	—	—
Business and marketing	20.8	79.2	34.8	44.4	—	—	—	—	—	—	—
Communications	22.8	77.2	41.6	35.6	—	—	—	—	—	—	—
Computer sciences	23.5	76.5	27.9	48.6	—	—	—	—	—	—	—
Education	24.0	76.0	44.2	31.8	—	—	—	—	—	—	—
Engineering and architectural sciences	19.2	80.8	36.4	44.4	—	—	—	—	—	—	—
Health care	24.2	75.8	39.8	36.0	—	—	—	—	—	—	—
Legal services	34.1	65.9	26.9	39.0	—	—	—	—	—	—	—
Personal and consumer services	31.9	68.1	38.0	30.1	—	—	—	—	—	—	—
Protective services	17.8	82.2	23.9	58.3	—	—	—	—	—	—	—
Public, social, and human services	22.1	77.9	45.7	32.2	—	—	—	—	—	—	—
Trade and industry	23.5	76.5	22.1	54.3	—	—	—	—	—	—	—

See notes at end of table.

Table 3.20. Percentage distribution of credential-seeking undergraduates in career fields with each career major, by work experience while enrolled, work orientation, and attendance status: 1990, 2000, and 2004—Continued

Career major	Work experience while enrolled				Work orientation			Attendance status			
	Did not work	Worked, total	Worked part time	Worked full time	Student who works	Employee who studies	Does not work	Full-time/full-year	Full-time/part-year	Part-time/full-year	Part-time/part-year
2000											
All credential-seeking undergraduates in career fields	19.4	80.6	39.3	41.3	47.5	33.0	19.5	39.4	14.8	23.6	22.2
Agriculture and natural resources	23.1	76.9	54.4	22.5	64.1	12.8	23.2	57.8	11.7	18.3	12.2
Business and marketing	18.4	81.6	36.1	45.5	45.3	36.2	18.5	40.1	13.1	23.9	22.9
Communications	18.8	81.2	55.4	25.8	62.9	18.2	18.9	54.9	10.3	20.1	14.7
Computer sciences	19.3	80.7	32.8	47.9	40.6	40.0	19.4	30.9	18.8	25.1	25.2
Education	20.5	79.5	46.0	33.5	54.3	25.0	20.7	43.7	11.5	24.0	20.7
Engineering and architectural sciences	21.5	78.5	40.0	38.5	51.6	26.8	21.7	47.4	10.9	24.0	17.8
Health care	20.2	79.8	43.0	36.8	49.5	30.2	20.3	38.2	16.5	23.9	21.4
Legal services	22.7	77.3	29.0	48.3	40.0	36.7	23.3	33.6	17.9	27.3	21.2
Personal and consumer services	25.1	74.9	43.9	31.0	47.2	27.1	25.7	35.1	24.9	18.9	21.1
Protective services	11.5	88.5	32.7	55.8	46.7	41.8	11.5	36.5	14.3	19.9	29.4
Public, social, and human services	19.0	81.0	44.4	36.6	47.6	33.3	19.1	39.7	11.3	25.0	24.0
Trade and industry	18.0	82.0	27.6	54.5	31.5	50.4	18.1	27.0	20.9	24.0	28.2

See notes at end of table.

Table 3.20. Percentage distribution of credential-seeking undergraduates in career fields with each career major, by work experience while enrolled, work orientation, and attendance status: 1990, 2000, and 2004—Continued

Career major	Work experience while enrolled				Work orientation			Attendance status			
	Did not work	Worked, total	Worked part time	Worked full time	Student who works	Employee who studies	Does not work	Full-time/full-year	Full-time/part-year	Part-time/full-year	Part-time/part-year
2004											
All credential-seeking undergraduates in career fields	24.8	75.2	41.1	34.1	48.0	27.2	24.8	41.9	14.9	23.5	19.8
Agriculture and natural resources	27.2	72.8	51.2	21.6	60.2	12.6	27.2	56.1	12.1	21.0	10.7
Business and marketing	22.7	77.3	37.9	39.3	45.3	32.0	22.7	41.2	15.0	22.4	21.5
Communications	26.5	73.5	52.3	21.2	61.1	12.4	26.5	56.8	13.4	16.9	12.8
Computer sciences	22.9	77.1	35.9	41.2	43.9	33.2	22.9	38.2	16.1	23.1	22.5
Education	24.3	75.7	49.2	26.5	55.7	20.1	24.3	51.2	9.9	22.5	16.4
Engineering and architectural sciences	32.8	67.2	41.4	25.7	48.5	18.7	32.8	52.0	12.3	20.7	15.0
Health care	24.3	75.7	41.7	34.0	45.6	30.0	24.3	32.8	15.9	29.3	21.9
Legal services	21.0	79.0	32.2	46.7	42.6	36.4	21.0	31.5	19.5	20.4	28.6
Personal and consumer services	30.0	70.0	41.7	28.4	47.7	22.3	30.0	43.3	22.2	18.2	16.2
Protective services	20.7	79.3	39.7	39.6	52.6	26.6	20.7	41.2	13.5	25.0	20.3
Public, social, and human services	27.4	72.6	34.3	38.3	40.9	31.6	27.4	37.3	16.3	23.7	22.7
Trade and industry	25.2	74.8	35.9	38.9	44.3	30.5	25.2	34.9	20.7	21.4	23.0

— Not available.

NOTE: Estimates include students from the 50 states, DC, and Puerto Rico. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90, 1999–2000, and 2003–04 National Postsecondary Student Aid Studies (NPSAS:90, NPSAS:2000, and NPSAS:04).

percent), and a larger percentage were enrolled part time for part of the academic year than most other career majors (29 vs. 11–23 percent) (table 3.20).⁶⁹

Table 3.21 presents a summary of selected characteristics of undergraduates seeking credentials in career fields in 2004 according to their specific career major fields. Several patterns emerge. For example, as mentioned above, higher concentrations of students with majors in the fields of agriculture and natural resources, communications, and engineering and architectural sciences had at least one parent with a bachelor's or higher degree than other career majors, and the majority of the majors in these three fields were themselves seeking bachelor's degrees. Moreover, agriculture and natural resources majors and communications majors had higher rates of enrolling full time for the full academic year than other career majors. In contrast, higher percentages of legal services majors in 2004 were over 35 years old, had parents whose highest educational degree was a high school diploma, and were financially independent. The majority of these legal services majors were seeking an associate's degree.

Changes in Undergraduates Majoring in Career Education: 1990 and 2004

Changes in the Prevalence of Career Majors

Between 1990 and 2004, the number of credential-seeking undergraduates majoring in career fields increased by about one-half million students (from 10.1 to 10.6 million) (table 3.8). Over the same period, the number of credential-seeking undergraduates majoring in academic fields increased by about 400,000 students (from 3.6 to 4.0 million) and the number majoring in “other” fields increased by about 800,000 students (from 1.4 to 2.2 million).⁷⁰ As a result of these changes, career majors represented a smaller percentage of the total credential-seeking undergraduate population by the end of the period (63 percent down from 67 percent).

The number of career majors increased between 1990 and 2004 among both associate's and bachelor's degree seekers (from 3.8 to 4.4 million and from 4.2 to 5.3 million, respectively), while the number of certificate-seeking undergraduates majoring in career education decreased (from 2.1 to 1.0 million) (table 3.8). Over the same period, there was no measurable change in the percentage of bachelor's degree seekers with career majors (59–60 percent), although the per-

⁶⁹ No measurable differences were detected in the percentages of legal services majors and majors in health care, trade and industry, and public, social, and human services who were enrolled full time for the full academic year, nor were measurable differences detected in the percentages of legal services majors and majors in public, social, and human services, trade and industry, and computer sciences who were enrolled part time for part of the academic year.

⁷⁰ “Other” major fields include interdisciplinary studies, basic skills, other unspecified majors, and undeclared majors. See appendix A for detail on how majors were classified.

Table 3.21. Summary of selected characteristics of credential-seeking undergraduates with specific career majors: 2004

Specific career major	Majority seeking a bachelor's degree	Majority seeking an associate's degree	Majority female ¹	Among career majors, highest concentrations of students who were:			A "student who works"	Among career majors, highest rates of:			
				White	Black	35 years or older		Having a parent with a bachelor's degree or higher	Having a parent whose highest degree is a high school diploma	Attending full time for full academic year	Earning a postsecondary GPA below 3.5
Agriculture and natural resources	✓			✓			✓	✓		✓	✓
Business and marketing	✓		✓								
Communications	✓		✓				✓	✓		✓	
Computer sciences											
Education	✓		✓	✓							
Engineering and architectural sciences	✓							✓			
Health care		✓									
Legal services		✓							✓		
Personal and consumer services			✓								
Protective services											
Public, social, and human services	✓		✓		✓	✓			✓		
Trade and industry											

¹ Male students were the majority in the remaining career fields except agriculture and natural resources where there were no measurable differences between males and females. SOURCE: U.S. Department of Education, National Center for Education Statistics, 2003–04 National Postsecondary Student Aid Study (NPSAS:04).

centage of associate's degree seekers with career majors decreased (from 69 to 64 percent) as did the percentage of certificate seekers (from 87 to 81 percent). Nevertheless, career majors still represented the majority of credential-seeking undergraduates at each credential level in 2004 (60–81 percent).

The number of students majoring in career education increased in some fields between 1990 and 2004, but decreased in others (table 3.10). Particularly notable was the increase in health care majors, who grew in number from 1.7 to 2.3 million and in percentage from 17 to 22 percent of all career majors, with most of this growth occurring during the period from 2000 to 2004. A notable decrease between 1990 and 2004 occurred in business and marketing, where both the number of majors (from 3.4 to 2.9 million) and their percentage among all career majors (from 34 to 28 percent) declined. Another notable change occurred in computer sciences. While the number and percentage of computer sciences majors increased over the entire period from 1990 to 2004, the interim period from 2000 to 2004 saw a decrease in both the number of computer sciences majors (from 1.3 million to about 900,000) and the percentage of all career majors who were in this field (from 12 to 9 percent).

Changes between 1990 and 2004 in the percentage of students majoring in different career fields varied across credential levels. For example, the percentage of students majoring in the health care field increased at the associate's degree (from 19 to 30 percent) and certificate (from 17 to 40 percent) levels, but did not change measurably at the bachelor's degree level (12–14 percent in each year) (table 3.10). In contrast, the percentage of computer sciences majors showed a measurable increase only at the bachelor's degree level (from 6 to 9 percent). Over the same period, the percentage of students majoring in business and marketing declined at all three credential levels (from 37 to 33 percent of bachelor's degree seekers, 36 to 25 percent of associate's degree seekers, and 25 to 11 percent of certificate seekers).

Over the period from 1990 to 2004 changes occurred in the types of credentials that career majors sought (table 3.11). The percentages of career majors seeking bachelor's and associate's degrees increased (from 42 to 49 percent and from 37 to 41 percent, respectively), while the percentage seeking certificates decreased (from 20 to 9 percent). Some changes also occurred in the type of credential that students with various career majors sought. For example, among students majoring in communications, protective services, legal services, business and marketing, computer sciences, engineering and architectural sciences, and trade and industry, the percentage seeking bachelor's degrees increased (by 7 to 16 percentage points). Among students majoring in trade and industry, public, social, and human services, health care, education, legal services, personal and consumer services, and computer sciences, the percentage seeking an associate's degree increased (by 5 to 17 percentage points). With the exception of majors in the fields of

agriculture and natural resources and personal and consumer services, the percentage of career majors seeking certificates decreased in all career fields (by 4 to 23 percentage points).⁷¹

Changes in the Student Characteristics of Career and Academic Majors

This section focuses on how the characteristics of career majors changed between 1990 and 2004, compares these changes with those for academic majors, and compares changes among career majors according to their credential level.

Sex and Race/Ethnicity

Females constituted 58 percent of all career majors in 2004, a percentage that was not measurably different from 1990 (table 3.12). Over the same period, however, the percentage of academic majors who were female increased from 55 to 58 percent. While there was no measurable change between 1990 and 2004 in the percentage of bachelor's degree seekers in career fields who were female, the percentages of associate's degree and certificate seekers in career fields who were female increased from 58 to 62 percent and from 58 to 66 percent, respectively. The racial/ethnic composition of undergraduates with career majors also changed between 1990 and 2004. The percentage of credential-seeking undergraduate career majors who were White decreased (from 75 to 63 percent), while the percentage of career majors who were Black increased (from 12 to 17 percent). A similar decrease occurred in the percentage of academic majors who were White, although there were measurable increases over the period both in the percentage of academic majors who were Black and in the percentage of these majors who were Hispanic.

Age and Financial Aid

No measurable changes were detected in the age distributions of either career or academic majors between 1990 and 2004 (table 3.12). However, the percentage of students receiving financial aid increased between 1990 and 2004, from 45 to 68 percent for career majors and from 40 to 66 percent for academic majors (table 3.14). Increases in the receipt of financial aid by career majors were found during this period at all credential levels.

⁷¹ Apparent decreases of majors in the fields of agriculture and natural resources and personal and consumer services were not statistically significant.

Parental Education

Overall, career majors in 2004 appeared to have better educated parents than their counterparts who were enrolled in 1990 (table 3.13), but the large percentage of students in 1990 who did not report their parents' highest level of education (27 percent) makes this observation difficult to confirm. Between 2000 and 2004, the percentage of career majors who had at least one parent with a bachelor's degree increased from 34 to 37 percent. At the same time, there was no measurable change in the percentage of academic majors whose parents had attained this level of education. The only credential level at which there was a measurable increase between 2000 and 2004 in the percentage of career majors with at least one parent with a bachelor's or higher degree was the certificate level.

Prior Degrees and Postsecondary GPA

Over the period from 1990 to 2004, the percentage of career majors who had previously earned a bachelor's degree increased from 2 to 6 percent, while there was no measurable difference in the percentage of academic majors with such a degree (table 3.14). Among career majors, the only substantive increase was among associate's degree seekers, where the percentage who had previously earned a bachelor's degree increased by the same overall amount (from 2 to 6 percent). The percentage of students earning high GPAs (3.5 or higher) increased between 1990 and 2004 among both career and academic majors; this pattern was detectable for career majors at all three credential levels.

Employment and Enrollment Status

While there was no substantive change between 1990 and 2004 in the percentage of credential-seeking undergraduates majoring in career fields who worked while enrolled (75–77 percent), the percentage of academic majors who worked while enrolled decreased from 77 to 72 percent (table 3.15). However, the percentage of career majors who worked part time increased over the period (from 36 to 41 percent), while the percentage who worked full time decreased (from 42 to 34 percent). These patterns held for career majors pursuing associate's degrees and certificates. While the percentage of bachelor's degree-seeking career majors who worked part time did not measurably change, the percentage of those who worked full time decreased.

Changes in Student Characteristics by Career Major Field

The following sections describe changes in the characteristics of all undergraduates majoring in the different career fields. Detail on the characteristics of bachelor's degree, associate's

degree, and certificate students majoring in the different career fields can be found on the Career/Technical Education Statistics (CTES) website (<http://nces.ed.gov/surveys/ctes/>).⁷²

Sex and Race/Ethnicity

As described above, the gender composition of undergraduates majoring in career education overall did not change significantly between 1990 and 2004 (table 3.17), although changes were apparent in some fields. Specifically, the percentage of career majors who were female increased over the period in the fields of protective services, agriculture and natural resources, health care, and communications (by 4 to 17 percentage points), and decreased in computer sciences and legal services (by 8 to 22 percentage points). The largest increase in the representation of females was in protective services, where the percentage of female majors increased from 28 to 45 percent, while the largest decrease occurred in computer sciences, where the percentage of female majors declined from 49 to 27 percent.

As described above, a smaller percentage of career majors overall were White in 2004 than in 1990, and a larger percentage were Black (table 3.17). The percentage of career majors who were White decreased in all career fields between 1990 and 2004 (decreases ranged from 8 to 25 percentage points), while the percentage of career majors who were Black increased in 9 out of 12 career fields (increases ranged from 3 to 16 percentage points) (the exceptions were personal and consumer services, legal services, and communications). The percentage of career majors who were Hispanic increased in the fields of agriculture and natural resources, legal services, health care, and personal and consumer services (increases ranged from 5 to 6 percentage points), and the percentage of career majors who were Asian or Pacific Islander increased in public, social, and human services by 5 percentage points.⁷³

Age and Financial Aid

Overall, among undergraduates there was no measurable change in the age distribution of career majors between 1990 and 2004 (table 3.17). However, there were changes in a number of career fields. In several fields, the mix of career majors was generally younger (in the “younger than 25” category) in 2004 than in 1990 (including agriculture and natural resources, communications, computer sciences, and education). In other fields, the mix of career majors was generally older (in the “35 or older” category) at the end of the period (including health care, business

⁷² Recent trends (1995–2004) in the characteristics of undergraduates enrolled in selected majors can also be found on the National Science Foundation website for Women, Minorities, and Persons with Disabilities in Science and Engineering (<http://www.nsf.gov/statistics/wmpd/>) (National Science Foundation 2007). Some tables provide detail at different degree levels.

⁷³ There were no measurable changes in the percentage of majors in any career field who were American Indian.

and marketing, legal services, and public, social, and human services). Career majors in all fields were more likely to receive financial aid in 2004 than in 1990 (64–74 vs. 37–55 percent) (table 3.19).

Parental Education

Career majors in several fields had better educated parents in 2004 than did their counterparts in 2000 (table 3.18).⁷⁴ The percentage of students with at least one parent who had a bachelor's or higher degree increased between 2000 and 2004 in the fields of trade and industry, personal and consumer services, legal services, computer sciences, and education (by 4 to 9 percentage points).

Prior Degrees and Postsecondary GPA

An increase in the percentage of career majors who had a prior bachelor's degree was observed in 5 out of the 12 career fields (public, social, and human services; legal services; trade and industry; health care; and personal and consumer services), while no measurable change was found for the rest of the career fields (table 3.19). An increase between 1990 and 2004 in the percentage of students earning GPAs of 3.5 or higher was evident in over half of the career fields (public, social, and human services; health care; engineering and architectural sciences; protective services; business and marketing; personal and consumer services; and education).

Employment and Enrollment Status

As noted above, no measurable change occurred between 1990 and 2004 in the percentage of career majors who worked while enrolled, but more of these students worked part time (41 vs. 36 percent) and fewer worked full time (34 vs. 42 percent) in 2004 compared with 1990 (table 3.20). This pattern held for most career program areas. However, a larger percentage of legal services majors worked while enrolled in 2004 than in 1990 (79 vs. 66 percent), and smaller percentages of majors in the following fields worked while enrolled: agriculture and natural resources; engineering and architectural sciences; public, social, and human services; and communications (67–74 percent vs. 77–84 percent). Also in contrast to the overall trend, majors in legal services and in public, social, and human services worked full time in larger percentages in 2004 than in 1990 (47 vs. 39 percent and 38 vs. 32 percent, respectively).

⁷⁴ The relatively large percentage of students in 1990 who did not report their parents' education level makes it difficult to compare this year with subsequent years.

D. WHO TEACHES CAREER EDUCATION?

About 10.6 million credential-seeking undergraduates majored in career fields in 2004 in the about 5,700 postsecondary institutions that awarded credentials in career fields (tables 3.8 and 3.1, respectively). Career education represented a substantial percentage of the total undergraduate enterprise: 90 percent of institutions offered programs in career fields in 2005 and 63–67 percent of students majored in this area in the years studied in this report.

This section of the report turns to the question of who taught postsecondary career education during this period. The section draws upon data collected from the National Study of Postsecondary Faculty (NSOPF) in the fall of 1992, 1998, and 2003 to describe the size of the postsecondary career education teaching force, their teaching conditions and background characteristics, and how they compare with their academic colleagues. The analysis focuses on “teaching faculty,” defined as all faculty and instructional staff who taught at least one class during the fall semester of the year. NSOPF includes all such teaching faculty at 4- and 2-year public and private not-for-profit postsecondary institutions. Unlike the surveys described in the other sections of this chapter, NSOPF is restricted to 2- and 4-year not-for-profit degree-granting postsecondary institutions and thus does not include teaching faculty in less-than-2-year institutions or in for-profit institutions. About 50 percent of the postsecondary certificates, 21 percent of the associate’s degrees, and 5 percent of the bachelor’s degrees awarded in career fields in 2005 were awarded by these excluded institutions.⁷⁵ Thus, the teaching faculty described in this section are likely to underrepresent those who taught in postsecondary certificate and associate’s degree programs, in particular, in career fields. The teaching faculty described here, however, include those who taught noncredit as well as for-credit courses at the included institutions.

Due to the way that the survey questions were asked, postsecondary teaching faculty are classified by the level of their postsecondary institution (4- or 2-year), rather than by the credential level of the students they taught. Teaching faculty were classified as career, academic, or “other” based on their principal teaching field (as indicated in exhibit 1.2). Some of the career fields were combined or further subdivided for this faculty analysis. Additional information on NSOPF and the classification used in this section can be found in appendix A.

This section of the report describes postsecondary faculty who taught in career fields in fall 1992, fall 1998, and fall 2003 and compares them with their academic colleagues. The section also compares career education faculty at the four main institution types (public and private not-for-profit 4-year and 2-year institutions) and compares faculty in the 11 specific career fields presented. Additional detail on the characteristics of faculty in specific career fields at different

⁷⁵ See table 3.35 later in this report.

postsecondary institution types can be found on the Career/Technical Education Statistics (CTES) website (<http://nces.ed.gov/surveys/ctes/>).

The Size of the Postsecondary Career Education Teaching Force: Fall 2003

Just over one-half million faculty taught in career fields at not-for-profit degree-granting postsecondary institutions in fall 2003 (table 3.22). The largest group of career faculty taught in public 4-year institutions (39 percent), followed by public 2-year institutions (34 percent) and private not-for-profit 4-year institutions (26 percent), and trailed by private not-for-profit 2-year institutions (1 percent) (table 3.23). No measurable difference was found in the overall number of career and academic teaching faculty in this semester (522,000 and 509,000, respectively) (table 3.22). A larger percentage of academic faculty taught at private not-for-profit 4-year institutions compared with career faculty (30 vs. 26 percent) while a larger percentage of career than academic faculty taught at public 2-year institutions (34 vs. 31 percent) (table 3.23). Because of small sample sizes and large standard errors, teaching faculty in private not-for-profit 2-year institutions are generally not discussed in the rest of this chapter.

The three largest postsecondary career teaching fields in fall 2003 were health (109,000 teaching faculty), education (95,000 teaching faculty), and business (82,000 teaching faculty) (table 3.22). Although these three fields were among the largest career teaching fields at each of the three institution types for which data were available, the prevalence of career fields varied somewhat by institution type. At each of the main institution types examined, additional fields were also among the largest career teaching fields. At public 4-year institutions, engineering and architectural sciences (27,000 teaching faculty) was among the top four career fields. At private not-for-profit 4-year institutions, public, social, human, and legal services (14,000 teaching faculty) figured among the top four fields.⁷⁶ At public 2-year institutions, computer science (24,000 teaching faculty) was among the top four fields. These findings are consistent with those in the previous section, which showed that business and marketing, health care, and education were the most common career majors among credential-seeking undergraduates in 2004.

The majority of all agriculture and natural resources teaching faculty (67 percent) taught at public 4-year institutions in fall 2003 (table 3.23). In contrast, the majority of all teaching faculty in the fields of protective services (70 percent) and trade and industry (82 percent) taught at pub-

⁷⁶ Engineering and architectural sciences was not measurably different from public, social, human, and legal services at private not-for-profit 4-year institutions.

Table 3.22. Number of teaching faculty, by level of institution and sector, principal teaching field, and specific career field: Fall 1992, 1998, and 2003

Principal teaching field and specific career field	Total	4-year		2-year	
		Public	Private not- for-profit	Public	Private not- for-profit
1992					
All faculty	830,000	322,000	228,400	265,600	14,000
Principal teaching field					
Career education	397,200	158,600	107,900	124,000	6,700
Academic	394,900	152,300	112,800	122,900	6,900
Other	37,900	11,100	7,600	18,600	500 !
Specific career field					
Agriculture and natural resources	7,200	5,000	800 !	1,400	100 !
Business	6,600 !	800 !	300 !	5,100 !	400 !
Communications and design	23,400	9,400	8,300	5,200	600 !
Computer science	26,400	7,500	5,500	13,000	300 !
Engineering and architectural sciences	42,900	22,100	8,900	11,600	300 !
Health care	96,900	43,100	25,800	25,700	2,200 !
Personal and consumer services	12,100	4,900	2,100	4,700	300 !
Protective services	6,800	1,100	500 !	5,300	#
Public, social, human, and legal services	33,700	9,300	18,600	5,400	400 !
Education	58,000	30,800	15,100	11,600	500 !
Trade and industry	16,100	1,600	1,000 !	13,400	#
1998					
All faculty	927,300	370,500	262,900	282,400	11,500 !
Principal teaching field					
Career education	445,900	183,000	125,100	132,500	5,400 !
Academic	442,600	176,700	129,600	130,500	5,700 !
Other	38,700	10,800	8,200	19,400	400 !
Specific career field					
Agriculture and natural resources	8,900	6,600	400 !	1,800	#
Business	68,400	20,600	23,800	22,100	1,800 !
Communications and design	23,400	9,900	7,600	5,600	300 !
Computer science	37,100	9,800	7,300	19,400	500 !
Engineering and architectural sciences	41,800	24,600	9,100	8,000	#
Health care	107,400	48,300	30,600	27,700	900 !
Personal and consumer services	9,300	4,300	1,400 !	3,500	200 !
Protective services	9,300	2,500	700	6,000	100 !
Public, social, human, and legal services	37,700	13,700	18,800	4,700	400 !
Education	85,300	39,800	24,000	20,400	1,100 !
Trade and industry	17,300	2,800	1,200 !	13,200	#

See notes at end of table.

Table 3.22. Number of teaching faculty, by level of institution and sector, principal teaching field, and specific career field: Fall 1992, 1998, and 2003—Continued

Principal teaching field and specific career field	Total	4-year		2-year	
		Public	Private not- for-profit	Public	Private not- for-profit
2003					
All faculty	1,041,600	405,300	291,700	336,100	8,300
Principal teaching field					
Career education	522,200	203,800	137,400	176,700	4,300
Academic	508,900	198,800	150,800	155,200	4,000
Other	10,500 †	2,800 †	3,600 †	4,200 †	‡
Specific career field					
Agriculture and natural resources	10,200	6,800	‡	2,900	‡
Business	81,700	28,400	29,800	22,800	‡
Communications and design	28,200	11,900	6,900 †	9,000	‡
Computer science	46,400	13,200	9,100	23,900	‡
Engineering and architectural sciences	50,500	27,300	11,500	11,700	‡
Health care	109,200	44,300	30,400	34,000	‡
Personal and consumer services	34,300	13,100	6,000 †	14,700	‡
Protective services	15,800	2,900 †	1,700 †	11,100	‡
Public, social, human, and legal services	36,100	15,200	13,900	6,600	‡
Education	94,900	38,500	27,200	27,900	‡
Trade and industry	14,900	2,300 †	‡	12,200	‡

Rounds to zero.

! Interpret data with caution.

‡ Reporting standards not met. (Too few cases for a reliable estimate.)

NOTE: Teaching faculty includes all faculty and instructional staff who taught at least one class in Fall 1992, 1998, or 2003. "Other" teaching fields include basic skills, English as a second language, military studies, interdisciplinary studies, and other unspecified fields. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993, 1999, and 2004 National Study of Postsecondary Faculty (NSOPF:93, NSOPF:99, and NSOPF:04).

lic 2-year institutions. In no other career field was the majority of teaching faculty employed at one of the four institution types studied.⁷⁷

⁷⁷ At public 4-year institutions, the percentage of faculty teaching engineering and architectural sciences was not significantly greater than 50 percent, and at public 2-year institutions, the percentage teaching computer science was not significantly greater than 50 percent.

Table 3.23. Percentage distribution of teaching faculty in each principal teaching field and specific career field, by level of institution and sector: Fall 1992, 1998, and 2003

Principal teaching field and specific career field	Total	4-year		2-year	
		Public	Private not- for-profit	Public	Private not- for-profit
1992					
All faculty	100.0	38.8	27.5	32.0	1.7
Principal teaching field					
Career education	100.0	39.9	27.2	31.2	1.7
Academic	100.0	38.6	28.6	31.1	1.7
Other	100.0	29.4	20.1	49.2	1.3 !
Specific career field					
Agriculture and natural resources	100.0	68.7	10.7 !	18.9	1.6 !
Business	100.0	32.1	29.1	36.3	2.4 !
Communications and design	100.0	40.2	35.2	22.2	2.4 !
Computer science	100.0	28.4	20.9	49.3	1.3 !
Engineering and architectural sciences	100.0	51.6	20.7	27.1	0.6 !
Health care	100.0	44.5	26.7	26.5	2.3 !
Personal and consumer services	100.0	41.0	17.5	38.9	2.7 !
Protective services	100.0	15.8	6.6 !	77.6	#
Public, social, human, and legal services	100.0	27.7	55.1	15.9	1.3 !
Education	100.0	53.1	26.0	20.0	0.9 !
Trade and industry	100.0	10.1	6.4 !	83.3	0.2 !
1998					
All faculty	100.0	40.0	28.4	30.5	1.2 !
Principal teaching field					
Career education	100.0	41.0	28.0	29.7	1.2 !
Academic	100.0	39.9	29.3	29.5	1.3 !
Other	100.0	27.8	21.2	50.1	0.9 !
Specific career field					
Agriculture and natural resources	100.0	74.1	4.9 !	20.4	0.5 !
Business	100.0	30.1	34.8	32.3	2.7 !
Communications and design	100.0	42.4	32.5	24.0	1.1 !
Computer science	100.0	26.6	19.7	52.4	1.4 !
Engineering and architectural sciences	100.0	58.8	21.9	19.2	0.1 !
Health care	100.0	44.9	28.5	25.8	0.8 !
Personal and consumer services	100.0	45.6	14.9 !	37.4	2.1 !
Protective services	100.0	27.4	7.0 !	64.7	0.8 !
Public, social, human, and legal services	100.0	36.4	49.9	12.5	1.1 !
Education	100.0	46.7	28.2	23.9	1.3 !
Trade and industry	100.0	16.3	7.2 !	76.3	0.3 !

See notes at end of table.

Table 3.23. Percentage distribution of teaching faculty in each principal teaching field and specific career field, by level of institution and sector: Fall 1992, 1998, and 2003—Continued

Principal teaching field and specific career field	Total	4-year		2-year	
		Public	Private not- for-profit	Public	Private not- for-profit
2003					
All faculty	100.0	38.9	28.0	32.3	0.8
Principal teaching field					
Career education	100.0	39.0	26.3	33.8	0.8
Academic	100.0	39.1	29.6	30.5	0.8
Other	100.0	26.6	33.7	39.6	0.1 !
Specific career field					
Agriculture and natural resources	100.0	66.7	5.2	28.1	#
Business	100.0	34.7	36.4	27.9	1.0 !
Communications and design	100.0	42.2	24.5	31.8	1.5 !
Computer science	100.0	28.4	19.5	51.6	0.5 !
Engineering and architectural sciences	100.0	53.9	22.8	23.2	#
Health care	100.0	40.6	27.9	31.1	0.4 !
Personal and consumer services	100.0	38.2	17.4	42.9	1.4 !
Protective services	100.0	18.4	11.0	70.2	0.4 !
Public, social, human, and legal services	100.0	42.1	38.5	18.2	1.2 !
Education	100.0	40.5	28.6	29.4	1.4
Trade and industry	100.0	15.4 !	2.4 !	82.1	#

Rounds to zero.

! Interpret data with caution.

NOTE: Teaching faculty includes all faculty and instructional staff who taught at least one class in Fall 1992, 1998, or 2003. "Other" teaching fields include basic skills, English as a second language, military studies, interdisciplinary studies, and other unspecified fields. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993, 1999, and 2004 National Study of Postsecondary Faculty (NSOPF:93, NSOPF:99, and NSOPF:04).

Teaching Conditions of Career and Academic Faculty: Fall 2003

Employment Status

Although a majority of postsecondary teaching faculty in both career and academic fields (53 percent and 58 percent, respectively) were employed full time during fall 2003, a lower percentage of career faculty than academic faculty were employed full time (table 3.24). Less than half of career teaching faculty in public 2-year institutions were employed full time (34 percent), in contrast with more than half of career teaching faculty in both types of 4-year institutions (58–

71 percent). Among career teaching faculty, only in the fields of protective services (22 percent) and education (44 percent) were a minority employed full time.⁷⁸

Table 3.24. Percentage distribution of teaching faculty in various principal and career fields and institution types, by employment status, and among part-time faculty, by reason for part-time employment: Fall 1992, 1998, and 2003

Principal teaching field, career teaching faculty by type of institution, and specific career field	Employment status		Among part-time faculty, reason for part-time employment ¹	
	Full-time	Part-time	Full-time position unavailable	Personal preference
1992				
All faculty	58.1	41.9	55.8	49.0
Principal teaching field				
Career education	57.4	42.6	65.6	39.3
Academic	59.6	40.4	45.2	58.4
Other	50.6	49.4	58.0	55.7
Career teaching faculty in each type of institution				
Public 4-year	73.2	26.8	66.1	37.3
Private not-for-profit 4-year	52.9	47.1	71.2	38.0
Public 2-year	42.3	57.7	61.8	41.5
Private not-for-profit 2-year	35.0	65.0	59.3	37.9
Specific career field				
Agriculture and natural resources	84.1	15.9	‡	‡
Business	53.5	46.5	64.3	42.8
Communications and design	50.1	49.9	52.0	49.8
Computer science	49.9	50.1	70.8	35.0
Engineering and architectural sciences	64.8	35.2	67.4	37.8
Health care	64.5	35.5	73.2	30.6
Personal and consumer services	59.9	40.1	55.9	44.5
Protective services	26.3	73.7	70.8	35.1
Public, social, human, and legal services	50.6	49.4	70.0	46.2
Education	56.4	43.6	62.9	38.2
Trade and industry	52.8	47.2	48.3	41.9

See notes at end of table.

⁷⁸ Business, computer science, and trade and industry were not significantly less than 50 percent.

3. Career Education at the Postsecondary Level

Table 3.24. Percentage distribution of teaching faculty in various principal and career fields and institution types, by employment status, and among part-time faculty, by reason for part-time employment: Fall 1992, 1998, and 2003—Continued

Principal teaching field, career teaching faculty by type of institution, and specific career field	Employment status		Among part-time faculty, reason for part-time employment ¹	
	Full-time	Part-time	Full-time position unavailable	Personal preference
1998				
All faculty	55.4	44.6	58.9	74.9
Principal teaching field				
Career education	56.3	43.7	52.5	81.9
Academic	55.7	44.3	64.9	67.8
Other	41.9	58.1	62.2	75.9
Career teaching faculty in each type of institution				
Public 4-year	70.2	29.8	51.3	80.9
Private not-for-profit 4-year	54.4	45.6	44.7	85.6
Public 2-year	39.2	60.8	58.4	80.0
Private not-for-profit 2-year	46.7	53.3	64.0	82.7
Specific career field				
Agriculture and natural resources	82.8	17.2	‡	‡
Business	53.4	46.6	51.3	83.1
Communications and design	51.0	49.0	51.7	77.1
Computer science	45.5	54.5	54.4	80.8
Engineering and architectural sciences	69.0	31.0	56.0	72.9
Health care	63.3	36.7	49.5	84.1
Personal and consumer services	51.4	48.6	64.8	90.2
Protective services	26.5	73.5	32.9	93.5
Public, social, human, and legal services	52.1	47.9	54.4	79.2
Education	52.9	47.1	55.7	81.9
Trade and industry	54.2	45.8	51.9	85.7

See notes at end of table.

Table 3.24. Percentage distribution of teaching faculty in various principal and career fields and institution types, by employment status, and among part-time faculty, by reason for part-time employment: Fall 1992, 1998, and 2003—Continued

Principal teaching field, career teaching faculty by type of institution, and specific career field	Employment status		Among part-time faculty, reason for part-time employment ¹	
	Full-time	Part-time	Full-time position unavailable	Personal preference
2003				
All faculty	55.2	44.8	—	—
Principal teaching field				
Career education	52.9	47.1	—	—
Academic	57.6	42.4	—	—
Other	50.9	49.1	—	—
Career teaching faculty in each type of institution				
Public 4-year	71.0	29.0	—	—
Private not-for-profit 4-year	57.9	42.1	—	—
Public 2-year	33.6	66.4	—	—
Private not-for-profit 2-year	57.3	42.7	—	—
Specific career field				
Agriculture and natural resources	75.0	25.0	—	—
Business	49.2	50.8	—	—
Communications and design	53.1	46.9	—	—
Computer science	49.0	51.0	—	—
Engineering and architectural sciences	67.1	32.9	—	—
Health care	61.7	38.3	—	—
Personal and consumer services	53.4	46.6	—	—
Protective services	21.8	78.2	—	—
Public, social, human, and legal services	51.9	48.1	—	—
Education	44.3	55.7	—	—
Trade and industry	44.5	55.5	—	—

— Not available.

‡ Reporting standards not met. (Too few cases for a reliable estimate.)

¹ Respondents could select multiple reasons for their part-time employment.

NOTE: Teaching faculty includes all faculty and instructional staff who taught at least one class in Fall 1992, 1998, or 2003. "Other" teaching fields include basic skills, English as a second language, military studies, interdisciplinary studies, and other unspecified fields. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993, 1999, and 2004 National Study of Postsecondary Faculty (NSOPF:93, NSOPF:99, and NSOPF:04).

A larger percentage of career than academic teaching faculty performed outside consulting or had other professional employment in fall 2003 (60 vs. 50 percent) (table 3.25). Career teaching faculty in public 4-year institutions performed outside consulting or had other professional employment less often than their peers in private not-for-profit 4-year or public 2-year institutions (48 vs. 57–62 percent). Among the specific career fields, teaching faculty in protective services had the lowest percentage teaching full time (22 vs. 44–75 percent) (table 3.24) and the highest percentage with outside consulting or other professional employment (81 vs. 54–65 percent) (table 3.25).

Table 3.25. Percentage of teaching faculty with selected employment characteristics, by principal teaching field, type of institution, career teaching faculty, and specific career field: Fall 1998 and 2003

Principal teaching field, career teaching faculty by type of institution, and specific career field	Considered position as primary employment	Performed outside consulting or had other professional employment, total	Performed outside consulting	Had other professional employment
1998				
All faculty	68.4	63.0	32.2	49.5
Principal teaching field				
Career education	65.8	67.7	38.4	51.1
Academic	71.6	58.9	26.7	47.9
Other	63.8	56.2	24.4	49.3
Career teaching faculty in each type of institution				
Public 4-year	77.2	62.8	39.7	41.7
Private not-for-profit 4-year	63.2	70.3	43.6	53.0
Public 2-year	52.8	71.9	32.2	61.7
Private not-for-profit 2-year	55.0	73.1	26.5	67.5
Specific career field				
Agriculture and natural resources	88.9	51.6	33.6	31.9
Business	62.8	67.0	38.7	51.8
Communications and design	65.5	68.0	40.7	54.6
Computer science	57.1	69.9	40.8	54.2
Engineering and architectural sciences	74.7	66.1	49.2	37.9
Health care	72.9	69.0	35.2	54.9
Personal and consumer services	78.4	53.6	32.0	37.7
Protective services	29.3	83.2	39.3	70.2
Public, social, human, and legal services	55.3	74.5	39.0	55.8
Education	64.9	65.0	36.0	49.5
Trade and industry	58.6	67.7	38.3	50.3

See notes at end of table.

Table 3.25. Percentage of teaching faculty with selected employment characteristics, by principal teaching field, type of institution, career teaching faculty, and specific career field: Fall 1998 and 2003
—Continued

Principal teaching field, career teaching faculty by type of institution, and specific career field	Considered position as primary employment	Performed outside consulting or had other professional employment, total	Performed outside consulting	Had other professional employment
2003				
All faculty	—	55.2	—	—
Principal teaching field				
Career education	—	60.0	—	—
Academic	—	50.2	—	—
Other	—	61.8	—	—
Career teaching faculty in each type of institution				
Public 4-year	—	48.3	—	—
Private not-for-profit 4-year	—	57.2	—	—
Public 2-year	—	62.0	—	—
Private not-for-profit 2-year	—	45.6	—	—
Specific career field				
Agriculture and natural resources	—	54.1	—	—
Business	—	61.5	—	—
Communications and design	—	57.8	—	—
Computer science	—	56.2	—	—
Engineering and architectural sciences	—	59.0	—	—
Health care	—	57.2	—	—
Personal and consumer services	—	55.3	—	—
Protective services	—	80.7	—	—
Public, social, human, and legal services	—	65.4	—	—
Education	—	61.1	—	—
Trade and industry	—	63.6	—	—

— Not available.

NOTE: Teaching faculty includes all faculty and instructional staff who taught at least one class in Fall 1998 or Fall 2003. "Other" teaching fields include basic skills, English as a second language, military studies, interdisciplinary studies, and other unspecified fields. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1999 and 2004 National Study of Postsecondary Faculty (NSOPF:99 and NSOPF:04).

Job Satisfaction

The majority of teaching faculty in fall 2003 reported being either somewhat or very satisfied with many aspects of their job, including their job overall (90 percent), benefits (67 percent), and salary (63 percent) in fall 2003 (table 3.26). Postsecondary teaching faculty in career fields were more satisfied in all surveyed aspects of their jobs than their academic colleagues. Ninety-one percent of career teaching faculty reported being somewhat or very satisfied with their jobs

overall compared with 88 percent of academic faculty. This pattern held with regard to salary, benefits, and workload. Among career teaching faculty, those in public 4-year institutions were less satisfied with their jobs overall (86 vs. 90–93 percent), with their salary (56 vs. 65–70 percent), and with their workload (75 vs. 81–85 percent), than their peers in private not-for-profit 4-year and public 2-year institutions. Career faculty at public 4-year institutions were more satisfied with their benefits than faculty at public 2-year institutions (70 vs. 63 percent).⁷⁹

Table 3.26. Percentage of teaching faculty who were either somewhat or very satisfied with selected aspects of their jobs, by principal teaching field, career teaching faculty by type of institution, and specific career field: Fall 1992, 1998, and 2003

Principal teaching field, career teaching faculty by type of institution, and specific career field	Overall job	Salary	Benefits	Workload	Time available	
					Job security	to keep current in field
1992						
All faculty	84.6	54.3	61.1	74.6	69.9	56.3
Principal teaching field						
Career education	87.3	58.1	64.8	77.1	72.9	59.2
Academic	81.7	50.4	57.8	71.8	67.2	53.6
Other	86.0	54.4	57.2	77.9	66.7	54.2
Career teaching faculty by type of institution						
Public 4-year	84.6	52.9	68.7	71.7	72.6	53.5
Private not-for-profit 4-year	89.3	58.7	61.7	80.2	74.5	65.0
Public 2-year	88.8	64.2	62.9	80.9	72.3	61.0
Private not-for-profit 2-year	89.9	59.4	58.9	85.4	65.7	64.6
Specific career field						
Agriculture and natural resources	88.3	57.6	69.8	64.4	85.6	45.7
Business	88.4	58.8	61.1	81.7	72.4	63.5
Communications and design	83.9	50.1	55.0	74.9	65.0	53.2
Computer science	87.0	62.8	63.5	79.4	69.4	58.7
Engineering and architectural sciences	85.0	56.9	63.8	75.2	71.6	56.7
Health care	87.0	57.1	70.9	73.2	77.5	57.4
Personal and consumer services	90.8	59.4	69.2	74.9	69.9	61.5
Protective services	88.4	69.7	58.6	86.4	76.6	69.0
Public, social, human, and legal services	89.3	60.5	65.8	83.3	72.4	65.4
Education	88.2	55.1	63.9	76.0	72.8	58.1
Trade and industry	84.3	69.5	63.0	78.3	64.9	56.6

See notes at end of table.

⁷⁹ There was no measurable, substantive difference in satisfaction with benefits between career faculty at public 4-year institutions and private not-for-profit 4-year institutions.

Table 3.26. Percentage of teaching faculty who were either somewhat or very satisfied with selected aspects of their jobs, by principal teaching field, career teaching faculty by type of institution, and specific career field: Fall 1992, 1998, and 2003—Continued

Principal teaching field, career teaching faculty by type of institution, and specific career field	Overall job	Salary	Benefits	Workload	Job security	Time available
						to keep current in field
1998						
All faculty	84.7	55.5	63.9	74.4	73.6	58.1
Principal teaching field						
Career education	86.8	59.0	67.6	75.7	76.3	60.0
Academic	82.5	51.8	60.7	72.7	71.7	55.9
Other	86.4	57.7	58.1	78.7	63.4	61.6
Career teaching faculty by type of institution						
Public 4-year	84.4	56.7	72.2	72.0	78.1	56.9
Private not-for-profit 4-year	88.4	57.1	64.6	76.2	77.4	61.6
Public 2-year	88.9	64.1	64.3	80.0	73.3	62.4
Private not-for-profit 2-year	81.1	58.9	63.9	87.6	68.6	70.2
Specific career field						
Agriculture and natural resources	87.5	59.3	74.6	70.9	81.5	52.1
Business	84.9	56.4	64.7	79.9	75.6	64.0
Communications and design	82.7	56.1	60.0	76.4	73.9	57.5
Computer science	85.8	62.2	63.7	75.2	76.9	57.3
Engineering and architectural sciences	84.5	59.7	70.5	71.4	81.9	59.0
Health care	87.4	59.6	72.6	72.3	75.6	57.7
Personal and consumer services	95.1	47.9	74.0	79.7	79.8	72.1
Protective services	93.3	78.9	72.2	90.1	84.9	77.3
Public, social, human, and legal services	89.3	58.0	65.1	79.7	76.6	65.2
Education	87.2	57.8	65.2	74.4	74.3	56.3
Trade and industry	88.9	64.0	68.2	81.7	73.4	65.6

See notes at end of table.

Table 3.26. Percentage of teaching faculty who were either somewhat or very satisfied with selected aspects of their jobs, by principal teaching field, career teaching faculty by type of institution, and specific career field: Fall 1992, 1998, and 2003—Continued

Principal teaching field, career teaching faculty by type of institution, and specific career field	Overall job	Salary	Benefits	Workload	Job security	Time available to keep current in field
2003						
All faculty	89.5	63.3	67.0	80.1	—	—
Principal teaching field						
Career education	91.2	65.9	69.0	82.5	—	—
Academic	87.8	60.5	64.9	77.7	—	—
Other	89.0	68.4	69.9	82.0	—	—
Career teaching faculty by type of institution						
Public 4-year	86.2	56.1	70.0	75.4	—	—
Private not-for-profit 4-year	90.3	64.8	67.6	81.4	—	—
Public 2-year	92.7	70.3	62.6	84.6	—	—
Private not-for-profit 2-year	97.9	75.0	76.9	83.5	—	—
Specific career field						
Agriculture and natural resources	90.8	68.5	76.4	82.6	—	—
Business	91.6	65.8	65.4	85.7	—	—
Communications and design	90.9	56.0	60.4	80.8	—	—
Computer science	90.0	70.3	66.8	82.2	—	—
Engineering and architectural sciences	89.2	65.0	70.2	77.8	—	—
Health care	90.0	64.9	75.8	79.8	—	—
Personal and consumer services	93.5	65.9	71.2	84.7	—	—
Protective services	92.0	77.4	67.1	86.1	—	—
Public, social, human, and legal services	93.2	62.1	64.7	82.7	—	—
Education	92.4	66.0	67.0	83.6	—	—
Trade and industry	92.3	76.1	72.0	87.3	—	—

— Not available.

NOTE: Teaching faculty includes all faculty and instructional staff who taught at least one class in Fall 1992, 1998, or 2003. "Other" teaching fields include basic skills, English as a second language, military studies, interdisciplinary studies, and other unspecified fields. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993, 1999, and 2004 National Study of Postsecondary Faculty (NSOPF:93, NSOPF:99, and NSOPF:04).

Characteristics of Career and Academic Faculty: Fall 2003

Age and Teaching Experience

In fall 2003, career education faculty were, on average, age 50, with an average of 9 years in their current job (table 3.27). There were no measurable differences in age or years of em-

ployment in their current job between career and academic teaching faculty overall. Agriculture and natural resources faculty were employed longer in their current jobs (13 vs. 7–11 years) than their peers in most other career fields.⁸⁰

Table 3.27. Average age of teaching faculty and their average number of years teaching in higher education and employed in current job, by principal teaching field, career teaching faculty by type of institution, and specific career field: Fall 1992, 1998, and 2003

Principal teaching field, career teaching faculty by type of institution, and specific career field	Age	Years teaching in higher education	Years employed in current job
1992			
All faculty	47.1	—	—
Principal teaching field			
Career education	46.9	—	—
Academic	47.6	—	—
Other	45.2	—	—
Career teaching faculty by type of institution			
Public 4-year	47.4	—	—
Private not-for-profit 4-year	46.9	—	—
Public 2-year	46.0	—	—
Private not-for-profit 2-year	47.3	—	—
Specific career field			
Agriculture and natural resources	47.8	—	—
Business	47.6	—	—
Communications and design	45.5	—	—
Computer science	44.9	—	—
Engineering and architectural sciences	46.6	—	—
Health care	45.8	—	—
Personal and consumer services	46.8	—	—
Protective services	45.9	—	—
Public, social, human, and legal services	47.1	—	—
Education	49.1	—	—
Trade and industry	47.0	—	—

See notes at end of table.

⁸⁰ There was no measurable difference in the number of years employed in their current job between faculty in agriculture and natural resources and those in engineering and architectural sciences.

Table 3.27. Average age of teaching faculty and their average number of years teaching in higher education and employed in current job, by principal teaching field, career teaching faculty by type of institution, and specific career field: Fall 1992, 1998, and 2003—Continued

Principal teaching field, career teaching faculty by type of institution, and specific career field	Age	Years teaching in higher education	Years employed in current job
1998			
All faculty	48.7	13.8	9.8
Principal teaching field			
Career education	48.4	12.7	9.0
Academic	49.0	15.1	10.8
Other	48.5	11.6	8.3
Career teaching faculty by type of institution			
Public 4-year	49.0	14.2	10.0
Private not-for-profit 4-year	48.8	12.9	8.7
Public 2-year	47.4	10.5	7.9
Private not-for-profit 2-year	46.7	10.5	6.6
Specific career field			
Agriculture and natural resources	49.2	16.7	14.5
Business	49.7	13.3	8.8
Communications and design	47.5	13.0	8.3
Computer science	46.3	10.4	7.5
Engineering and architectural sciences	48.9	14.5	11.1
Health care	47.5	12.7	8.6
Personal and consumer services	45.9	11.3	8.0
Protective services	46.6	10.7	7.0
Public, social, human, and legal services	49.6	13.4	9.9
Education	49.6	12.0	8.6
Trade and industry	48.0	11.7	9.4

See notes at end of table.

Table 3.27. Average age of teaching faculty and their average number of years teaching in higher education and employed in current job, by principal teaching field, career teaching faculty by type of institution, and specific career field: Fall 1992, 1998, and 2003—Continued

Principal teaching field, career teaching faculty by type of institution, and specific career field	Age	Years teaching in higher education	Years employed in current job
2003			
All faculty	49.5	—	9.8
Principal teaching field			
Career education	49.6	—	9.0
Academic	49.5	—	10.5
Other	49.1	—	8.5
Career teaching faculty by type of institution			
Public 4-year	49.4	—	10.6
Private not-for-profit 4-year	49.8	—	9.8
Public 2-year	49.5	—	8.8
Private not-for-profit 2-year	48.5	—	7.1
Specific career field			
Agriculture and natural resources	49.8	—	13.3
Business	50.8	—	9.4
Communications and design	49.4	—	9.2
Computer science	48.5	—	8.4
Engineering and architectural sciences	49.9	—	10.9
Health care	48.7	—	8.9
Personal and consumer services	47.4	—	9.2
Protective services	47.7	—	8.4
Public, social, human, and legal services	49.9	—	9.7
Education	51.2	—	7.4
Trade and industry	49.1	—	9.3

— Not available.

NOTE: Teaching faculty includes all faculty and instructional staff who taught at least one class in Fall 1992, 1998, or 2003. "Other" teaching fields include basic skills, English as a second language, military studies, interdisciplinary studies, and other unspecified fields. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993, 1999, and 2004 National Study of Postsecondary Faculty (NSOPF:93, NSOPF:99, and NSOPF:04).

Educational Attainment

The majority of postsecondary teaching faculty in both career and academic fields in fall 2003 possessed a graduate degree,⁸¹ although a larger percentage of academic teaching faculty than their career colleagues attained this level of education (92 vs. 81 percent) (table 3.28). Larger percentages of career teaching faculty than their academic colleagues possessed a bachelor's

⁸¹ Graduate degrees include all degrees beyond a bachelor's degree, including M.A., M.S., M.B.A., Ph.D., and J.D.

degree as their highest degree (12 vs. 7 percent) or had less than a bachelor's degree as their highest degree (7 vs. 1 percent). A larger percentage of career teaching faculty at public 2-year institutions than their peers at 4-year institutions had less than a bachelor's degree as their highest degree (11 vs. 1 percent each) and a smaller percentage possessed a graduate degree (71 vs. 94 percent each). The two career fields with the highest concentrations of teaching faculty with less than a bachelor's degree as their highest degree included trade and industry (58 percent) and protective services (29 percent). The majority of teaching faculty in all other career fields held graduate degrees (73–96 percent).

Table 3.28. Percentage distribution of teaching faculty in various principal and career fields and institution types, by highest degree earned: Fall 1992, 1998, and 2003

Principal teaching field, career teaching faculty by type of institution, and specific career field	Total	Less than bachelor's degree					Graduate degree		
		Total	None	Certificate	Associate's degree	Bachelor's degree	Total	Master's degree	Doctorate or first-professional degree
1992									
All faculty	100.0	2.7	†	1.0	1.7	9.3	88.0	39.9	48.0
Principal teaching field									
Career education	100.0	4.7	†	1.7	3.0	12.8	82.6	36.7	45.9
Academic	100.0	0.4	†	0.2	0.2	5.7	93.9	42.0	51.9
Other	100.0	6.8	†	2.7	4.1	12.0	81.2	52.8	28.4
Career teaching faculty by type of institution									
Public 4-year	100.0	0.3	†	0.2 !	0.2 !	5.1	94.6	27.4	67.2
Private not-for-profit 4-year	100.0	0.3	†	0.2 !	0.2 !	6.7	93.0	37.0	55.9
Public 2-year	100.0	14.2	†	5.1	9.1	27.9	57.9	47.3	10.6
Private not-for-profit 2-year	100.0	6.0	†	#	6.0	20.5	73.5	60.8	12.7
Specific career field									
Agriculture and natural resources	100.0	0.9 !	†	0.7 !	0.3 !	6.6 !	92.5	22.8	69.7
Business	100.0	1.3 !	†	0.6 !	0.7 !	12.4	86.3	48.2	38.1
Communications and design	100.0	1.6 !	†	#	1.6 !	18.3	80.2	49.7	30.5
Computer science	100.0	4.3	†	1.1 !	3.2	24.3	71.4	43.0	28.4
Engineering and architectural sciences	100.0	6.3	†	1.5	4.8	14.4	79.3	28.7	50.7
Health care	100.0	4.8	†	2.2	2.6	11.4	83.8	32.9	50.9
Personal and consumer services	100.0	5.2 !	†	3.4 !	1.8 !	18.3	76.5	48.8	27.7
Protective services	100.0	22.3	†	7.9 !	14.5	27.2	50.5	32.2	18.3
Public, social, human, and legal services	100.0	0.6 !	†	0.1 !	0.5 !	1.8 !	97.6	16.3	81.4
Education	100.0	0.4 !	†	0.1 !	0.3 !	6.8	92.8	41.5	51.3
Trade and industry	100.0	41.0	†	13.6	27.4	30.6	28.5	22.1	6.4

See notes at end of table.

Table 3.28. Percentage distribution of teaching faculty in various principal and career fields and institution types, by highest degree earned: Fall 1992, 1998, and 2003—Continued

Principal teaching field, career teaching faculty by type of institution, and specific career field	Total	Less than bachelor's degree					Graduate degree		
		Total	None	Certificate	Associate's degree	Bachelor's degree	Total	Master's degree	Doctorate or first-professional degree
1998									
All faculty	100.0	3.1	0.9	0.6	1.6	9.3	87.7	40.5	47.1
Principal teaching field									
Career education	100.0	4.7	1.1	1.0	2.6	11.9	83.4	38.0	45.4
Academic	100.0	0.8	0.3	0.1 !	0.5 !	5.7	93.5	42.4	51.0
Other	100.0	9.6	4.8	1.8 !	3.0	19.5	71.0	48.6	22.3
Career teaching faculty by type of institution									
Public 4-year	100.0	0.4	0.3	#	0.1	4.8	94.8	28.4	66.4
Private not-for-profit 4-year	100.0	0.6	0.2 !	0.1 !	0.2	6.5	92.9	37.7	55.3
Public 2-year	100.0	14.6	3.2	3.2	8.2	26.1	59.3	51.0	8.3
Private not-for-profit 2-year	100.0	3.9	#	1.2 !	2.7	29.7	66.4	51.7	14.7
Specific career field									
Agriculture and natural resources	100.0	4.6 !	2.2 !	0.8 !	1.6 !	6.2 !	89.2	26.3	62.9
Business	100.0	1.6 !	0.3 !	0.4 !	1.0 !	10.4	88.0	53.5	34.4
Communications and design	100.0	1.5 !	1.0 !	0.2 !	0.3 !	16.5	82.0	47.5	34.5
Computer science	100.0	7.3	1.7 !	1.6 !	3.9 !	21.6	71.2	43.8	27.4
Engineering and architectural sciences	100.0	2.6	0.8 !	#	1.8	10.1	87.3	28.6	58.8
Health care	100.0	4.0	0.3 !	1.1 !	2.6	9.8	86.2	32.0	54.2
Personal and consumer services	100.0	12.2 !	2.6 !	5.4 !	4.2 !	20.5	67.3	48.9	18.4
Protective services	100.0	28.7	5.3 !	5.5 !	17.9	21.1	50.2	21.1	29.1
Public, social, human, and legal services	100.0	0.7 !	0.3 !	#	0.4 !	3.1	96.2	24.5	71.7
Education	100.0	1.4	0.3 !	0.1 !	1.0	10.8	87.8	43.0	44.8
Trade and industry	100.0	34.3	11.8 !	7.2	15.3	26.2	39.5	24.9	14.6

See notes at end of table.

3. Career Education at the Postsecondary Level

Table 3.28. Percentage distribution of teaching faculty in various principal and career fields and institution types, by highest degree earned: Fall 1992, 1998, and 2003—Continued

Principal teaching field, career teaching faculty by type of institution, and specific career field	Total	Less than bachelor's degree					Graduate degree		
		Total	None	Certificate	Associate's degree	Bachelor's degree	Total	Master's degree	Doctorate or first-professional degree
2003									
All faculty	100.0	4.2	1.3	0.7	2.2	9.4	86.4	39.1	47.3
Principal teaching field									
Career education	100.0	7.3	2.0	1.3	4.0	11.6	81.1	39.2	41.9
Academic	100.0	1.1	0.6	0.2	0.4	7.0	91.9	39.0	52.9
Other	100.0	5.2	2.9 †	0.5 †	1.8 †	12.6	82.2	40.0	42.2
Career teaching faculty by type of institution									
Public 4-year	100.0	0.8	0.3	0.2 †	0.3 †	5.0	94.2	27.0	67.2
Private not-for-profit 4-year	100.0	0.9	0.5	0.3	0.2 †	5.3	93.8	36.0	57.8
Public 2-year	100.0	11.2	3.3	1.8	6.2	17.9	70.8	56.1	14.8
Private not-for-profit 2-year	100.0	6.6 †	2.2 †	#	4.5 †	18.2	75.2	52.2	23.0
Specific career field									
Agriculture and natural resources	100.0	4.3 †	0.3 †	0.9 †	3.0 †	13.5	82.2	25.3	56.9
Business	100.0	1.0 †	0.2 †	#	0.7 †	8.9	90.1	50.1	40.0
Communications and design	100.0	1.2 †	0.8 †	#	0.4 †	13.2	85.6	50.8	34.8
Computer science	100.0	5.0	2.1 †	0.3 †	2.6	20.6	74.4	46.4	28.0
Engineering and architectural sciences	100.0	8.7	1.4 †	1.7 †	5.6	11.4	79.9	23.6	56.3
Health care	100.0	9.3	0.8	2.4	6.1	10.9	79.8	30.5	49.3
Personal and consumer services	100.0	9.6	5.7	1.4 †	2.5	17.3	73.2	49.5	23.7
Protective services	100.0	29.3	9.4	3.4 †	16.5	17.7	53.0	29.5	23.5
Public, social, human, and legal services	100.0	2.2 †	0.8 †	#	1.4 †	1.9 †	95.9	30.0	65.9
Education	100.0	2.3	0.8 †	0.2 †	1.2 †	8.1	89.6	49.1	40.5
Trade and industry	100.0	57.9	19.1	11.3	27.5	27.1	15.0	8.1	6.9 †

† Not applicable.

Rounds to zero.

! Interpret data with caution.

NOTE: Teaching faculty includes all faculty and instructional staff who taught at least one class in Fall 1992, 1998, or 2003. "Other" teaching fields include basic skills, English as a second language, military studies, interdisciplinary studies, and other unspecified fields. Detail may not sum to totals because of rounding. Standard error tables are available at

<http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993, 1999, and 2004 National Study of Postsecondary Faculty (NSOPF:93, NSOPF:99, and NSOPF:04).

Sex and Race/Ethnicity

The majority of postsecondary teaching faculty in both career and academic fields in fall 2003 were male, although a larger percentage of academic teaching faculty were male compared

with career faculty (59 vs. 56 percent) (table 3.29). Among career teaching faculty, males made up the majority at both types of 4-year institutions (60–61 percent), although males represented about half (52 percent) of the career teaching faculty at public 2-year institutions. Female faculty represented the majority of those teaching health care (62 percent) and education (67 percent). Male faculty, on the other hand, represented the majority of those teaching agriculture and natural resources (78 percent), business (70 percent), computer science (69 percent), engineering and architectural sciences (89 percent), protective services (88 percent), and trade and industry (98 percent).

Table 3.29. Percentage distribution of teaching faculty in various principal and career fields and institution types, by sex: Fall 1992, 1998, and 2003

Principal teaching field, career teaching faculty by type of institution, and specific career field	1992		1998		2003	
	Male	Female	Male	Female	Male	Female
All faculty	62.1	37.9	58.4	41.6	57.8	42.2
Principal teaching field						
Career education	62.0	38.0	57.5	42.5	56.4	43.6
Academic	63.7	36.3	60.5	39.5	59.4	40.6
Other	46.0	54.0	44.3	55.7	50.1	49.9
Career teaching faculty by type of institution						
Public 4-year	65.1	34.9	61.2	38.8	61.2	38.8
Private not-for-profit 4-year	63.5	36.5	61.4	38.6	60.2	39.8
Public 2-year	58.1	41.9	49.7	50.3	51.7	48.3
Private not-for-profit 2-year	39.1	60.9	31.4	68.6	53.3	46.7
Specific career field						
Agriculture and natural resources	89.3	10.7	81.4	18.6	78.0	22.0
Business	69.3	30.7	64.2	35.8	70.0	30.0
Communications and design	55.8	44.2	56.6	43.4	55.4	44.6
Computer science	79.4	20.6	64.0	36.0	69.3	30.7
Engineering and architectural sciences	88.9	11.1	88.5	11.5	89.2	10.8
Health care	43.1	56.9	42.2	57.8	37.9	62.1
Personal and consumer services	47.3	52.7	36.1	63.9	47.1	52.9
Protective services	83.6	16.4	83.1	16.9	88.2	11.8
Public, social, human, and legal services	68.9	31.1	61.2	38.8	51.8	48.2
Education	43.2	56.8	41.9	58.1	33.5	66.5
Trade and industry	94.6	5.4	92.0	8.0	97.8	2.2

NOTE: Teaching faculty includes all faculty and instructional staff who taught at least one class in Fall 1992, 1998, or 2003. "Other" teaching fields include basic skills, English as a second language, military studies, interdisciplinary studies, and other unspecified fields. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993, 1999, and 2004 National Study of Postsecondary Faculty (NSOPF:93, NSOPF:99, and NSOPF:04).

3. Career Education at the Postsecondary Level

The majority of postsecondary teaching faculty in both career and academic fields in fall 2003 were White (83 percent each) (table 3.30). There were no measurable differences in the racial/ethnic composition of career and academic teaching faculty overall. However, a lower percentage of career faculty in public 4-year institutions were White than their peers at private 4-year institutions (81 vs. 85 percent). Few differences in race/ethnicity were apparent across the career program areas. However, lower percentages of engineering and architectural sciences and

Table 3.30. Percentage distribution of teaching faculty in various principal and career fields and institution types, by race/ethnicity: Fall 1992, 1998, and 2003

Principal teaching field, career teaching faculty by type of institution, and specific career field	White	Black	Hispanic	Asian/ Pacific Islander	American Indian	More than one race/ ethnicity
1992						
All faculty	87.5	4.9	2.8	4.2	0.6	†
Principal teaching field						
Career education	87.4	5.3	2.2	4.4	0.7	†
Academic	87.6	4.7	3.1	4.1	0.4	†
Other	87.9	3.9	4.3	3.1	0.8 !	†
Career teaching faculty by type of institution						
Public 4-year	85.9	5.6	1.9	6.1	0.5	†
Private not-for-profit 4-year	89.2	4.7	1.5	4.3	0.3	†
Public 2-year	87.9	5.4	3.3	2.3	1.0	†
Private not-for-profit 2-year	87.6	6.9 !	0.5 !	2.7 !	2.3 !	†
Specific career field						
Agriculture and natural resources	92.0	3.3 !	3.0 !	1.7 !	#	†
Business	89.1	4.5	2.1	3.5	0.8	†
Communications and design	90.1	4.2	1.0 !	4.1 !	0.7 !	†
Computer science	84.9	3.3	2.3	8.3	1.2 !	†
Engineering and architectural sciences	81.0	2.8	3.0	12.2	0.9 !	†
Health care	88.2	5.6	1.5	4.2	0.4 !	†
Personal and consumer services	87.6	6.1	2.7 !	2.6	1.0 !	†
Protective services	88.9	4.5	3.9 !	2.4 !	0.2 !	†
Public, social, human, and legal services	88.5	7.7	2.2	1.6	#	†
Education	86.8	8.4	2.5	1.4	1.0	†
Trade and industry	90.0	3.5	4.3	1.9 !	0.4 !	†

See notes at end of table.

Table 3.30. Percentage distribution of teaching faculty in various principal and career fields and institution types, by race/ethnicity: Fall 1992, 1998, and 2003—Continued

Principal teaching field, career teaching faculty by type of institution, and specific career field	White	Black	Hispanic	Asian/ Pacific Islander	American Indian	More than one race/ ethnicity
1998						
All faculty	85.8	4.9	3.5	4.3	0.5	0.9
Principal teaching field						
Career education	86.4	4.9	3.0	4.3	0.6	0.8
Academic	85.8	4.7	3.9	4.1	0.4	1.0
Other	79.5	8.1	4.6	6.3	0.4 !	1.0 !
Career teaching faculty by type of institution						
Public 4-year	84.6	4.8	2.8	6.2	0.5	1.0
Private not-for-profit 4-year	88.2	4.2	2.6	3.8	0.4	0.9
Public 2-year	87.2	5.7	3.7	2.0	0.8	0.6 !
Private not-for-profit 2-year	86.0	6.3 !	4.0	3.3 !	#	0.4 !
Specific career field						
Agriculture and natural resources	87.5	4.2 !	2.1 !	3.1 !	1.1 !	1.9 !
Business	88.8	5.2	1.5	3.3	0.1 !	1.0 !
Communications and design	90.5	3.6	2.6	2.6 !	0.1 !	0.6 !
Computer science	87.0	4.0	2.6	5.2	0.7 !	0.5 !
Engineering and architectural sciences	78.9	2.8	5.3	11.4	0.4 !	1.2 !
Health care	87.3	4.2	2.8	4.4	0.5 !	0.8
Personal and consumer services	68.2	9.6 !	2.5 !	14.1 !	5.4 !	0.3 !
Protective services	91.5	4.9	2.0 !	0.3 !	0.5 !	0.7 !
Public, social, human, and legal services	87.9	5.4	3.3	3.0	0.3 !	0.1 !
Education	85.5	7.1	3.9	1.9	0.7 !	0.8
Trade and industry	90.4	2.9 !	3.2 !	1.6 !	0.5 !	1.3 !

See notes at end of table.

3. Career Education at the Postsecondary Level

Table 3.30. Percentage distribution of teaching faculty in various principal and career fields and institution types, by race/ethnicity: Fall 1992, 1998, and 2003—Continued

Principal teaching field, career teaching faculty by type of institution, and specific career field	White	Black	Hispanic	Asian/ Pacific Islander	American Indian	More than one race/ ethnicity
2003						
All faculty	82.9	5.7	3.6	5.7	0.4	1.7
Principal teaching field						
Career education	82.6	6.0	3.3	6.0	0.5	1.6
Academic	83.1	5.3	3.9	5.6	0.3	1.8
Other	86.6	7.7	2.1 !	1.4 !	0.8 !	1.4 !
Career teaching faculty by type of institution						
Public 4-year	81.1	5.3	3.3	8.2	0.3	1.7
Private not-for-profit 4-year	85.0	5.0	2.7	5.5	0.2 !	1.6
Public 2-year	82.9	6.8	4.8	3.1	0.6	1.8
Private not-for-profit 2-year	95.2	1.9 !	0.4 !	1.1 !	#	1.4 !
Specific career field						
Agriculture and natural resources	90.3	0.4 !	2.1 !	4.1 !	#	3.1 !
Business	82.8	5.3	2.3	7.1	0.4 !	2.0
Communications and design	87.3	4.7	2.9	1.9 !	0.6 !	2.5 !
Computer science	78.1	5.9	3.5	10.6	0.2 !	1.7
Engineering and architectural sciences	75.4	5.4	2.9	14.7	0.3 !	1.3 !
Health care	83.4	5.2	2.5	6.9	0.5 !	1.6
Personal and consumer services	86.9	6.2	2.7	2.0	0.5 !	1.7
Protective services	89.0	5.6 !	2.5	0.2 !	1.4 !	1.3 !
Public, social, human, and legal services	80.6	10.1	4.4	2.9	0.7 !	1.2
Education	83.3	7.5	4.9	2.6	0.4	1.3
Trade and industry	85.1	3.5	7.2	2.0 !	1.1 !	1.0 !

† Not applicable.

Rounds to zero.

! Interpret data with caution.

NOTE: Teaching faculty includes all faculty and instructional staff who taught at least one class in Fall 1992, 1998, or 2003. Black includes African American, Hispanic includes Latino, Pacific Islander includes Native Hawaiian, and American Indian includes Alaska Native. Race categories exclude Hispanic origin unless specified. "Other" teaching fields include basic skills, English as a second language, military studies, interdisciplinary studies, and other unspecified fields. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993, 1999, and 2004 National Study of Postsecondary Faculty (NSOPF:93, NSOPF:99, and NSOPF:04).

computer science teaching faculty were White than their peers in other career fields (75–78 percent vs. 81–90 percent). In these same two fields, larger percentages of faculty were Asian or Pacific Islander than faculty in all other career fields (11–15 vs. 7 percent or less).⁸²

Summary of Faculty Comparisons: Fall 2003

Tables 3.31 and 3.32 provide summaries of selected comparisons among teaching faculty in fall 2003 according to their primary teaching field, level and sector of institution, and specific career field. Table 3.31 shows that in comparison with their academic colleagues, greater percentages of career teaching faculty were employed part time, performed outside consulting or other professional employment, were satisfied overall with their postsecondary job, possessed less than a bachelor's degree, and were female. No measurable differences were detected between career and academic teaching faculty with regard to years employed in their current job or minority racial/ethnic status.

Table 3.31. Summary of selected comparisons of teaching faculty, by principal teaching field and institution type: Fall 2003

	Career vs. academic	Career		
		Public 2-year vs. public 4-year	Public 2-year vs. private 2-year	Private 4-year vs. public 4-year
Employed part time	+	+	+	+
Performed outside consulting or had other professional employment	+	+	+	+
Satisfied with job overall	+	+	0	+
Years employed in current job	0	0	0	0
Possess less than a bachelor's degree	+	+	+	0
Female	+	+	+	0
From a racial/ethnic minority	0	0	0	-

NOTE: Plus sign means that faculty in the first group listed were more likely to have this characteristic or had a higher value on this characteristic than the faculty in the second group listed; minus sign means that faculty in the first group listed were less likely to have this characteristic or had a lower value on this characteristic than the faculty in the second group listed; and zero means that no measurable difference was found between the two groups.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2004 National Study of Postsecondary Faculty (NSOPF:04).

⁸² There was no measurable difference in the percentage of computer science and public, social, human, legal, and services faculty who were White.

3. Career Education at the Postsecondary Level

Table 3.31 also shows that the characteristics of career teaching faculty often varied by the level and sector of the institution at which they were employed. For example, compared with their colleagues at both types of 4-year institutions, greater percentages of career teaching faculty at public 2-year institutions were employed part time, had performed outside consulting or another professional job, possessed less than a bachelor's degree, and were female.

Table 3.32 compares teaching faculty in various career fields on selected characteristics, revealing some common patterns. For example, the majority of teaching faculty in the fields of protective services and education were employed part time, and these two areas had the highest concentrations of faculty performing outside consulting or other professional employment. However, they diverged on other indicators. Education represented one of the largest career faculties and had one of the highest concentrations of female faculty. Protective services, on the other hand, had one of the highest concentrations of faculty with less than a bachelor's degree, and the majority of faculty in this field were employed at public 2-year institutions.

Table 3.32. Summary of selected characteristics of teaching faculty in specific career fields: Fall 2003

Specific career field	Largest career fields in 2003	Majority at public 4-year institution	Majority at public 2-year institution	Majority employed part time	Among career fields, highest concentration of faculty who:			
					Performed outside consulting or other professional employment	Held less than a bachelor's degree	Were female	Were from minority racial/ethnic group
Agriculture and natural resources		✓						
Business	✓							
Communications and design								
Computer science								
Engineering and architectural sciences								✓
Health	✓							✓
Personal and consumer services								
Protective services			✓	✓	✓	✓		
Public, social, human, and legal services								
Education	✓			✓	✓			✓
Trade and industry			✓					✓

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2004 National Study of Postsecondary Faculty (NSOPF:04).

Changes in the Size of the Career Education Teaching Force: 1992 and 2003

Some changes in the career education teaching force were observed between fall 1992 and fall 2003. These changes included the size and distribution of career faculty, the distribution of faculty by career field, employment intensity, job satisfaction, demographics, and educational attainment by career field. The number of postsecondary teaching faculty who taught in career and academic fields increased by 125,000 and 114,000, respectively, between fall 1992 and fall 2003 (table 3.22). Increases in career and academic faculty were found at public 4-year institutions, private not-for-profit 4-year institutions, and public 2-year institutions. No measurable changes were detected in the number of career and academic teaching faculty at private not-for-profit 2-year institutions. All but 3 of the 11 career fields examined exhibited significant increases in the number of teaching faculty over the period. The exceptions were found in agricultural and natural resources; public, social, human, and legal services; and trade and industry, each of which experienced no measurable change in the size of the teaching faculty over this period.

Changes in Teaching Conditions: 1992 and 2003

Employment Status

The percentage of career teaching faculty who were employed part time increased between 1992 and 2003 from 43 to 47 percent, while no measurable change was detected in the percentage of academic faculty who worked part time (40–42 percent in both years) (table 3.24). The percentage of career faculty working part time increased at public 2-year institutions, but no measurable change was detected among career faculty at public 4-year institutions. The percentage of career faculty working part time at private 4-year institutions decreased.

Job Satisfaction

Job satisfaction increased for both career and academic faculty between fall 1992 and fall 2003, overall and with regard to salary, benefits, and workload (table 3.26). Satisfaction with salary and workload increased among career teaching faculty at public 4-year institutions, while satisfaction with salary and benefits increased among career faculty at private 4-year institutions. Career faculty at public 2-year institutions experienced increases in satisfaction overall and with salary and workload. Increases in overall job satisfaction were found among faculty in the specific career fields of business; communications and design; engineering and architectural sciences; health; public, social, human and legal services; and education.

Changes in Faculty Characteristics: 1992 and 2003

Demographics

No substantive changes were detected between fall 1992 and fall 2003 in the average age of career and academic teaching faculty overall or among career faculty at public or private 4-year postsecondary institutions (tables 3.27 and 3.30). However, average age increased among career teaching faculty at public 2-year institutions and in the fields of business and health. The percentages of non-White faculty increased among academic faculty and among career faculty overall and among those at public and private 4-year institutions and public 2-year institutions. An increase in the percentage of non-White faculty was found among the specific career fields of business; computer science; engineering and architectural sciences; health; public, social, human and legal services; and education.

The percentages of career and academic faculty overall who were male declined between fall 1992 and fall 2003 (by 4 to 6 percentage points) (table 3.29). The decline in the percentage of male career teaching faculty occurred primarily at public 4-year and public 2-year institutions (with declines of 4 and 6 percentage points, respectively) and among career faculty in the fields of agriculture and natural resources; computer science; health; public, social, human and legal services; and education (with declines of 5 to 17 percentage points).

Educational Attainment

No substantive changes were detected between fall 1992 and fall 2003 in the educational attainment of career and academic faculty overall or among career faculty at any of the postsecondary institution types, with the exception of an increase in the percentage of career faculty at public 2-year colleges who possessed a graduate degree (table 3.28). Some changes among specific career fields were also noted. The percentage of career faculty with graduate degrees increased in business and decreased in the fields of agriculture and natural resources, health, education, and trade and industry.

Summary of Faculty Changes: 1992 and 2003

Career and academic teaching faculty overall exhibited some similar and some divergent changes between fall 1992 and fall 2003. For example, both groups increased in number and were more satisfied with their jobs in 2003 than in 1992. However, the percentage of career teaching faculty who worked part time increased over the period while no measurable change in part-time status was detected among academic faculty.

E. WHAT IS ACCOMPLISHED?

This section of the report focuses on education and employment outcomes for career majors. It uses data from the 2004–05 Integrated Postsecondary Education Data System (IPEDS) (referred to here as 2005) to provide an overview of credentials awarded to postsecondary students in 2005 and from the 1996/01 Beginning Postsecondary Students Longitudinal Study (BPS:96/01) to look at persistence, attainment, and labor market outcomes of career majors who began their postsecondary education during the 1995–96 academic year.

Postsecondary Credentials Awarded: 2005

Information on credentials awarded in career fields was obtained from IPEDS for 2005, which is restricted to awards at Title IV eligible 4-year, 2-year, and less-than-2-year postsecondary institutions. A total of about 1.9 million undergraduate credentials were awarded in career fields by these institutions in 2005 (table 3.33). Among career credentials awarded in 2005, about 44 percent were bachelor's degrees, 21 percent were associate's degrees, and 36 percent were certificates (table 3.34). About half (50 percent) of career credentials in 2005 were awarded by 4-year institutions, 38 percent by 2-year institutions, and 13 percent by less-than-2-year institutions (table 3.35).

The most common career credential field was health care, representing 26 percent of all credentials awarded in career fields in 2005, followed by business and marketing, which accounted for 24 percent of all career credentials in this year (table 3.36). The majority of postsecondary credentials awarded in health care were certificates (60 percent) followed by associate's degrees (24 percent) and bachelor's degrees (16 percent) (table 3.34). In contrast, the majority of credentials awarded in business and marketing were bachelor's degrees (67 percent) followed by associate's degrees (20 percent) and certificates (13 percent).

The most common career credential fields varied by credential level. Among certificates awarded in 2005, the most common career field was health care (44 percent of all CTE certificates), followed by trade and industry (17 percent), and personal and consumer services (15 percent) (table 3.36). The dominant career fields for associate's degrees included health care (31 percent), business and marketing (23 percent), and engineering and architectural sciences (9 percent). Among bachelor's degrees, the most common fields were business and marketing (37 percent), education (13 percent), engineering and architectural sciences (11 percent), and health care (10 percent).

Table 3.33. Number of undergraduate credentials awarded in career fields by Title IV eligible postsecondary institutions, by career field and type of credential: 2004–05

Type of credential	Total	Agricul- tural and natural resources	Business and marketing	Communi- cations	Computer sciences	Education	Engi- neering and archi- tectural sciences	Health care	Legal services	Personal and consumer services	Protective services	Public, social, and human services	Trade and industry
Total	1,923,400	34,642	461,974	86,106	114,769	125,545	148,270	503,135	20,075	174,082	83,010	27,492	144,300
Certificates, total	685,450	5,236	61,286	5,001	26,013	6,823	21,664	300,631	7,038	103,557	28,310	1,524	118,367
Less than 1 year	356,536	3,355	37,676	2,357	14,397	4,312	10,592	161,785	2,736	41,910	22,160	987	54,269
At least 1 but													
less than 2 years	301,808	1,667	22,776	2,402	10,761	2,412	10,171	129,795	3,915	56,206	5,986	514	55,203
2 or more years	27,106	214	834	242	855	99	901	9,051	387	5,441	164	23	8,895
Degrees, total	1,237,950	29,406	400,688	81,105	88,756	118,722	126,606	202,504	13,037	70,525	54,700	25,968	25,933
Associate's degree	398,673	6,404	91,493	6,058	35,864	13,299	37,753	122,141	9,876	26,977	24,071	4,127	20,610
Bachelor's degree	839,277	23,002	309,195	75,047	52,892	105,423	88,853	80,363	3,161	43,548	30,629	21,841	5,323

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Completions and Institutional Characteristics data file, 2004–05.

Table 3.34. Percentage distribution of undergraduate credentials awarded by Title IV eligible postsecondary institutions in each career field, by type of credential: 2004–05

Type of credential	Total	Agricul- tural and natural resources	Business and marketing	Communi- cations	Computer sciences	Education	Engi- neering and archi- tectural sciences	Health care	Legal services	Personal and consumer services	Protective services	Public, social, and human services	Trade and industry
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Certificates, total	35.6	15.1	13.3	5.8	22.7	5.4	14.6	59.8	35.1	59.5	34.1	5.5	82.0
Less than 1 year	18.5	9.7	8.2	2.7	12.5	3.4	7.1	32.2	13.6	24.1	26.7	3.6	37.6
At least 1 but less than 2 years	15.7	4.8	4.9	2.8	9.4	1.9	6.9	25.8	19.5	32.3	7.2	1.9	38.3
2 or more years	1.4	0.6	0.2	0.3	0.7	0.1	0.6	1.8	1.9	3.1	0.2	0.1	6.2
Degrees, total	64.4	84.9	86.7	94.2	77.3	94.6	85.4	40.2	64.9	40.5	65.9	94.5	18.0
Associate's degree	20.7	18.5	19.8	7.0	31.2	10.6	25.5	24.3	49.2	15.5	29.0	15.0	14.3
Bachelor's degree	43.6	66.4	66.9	87.2	46.1	84.0	59.9	16.0	15.7	25.0	36.9	79.4	3.7

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

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Completions and Institutional Characteristics data file, 2004–05.

Table 3.35. Number and percentage distribution of undergraduate credentials awarded in career fields by Title IV eligible postsecondary institutions at each level and sector, by type of credential: 2004–05

Level and sector of institution	Total	Certificates			Degrees			
		Total	Less than 1 year	At least 1 but less than 2 years	2 or more years	Total	Associate's degree	Bachelor's degree and above
Number of credentials								
Total	1,923,400	685,450	356,536	301,808	27,106	1,237,950	398,673	839,277
4-year total	952,952	27,934	11,397	14,728	1,809	925,018	85,746	839,272
Public	586,908	10,385	4,459	4,754	1,172	576,523	28,833	547,690
Private not-for-profit	286,915	7,921	2,940	4,559	422	278,994	25,961	253,033
Private for-profit	79,129	9,628	3,998	5,415	215	69,501	30,952	38,549
2-year total	728,110	415,328	220,691	169,851	24,786	312,782	312,777	5
Public	561,863	311,735	183,099	118,587	10,049	250,128	250,124	4
Private not-for-profit	19,001	10,790	4,791	2,035	3,964	8,211	8,211	0
Private for-profit	147,246	92,803	32,801	49,229	10,773	54,443	54,442	1
Less-than-2-year total	242,338	242,188	124,448	117,229	511	150	150	0
Public	38,644	38,644	16,884	21,422	338	0	0	0
Private not-for-profit	11,172	11,145	6,353	4,792	0	27	27	0
Private for-profit	192,522	192,399	101,211	91,015	173	123	123	0

See notes at end of table.

Table 3.35. Number and percentage distribution of undergraduate credentials awarded in career fields by Title IV eligible postsecondary institutions at each level and sector, by type of credential: 2004–05—Continued

Level and sector of institution	Total	Certificates			Degrees			
		Total	Less than 1 year	At least 1 but less than 2 years	2 or more years	Total	Associate's degree	Bachelor's degree and above
Percentage distribution of credentials within credential type								
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
4-year total	49.5	4.1	3.2	4.9	6.7	74.7	21.5	100.0
Public	30.5	1.5	1.3	1.6	4.3	46.6	7.2	65.3
Private not-for-profit	14.9	1.2	0.8	1.5	1.6	22.5	6.5	30.1
Private for-profit	4.1	1.4	1.1	1.8	0.8	5.6	7.8	4.6
2-year total	37.9	60.6	61.9	56.3	91.4	25.3	78.5	0.0
Public	29.2	45.5	51.4	39.3	37.1	20.2	62.7	0.0
Private not-for-profit	1.0	1.6	1.3	0.7	14.6	0.7	2.1	0.0
Private for-profit	7.7	13.5	9.2	16.3	39.7	4.4	13.7	0.0
Less-than-2-year total	12.6	35.3	34.9	38.8	1.9	0.0	0.0	0.0
Public	2.0	5.6	4.7	7.1	1.2	0.0	0.0	0.0
Private not-for-profit	0.6	1.6	1.8	1.6	0.0	0.0	0.0	0.0
Private for-profit	10.0	28.1	28.4	30.2	0.6	0.0	0.0	0.0

See notes at end of table.

Table 3.35. Number and percentage distribution of undergraduate credentials awarded in career fields by Title IV eligible postsecondary institutions at each level and sector, by type of credential: 2004–05—Continued

Level and sector of institution	Total	Certificates				Degrees		
		Total	Less than 1 year	At least 1 but less than 2 years	2 or more years	Total	Associate's degree	Bachelor's degree and above
Percentage distribution of credentials within institution type								
Total	100.0	35.6	18.5	15.7	1.4	64.4	20.7	43.6
4-year total	100.0	2.9	1.2	1.5	0.2	97.1	9.0	88.1
Public	100.0	1.8	0.8	0.8	0.2	98.2	4.9	93.3
Private not-for-profit	100.0	2.8	1.0	1.6	0.1	97.2	9.0	88.2
Private for-profit	100.0	12.2	5.1	6.8	0.3	87.8	39.1	48.7
2-year total	100.0	57.0	30.3	23.3	3.4	43.0	43.0	0.0
Public	100.0	55.5	32.6	21.1	1.8	44.5	44.5	0.0
Private not-for-profit	100.0	56.8	25.2	10.7	20.9	43.2	43.2	0.0
Private for-profit	100.0	63.0	22.3	33.4	7.3	37.0	37.0	0.0
Less-than-2-year total	100.0	99.9	51.4	48.4	0.2	0.1	0.1	0.0
Public	100.0	100.0	43.7	55.4	0.9	0.0	0.0	0.0
Private not-for-profit	100.0	99.8	56.9	42.9	0.0	0.2	0.2	0.0
Private for-profit	100.0	99.9	52.6	47.3	0.1	0.1	0.1	0.0

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

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Completions and Institutional Characteristics data file, 2004–05.

Table 3.36. Percentage distribution of undergraduate credentials awarded in career fields by Title IV eligible postsecondary institutions for each type of credential, by career field: 2004–05

Type of credential	Total	Agricul- tural and natural resources	Business and marketing	Communi- cations	Computer sciences	Education	Engi- neering and archi- tectural sciences	Health care	Legal services	Personal and consumer services	Protective services	Public, social, and human services	Trade and industry
Total	100.0	1.8	24.0	4.5	6.0	6.5	7.7	26.2	1.0	9.1	4.3	1.4	7.5
Certificates, total	100.0	0.8	8.9	0.7	3.8	1.0	3.2	43.9	1.0	15.1	4.1	0.2	17.3
Less than 1 year	100.0	0.9	10.6	0.7	4.0	1.2	3.0	45.4	0.8	11.8	6.2	0.3	15.2
At least 1 but less than 2 years	100.0	0.6	7.5	0.8	3.6	0.8	3.4	43.0	1.3	18.6	2.0	0.2	18.3
2 or more years	100.0	0.8	3.1	0.9	3.2	0.4	3.3	33.4	1.4	20.1	0.6	0.1	32.8
Degrees, total	100.0	2.4	32.4	6.6	7.2	9.6	10.2	16.4	1.1	5.7	4.4	2.1	2.1
Associate's degree	100.0	1.6	22.9	1.5	9.0	3.3	9.5	30.6	2.5	6.8	6.0	1.0	5.2
Bachelor's degree	100.0	2.7	36.8	8.9	6.3	12.6	10.6	9.6	0.4	5.2	3.6	2.6	0.6

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

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Completions and Institutional Characteristics data file, 2004–05.

Tables 3.37 and 3.38 show the number and percentage of credentials awarded in the various career fields by each institution type in 2005. Four-year institutions conferred the majority of credentials in the fields of communications (89 percent), education (86 percent), public, social, and human services (82 percent), business and marketing (72 percent), agricultural and natural resources (71 percent), engineering and architectural sciences (68 percent), and computer sciences (58 percent) (table 3.38). Two-year institutions conferred the majority of credentials in trade and industry (72 percent), legal services (57 percent), protective services (54 percent), and health care (53 percent). The largest concentration of credentials awarded by less-than-2-year institutions was in personal and consumer services, with these institutions conferring 35 percent of all personal and consumer services credentials in 2005.

Looking within each type of institution, 4-year institutions awarded their largest percentage of undergraduate career credentials in the field of business and marketing (35 percent), whereas 2-year and less-than-2-year institutions both awarded their largest percentages of career credentials in health care (37 and 49 percent, respectively) (table 3.39).

Beginning Postsecondary Student Outcomes: 1996–2001

The rates at which students with career majors persist in postsecondary education, attain certificates and degrees, and are successful in the labor market are key measures of their accomplishment. This section uses tables excerpted from the NCES report *Students Entering and Leaving Postsecondary Occupational Education: 1995–2001* (Hudson, Kienzl, and Diehl 2007)⁸³ to examine these measures. This section presents findings on differences between relevant groups that were statistically significant (sometimes referred to as measurably different). Substantive difference is not considered, because the source report for this section did not apply this criterion. Because success in postsecondary education and the labor market depends in part on students' characteristics and enrollment patterns, these are described first.

Hudson, Kienzl, and Diehl (2007) used data from the 1996/01 Beginning Postsecondary Students Longitudinal Study (BPS:96/01), a dataset that follows students who enrolled in postsecondary education for the first time in 1995–96 over a 6-year period to study their progress through postsecondary education and into the labor force. The base year sample for BPS:96/01 came from the 1995–96 National Postsecondary Student Aid Study (NPSAS:96), a nationally representative survey of all postsecondary students in the United States who attended less-than-2-

⁸³ Some of the terminology used in Hudson, Kienzl, and Diehl (2007) was changed in this section to be consistent with how career education is described in this report.

Table 3.37. Number of undergraduate credentials awarded in career fields by Title IV eligible postsecondary institutions, by career field, level of institution, and sector: 2004–05

Level and sector of institution	Total	Agricultural and natural resources	Business and marketing	Communi-cations	Computer sciences	Education	Engi-neering and archi-tectural sciences	Health care	Legal services	Personal and consumer services	Protective services	Public, social, and human services	Trade and industry
Total	1,923,400	34,642	461,974	86,106	114,769	125,545	148,270	503,135	20,075	174,082	83,010	27,492	144,300
4-year total	952,952	24,557	333,610	76,720	66,197	107,496	101,296	114,855	6,668	52,153	36,273	22,523	10,604
Public	586,908	21,062	186,270	52,044	29,795	75,511	72,765	66,494	2,508	36,376	24,553	14,294	5,236
Private not-for-profit	286,915	3,495	118,934	23,167	16,777	31,848	20,081	36,680	2,250	12,922	8,640	7,563	4,558
Private for-profit	79,129	0	28,406	1,509	19,625	137	8,450	11,681	1,910	2,855	3,080	666	810
2-year total	728,110	9,775	116,130	7,033	41,178	16,164	42,092	268,653	11,336	61,656	45,270	4,936	103,887
Public	561,863	9,664	96,770	6,298	30,794	15,192	33,431	195,418	7,182	42,144	42,857	4,913	77,200
Private not-for-profit	19,001	33	5,725	81	1,100	221	1,300	7,624	168	710	371	23	1,645
Private for-profit	147,246	78	13,635	654	9,284	751	7,361	65,611	3,986	18,802	2,042	0	25,042
Less-than-2-year total	242,338	310	12,234	2,353	7,394	1,885	4,882	119,627	2,071	60,273	1,467	33	29,809
Public	38,644	216	3,757	204	1,565	3	1,252	18,209	68	2,822	1,387	22	9,139
Private not-for-profit	11,172	47	1,608	13	387	836	147	4,120	0	431	0	11	3,572
Private for-profit	192,522	47	6,869	2,136	5,442	1,046	3,483	97,298	2,003	57,020	80	0	17,098

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

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Completions and Institutional Characteristics data file, 2004–05.

Table 3.38. Percentage distribution of undergraduate credentials awarded by Title IV eligible postsecondary institutions in each career field, by level of institution and sector: 2004–05

Level and sector of institution	All fields of study	Agricultural and natural resources	Business and marketing	Communications	Computer sciences	Education	Engineering and architectural sciences	Health care	Legal services	Personal and consumer services	Protective services	Public, social, and human services	Trade and industry
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
4-year total	49.5	70.9	72.2	89.1	57.7	85.6	68.3	22.8	33.2	30.0	43.7	81.9	7.3
Public	30.5	60.8	40.3	60.4	26.0	60.1	49.1	13.2	12.5	20.9	29.6	52.0	3.6
Private not-for-profit	14.9	10.1	25.7	26.9	14.6	25.4	13.5	7.3	11.2	7.4	10.4	27.5	3.2
Private for-profit	4.1	0.0	6.1	1.8	17.1	0.1	5.7	2.3	9.5	1.6	3.7	2.4	0.6
2-year total	37.9	28.2	25.1	8.2	35.9	12.9	28.4	53.4	56.5	35.4	54.5	18.0	72.0
Public	29.2	27.9	20.9	7.3	26.8	12.1	22.5	38.8	35.8	24.2	51.6	17.9	53.5
Private not-for-profit	1.0	0.1	1.2	0.1	1.0	0.2	0.9	1.5	0.8	0.4	0.4	0.1	1.1
Private for-profit	7.7	0.2	3.0	0.8	8.1	0.6	5.0	13.0	19.9	10.8	2.5	0.0	17.4
Less-than-2-year total	12.6	0.9	2.6	2.7	6.4	1.5	3.3	23.8	10.3	34.6	1.8	0.1	20.7
Public	2.0	0.6	0.8	0.2	1.4	0.0	0.8	3.6	0.3	1.6	1.7	0.1	6.3
Private not-for-profit	0.6	0.1	0.3	0.0	0.3	0.7	0.1	0.8	0.0	0.2	0.0	0.0	2.5
Private for-profit	10.0	0.1	1.5	2.5	4.7	0.8	2.3	19.3	10.0	32.8	0.1	0.0	11.8

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

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Completions and Institutional Characteristics data file, 2004–05.

Table 3.39. Percentage distribution of undergraduate credentials awarded in career fields by Title IV eligible postsecondary institutions at each institution level and sector, by career field: 2004–05

Level and sector of institution	All fields of study	Agricultural and natural resources	Business and marketing	Communi- cations	Computer sciences	Education	Engi- neering and archi- tectural sciences	Health care	Legal services	Personal and consumer services	Protective services	Public, social, and human services	Trade and industry
Total	100.0	1.8	24.0	4.5	6.0	6.5	7.7	26.2	1.0	9.1	4.3	1.4	7.5
4-year total	100.0	2.6	35.0	8.1	6.9	11.3	10.6	12.1	0.7	5.5	3.8	2.4	1.1
Public	100.0	3.6	31.7	8.9	5.1	12.9	12.4	11.3	0.4	6.2	4.2	2.4	0.9
Private not-for-profit	100.0	1.2	41.5	8.1	5.8	11.1	7.0	12.8	0.8	4.5	3.0	2.6	1.6
Private for-profit	100.0	0.0	35.9	1.9	24.8	0.2	10.7	14.8	2.4	3.6	3.9	0.8	1.0
2-year total	100.0	1.3	15.9	1.0	5.7	2.2	5.8	36.9	1.6	8.5	6.2	0.7	14.3
Public	100.0	1.7	17.2	1.1	5.5	2.7	6.0	34.8	1.3	7.5	7.6	0.9	13.7
Private not-for-profit	100.0	0.2	30.1	0.4	5.8	1.2	6.8	40.1	0.9	3.7	2.0	0.1	8.7
Private for-profit	100.0	0.1	9.3	0.4	6.3	0.5	5.0	44.6	2.7	12.8	1.4	0.0	17.0
Less-than-2-year total	100.0	0.1	5.0	1.0	3.1	0.8	2.0	49.4	0.9	24.9	0.6	0.0	12.3
Public	100.0	0.6	9.7	0.5	4.0	0.0	3.2	47.1	0.2	7.3	3.6	0.1	23.6
Private not-for-profit	100.0	0.4	14.4	0.1	3.5	7.5	1.3	36.9	0.0	3.9	0.0	0.1	32.0
Private for-profit	100.0	0.0	3.6	1.1	2.8	0.5	1.8	50.5	1.0	29.6	0.0	0.0	8.9

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

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Completions and Institutional Characteristics data file, 2004–05.

year, 2-year, or 4-year institutions.⁸⁴ NPSAS:96 students who enrolled in postsecondary education for the first time in 1995–96 formed the BPS sample. Students in this sample were asked additional questions in 1995–96 and were reinterviewed in 1998 and 2001. While BPS:96/01 includes beginning students of all ages, as a group these students are younger than the NPSAS population as a whole—45 percent of BPS:96/01 students were age 18 or younger compared with 10 percent of NPSAS:96 students (Kojaku and Nunez 1998; Horn and Berkold 1998). In part because of this age difference, the background characteristics and enrollment patterns of BPS students differ from those of the NPSAS students described in section C.

In addition, the beginning postsecondary students examined in this section were limited to those who had earned a high school diploma or its equivalent (such as a general educational development [GED] certificate) and who reported in 1995–96 that their goal was a certificate, an associate’s degree, a bachelor’s degree, or transfer to another institution.⁸⁵ These students are referred to here as “credential seeking.”⁸⁶ In 1995–96, this restricted population of beginning students numbered about 2.5 million (table 3.40).

For this analysis, these beginning postsecondary students were classified as either subbaccalaureate or baccalaureate based on their first institution and credential goal. Subbaccalaureate students were those who enrolled first at a less-than-4-year institution (about 96 percent of all subbaccalaureate students) or enrolled at a 4-year institution but were seeking less than a bachelor’s degree at that institution or planning to transfer downward to a less-than-4-year institution (about 4 percent of all subbaccalaureate students) (Hudson, et al., 2007). Baccalaureate students were those who initially enrolled at a 4-year institution and were seeking a bachelor’s or higher degree at that institution (93 percent of all baccalaureate students) or planning to transfer to another 4-year institution (7 percent of all baccalaureate students).

Students’ majors (as reported in 1995–96) were classified as academic, career, or “other” according to a taxonomy similar to the one used in section C and shown in exhibit 1.2. “Other” majors include primarily undeclared majors.⁸⁷ The taxonomies used for the different postsecondary analyses in this report are shown in appendix A.

⁸⁴ See the BPS:96/01 methodology report (Wine et al. 2002) for additional details on the study.

⁸⁵ Based on these criteria, 24 percent of all BPS students were omitted from this study: 17 percent because of “missing” or “don’t know” responses to the question about credential goals, 6 percent because they had no credential goal, and 1 percent because they did not have a high school diploma or equivalent.

⁸⁶ In contrast, in section C, credential-seeking students were identified based on the type of degree program in which they were currently enrolled, rather than on the highest level of education students sought at their first institution.

⁸⁷ “Other” majors did not include interdisciplinary studies, which was included under academic majors in the BPS:96/01 analysis. This differed from the NPSAS analysis in section C, where interdisciplinary studies had to be included under “other” majors because of differences in the coding used in NPSAS:90 and NPSAS:2000.

Table 3.40. Number and percentage distribution of credential-seeking beginning postsecondary students, by initial credential goal and major field: 1995–96

Initial credential goal and major field	Number	Percent
Total	2,472,000	100.0
Subbaccalaureate	1,429,000	57.8
Career education	893,000	36.1
Certificate	279,000	11.3
Associate's degree or higher	614,000	24.9
Academic	233,000	9.4
Certificate	6,000 !	0.3
Associate's degree or higher	227,000	9.2
Other	302,000	12.2
Baccalaureate	1,043,000	42.2
Career education	468,000	18.9
Academic	258,000	10.4
Other	317,000	12.8

! Interpret data with caution.

NOTE: Subbaccalaureate includes students who were initially enrolled at a less-than-4-year institution, as well as students initially enrolled at a 4-year institution who were either seeking less than a bachelor's degree at that institution or seeking to transfer to a less-than-4-year institution. All subbaccalaureate students planning to transfer are included under associate's degree or higher. Baccalaureate includes students who were initially enrolled at a 4-year institution and were either seeking a bachelor's or higher degree at that institution or seeking to transfer to another 4-year institution. Students in the "other" category have mainly undeclared majors. Estimates include students from the 50 states, DC, and Puerto Rico. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

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

In 1995–96, more than half of the beginning postsecondary students in this analysis (58 percent) were enrolled at the subbaccalaureate level—36 percent with a career major, 9 percent with an academic major, and 12 percent with an “other” major (table 3.40). The other 42 percent were baccalaureate students—19 percent with a career major, 10 percent with an academic major, and 13 percent with an “other” major. Thus, taking into account both level and major, subbaccalaureate career majors—at 36 percent—constituted the largest group of beginning postsecondary students. At both the subbaccalaureate and baccalaureate levels, more students majored in career fields than in academic fields.

The tables in this section show detailed information by level (subbaccalaureate and baccalaureate), credential (certificate, associate's degree, and bachelor's degree), and field of major (career and academic). For simplicity, subbaccalaureate students seeking an associate's degree or planning to transfer without a degree to a 4-year institution to earn a bachelor's degree are referred to in the tables as having a goal of “associate's degree or higher” and in the text as “subbaccalaureate degree seekers.” The discussion focuses on three main comparisons:

subbaccalaureate degree seekers with career versus academic majors, subbaccalaureate career majors seeking a certificate versus a degree, and baccalaureate students with career versus academic majors. (There were too few students seeking an academic certificate to permit comparisons of this group with career certificate seekers.)

Characteristics of Beginning Postsecondary Students

Student outcomes depend in part on the characteristics of students who enter postsecondary education and on their enrollment patterns. Research has shown that students are less likely to persist in postsecondary education if, for example, they come from low socioeconomic backgrounds, earn a GED rather than a regular high school diploma, delay their entry into postsecondary education (and thus are older when they begin), enroll part time, work full time while enrolled, have dependents other than a spouse, or are (for financial aid purposes) financially independent (Horn and Berger 2004; Hoachlander, Sikora, and Horn 2003; Horn 1996; Berkner, Cuccaro-Alamin, and McCormick 1996). Thus, before turning to an examination of their educational and labor market outcomes, it is useful to look at the characteristics of career and academic beginning postsecondary students (Bailey et al. 2004).

At the subbaccalaureate level, greater percentages of degree seekers with career majors compared with their counterparts with academic majors were Black (15 vs. 7 percent) and attended private for-profit institutions (10 vs. 1 percent) (table 3.41). As one might expect, career majors also appeared to be more employment oriented: a larger percentage of career majors compared with academic majors enrolled mainly to obtain job skills (24 vs. 7 percent) and considered themselves as employees going to school (28 vs. 16 percent).

Among subbaccalaureate career majors, certificate seekers were older, on average, than degree seekers (27 vs. 22 years old) and more often exhibited some of the characteristics mentioned above as associated with lower rates of persistence and completion (table 3.41). Specifically, larger percentages of career certificate seekers than career subbaccalaureate degree seekers had a GED (18 vs. 9 percent), delayed enrollment in postsecondary education after finishing high school⁸⁸ (73 vs. 48 percent), and had parents without a college degree (70 vs. 50 percent). In addition, compared with career subbaccalaureate majors seeking a degree, larger percentages of career certificate seekers enrolled in private for-profit institutions (55 vs. 10 percent) and reported that their main reason for enrolling was to obtain job skills (78 vs. 24 percent). On the other hand, a smaller percentage of career certificate seekers than career subbaccalaureate degree seekers worked while enrolled (61 vs. 80 percent).

⁸⁸ Delayed enrollment was defined in the BPS as enrollment by a student who received a high school diploma prior to 1995 or who reached age 20 before December 31, 1995.

Table 3.41. Average age and percentage of beginning postsecondary students with various demographic and enrollment characteristics and summary of comparisons, by initial credential goal and major field: 1995–96

Demographic or enrollment characteristic	Summary of comparisons ¹						Career education	
	Subbaccalaureate		Baccalaureate		Degree	Career education		
	Degree	Certificate	Career education	Academic	Career education vs. academic	Certificate		
Average age	22.1	20.9	26.8	19.1	18.9	0	+	
Female	55.5	46.3	60.7	50.6	60.4	0	0	
Race/ethnicity ²								
White	72.6	79.3	65.6	75.6	73.7	0	0	
Black	14.5	6.7 !	17.7	11.4	10.4	+	0	
Hispanic	7.2	6.8 !	13.5	7.1	7.3	0	0	
Other	5.6	7.2 !	3.2	5.9	8.6	0	0	
Family in lowest SES quartile	28.6	22.6	33.6	19.8	19.4	0	0	
Parents do not have a college degree	49.9	39.8	70.1	29.3	26.4	0	+	
GED instead of regular high school diploma	8.6	6.6	17.9	1.4	1.5	0	+	
Delayed postsecondary enrollment	48.1	33.8	73.3	11.9	10.9	0	+	
Enrolled full time	56.6	52.7	67.7	88.0	86.7	0	0	
First postsecondary institution sector								
Public	86.3	97.3	43.2	65.6	62.3	–	–	
Private not-for-profit	3.9	1.6	1.8 !	32.1	‡	+	0	
Private for-profit	9.7	1.1	55.0	2.3	‡	+	+	

See notes at end of table.

Table 3.41. Average age and percentage of beginning postsecondary students with various demographic and enrollment characteristics and summary of comparisons, by initial credential goal and major field: 1995–96—Continued

Demographic or enrollment characteristic	Subbaccalaureate		Baccalaureate		Summary of comparisons ¹		
	Degree		Certificate			Degree	Career education
	Career education	Academic	Career education	Career education	Academic	Career education vs. academic	Certificate
Work status and orientation							
Worked while enrolled	79.6	75.7	60.5	63.6	61.2	0	–
Student working to meet expenses	52.0	59.5	29.8	57.5	55.8	0	–
Employee who enrolled	27.6	16.2	30.7	6.1	5.4	+	0
Worked full time (40 hours or more)	12.0	11.3 !	12.6	2.4	1.8	0	0
Job skills were primary enrollment purpose	23.5	6.9 !	77.7	†	†	+	+

† Not applicable. Primary purpose for enrolling was asked only of students enrolled in less-than-4-year postsecondary institutions.

! Interpret data with caution. Standard errors were more than one-third as large as the estimate.

‡ Reporting standards not met. (Too few cases for a reliable estimate.)

¹ Plus sign means that students in the first group listed were more likely to have this characteristic or had a higher value on this characteristic than the students in the second group listed; minus sign means that students in the first group listed were less likely to have this characteristic or had a lower value on this characteristic than the students in the second group listed; and zero means that no measurable difference was found between the two groups.

² Black includes African American, Hispanic includes Latino, and Other includes Asian/Pacific Islander, American Indian/Alaska Native, and “other” race/ethnicities. Race categories exclude Hispanic origin unless specified.

NOTE: Subbaccalaureate includes students who were initially enrolled at a less-than-4-year institution, as well as students initially enrolled at a 4-year institution who were either seeking less than a bachelor’s degree at that institution or seeking to transfer to a less-than-4-year institution. All subbaccalaureate students planning to transfer are included under associate’s degree or higher. Baccalaureate includes students who were initially enrolled at a 4-year institution and were either seeking a bachelor’s or higher degree at that institution or seeking to transfer to another 4-year institution. Estimates include students from the 50 states, DC, and Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

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

At the baccalaureate level, students with career majors were less often female compared with academic majors (51 vs. 60 percent). Otherwise, the two groups were not measurably different from each other on any of the characteristics shown in table 3.41.

Postsecondary Education Persistence and Attainment

Several educational outcomes are examined in this section, including rates of persistence and credential attainment, types of credentials earned relative to initial goals, and, for noncompleters, reasons for leaving postsecondary education. These outcomes are assessed as of June 2001, approximately 6 years after most beginning postsecondary students enrolled in 1995–96.

Persistence and Attainment

Among credential-seeking students who began at the subbaccalaureate level in 1995–96, some 60 percent had either earned a credential or were still enrolled in postsecondary education as of June 2001 (table 3.42). Apparent differences between degree seekers with career and academic majors and between certificate and degree seekers with career majors were not measurable.

Among subbaccalaureate students with degree goals, no measurable differences were found between career and academic students in the percentage who earned any credential (42 and 44 percent, respectively), earned an associate's degree (20 and 21 percent, respectively), or had no credential but were still enrolled (15 and 19 percent, respectively) (figure 3.1 and table 3.42). However, compared with their counterparts who had academic majors, degree-seeking students with career majors earned a certificate more often (11 vs. 2 percent).⁸⁹

Among career students whose initial goal was a certificate, 62 percent had earned some type of credential by 2001. Fifty-seven percent had earned a certificate, with the rest exceeding their initial goals and earning an associate's degree (5 percent) or a bachelor's degree (1 percent). Another 3 percent had not earned any credential but were still enrolled. Among career subbaccalaureate majors with degree goals, 42 percent had attained a credential: among them, 20 percent had earned an associate's degree; 11 percent had earned a bachelor's degree; and the remaining 11 percent attained a certificate (some of these students might also still have been enrolled for another credential). Another 15 percent were still enrolled (without a credential). While a larger

⁸⁹ The apparent difference in bachelor's degree attainment was not measurable, given the relatively large standard errors (reflecting the small sample sizes) for this group.

Table 3.42. Percentage of credential-seeking 1995–96 beginning postsecondary students who attained a credential or were still enrolled by June 2001, and percentage distribution of these students in terms of their attainment and enrollment status in 2001, by initial credential goal and major field

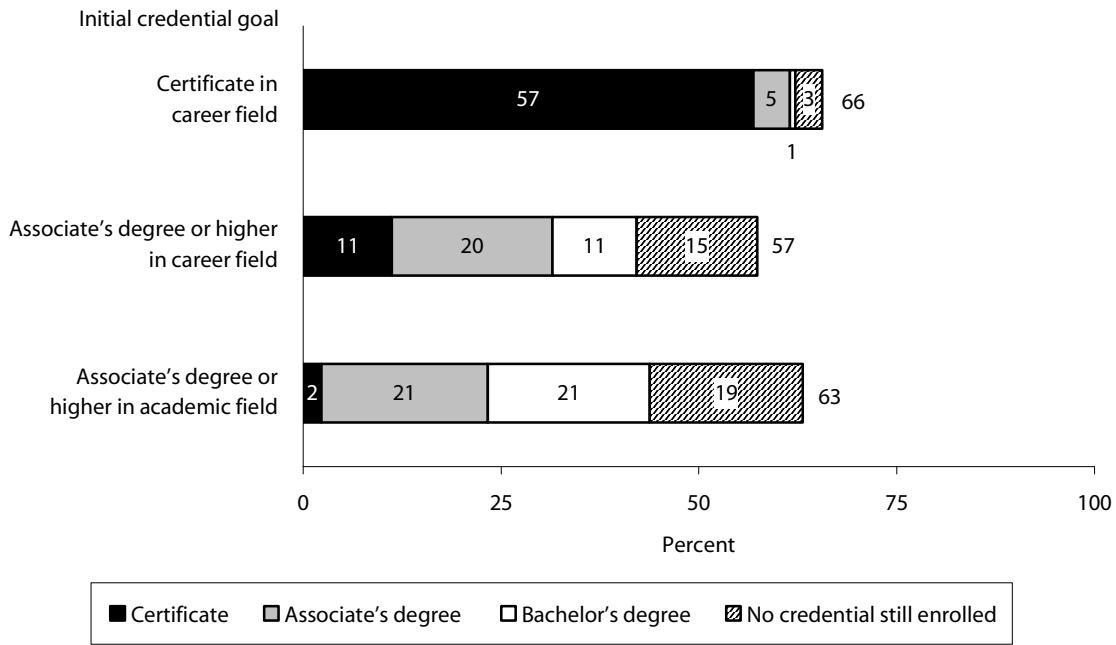
Initial credential goal and major field	Attained a credential or were still enrolled	Attainment and enrollment status					
		Highest credential attained				No credential, still enrolled	No credential, no longer enrolled
		Any credential	Certificate	Associate's degree	Bachelor's degree		
All students	69.7	54.7	11.5	10.3	32.9	15.0	30.3
Subbaccalaureate	60.4	44.9	18.4	16.1	10.5	15.5	39.6
Career education	59.9	48.4	25.4	15.4	7.5	11.6	40.1
Certificate	65.6	62.2	56.9	4.6 !	0.7	3.4 !	34.4
Associate's degree or higher	57.4	42.1	11.2	20.3	10.6	15.3	42.6
Academic	63.6	43.5	3.0 !	20.6	20.0	20.1	36.4
Certificate	83.3	34.6 !	27.4 !	4.5 !	2.8 !	48.7 !	16.7 !
Associate's degree or higher	63.0	43.8	2.3 !	21.0	20.5	19.3	37.0
Other	59.6	35.9	9.6	14.5	11.8	23.6	40.4
Baccalaureate	82.3	68.0	2.0	2.5	63.5	14.3	17.7
Career education	82.5	68.6	2.2	2.9	63.5	13.8	17.6
Academic	82.5	69.4	1.7	2.0	65.7	13.2	17.5
Other	81.9	66.1	1.9 !	2.4	61.8	15.8	18.1

! Interpret data with caution. Standard errors were more than one-third as large as the estimate.

NOTE: Subbaccalaureate includes students who were initially enrolled at a less-than-4-year institution, as well as students initially enrolled at a 4-year institution who were either seeking less than a bachelor's degree at that institution or seeking to transfer to a less-than-4-year institution. All subbaccalaureate students planning to transfer are included under associate's degree or higher. Baccalaureate includes students who were initially enrolled at a 4-year institution and were either seeking a bachelor's or higher degree at that institution or seeking to transfer to another 4-year institution. Students in the "other" category have mainly undeclared majors. Estimates include students from the 50 states, DC, and Puerto Rico. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

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

Figure 3.1. Percentage of subbaccalaureate credential-seeking 1995–96 beginning postsecondary students with various levels of attainment as of 2001, by initial credential goal



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

percentage of career majors who started with a certificate goal than career majors who started with a degree goal earned some type of credential by 2001, this gap may change over time because a greater percentage of degree seekers were still enrolled.

At the baccalaureate level, both career and academic majors persisted or attained at rates of about 82–83 percent. No measurable differences were found between the two groups in the percentages who earned bachelor's degrees (63 and 66 percent, respectively) or in the percentages who were still enrolled (14 and 13 percent, respectively) as of 2001.

Reasons for Leaving Postsecondary Education

As seen in table 3.42, 30 percent of all credential-seeking students who began their postsecondary education in 1995–96 had not earned a credential and were no longer enrolled in 2001. This section examines the reasons these students gave for leaving school, comparing groups of interest. Among subbaccalaureate career students, 40 percent had left school without a credential (table 3.43). Job or financial demands was the most frequently cited reason for leaving school, with 14 percent of subbaccalaureate career students leaving primarily for this reason. From 2 to 6 percent each reported leaving primarily due to dissatisfaction with their program or academic problems, completion of the desired classes, family demands, moving to another city or state, “other,” or unknown reasons.

Among degree seekers at the subbaccalaureate level, no measurable differences were detected between students with career and academic majors in the percentages leaving for any of these reasons (table 3.43).⁹⁰ However, among career majors, certificate and degree seekers differed in some respects. For example, a smaller percentage of certificate seekers left because of job or financial demands (7 vs. 17 percent) or because of family demands (3 vs. 7 percent). This finding may reflect, at least in part, the fact that certificate programs tend to be shorter and therefore require less time out of the labor force or away from home. Alternatively, this finding may reflect the fact that a larger percentage of career certificate seekers than career subbaccalaureate degree seekers were enrolled to obtain job skills or that a smaller percentage of these certificate seekers than subbaccalaureate degree seekers worked while enrolled. These are only some of the possible explanations for these findings. A larger percentage of career certificate seekers than career degree seekers left because they were finished taking the classes they wanted (5 vs. 2 percent).

At the baccalaureate level, 18 percent left without earning a credential, and 6 percent left because of job or financial demands. No measurable differences were found between career and academic majors in their reasons for leaving.

⁹⁰ This was true where sample sizes were sufficient to test differences; samples sizes were not sufficient for dissatisfaction with the program or other academic problems and for completion of the desired classes.

Table 3.43. Percentage of credential-seeking 1995–96 beginning postsecondary students who had left and had not returned to postsecondary education by 2001, by reason for leaving and initial credential goal and major field

Initial credential goal and major field	Total who left and did not return	Reason for leaving						Unknown
		Not satisfied/academic problems	Done with desired classes	Family demands	Job/financial demands	Moved to another city or state	Any other reason	
All students	30.3	2.0	1.8	4.0	10.7	4.0	4.1	3.6
Subbaccalaureate	39.6	2.0	2.8	5.3	14.4	5.9	4.8	4.4
Career education	40.1	2.5	2.7	6.0	13.5	6.1	4.3	4.9
Certificate	34.4	2.1	5.5	3.2	6.5	9.1	2.5 !	5.5
Associate's degree or higher	42.6	2.7 !	1.5 !	7.3	16.6	4.8	5.1	4.6
Academic	36.4	0.4 !	1.8 !	5.3	16.6	5.5 !	3.5 !	3.2 !
Certificate	16.7 ‡	‡	‡	‡	‡	‡	‡	‡
Associate's degree or higher	37.0	‡	‡	5.4	17.1	5.5 !	3.6 !	3.2 !
Other	40.4	1.7 !	3.7 !	3.4	15.3	5.6	7.2	3.6 !
Baccalaureate	17.7	2.0	0.5	2.3	5.6	1.4	3.3	2.6
Career education	17.6	2.1	0.6 !	1.7	5.7	1.5	3.5	2.4
Academic	17.5	1.6 !	0.5 !	2.6	5.7	1.3	3.2	2.5
Other	18.1	2.3	0.4 !	2.8	5.4	1.3	3.0	2.9

! Interpret data with caution. Standard errors were more than one-third as large as the estimate.

‡ Reporting standards not met. (Too few cases for a reliable estimate.)

NOTE: Subbaccalaureate includes students who were initially enrolled at a less-than-4-year institution, as well as students initially enrolled at a 4-year institution who were either seeking less than a bachelor's degree at that institution or seeking to transfer to a less-than-4-year institution. All subbaccalaureate students planning to transfer are included under associate's degree or higher. Baccalaureate includes students who were initially enrolled at a 4-year institution and were either seeking a bachelor's or higher degree at that institution or seeking to transfer to another 4-year institution. Students in the "other" category have mainly undeclared majors. Estimates include students from the 50 states, DC, and Puerto Rico. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

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

Labor Market Outcomes

This section of the chapter focuses on the labor market outcomes of beginning students who earned (rather than sought) career credentials, classifying students according to the highest level of credential they earned by 2001. These postsecondary completers are compared with non-completers, who were classified according to their initial credential goal. Table 3.44 and figure 3.2 show the percentage of 1995–96 credential-seeking beginning postsecondary students who had earned a credential by 2001 according to the highest credential earned. Among completers, 33 percent earned certificates and associate’s degrees in career fields (19 percent earned certificates and 14 percent earned associate’s degrees), and 34 percent earned bachelor’s degrees in career fields.

Table 3.44. Percentage distribution of credential-seeking 1995–96 beginning postsecondary students who had, by 2001, obtained each credential as their highest credential, by credential type and major field: 2001

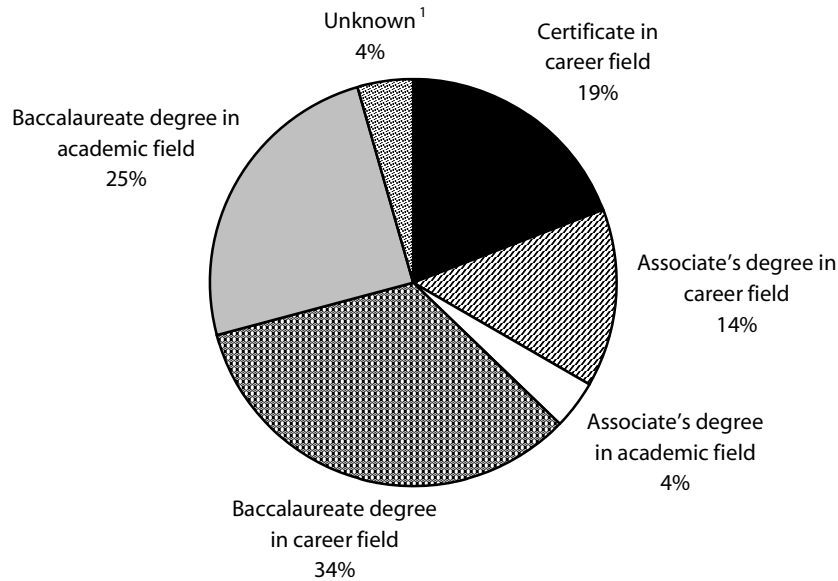
Credential type and major field	Percent
Total	100.0
Subbaccalaureate	38.5
Career education	33.4
Certificate	19.2
Associate’s degree or higher	14.2
Academic	4.2
Certificate	0.5
Associate’s degree or higher	3.7
Other	0.9
Baccalaureate	58.8
Career education	33.6
Academic	24.8
Other	0.4 !
Unknown	2.8

! Interpret data with caution. Standard errors were more than one-third as large as the estimate.

NOTE: Subbaccalaureate includes students who were initially enrolled at a less-than-4-year institution, as well as students initially enrolled at a 4-year institution who were either seeking less than a bachelor’s degree at that institution or seeking to transfer to a less-than-4-year institution. All subbaccalaureate students planning to transfer are included under associate’s degree or higher. Baccalaureate includes students who were initially enrolled at a 4-year institution and were either seeking a bachelor’s or higher degree at that institution or seeking to transfer to another 4-year institution. Students in the “other” category have mainly undeclared majors. Estimates include students from the 50 states, DC, and Puerto Rico. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

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

Figure 3.2. Percentage distribution of 1995–96 credential-seeking beginning postsecondary students who had attained a credential by 2001, by type of credential



¹ Subject and/or level of credential could not be determined.

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

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

This section presents an examination of several labor market outcomes, including rates of labor force participation and unemployment, employment status (working full or part time), average annual salary, and relatedness of coursework to employment. These labor market outcomes are examined here only for students who sought or earned subbaccalaureate credentials.

Employment Rates

The percentage of graduates who are employed is one measure of the success of a postsecondary program. Among the 1995–96 beginning postsecondary students who earned certificates or associate's degrees in career fields, 87 percent were employed in 2001 (table 3.45). Another 7 percent were not employed and looking for work ("unemployed"), and the remaining 6 percent were not employed and not looking for work.

Table 3.45. Percentage of subbaccalaureate credential-seeking 1995–96 beginning postsecondary students with selected labor force participation characteristics as of 2001, by attainment status, type of subbaccalaureate credential attained or sought, and major field

Attainment status, type of subbaccalaureate credential attained or sought, and major field	Employed	Not employed		Labor force participation rate ¹	Unemployment rate ²
		Not looking for work	Looking for work		
All subbaccalaureate students	86.1	6.2	7.7	93.8	8.2
Attained a subbaccalaureate credential, total	87.1	6.3	6.6	93.7	7.0
Career education	87.0	6.0	7.0	94.0	7.4
Certificate	87.1	5.6	7.3	94.4	7.8
Associate's degree or higher	86.9	6.7 !	6.4 !	93.3	6.9 !
Academic	85.8	‡	‡	89.7	‡
Certificate	98.9	‡	‡	98.9	‡
Associate's degree or higher	83.7	‡	‡	88.3	‡
Other	98.7	‡	‡	100.0	‡
Did not attain but sought a subbaccalaureate credential, total	85.3	6.2	8.5	93.8	9.1
Career education	85.2	7.1	7.7	92.9	8.3
Certificate	74.4	11.1 !	14.5 !	88.9	16.3 !
Associate's degree or higher	89.2	5.7	5.1 !	94.3	5.4 !
Academic	79.0	6.7 !	14.3	93.3	15.3
Certificate	‡	‡	‡	‡	‡
Associate's degree or higher	79.1	6.5 !	14.5	93.5	15.5
Other	90.1	3.2 !	6.7 !	96.8	6.9 !

! Interpret data with caution. Standard errors were more than one-third as large as the estimate.

‡ Reporting standards not met. (Too few cases for a reliable estimate.)

¹ Labor force participants are adults who are employed or not employed but looking for work. The labor force participation rate is the number of adults who are in the labor force divided by the number of adults in the total population.

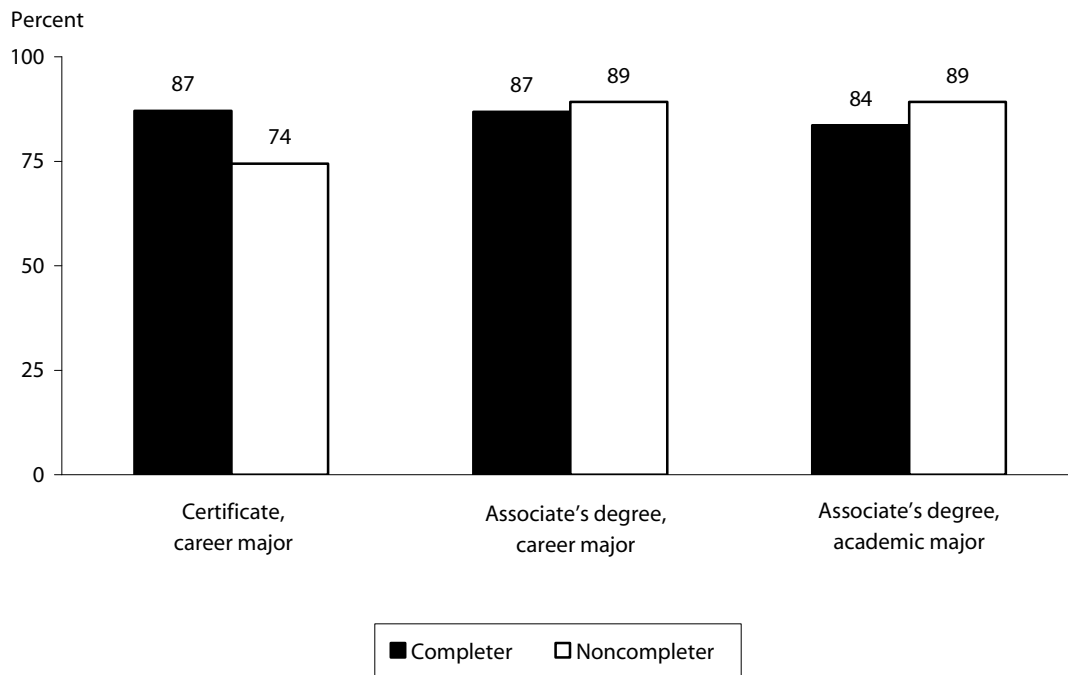
² The unemployed are adults who are not employed but are looking for work. The unemployment rate is the number of unemployed adults divided by the number of adults in the labor force.

NOTE: The category of students who did not attain but sought a subbaccalaureate credential includes students who were initially enrolled at a less-than-4-year institution, as well as students initially enrolled at a 4-year institution who were either seeking less than a bachelor's degree at that institution or seeking to transfer to a less-than-4-year institution; subbaccalaureate seekers planning to transfer are included under associate's degree or higher. Students in the "other" category have mainly undeclared majors. Estimates include students from the 50 states, DC, and Puerto Rico. Detail may not sum to totals because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

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

Among completers of associate’s degrees, the employment rate for career majors was 87 percent, which was not measurably higher than the 84 percent rate observed for completers with academic majors. Among career completers, both certificate and associate’s degree recipients had 87 percent employment rates. Students who earned career certificates had a higher employment rate (87 percent) than those who started with a career certificate goal when they first enrolled but did not complete the certificate (74 percent) (figure 3.3). In contrast, there was no measurable difference in the employment rates of students who earned an associate’s degree in a career field and those who started with that goal but did not complete the degree (87 and 89 percent, respectively). Small sample sizes make it difficult to make reliable comparisons among subgroups that were not employed.

Figure 3.3. Percentage of credential-seeking 1995–96 beginning postsecondary students who were employed in 2001, by attainment status and type of major



NOTE: Completers are students who attained the indicated credential by 2001, regardless of their initial credential goal. Non-completers are students who initially intended to earn the indicated credential, but who left school without a credential as of 2001. SOURCE: U.S. Department of Education, National Center for Education Statistics, 1996/01 Beginning Postsecondary Students Longitudinal Study (BPS:96/01).

Full-time employment is another measure of labor market success. Overall, 86 percent of 1995–96 beginning students who had earned a subbaccalaureate credential in a career field and were working in 2001 were employed full time (table 3.46). A larger percentage of employed associate’s degree recipients worked full time compared with employed certificate recipients (91 vs. 84 percent) There were no measurable differences in the full-time employment rates of completers and noncompleters at either the certificate or associate’s degree level.

Table 3.46. Percentage of subbaccalaureate credential-seeking 1995–96 beginning postsecondary students with part- and full-time employment status during 2001, by attainment status, type of subbaccalaureate credential attained or sought, and major field

Attainment status, type of subbaccalaureate credential attained or sought, and major field	All labor force participants ¹		Those currently employed	
	Part-time	Full-time	Part-time	Full-time
All subbaccalaureate students	11.8	74.3	13.7	86.3
Attained a subbaccalaureate credential, total	11.4	75.7	13.1	86.9
Career education	11.9	75.1	13.6	86.4
Certificate	14.2	72.8	16.4	83.6
Associate’s degree or higher	7.6 !	79.3	8.8 !	91.2
Academic	9.4 !	76.4	11.0 !	89.0
Certificate	32.0 !	66.8	32.4 !	67.6
Associate’s degree or higher	‡	‡	‡	‡
Other	‡	‡	‡	‡
Did not attain but sought a subbaccalaureate credential, total	12.1	73.2	14.2	85.8
Career education	9.8	75.4	11.5	88.5
Certificate	13.2 !	61.3	17.7 !	82.3
Associate’s degree or higher	8.6	80.6	9.6	90.4
Academic	14.6 !	64.4	18.5 !	81.5
Certificate	‡	‡	‡	‡
Associate’s degree or higher	14.7 !	64.4	18.6 !	81.4
Other	16.9 !	73.2	18.7 !	81.3

! Interpret data with caution. Standard errors were more than one-third as large as the estimate.

‡ Reporting standards not met. (Too few cases for a reliable estimate.)

¹ Labor force participants are adults who are employed or not employed but looking for work.

NOTE: The category of students who did not attain but sought a subbaccalaureate credential includes students who were initially enrolled at a less-than-4-year institution, as well as students initially enrolled at a 4-year institution who were either seeking less than a bachelor’s degree at that institution or seeking to transfer to a less-than-4-year institution; subbaccalaureate seekers planning to transfer are included under associate’s degree or higher. Students in the “other” category have mainly undeclared majors. Estimates include students from the 50 states, DC, and Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

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

Salaries

Salary is an important indicator of the return on the investment students make in their education. Among career completers, the average 2001 salary was \$27,400 (table 3.47). The salary of career certificate recipients (\$25,900) was lower than that of their counterparts who had earned associate's degrees in career fields (\$30,100). Comparing only full-time workers, however, no measurable difference was found between these two groups (\$27,900 and \$30,700). Nor were measurable differences found between the salaries of career completers and noncompleters at either the certificate or associate's degree level for all workers or for full-time workers.

Table 3.47. Annual salary of subbaccalaureate credential-seeking 1995–96 beginning postsecondary students, by employment status, attainment status, type of subbaccalaureate credential attained or sought, and major field: 2001

Attainment status, type of subbaccalaureate credential attained or sought, and major field	Part-time	Full-time	Total
All subbaccalaureate students	\$16,200	\$28,300	\$26,700
Attained a subbaccalaureate credential, total	17,100	29,000	27,500
Career education	17,000	29,000	27,400
Certificate	15,200	27,900	25,900
Associate's degree or higher	23,000	30,700	30,100
Academic	‡	31,100	29,800
Certificate	‡	30,600	27,600
Associate's degree or higher	‡	31,200	30,200
Other	‡	21,900	21,900
Did not attain but sought a subbaccalaureate credential, total	15,600	27,800	26,100
Career education	12,800	28,000	26,200
Certificate	14,100 !	26,600	24,400
Associate's degree or higher	12,100	28,400	26,700
Academic	19,600	25,100	24,000
Certificate	‡	‡	‡
Associate's degree or higher	19,700	25,200	24,100
Other	17,800	28,800	27,000

‡ Reporting standards not met. (Too few cases for a reliable estimate.)

NOTE: The category of students who did not attain but sought a subbaccalaureate credential includes students who were initially enrolled at a less-than-4-year institution, as well as students initially enrolled at a 4-year institution who were either seeking less than a bachelor's degree at that institution or seeking to transfer to a less-than-4-year institution; subbaccalaureate seekers planning to transfer are included under associate's degree or higher. Students in the "other" category have mainly undeclared majors. Estimates include students from the 50 states, DC, and Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

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

Employment in a Related Field

Based on self-reports of relatedness of employment to field of study, most career majors who had completed a subbaccalaureate credential and were working in 2001 reported that they were employed in a job that was related to their field of study (70 percent) (table 3.48). Among career completers, no measurable difference was found between certificate and associate's degree recipients in their likelihood of being employed in a related job (68 and 75 percent, respectively). Career majors who had completed associate's degrees were more often employed in a related field than noncompleters (75 vs. 43 percent). The apparent difference for career certificate completers and noncompleters (68 vs. 58 percent) was not measurable.

Table 3.48. Percentage of working subbaccalaureate credential-seeking 1995–96 beginning postsecondary students whose employment was related to their credential program, by attainment status, type of subbaccalaureate credential attained or sought, and major field

Attainment status, type of subbaccalaureate credential attained or sought, and major field	Employment closely or somewhat related ¹
All subbaccalaureate students	52.0
Attained a subbaccalaureate credential, total	67.4
Career education	70.1
Certificate	67.6
Associate's degree or higher	74.5
Academic	39.0
Certificate	26.5 !
Associate's degree or higher	41.4 !
Other	74.7
Did not attain but sought a subbaccalaureate credential, total	40.0
Career education	46.2
Certificate	57.8
Associate's degree or higher	42.6
Academic	25.5 !
Certificate	‡
Associate's degree or higher	25.1 !
Other	32.0

! Interpret data with caution. Standard errors were more than one-third as large as the estimate.

‡ Reporting standards not met. (Too few cases for a reliable estimate.)

¹ All other respondents rated their employment as "not related" to their credential program.

NOTE: The category of students who did not attain but sought a subbaccalaureate credential includes students who were initially enrolled at a less-than-4-year institution, as well as students initially enrolled at a 4-year institution who were either seeking less than a bachelor's degree at that institution or seeking to transfer to a less-than-4-year institution; subbaccalaureate seekers planning to transfer are included under associate's degree or higher. Students in the "other" category have mainly undeclared majors. Estimates include students from the 50 states, DC, and Puerto Rico. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

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

F. SUMMARY OF FINDINGS

Size and Scope of the Postsecondary Career Education Enterprise

Career education represented a substantial percentage of the total undergraduate enterprise during the period covered in this chapter: 63–67 percent of students majored in career fields during the period examined in this report (table 3.8) and 90 percent of postsecondary institutions awarded a total of 1.9 million career credentials in 2005 (tables 3.1 and 3.33). In addition, just over one-half million faculty taught in career fields at not-for-profit 2- and 4-year degree-granting postsecondary institutions in fall 2003 (table 3.22), a number that was not measurably different from the number of academic teaching faculty in this semester (table 3.22).

Despite some differences in sampling frames and available data for the various analyses in this chapter, there were a number of consistent findings. For example, health care and business and marketing were among the largest career fields in terms of student majors, teaching faculty, and credentials awarded in recent years (2003–2005) (tables 3.10, 3.22, and 3.35). In these same years, agriculture was predominantly a 4-year or baccalaureate enterprise: the majority of students who majored, faculty who taught, and credentials that were awarded in this field were found at the bachelor's degree or 4-year institution level (65 percent, 72 percent, and 71 percent, respectively) (tables 3.11, 3.23, and 3.37). In contrast, half or more of students, faculty, and credentials in the fields of protective services and trade and industry were found at the subbaccalaureate or 2-year institution level (54–84 percent, 71–82 percent, and 55–72 percent, respectively). Finally, about half or more of the students who majored and credentials that were awarded in the fields of business and marketing, communications, computer sciences, education, engineering and architectural sciences, and public, social, and human services were found at the bachelor's degree level (49–77 percent of students and 58–89 percent of credentials), while the majority of students and credentials in the fields of health care and legal services were found at the subbaccalaureate level (56–65 percent of students and 53–56 percent of credentials) (tables 3.11 and 3.37).

Over the decade and a half examined, changes in the size of the postsecondary student body and teaching force occurred somewhat in parallel. Between 1990 and 2004, the number of credential-seeking undergraduates majoring in career fields increased overall and at the associate's and bachelor's degree levels (table 3.8). Similarly, the number of postsecondary teaching faculty who taught in career fields increased between fall 1992 and fall 2003 overall and at public 4-year institutions, private not-for-profit 4-year institutions, and public 2-year institutions (table 3.22). In contrast, the number of career majors seeking certificates decreased, and no measurable change was detected in the number of career teaching faculty at private not-for-profit 2-year institutions.

Changes over time varied by career field. Increases in the number of both student majors and teaching faculty occurred in the fields of health care, education, communications, computer science, and protective services (tables 3.10 and 3.22). In contrast, while the number of student majors declined in business, engineering and architectural sciences, and personal and consumer services, the number of faculty increased in these fields.

Beginning Postsecondary Student Outcomes

Overall, the majority of credential-seeking undergraduates had attained a degree or were still enrolled 6 years after beginning postsecondary education in 1995–96 (70 percent) (table 3.42). By 2001, 82 percent of students who initially in 1995–96 were career majors seeking a bachelor’s degree and 60 percent of those initially seeking a subbaccalaureate career credential had attained a degree or were still enrolled. Although a larger percentage of career certificate seekers than career subbaccalaureate degree seekers possessed characteristics associated with lower rates of postsecondary persistence and attainment (table 3.41), a larger percentage of them met their educational goal (table 3.42). Subbaccalaureate career completers generally exhibited high labor force participation and employment rates, with 94 percent participating in the labor force in 2001, and 87 being employed (table 3.45). A greater percentage of those who completed certificates in career fields were employed compared with those who attempted but did not complete career certificates (figure 3.3). However, there were no measurable differences in the full-time employment rates of employed completers and noncompleters at either the certificate or associate’s degree level (table 3.46).

4. Adult Work-Related Coursetaking

Chapter 3 examined postsecondary career education, which is taken both by young adults who have just completed their high school education and by older adults who may have already entered the labor force. This chapter focuses on the courses that adults take outside of formal education programs in order to acquire, maintain, or upgrade their workforce skills. These courses can include employer-provided training, postsecondary courses (other than those taken as part of a degree program), professional or technical licensing or certification courses, and other types of work-related courses. Specifically, the chapter addresses the following questions:

- A. Who participates in work-related courses and what do they study?
- B. Who are the providers of work-related courses for adults?
- C. To what extent do work-related courses involve employer requirements or educational or occupational credentialing?
- D. To what extent is work-related coursetaking supported by employers?
- E. What are the outcomes of participation in work-related courses?

The analysis uses data from the National Center for Education Statistics (NCES) Adult Education Survey of the 2005 National Household Education Surveys Program (AE-NHES:2005), supplemented by data from the 2003 NHES Adult Education for Work-Related Reasons Survey (AEWR-NHES:2003).⁹¹ Both data collections surveyed a nationally representative sample of adults aged 16 or older who were no longer in compulsory education. These adults were asked about their participation in various types of learning activities during the previous 12 months. Thus, the reported participation data span the years 2002–03 (in AEWR-NHES:2003) and 2004–05 (in AE:NHES:2005).⁹²

The two previous chapters described in some detail the types of institutions that provide work-related learning at the secondary and postsecondary education levels. This chapter cannot do the same for adults, however, because describing the institutions that offer work-related learning for adults would require a nationally representative survey of providers, which is not

⁹¹ Because the AEWR-NHES:2003 focused on work-related education, it could delve in more depth into a few key issues, including the perceived utility of the courses adults took and of work-related learning in general. These issues are examined here using 2003 survey data that had been previously analyzed for the tables included on the Career/Technical Education Statistics (CTES) website (<http://nces.ed.gov/surveys/ctes/>).

⁹² Further details on the methodology for the AE-NHES:2005 are available in the user's manual in Hagedorn et al. (2006), and for the methodology of the AEWR-NHES:2003 in Hagedorn et al. (2004a, 2004b).

available. Therefore, this chapter takes the participant's perspective: it focuses on information that participants can reliably provide, including a description of their participation, the providers they used, and their perceptions of the results of their coursetaking. This chapter also does not include a detailed analysis of trends in participation in work-related coursetaking, because comparable data are available only from 2001 to 2005, which was deemed too short a period to warrant a trend examination in this report.⁹³

This chapter presents findings on differences between relevant groups that were statistically significant (sometimes referred to as measurably different)⁹⁴ and also substantively different, the latter defined as a difference of at least 3 percentage points or the equivalent.⁹⁵ Statistically significant differences of a magnitude smaller than 3 percentage points or the equivalent are generally not reported.

Definition and Extent of Participation in Work-Related Coursetaking

Definition of Work-Related Coursetaking

The AE-NHES:2005 includes a number of survey sections, each asking adults about their participation in a different type of activity during the 12 months preceding the survey:

- English as a Second Language (ESL) classes;
- basic skills and General Educational Development (GED) preparation classes (classes to improve basic reading, writing, and mathematics skills; classes to prepare for the GED test; and other high school equivalency or adult high school programs);
- college and university degree programs;
- vocational and technical diploma programs;
- apprenticeship programs; and
- other courses.⁹⁶

In the last section of the survey, adults who had participated in any courses (exclusive of courses addressed in previous survey sections) were asked to list each course (up to 20) and to

⁹³ Although NCES conducted surveys of adult learning prior to 2001, those surveys used a different format for collecting data on work-related coursetaking, which makes them less comparable to more recent surveys for examining trends in this type of learning (see Kim et al. 2004, p. 8).

⁹⁴ The statistical significance of a difference was determined using a Student's *t* test and an alpha level of .05, as described in appendix A. Adjustments were not made for multiple comparisons.

⁹⁵ On a scale that ranged from 0 to 10 million adults, for example, the equivalent substantive difference would be 300,000 students.

⁹⁶ Courses are defined to include training seminars, classes, workshops, and other types of courses, any of which involve an instructor.

state whether each course was taken mainly for work-related reasons or for personal interest. Although enrollment in postsecondary credential programs (programs leading to a postsecondary degree, certificate, or diploma) is not counted as participation in work-related coursetaking, participation in a postsecondary course outside of a postsecondary credential program is counted as work-related coursetaking. Adults who listed at least one course as taken mainly for work-related reasons, or equally for both work-related reasons and personal interest, are counted here as participants in work-related courses. For each of these participants, the AE-NHES:2005 collected detailed coursetaking information on up to four courses.

The AEWR-NHES:2003 followed the same general pattern, asking about participation in specific learning activities during the 12 months preceding the survey. However, because the AEWR-NHES:2003 focused on work-related learning, it had fewer sections, all focused exclusively on learning activities in which adults participated for work-related reasons:⁹⁷

- college and university degree programs taken for work-related reasons;
- vocational and technical diploma programs taken for work-related reasons;
- apprenticeship programs; and
- courses taken for work-related reasons.

As in the AE-NHES:2005, adults who reported in the last section that they had participated in any courses were asked to list these courses (up to 20) and detailed information was collected on up to four courses.

The analysis in this chapter defines participants as those adults who took at least one course for work-related reasons during the 12 months preceding the survey interview. The characteristics of their courses were determined mainly from the responses that the participants in each survey gave concerning the four work-related courses that they were asked about in detail.⁹⁸ Because some adults took more than one work-related course over the 12-month period, the results from each survey reflect the percentage of adults who participated in at least one course (or at least one course with a given characteristic); however, for the sake of simplicity, this chapter will often refer to participation in work-related courses rather than to participation in at least one course. The occurrence of multiple coursetaking also means that many of the table percentages in this chapter sum to greater than 100. As a hypothetical example, in a population of 100 adults, if 30 participated only in a course taught in the morning, 30 participated only in a course taught in the afternoon, and 30 participated in both a morning and an afternoon course, the

⁹⁷ This survey did not ask respondents whether they participated in the activity mainly for work-related reasons or for personal interest (as in the AE-NHES:2005), but simply whether they participated in the activity for work-related reasons.

⁹⁸ There are two exceptions: for the average number of courses taken and the average hours of coursetaking, information was available and was used from the survey list of up to 20 courses.

percentage of “morning coursetakers” would be 60, and the percentage of “afternoon coursetakers” would be 60; however, these percentages do not sum to the total percentage of coursetakers (which is 90, not 120).

This chapter examines participation among adults and courses with varying characteristics; however, most analyses (other than those that examine overall participation rates) focus on a select set of characteristics that preliminary analyses suggested had the most consistent relationship to work-related coursetaking (i.e., adults’ education attainment, adults’ occupation, topic of instruction, and, in some cases, type of provider).

Extent of Participation

Surveys conducted since 1995 have found that adults’ participation rate in formal learning activities over a 1-year period have ranged between 42 and 46 percent (Creighton and Hudson 2002; Kim et al. 2004; O’Donnell 2006).⁹⁹ Much of this participation is in work-related courses. In the AE-NHES:2005, for example, 56 percent of the adults who participated in formal learning activities had participated in work-related learning.

The past three NHES adult education surveys (in 2001, 2003, and 2005) found that between 27 and 33 percent of all adults participated in work-related courses during these years (Kim et al. 2004; Kleiner et al. 2005; O’Donnell 2006). The rate of participation declined in 2004–05, decreasing to 27 percent from 33 percent in 2003. Participation rates tended to be higher among adults who were in the labor force (working or unemployed and looking for work); in 2004–05, some 37 percent of labor force members participated in work-related courses, compared with 27 percent of all adults (table 4.1).

Participation rates provide an indicator of the breadth of participation in work-related courses—i.e., they reveal how widespread participation is. Another way to examine participation is to look at the depth of participation—i.e., at how extensively each person participates. Two measures of the depth of participation are the average number of work-related courses that participants take, and the average hours of instruction they receive across all work-related courses. Because the distributions of both these measures are skewed, both mean (average) and

⁹⁹ All participation rates presented in this chapter refer to formal learning activities only; participation in informal learning activities (e.g., on-the-job training, self-paced study using computer software) has been included in many surveys, but is not reported here. The Kim et al. (2004) and O’Donnell (2006) analyses excluded participation in full-time postsecondary education; the Creighton and Hudson (2002) analysis excluded participation in full-time postsecondary education among those ages 16–24.

Table 4.1. Number of adults and labor force members, and percentage of adults and labor force members who participated in work-related courses, by selected adult characteristics: 2004–05

Characteristic	Number of adults (thousands)	Number of labor force members ¹ (thousands)	Percent of adults who participated in work-related course	Percent of labor force members who participated in work-related course
All adults	211,607	53,133	26.9	37.1
Sex				
Female	110,011	29,874	29.2	44.1
Male	101,596	23,258	24.5	30.7
Race/ethnicity				
White, non-Hispanic	146,614	40,117	29.1	40.2
Black, non-Hispanic	23,467	5,614	27.0	35.9
Hispanic	26,101	4,040	16.8	22.3
Other ²	15,426	3,363	23.8	34.2
Age as of 2004				
16–24 years	25,104	4,438	21.2	23.4
25–34 years	38,784	11,785	31.7	37.1
35–44 years	42,890	13,874	33.7	39.3
45–54 years	41,840	14,657	36.5	43.2
55–64 years	29,068	7,097	27.0	40.9
65 years or older	33,922	1,283 !	5.2	21.3
Highest level of education attainment				
Less than a high school diploma or equivalent	31,017	1,123 !	4.2	7.3
High school diploma or equivalent	64,334	9,427	16.5	22.7
Some college/vocational/associate's degree	58,545	17,148	31.4	42.0
Bachelor's degree	37,244	15,495	43.8	52.7
Graduate or professional degree	20,466	9,938	50.7	61.6
Employment status ¹				
Employed	133,479	51,767	38.8	38.8
Full-time	106,388	43,083	40.5	40.5
Part-time	27,090	8,684	32.1	32.1
Unemployed and looking for work	9,941	1,366 !	13.7	13.7
Not in the labor force	68,187	†	5.7	†
Months employed in the past 12 months ³				
1–11 months	41,785	10,428	28.4	32.7
12 months	110,665	42,315	38.7	39.3

See notes at end of table.

Table 4.1. Number of adults and labor force members, and percentage of adults and labor force members who participated in work-related courses, by selected adult characteristics: 2004–05—Continued

Characteristic	Number of adults (thousands)	Number of labor force members ¹ (thousands)	Percent of adults who participated in work-related course	Percent of labor force members who participated in work-related course
Occupation ³				
Professional and managerial	48,647	26,516	56.3	58.0
Sales, service, and clerical	66,218	19,458	30.6	32.7
Trades and labor	37,585	6,769	18.7	19.7

† Not applicable.

! Interpret data with caution.

¹ Labor force participants are adults who are employed or not employed but looking for work. Labor force status and employment status are based on the respondent's employment status during the week he or she was surveyed.

² Other includes Asian/Pacific Islander, American Indian/Alaska Native, those with more than one race, and those of other (unspecified) race.

³ Includes only adults who worked in the past 12 months.

NOTE: Detail may not sum to total because of rounding. Standard error tables are available at

<http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the 2005 National Household Education Surveys Program (AE-NHES:2005).

median values are presented here.¹⁰⁰ Among participants in work-related courses in 2004–05, the average number of courses taken over the year was 2.1. However, half (51 percent) of participants took one course, while 74 percent took one or two courses (table 4.2). Likewise, the average number of hours that participants spent in work-related courses per year was 42.3, but half of participants spent 20 or fewer hours in these courses and 72 percent spent 40 or fewer hours (table 4.3).

¹⁰⁰ Each distribution has a positive skew, as indicated by the higher mean (average) than median (50th percentile) for each measure seen in tables 4.2 and 4.3. Positive skewness results from a distribution having a few very high values that pull the mean toward the higher end of the distribution.

Table 4.2. Average and median number of work-related courses taken by participants in the past 12 months and percentage distribution of the number of such courses: 2004–05

	Number or percent
Average number of courses taken	2.1
Median number of courses taken	1.0
Percentage distribution of the number of courses taken	
1 course	51.3
2 courses	22.5
3–4 courses	18.3
5 or more courses	7.8

NOTE: Detail may not sum to total because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the 2005 National Household Education Surveys Program (AE-NHES:2005).

Table 4.3. Average and median number of hours participants spent in work-related courses in the past 12 months and percentage distribution of the number of hours: 2004–05

	Number or percent
Average number of hours spent in courses	42.3
Median number of hours spent in courses	20.0
Percentage distribution of the number of hours	
1–4 hours	14.1
5–8 hours	16.2
9–20 hours	20.7
21–40 hours	21.0
41 or more hours	28.0

NOTE: Detail may not sum to total because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the 2005 National Household Education Surveys Program (AE-NHES:2005).

A. WHO PARTICIPATES IN WORK-RELATED COURSES AND WHAT DO THEY STUDY?

Who Participates

Past studies have found a relatively consistent profile of the work-related learner in terms of age, education level, and employment characteristics. Research has generally shown higher participation rates in work-related learning among adults who are middle aged (rather than young or old), more (rather than less) educated, in the labor force (rather than out of it), and in

professional or managerial jobs (rather than in other jobs) (Bishop 1997; Creighton and Hudson 2002; Darkenwald, Kim, and Stowe 1998; Frazis et al. 1997; Hudson et al. 2005; Kim et al. 2004; Kim and Creighton 1999; Kleiner et al. 2005; Kopka, Schantz, and Korb 1998; Lee and Clery 1999; Lerman, McKernan, and Riegg 1999; Lynch and Black 1998; Valentine 1997; Veum 1993). As discussed below, the relationships between sex and participation and between race/ethnicity and participation have been less consistent.

Sociodemographic Characteristics

Age and Education Level

Similar to findings in past studies, this study found that participation rates in work-related courses were lowest for the youngest and oldest adults (ages 16–24 and age 65 or older) (table 4.1). Similarly, labor force members (those working or unemployed and looking for work) in the youngest and oldest age groups had lower rates of participation in work-related learning than did labor force members in the middle age groups (ages 25–64). Patterns by educational attainment level also mirrored those found in past studies, with participation rates increasing with adults' level of educational attainment, rising from 4 percent for those with less than a high school diploma to 51 percent for those with a graduate or professional degree. A similar relationship was found among labor force members, where participation rates ranged from 7 to 62 percent between the least educated and the most educated.

Sex

Although earlier studies showed greater participation in work-related learning among men than women (see review in Bishop 1997), these differences seem to have disappeared in more recent years (Kleiner et al. 2005). After controlling for labor force participation, recent studies have often found that women participate at a higher rate than men (Creighton and Hudson 2002; Hudson et al. 2005; Kleiner et al. 2005). In this analysis, women participated in work-related courses at a higher rate than men (29 vs. 24 percent) even without controlling for labor force participation (table 4.1). Looking only at adults who were in the labor force, the difference remained, with female labor force members participating at a rate of 44 percent compared with 31 percent for males.

*Race/Ethnicity*¹⁰¹

Past studies of the relationship between race/ethnicity and participation in work-related learning have not yielded consistent results, possibly because of variations in the definitions of work-related learning, analysis samples, and analytic techniques. For example, in a study using the AE-NHES:2001, Hudson et al. (2005) found that labor force members who were White or classified as “other race/ethnicity” (including Asians) participated in work-related learning (broadly defined) at a higher rate than did Black or Hispanic labor force members. In the AEWR-NHES:2003, participation rates in work-related courses were higher for White, Black, and Asian adults than for Hispanic adults (Kleiner et al. 2005). In this study, participation rates were higher for White and Black adults than for Hispanic adults (29 and 27 vs. 17 percent), with the “other race/ethnicity” group (including Asians) participating at a rate between those of Blacks and Hispanics (24 percent) (table 4.1). Among labor force members, Whites, Blacks, and the “other race/ethnicity” groups participated at higher rates than Hispanics (34–40 vs. 22 percent).¹⁰²

Labor Force Characteristics

Patterns of participation in work-related education by labor force characteristics were the same in 2004–05 as in previous years (table 4.1). First, individuals who were employed had higher rates of participation in work-related courses than those who were not employed; employed adults participated at a rate of 39 percent, compared with 14 percent for unemployed adults and 6 percent for those not in the labor force. In addition, adults employed full time had a higher rate of participation than those employed part time (41 vs. 32 percent). Participation rates were also highest for those in professional and managerial jobs, followed by those in sales, service, and clerical jobs and those in trades and labor occupations (56, 31, and 19 percent, respectively).

Number of Courses Taken by Participants

Among the adults who participated in work-related courses, some took more courses than others (table 4.4). On average, female participants in 2004–05 took more work-related courses than male participants (2.2 vs. 1.9 courses), participants with more education took more courses

¹⁰¹ In the NHES analyses discussed here, including this study, race/ethnicity categories include a category for Hispanic adults, with the remaining racial groups excluding those of Hispanic origin. Of the three studies discussed in this paragraph, only Kleiner et al. (2005) included a separate category for Asians.

¹⁰² To ensure representativeness of the Hispanic population, the NHES surveys are administered in Spanish and English. This means that the Hispanic sample may include a relatively high percentage of adults who do not speak English and whose participation in some coursetaking opportunities may be limited by language.

Table 4.4. Average number of work-related courses taken by participants in the past 12 months and percentage distribution of the number of such courses, by selected adult characteristics: 2004–05

Characteristic	Average number of courses taken	Percentage distribution of the number of courses taken			
		1 course	2 courses	3–4 courses	5 or more courses
All participants	2.1	51.3	22.5	18.3	7.8
Sex					
Female	2.2	48.5	23.0	19.2	9.2
Male	1.9	55.0	21.9	17.2	6.0
Race/ethnicity					
White, non-Hispanic	2.1	48.7	23.3	20.3	7.7
Black, non-Hispanic	1.8	64.1	19.8	10.7	5.4
Hispanic	2.2	53.2	20.6	13.4	12.7
Other ¹	2.1	58.2	20.2	14.1	7.6
Age as of 2004					
16–24 years	2.0	61.9	16.4	9.2	12.5
25–34 years	1.9	56.2	20.7	16.9	6.3
35–44 years	2.2	51.1	23.0	17.4	8.6
45–54 years	2.2	45.8	24.3	22.2	7.8
55–64 years	2.1	47.5	24.6	21.1	6.8
65 years or older	1.8	53.8	25.7	17.7	2.9
Highest level of education attainment					
Less than a high school diploma or equivalent	1.5	66.8	18.9	12.3	†
High school diploma or equivalent	1.9	56.4	20.6	16.9	6.2
Some college/vocational/associate's degree	2.1	52.7	20.6	15.8	10.9
Bachelor's degree	2.0	50.8	25.6	17.2	6.4
Graduate or professional degree	2.2	42.7	23.6	26.8	6.9
Employment status in the past 12 months					
Employed	2.1	50.1	23.0	18.9	8.1
Full-time	2.1	48.8	22.9	19.5	8.8
Part-time	1.9	56.2	23.3	15.8	4.8
Unemployed and looking for work	1.4	78.6	11.5	8.0	†
Not in the labor force	1.8	59.0	20.4	14.8	5.8
Months employed in the past 12 months ²					
1–11 months	2.0	51.3	25.6	15.7	7.3
12 months	2.1	50.3	21.8	19.6	8.3

See notes at end of table.

Table 4.4. Average number of work-related courses taken by participants in the past 12 months and percentage distribution of the number of such courses, by selected adult characteristics: 2004–05—Continued

Characteristic	Average number of courses taken	Percentage distribution of the number of courses taken			
		1 course	2 courses	3–4 courses	5 or more courses
Occupation ²					
Professional and managerial	2.2	45.8	23.6	22.7	7.9
Sales, service, and clerical	2.0	55.5	21.1	14.6	8.8
Trades and labor	2.0	54.6	23.6	15.5	6.4

‡ Reporting standards not met. (Too few cases for a reliable estimate.)

¹ Other includes Asian/Pacific Islander, American Indian/Alaska Native, those with more than one race, and those of other (unspecified) race.

² Includes only adults who worked in the past 12 months.

NOTE: Detail may not sum to total because of rounding. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the 2005 National Household Education Surveys Program (AE-NHES:2005).

than those with less education, employed participants took more courses than unemployed participants (2.1 vs. 1.4 courses), and participants who were employed full time took more courses than those employed part time (2.1 vs. 1.9 courses).

These differences in the number of courses taken compound differences in the prevalence of coursetaking among these groups. For example, not only do more females than males take work-related courses, but also when females do take such courses, they take more courses than males. It is not clear whether this difference translates into more hours of coursetaking; analyses of hours of coursetaking among participants (not shown here) did not show any measurable differences among the various groups of adults, but these data had relatively high standard errors, which limited their statistical power.¹⁰³

¹⁰³ For example, the average and standard error for total hours of coursetaking for Blacks were 42.7 and 8.45; for 16- to 24-year-olds they were 44.1 and 7.67; for those with a high school diploma they were 42.2 and 6.32; and for part-time workers they were 33.6 and 4.85.

Topics Studied

Hudson et al. (2005) found that the three most common topics studied by labor force members in 2000–01 were business (42 percent of participants), health (25 percent), and computer science (19 percent). For the current analysis, work-related coursetaking was classified into the same topic areas as in Hudson et al., with the addition of basic education¹⁰⁴ (table 4.5).

As shown in table 4.5, business and health remained the two most common topics studied by all adults in 2004–05. Overall, 35 percent of participants took a course in business and 32 percent in health, with each other topic area having been studied by 6–15 percent of participants. Looking at adults with various educational attainment levels shows different patterns, however. Among participants who had not completed high school, the two most common topics studied were health and vocational trades (32 and 29 vs. 6–15 percent in other topic areas).¹⁰⁵ Among adults who had completed high school, who had completed some college, and who had completed a bachelor’s degree, business and health were the two most common topics studied (26–40 vs. 2–18 percent in other areas). Among participants with a graduate or professional degree, the most commonly studied topics were business, health, and education (23–31 vs. 2–16 percent in other areas).¹⁰⁶ In addition, business and health were the two most commonly studied topics among participants who worked in professional and managerial jobs and those in sales, service, and clerical jobs (27–48 vs. 2–18 percent in other areas); however, among those in trades and labor, the topics studied most often were health, science, and vocational trades (26–39 vs. 2–19 percent in other topic areas).¹⁰⁷ Although computer science is not in any of these “most common topic” lists, it appears to be a relatively common topic among all participants because most groups of adults take computer science courses. For example, excluding those who had not completed high school and those working in the trades and labor, 13–18 percent of participants in each education and occupation group studied computer science in 2004–05.

¹⁰⁴ Basic education courses are courses in basic education, personal awareness/improvement, and physical education/leisure. Basic/recreational education was included in the miscellaneous “other” topic area in Hudson et al. (2005).

¹⁰⁵ These topics were studied more often than all other topics except business. Business was not found to be studied by more participants than any of the remaining topics.

¹⁰⁶ There was one exception: the percentage of adults with a graduate or professional degree who studied education was not measurably different from the percentage who studied computer science.

¹⁰⁷ There was one exception: the percentage of participants in trades and labor who studied vocational trades was not measurably different from the percentage who studied business.

Table 4.5. Percentage of participants in work-related courses who studied each topic of instruction, by selected adult characteristics: 2004–05

Characteristic	Basic education ¹	Business	Computer science	Education	Health	Science	Social sciences and services	Vocational trades	Other
All participants	8.0	35.4	15.2	9.2	31.9	10.3	6.3	9.8	9.5
Highest level of education attainment									
Less than a high school diploma or equivalent	8.0 !	14.6	7.6 !	‡	32.5	9.1 !	6.2 !	29.0	5.8 !
High school diploma or equivalent	5.9	37.8	13.8	2.3 !	34.7	13.6	4.7 !	13.2	10.8
Some college/vocational/associate's degree	8.2	33.8	13.5	4.2	39.6	11.8	3.3	13.0	11.1
Bachelor's degree	7.2	40.2	18.1	10.9	25.6	8.8	5.9	7.2	8.8
Graduate or professional degree	11.1	30.8	16.0	22.7	25.4	6.7	14.1	2.1	7.2
Occupation ²									
Professional and managerial	8.3	31.4	17.7	17.0	33.6	7.3	9.6	4.3	8.6
Sales, service, and clerical	8.6	47.7	14.1	1.8 !	27.5	6.1	3.5	11.6	11.6
Trade and labor	6.5	18.7	8.9	1.9 !	39.3	34.4	#	26.1	5.5

Rounds to zero.

! Interpret data with caution.

‡ Reporting standards not met. (Too few cases for a reliable estimate.)

¹ This category includes courses in basic education, personal awareness/improvement, and physical education/leisure.

² Includes only adults who worked in the past 12 months.

NOTE: Estimates were based on the responses given for up to four courses by each participant. Detail may exceed 100 percent because respondents can take multiple courses on different topics. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the 2005 National Household Education Surveys Program (AE-NHES:2005).

B. WHO ARE THE PROVIDERS OF WORK-RELATED COURSES FOR ADULTS?

Traditional education providers, such as elementary and secondary schools, colleges and universities, and vocational/technical schools, all play a role in providing work-related courses for adults; however, other organizations, such as businesses, professional associations, community and government agencies, and private, voluntary, and religious organizations, are also providers (Kim et al. 2004; Kopka, Schantz, and Korb 1998). As indicated earlier, it is not possible to describe these varied providers using a survey of adults, as the survey may not have sampled adults who had a given provider and also may have sampled multiple adults with the same provider. So, for example, a count of the number of adults who had professional associations as providers would not yield an accurate count of the number of professional associations that offer work-related courses for adults. Thus, rather than describing the providers of work-related coursetaking, this section provides an overview of the types of providers that participants use for work-related coursetaking. Specifically, the NHES adult education surveys ask who provided the instruction for a course (which may differ from the organization that provides the facilities for the course or that pays for the course).

Previous NHES studies have found that among the broad array of providers identified above, adults most often receive instruction for work-related courses from business or industry, followed by professional associations and postsecondary institutions (Darkenwald, Kim, and Stowe 1998; Kim et al. 2004). A previous analysis of the AE-NHES:2005 found that business or industry was the instructional provider for 52 percent of participants in work-related courses, followed by postsecondary schools, professional organizations, and government agencies (each with 16–19 percent of participants) (O’Donnell 2006). In many cases, the organization that is the provider of work-related instruction is also the participant’s employer. Employers were the most common provider, with 45 percent of participants in 2004–05¹⁰⁸ (table 4.6). Among non-employers of participants, business or industry was the second most common provider, with 25 percent of participants. Employers were also generally the most common providers for adults at each level of education, for adults in each occupational area, and for each topic studied.¹⁰⁹ However, a larger percentage of adults studying education had an employer as their instructional provider compared with those studying any other topic (66 vs. 39–54 percent).

¹⁰⁸ An “employer” could be a business or industry, postsecondary institution, professional association or organization, government agency or other organization.

¹⁰⁹ There were a few exceptions all among groups that had relatively high standard errors. First, among adults who had not completed high school, no measurable difference was found between the percentage of participants who had an employer as their instructional provider and the percentage who had business or industry, a professional association, or “other” as their instructional provider. Second, among adults who studied basic education, no measurable difference was found between the percentage of participants who had an employer as their instructional provider and the percentage who had business or industry as their instructional provider.

Table 4.6. Percentage of participants in work-related courses who reported each type of instructional provider, by selected adult and course characteristics: 2004–05

Characteristic	Employer ¹	Non-employer				Other
		Business or industry	Post-secondary institution	Professional association or organization	Government agency	
All participants	45.1	25.2	15.9	14.5	8.2	10.6
Highest level of education attainment						
Less than a high school diploma or equivalent	34.4	16.4 !	8.4 !	21.3 !	8.4 !	16.5 !
High school diploma or equivalent	44.0	21.0	15.3	10.5	12.7	11.3
Some college/vocational/associate's degree	44.6	26.3	16.1	10.8	9.3	10.6
Bachelor's degree	45.7	28.2	16.0	15.5	5.0	10.9
Graduate or professional degree	47.5	27.7	16.7	22.9	6.8	8.9
Occupation ²						
Professional and managerial	49.0	26.4	13.7	18.9	7.3	10.8
Sales, service, and clerical	45.3	23.2	16.8	11.7	9.5	8.9
Trade and labor	44.2	26.1	18.8	8.8	8.6	9.1
Topic of instruction						
Basic education ³	46.3	36.1	18.5	16.0	4.7	23.8
Business	48.3	29.4	14.8	16.5	7.4	5.5
Computer science	53.8	30.0	21.0	8.7	4.2	5.9
Education	66.2	18.7	26.8	14.5	8.9	8.5
Health	47.2	22.7	15.2	17.9	10.5	19.3
Science	46.7	28.8	22.2	11.8	9.1	9.3
Social sciences and services	39.2	16.1	14.7	30.5	6.1	27.0
Vocational trades	45.1	28.2	12.6	12.2	17.9 !	7.9
Other	50.5	24.7	25.8	9.2	10.0	5.0

! Interpret data with caution.

¹ Employer overrode other types of instructional providers.

² Includes only adults who worked in the past 12 months.

³ This category includes courses in basic education, personal awareness/improvement, and physical education/leisure.

NOTE: Estimates were based on the responses given for up to four courses by each participant. Detail may exceed 100 percent because respondents can take multiple courses from different providers. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the 2005 National Household Education Surveys Program (AE-NHES:2005).

C. TO WHAT EXTENT DO WORK-RELATED COURSES INVOLVE EMPLOYER REQUIREMENTS OR EDUCATIONAL OR OCCUPATIONAL CREDENTIALING?

Although adults can participate in work-related courses for many reasons, including to seek higher pay or a promotion or simply to do their job better, they can also be motivated by employer requirements for participation or by the need to attain an official education or occupational credential. This section examines the extent to which adults take work-related courses in response to at least one of these inducements. Specifically, the section examines the extent to which adults took work-related courses that (1) were required by their employer, (2) provided college credit, (3) provided continuing education credits, or (4) allowed them to get or keep a state, industry, or company certificate or license (i.e., provided an occupational credential).

Table 4.7 shows that 63 percent of participants in 2004–05 took at least one course that had been required by their employer; 42 percent took a course that allowed them to obtain or keep a state, industry, or company license; 33 percent earned continuing education credits for their participation; and 11 percent earned college credit.

Participants' education level and occupation were both associated with the frequency of taking courses to earn continuing education credits. Participants with higher levels of educational attainment more often sought continuing education credits than did those with lower levels of attainment; the percentage ranged from 11 percent for those who had not completed high school to 49 percent for those with a graduate or professional degree. Participants employed in professional and managerial occupations also more often sought continuing education credits than did those employed in other occupations (43 vs. 20–24 percent). Participants' education level was also related to occupational credentialing, but in the opposite way. Participation in a course that provided an occupational credential decreased with the participant's education level, ranging from 56 percent for those who had not completed high school to 35–39 percent for those with a bachelor's or higher degree.¹¹⁰

These findings do not mean that adults with higher education levels more often have continuing education requirements or that those with lower education levels more often seek occupational credentialing, but merely that when they do participate in work-related courses, their participation more often involves each of these inducements.

¹¹⁰ No systematic differences were found among participants in the frequency with which their coursetaking involved employer requirements and either their education level or occupation.

Table 4.7. Percentage of participants in work-related courses who reported each inducement for participation, by selected adult characteristics: 2004–05

Characteristic	Employer required course	Obtain or keep a state, industry, or company license	Earn continuing education credit	Earn college credit
All participants	63.0	41.6	33.2	11.0
Highest level of education attainment				
Less than a high school diploma or equivalent	66.3	56.5	10.8 !	2.6 !
High school diploma or equivalent	66.6	47.3	24.7	12.9
Some college/vocational/associate's degree	67.6	44.3	30.7	12.4
Bachelor's degree	59.5	35.0	33.3	10.0
Graduate or professional degree	55.9	39.3	49.0	9.3
Occupation ¹				
Professional and managerial	61.7	40.8	43.4	10.9
Sales, service, and clerical	65.9	40.8	23.9	9.7
Trade and labor	61.4	47.1	20.3	10.1

! Interpret data with caution.

¹ Includes only adults who worked in the past 12 months.

NOTE: Estimates were based on the responses given for up to four courses by each participant. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the 2005 National Household Education Surveys Program (AE-NHES:2005).

D. TO WHAT EXTENT IS WORK-RELATED COURSETAKING SUPPORTED BY EMPLOYERS?

Employers often assist their employees in furthering their education and improving their work skills (Frazis et al. 1997). This section examines the nature and extent of employer support for work-related coursetaking. Rather than providing the types of information typically gathered through employer surveys, the AE-NHES:2005 offers the employee's perspective on employer support. Because the survey captures all work-related coursetaking, not just coursetaking that is employer sponsored, it is possible to examine the proportion of all work-related coursetaking that is supported by employers and the types of coursetaking that are most often supported by employers. However, because the AE-NHES:2005 is a survey of adults, it describes only the extent to which employer support was used by participants and cannot be used to determine the extent to which employers provide support. For example, while the results of the survey indicate that the majority of work-related coursetakers received employer support, this finding does not mean that employer support was available to most employees.

O'Donnell's (2006) analysis of the AE-NHES:2005 examined the full range of employer support for adults' participation in learning activities and found that 91 percent of the employed adults who participated in work-related courses received some type of employer support. This chapter focuses on two types of financial support that employers can provide to help reduce or eliminate adults' participation costs: (1) employer payment for the employee's time during coursetaking and (2) employer funding for course tuition, fees, books, or materials. Because employer support necessitates having an employer, the analyses in this section are restricted to employed participants (those who worked at any time in the past 12 months).

Overall, 88 percent of employed participants received either form of employer financial support for their participation in at least one work-related course: 77 percent had their salary paid during their coursetaking, and 84 percent received employer funds to cover course expenses (table 4.8). Among these employed participants, a larger percentage working in professional and managerial jobs received employer financial support than did those working in sales, service, and clerical jobs (91 vs. 85 percent).¹¹¹ A larger percentage of employed participants whose instruction was provided by their employers or by a government agency received employer financial support than did those with other instructional providers (97 and 94 vs. 74–86 percent). Finally, in general, a larger percentage of employed participants studying business and computer science received employer support than did those studying many other topics (basic education, health, social sciences and services, and “other” topics) (94 for both business and computer science vs. 79–88 percent).

E. WHAT ARE THE OUTCOMES OF PARTICIPATION IN WORK-RELATED COURSES?

Adults presumably participate in work-related courses because these courses are perceived as useful, either by the participants themselves or by the organizations that employ them. The extent to which adults find such learning useful was assessed in the 2003 and 2005 NHES Adult Education surveys with questions that asked (1) participants about the usefulness of the skills or knowledge obtained from the course (AE-NHES:2005), (2) participants about the outcomes of their participation (e.g., learned new skills, made more money; AEWR-NHES:2003), and (3) adults about their views of work-related training and courses (e.g., interest in them, financial benefit from taking them; AEWR-NHES:2003).

¹¹¹ A difference of the same magnitude between professional and managerial workers and trade and labor workers was not statistically significant, because the estimate for the latter group is relatively unreliable (has a large standard error).

Table 4.8. Percentage of employed participants in work-related courses who reported each type of employer financial support for their participation, by selected adult and course characteristics: 2004–05

Characteristic	Any employer financial support	Employer paid for part or all of tuition, fees, books, and other materials	Employer paid salary during coursetaking
All employed participants	87.8	83.5	76.8
Highest level of education attainment			
Less than a high school diploma or equivalent	66.0	63.9	59.6
High school diploma or equivalent	90.1	83.8	78.5
Some college/vocational/associate's degree	85.3	82.4	76.1
Bachelor's degree	89.0	86.6	78.0
Graduate or professional degree	90.4	82.2	76.1
Occupation			
Professional and managerial	90.5	85.3	78.5
Sales, service, and clerical	85.1	81.5	76.0
Trade and labor	84.6	82.2	71.9
Type of instructional provider			
Employer	96.9	93.7	88.6
Postsecondary institution	73.5	69.7	57.1
Business or industry	86.2	80.8	74.2
Government agency	93.8	83.9	87.4
Professional association or organization	85.2	80.6	76.8
Other	76.4	70.3	61.9
Topic of instruction			
Basic education ¹	78.9	74.6	63.7
Business	93.7	89.6	88.2
Computer science	93.5	90.7	86.2
Education	90.6	86.4	74.7
Health	87.9	84.3	73.9
Science	89.3	85.9	83.5
Social sciences and services	81.1	70.3	70.2
Vocational trades	86.7	86.7	75.3
Other	81.2	77.8	77.8

¹This category includes courses in basic education, personal awareness/improvement, and physical education/leisure.

NOTE: Estimates were based on the responses given for up to four courses by each participant. In this table, employed participants are those who were employed at any time in the past 12 months. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the 2005 National Household Education Surveys Program (AE-NHES:2005).

Perceptions of Usefulness

As seen in table 4.9, most participants (65 percent) rated the skills or knowledge obtained from at least one of their work-related courses as “very useful.” Ninety-six percent of participants rated the skills and knowledge obtained as “very useful” or “useful.”¹¹² A minority of participants (7 percent) rated the skills and knowledge obtained from at least one course as “not too useful.” No systematic differences were found in the extent to which participants found at least one course to be “very useful,” based on their education level or occupation, the topic studied, or type of provider.

Outcomes of Participation

In the AEW-NHES:2003, adults were asked about various outcomes of their participation, as listed in table 4.10. The most commonly reported outcome was improvement in the skills and knowledge that one already had (94 percent), followed by increasing employability in the labor market, learning new skills, and an improved ability to advance in one’s career (71–74 percent); all of these outcomes were indicated by a majority of participants. Fewer participants reported that at least one work-related course resulted in an increase in earnings (22 percent), and fewer still reported that it resulted in a change in their job (13 percent).

The two least frequent outcomes (increased earnings and job change) were generally reported more often by participants who had not completed at least a 4-year college degree than by those who had completed one.¹¹³ For example, 28 percent of those with no more than a high school diploma reported that they made more money as a result of their participation in work-related coursetaking, compared with 18 percent of those with a bachelor’s degree and 15 percent of those with a graduate or professional degree. Similarly, 16 percent of those with no more than a high school diploma reported that they had obtained a new job as a result of their participation, compared with 10 percent of those with a bachelor’s degree and 7 percent of those with a graduate or professional degree.

Compared with participants in other jobs, those employed in professional and managerial jobs also reported less often that their coursetaking resulted in higher earnings or a new job (17 vs. 27–28 percent and 9 vs. 15 percent). However, professional and managerial workers reported more often than other workers that their participation improved their existing skills (97 vs. 91–93 percent).

¹¹² This statistic cannot be derived from table 4.9, as adults who participated in more than one course may have given each course a different rating, resulting in categories that are not mutually exclusive.

¹¹³ The exception to this pattern was that participants with a bachelor’s degree did not differ measurably from participants with a vocational or associate’s degree on these two outcomes.

Table 4.9. Percentage of participants in work-related courses who reported each level of usefulness of the skills and knowledge learned for their job, by selected adult and course characteristics: 2004–05

Characteristic	Very useful	Useful	Somewhat useful	Not too useful
All participants	65.4	30.5	21.6	7.0
Highest level of education attainment				
Less than a high school diploma or equivalent	55.4	14.4 !	15.7 !	5.4 !
High school diploma or equivalent	65.0	25.4	17.2	7.3
Some college/vocational/associate's degree	68.8	28.0	22.2	7.6
Bachelor's degree	61.4	34.2	23.4	7.6
Graduate or professional degree	67.2	36.4	23.0	5.0
Occupation ¹				
Professional and managerial	67.5	35.1	23.7	6.0
Sales, service, and clerical	70.4	28.2	21.3	7.7
Trade and labor	64.3	29.7	21.9	11.3
Type of instructional provider				
Employer	71.6	34.5	24.5	6.8
Postsecondary institution	69.9	39.5	31.9	14.6
Business or industry	69.4	36.0	25.4	9.0
Government agency	71.7	32.9	24.0	6.7
Professional association or organization	72.4	35.5	26.9	8.7
Other	71.5	39.8	25.3	11.5
Topic of instruction				
Basic education ²	68.6	37.9	19.9	16.9
Business	66.5	36.6	24.6	5.4
Computer science	69.3	34.0	26.1	7.7
Education	69.7	43.0	34.5	9.2
Health	74.4	31.2	21.7	8.0
Science	64.4	40.6	32.2	10.7
Social sciences and services	67.4	38.7	17.7	10.1
Vocational trades	71.2	27.6	24.7	10.0
Other	71.5	31.0	24.2	12.9

! Interpret data with caution.

¹ Includes only adults who worked in the past 12 months.

² This category includes courses in basic education, personal awareness/improvement, and physical education/leisure.

NOTE: Detail may exceed 100 percent because respondents can take multiple courses. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education Survey of the 2005 National Household Education Surveys Program (AE-NHES:2005).

Table 4.10. Percentage of participants in work-related courses who reported each result from their participation, by selected adult characteristics: 2002–03

Characteristic	Improved existing skills and knowledge	Learned new skills	Increased employability in the labor market	Improved ability to advance in career	Obtained new job or changed career	Made more money
All participants	94.2	73.6	73.8	70.6	12.9	22.5
Highest level of education attainment						
High school diploma or less	91.4	73.7	75.0	66.8	16.2	27.9
Some college but no degree	92.9	74.3	78.5	73.6	16.7	27.4
Vocational/associate's degree	96.9	82.3	78.5	73.0	14.6	23.6
Bachelor's degree	95.6	72.4	73.8	73.3	10.1	18.1
Graduate or professional degree	96.0	69.6	64.4	67.9	7.4	15.0
Occupation ¹						
Professional and managerial	96.6	72.0	72.2	70.2	9.3	17.4
Sales, service, and clerical	93.4	75.0	77.0	74.6	15.0	27.7
Trade and labor	90.8	73.3	75.2	64.4	15.4	26.9

¹Includes only adults who worked in the past 12 months.

NOTE: Estimates were based on the responses given for up to four courses by each participant. Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education for Work-Related Reasons Survey of the 2003 National Household Education Surveys Program (AEWR-NHES:2003).

Views on Work-Related Coursetaking

Finally, the AEWR-NHES:2003 asked adults a series of questions concerning their views about “work-related training or courses and whether or not it might be useful.” As indicated in table 4.11, about a third of adults (37 percent) expressed an interest in participating in additional work-related courses, while higher percentages (48–59 percent) felt that such training is necessary or beneficial (i.e., their job requires training, there would be financial benefit to training, or training would help them advance in their career). A majority of adults (70 percent) also reported that their supervisor supported their participation in training. Thus, although most adults saw a benefit to work-related training, fewer were interested in participating in more training than they were already taking.

Table 4.11. Percentage of adults who reported having each view about participation in work-related training or courses, by selected adult characteristics: 2002–03

Characteristic	Have an interest in taking any or additional work-related training	Supervisor supports me getting more training ¹	My job requires additional training ²	More training would help me get ahead in my job or career	There would be financial benefit to getting additional training
All adults	37.3	69.9	48.5	58.8	55.0
Took any work-related courses					
Yes	58.3	82.5	62.8	71.3	62.4
No	26.8	59.7	37.2	52.6	51.3
Highest level of education attainment					
High school diploma or less	27.0	61.5	40.3	54.5	52.2
Some college but no degree	40.5	67.6	46.3	64.3	59.8
Vocational/associate's degree	44.5	73.1	55.4	65.9	60.6
Bachelor's degree	48.6	79.5	56.5	62.9	58.2
Graduate or professional degree	52.4	83.7	61.0	55.1	48.7
Occupation ²					
Professional and managerial	57.4	81.1	58.4	63.1	53.9
Sales, service, and clerical	41.0	67.2	44.8	65.9	58.5
Trade and labor	36.1	60.5	42.6	60.1	54.9

¹ Includes only adults who worked in the past 12 months and were not self-employed only.

² Includes only adults who worked in the past 12 months.

NOTE: Standard error tables are available at <http://nces.ed.gov/pubs2008/2008035se.pdf>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Adult Education for Work-Related Reasons Survey of the 2003 National Household Education Surveys Program (AEWR-NHES:2003).

Adults who participated in work-related courses in 2002–03 reported more often than those who did not participate that they were interested in taking more training (58 vs. 27 percent); they also reported more often that their supervisor supports their training (82 vs. 60 percent), their job requires training (63 vs. 37 percent), training helps them advance in their career (71 vs. 53 percent), and training provides financial benefits (62 vs. 51 percent).

Interest in taking additional work-related training also increased with adults' educational attainment level; for example, 27 percent of adults whose highest level of attainment was high school or below reported an interest in additional training, compared with 49 percent of those with a bachelor's degree and 52 percent of those with a graduate or professional degree. Adults with higher education levels also reported more often that their supervisor supports their training and that their job requires training. For the perceived benefits of participation, a different pattern was found. On these questions, adults who completed no more than high school and adults who

completed a graduate or professional degree reported less often that there would be either a financial benefit or a career benefit to further training, compared with adults at other educational attainment levels.

Findings by occupation group were not as systematic. Interest in additional training did increase with the socioeconomic status of the job held (from trades and labor; to sales, service, and clerical; to professional and managerial), as did perceptions of supervisor support. Those in professional or managerial jobs also reported more often that their job required additional training, compared with those in sales, service, and clerical jobs and those in trades and labor jobs (58 vs. 45 and 43 percent). No clear patterns were evident in the extent to which different occupation groups perceived that there were financial or career benefits to participation.

F. SUMMARY OF FINDINGS

In 2004–05, some 27 percent of all adults and 37 percent of adults in the labor force (working or not working but looking for work) participated in at least one work-related course (table 4.1). About half of all adult participants took one course over a period of a year, and about half took more than one course (table 4.2); about half took courses totaling 20 or fewer hours, and about half took more than that (table 4.3).

Females participated in work-related coursetaking at a higher rate than males (29 vs. 24 percent), Blacks and Whites at higher rates than Hispanics (27–29 vs. 17 percent), and those with higher educational attainment levels at higher rates than those with lower attainment levels (table 4.1). Employment was also positively related to participation (39 vs. 6–14 percent), and those in professional and managerial jobs participated at a higher rate than those in sales, service, and clerical jobs, with both of those occupation groups participating at higher rates than those in trades and labor (31–56 vs. 19 percent). These differences are often compounded by differences in the extent of participation among those who took work-related courses: female participants took more courses than males (2.2 vs. 1.9 courses), those with higher levels of education took more courses than those with lower levels of education, employed participants took more courses than those who were unemployed (2.1 vs. 1.4 courses), and those employed full time took more courses than those employed part time (2.1 vs. 1.9 courses) (table 4.4).

Business and health were the most common topics studied in work-related courses in 2004–05 (35 and 32 vs. 6–15 percent), although this pattern varied somewhat by the education level of the participants. Vocational trades was a relatively common topic studied by those who had not completed high school (29 vs. 6–9 percent in other topic areas except business and health), as

was education among those with a graduate or professional degree (23 vs. 2–14 percent in other topic areas except business, health, and computer science) (table 4.5).

Employers play a significant role in work-related coursetaking. Employers were the most common provider of instruction for work-related courses in 2004–05 (table 4.6), and 63 percent of participants took at least one course that had been required by their employer (table 4.7). In addition, 88 percent of participants in work-related courses received employer financial support for their participation (table 4.8). Earning education credentials also plays a role in work-related coursetaking, with 33 percent of participants seeking continuing education credits, and 11 percent seeking postsecondary education credits (table 4.7). Professional requirements also contribute to coursetaking, with 42 percent of work-related course participants seeking to get or keep a state, industry, or company license.

Most participants found their coursetaking useful in terms of building the skills and knowledge they needed for work (74–94 percent), increasing their employability (74 percent), and improving their opportunities for career advancement (71 percent) (table 4.10). In addition, most adults believed that work-related training provides financial and career advantages (55–59 percent), although only about a third expressed an interest in getting additional training (table 4.11). Participants reported financial and career advantages to work-related training more often than did nonparticipants (62–71 vs. 51–53 percent); participants also reported more often that their job required training (63 vs. 37 percent) and that their supervisor supports it (82 vs. 60 percent).

Adults' educational attainment level was related to many aspects of participation. Not only did those with higher levels of education participate in work-related courses more often than those with lower levels of education (and take more courses when they did participate), but also they were more often interested in taking additional work-related courses, to report that their job requires training, and to report that their supervisor supports their participation in training. However, participants whose highest educational attainment was high school or some college (without a degree) reported more often than those with a bachelor's degree or higher that their participation resulted in a job change (16–17 vs. 7–10 percent) or in their having made more money (27–28 vs. 15–18 percent) (table 4.10).

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5. Summary

Career and technical education (CTE) spans secondary, postsecondary, and adult education levels. This report sought to describe this wide-ranging enterprise over the period from 1990 through 2005. The measures that were available for describing career and technical education at the different education levels varied somewhat, however. Participation in high school was generally measured in terms of credits earned in occupational education, for example, while participation at the postsecondary level was measured in terms of students majoring in career fields. While these measures are not directly comparable, they both indicate the prevalence of participation in career-related versus other curricula and majors, as well as indicate changes in the extent of participation over time. In addition, the available data sometimes described different years. For example, trends in high school student participation covered the period from 1990 to 2005, while trends in postsecondary student participation covered the period from 1990 to 2004, and trends for postsecondary faculty covered the period from 1992 to 2003. Differences in the timing or content of datasets used for the different analyses in the report are noted in the text and tables. This chapter highlights key findings from across the three education levels, focusing on common and consistent patterns, but also indicating where these patterns differ.

Institutional Providers

The majority of public high schools in 2002 and of undergraduate postsecondary institutions in 2005 offered career and technical education (88 and 90 percent) (tables 2.2 and 3.1). At the high school level, CTE was provided in three main settings, including approximately 17,000 comprehensive high schools that offered occupational programs either on or off site, 900 full-time CTE high schools, and 1,200 area CTE schools serving multiple high schools (tables 2.1 and 2.5). At the postsecondary education level, about 5,700 institutions offered career education to undergraduates, with public 4-year institutions awarding the largest numbers of undergraduate credentials in career fields in 2005 (587,000 credentials), followed by public 2-year institutions (562,000 credentials) (tables 3.1 and 3.4). Postsecondary institutions also figured in the provision of adult work-related learning, with 16 percent of adult participants in 2004–05 reporting a postsecondary institution as the instructional provider for at least one of their work-related courses, although employers were the most common provider for these courses (45 percent) (table 4.6).

The Scope of Participation

Student participation in career and technical education was relatively common at all three education levels. Just over 90 percent of public high school graduates from the class of 2005 took at least one occupational course during high school (table 2.16) and these graduates earned a higher average number of credits in occupational education than they earned in fine arts and foreign language (3.0 vs. 2.0–2.1 credits) (table 2.17). In addition, about one in five of the 2005 graduates concentrated in occupational education (21 percent) (table 2.18), earning 3.0 or more credits in at least one of the 18 high school occupational programs examined in the report. At the postsecondary level, a higher proportion of undergraduates in 2004 majored in career fields than in academic areas at each credential level (certificate, associate’s degree, and bachelor’s degree) (60–81 vs. 6–30 percent) (table 3.8). With regard to adult education, 37 percent of labor force members age 16 years or older participated in work-related courses in 2004–05 (table 4.1).

Trends in student participation at the secondary level showed no measurable changes over the period studied in overall participation in occupational education. For example, no measurable changes were detected between 1990 and 2005 in the average numbers of total CTE credits and occupational credits that public high school graduates earned (4.0–4.2 credits and 2.9–3.0 credits, respectively) (table 2.17). In contrast, between 1990 and 2004, the number of credential-seeking undergraduates majoring in career fields increased by about one-half million students (table 3.8). At both education levels, participation in academic education increased. Both the average numbers of total academic credits and core academic credits earned by public high school graduates increased between 1990 and 2005 (increases of 2.8 and 1.8 credits, respectively) (table 2.17), as did the number of undergraduates majoring in academic fields (an increase of 449,000 students) (table 3.8).

Common Occupational Programs

Business, health care, and computer science were among the most common occupational programs. Specifically, business and computer technology were the most common occupational programs offered by public high schools in 2002 (97 and 94 percent, respectively) (table 2.9), and the 2005 public high school graduates earned more credits in business services and in computer technology than in any other occupational program area (0.4 and 0.5 credits vs. 0.0–0.2 credits) (table 2.17). At the postsecondary level, more credential-seeking undergraduates majored in business and marketing and in health care than in any other career field in 2005 (22–28 vs. 1–12 percent) (table 3.10). In addition, more undergraduate credentials were awarded in business and marketing and in health care than in other career fields in 2005 (24–26 vs. 1–9 percent) (ta-

ble 3.35). At the adult education level, business and health were the topics studied most frequently by work-related coursetakers in 2004–05 (32–35 percent vs. 6–15 percent) (table 4.5).

Between 1990 and the mid-2000s, shifts in participation were detected among the different occupational program areas. At both the secondary and postsecondary levels, student participation (including coursetaking at the high school level and majors at the postsecondary level) increased in health care (by 0.1 credit on average and 639,000 majors) and computer science (by 0.2 credits on average and 265,000 majors) and decreased in business (by 0.3 credits in business services on average and 484,000 majors) (tables 2.17 and 3.10). However, despite a net increase in participation at the postsecondary level over the entire timespan, the number of computer science majors was lower in 2005 than in 2000 (by 338,000 majors).

Characteristics of Participants

This summary presents selected comparisons between participants and nonparticipants in career and technical education overall, while the body of the report also compares participants in different occupational and career programs. Among public high school graduates in 2005, the majority of occupational concentrators were male (59 percent), while the majority of nonconcentrators were female (54 percent) (table 2.21). At the postsecondary level, the majority of both credential-seeking undergraduates with career majors and those with academic majors were female in 2004 (58 percent each) (table 3.12). Higher rates of participation in work-related coursetaking were also observed for female than for male adult labor force members in 2004–05 (44 vs. 31 percent) and also for female than for male adults in general (29 vs. 24 percent) (table 4.1).

At both the high school and postsecondary levels, career and technical education participants had less advantaged educational backgrounds than nonparticipants. For example, in high school in 2005, a greater percentage of occupational concentrators took lower levels of 9th-grade mathematics courses compared with nonconcentrators (15 vs. 11 percent) (table 2.21). At the postsecondary level, a smaller percentage of undergraduate career majors had parents with a bachelor's or higher degree compared with academic majors (37 vs. 48 percent) (table 3.13). In contrast, adults with higher educational levels participated in work-related education in 2004–05 more often than those with lower educational levels (table 4.1).

Among bachelor's degree seekers in 2004, a larger percentage of undergraduate career majors than academic majors worked full time while enrolled (28 vs. 18 percent) and considered themselves to be an employee who studies (21 vs. 10 percent) rather than a student who works (table 3.15). This work-study linkage was also found among adult learners in 2004–05; higher rates of participation in work-related education were observed for employed than for unemployed

labor force members (39 vs. 14 percent), and for those employed full time compared to those employed part time (41 vs. 32 percent) (table 4.1).

Between 1990 and the mid-2000s, changes in the characteristics of students with a career and technical education focus were found at both the high school and postsecondary levels. Specifically, a larger percentage of the 2005 public high school graduates who took high-level 9th-grade mathematics courses completed an occupational concentration compared with their 1990 peers (an increase of 8 percentage points), while a smaller percentage of 2005 graduates who took low-level 9th-grade mathematics courses completed an occupational concentration compared with their 1990 peers (a decrease of 9 percentage points) (table 2.22). At the postsecondary level, undergraduate career majors in 2004 appeared to have better educated parents than their counterparts who were enrolled earlier (for example, 37 percent in 2004 vs. 23–34 percent in 1990 and 2000 had at least one parent with a bachelor's degree) (table 3.13), and the percentage of career majors who had previously earned a bachelor's degree increased between 1990 and 2004 (by 3 percentage points) (table 3.14).

Faculty

Data on career education faculty were available at the postsecondary level. Just over one-half million faculty taught in career fields at 2- and 4-year not-for-profit degree-granting postsecondary institutions in fall 2003 (table 3.22). The largest group of career education teaching faculty taught in public 4-year institutions (39 percent), followed by public 2-year institutions (34 percent) and private not-for-profit 4-year institutions (26 percent), and trailed by private not-for-profit 2-year institutions (1 percent) (table 3.23).

The majority of postsecondary career education teaching faculty in fall 2003 held a graduate degree, although the percentage who held a graduate degree was lower than that among academic teaching faculty (81 vs. 92 percent) (table 3.28). Larger percentages of career education teaching faculty than their academic colleagues possessed a bachelor's degree as their highest degree (12 vs. 7 percent) or had less than a bachelor's degree as their highest degree (7 vs. 1 percent). Career education teaching faculty with less than a bachelor's degree were concentrated in the trade and industry (58 percent) and protective services (29 percent) fields.

Between fall 1992 and fall 2003, the number of postsecondary faculty who taught in career fields increased by about 125,000 (table 3.22). This change generally coincided with an increase in the number of undergraduates seeking credentials in career fields, as noted above (an increase of 534,000 majors) (table 3.8).

Changes between the early 1990s and mid-2000s in the size of the postsecondary student body and teaching force varied by career field. Increases in the number of both student majors and teaching faculty occurred in the fields of health care, education, communications, computer science, and protective services (increases of 172,000–639,000 majors and 4,800–36,900 faculty) (tables 3.10 and 3.22). In contrast, while the number of student majors declined in business, engineering and architectural sciences, and personal and consumer services (decreases of 182,000–484,000 majors), the number of faculty increased measurably in these fields (increases of 7,600–75,100 faculty).

Academic Attainment

Between 1990 and 2005, the core academic coursetaking (including English, mathematics, science, and social studies coursework) of public high school graduates increased (by 1.8 credits on average), including among those who participated in the occupational curriculum (increases of 1.4–2.6 credits) (table 2.23). There were also increases in the percentage of CTE participants who met the New Basics core academic standards (increases of 17–42 percentage points)¹¹⁴ and who completed 4-year college-preparatory coursework¹¹⁵ (increases of 14–27 percentage points) (table 2.25). Moreover, the more occupational credits graduates earned in high school, the greater their academic coursetaking gains between 1990 and 2005. The higher prior achievement (as measured by 9th-grade mathematics coursetaking) of high school participants in the occupational curriculum at the end of the decade may have contributed to the increased academic outcomes among occupational participants over this period.

At the postsecondary level, a larger percentage of undergraduate career majors in 2004 reported earning high postsecondary grade point averages (GPAs of 3.5 or higher) compared with their counterparts 14 years earlier (an increase of 5 percentage points), and this pattern was detectable at all three credential levels (certificate, associate’s degree, and bachelor’s degree) (increases of 3–9 percentage points) (table 3.14).

Postsecondary Education Outcomes

The more occupational credits that the 1992 public high school graduates earned in high school, the more often they were in general to have no postsecondary plans or to have subbacc-

¹¹⁴ New Basics are core academic coursetaking standards that include 4 years of English and 3 years each of mathematics, science, and social studies (National Commission on Excellence in Education 1983).

¹¹⁵ Four-year college-preparatory coursework is defined in this report as earning 4.0 or more credits in English; 3.0 or more credits in mathematics at the algebra 1 or higher level; 2.0 or more credits in biology, chemistry, or physics; 2.0 or more credits in social studies with at least 1.0 credit in U.S. or world history; and 2.0 or more credits in a single foreign language.

laureate postsecondary plans (including a postsecondary certificate or an associate's degree) (table 2.27). Consistent with these aspirations, the more occupational credits that graduates earned in high school, the less often they were to enroll in postsecondary education within 8 years of graduating (table 2.28). Among those who enrolled, the more occupational credits high school graduates earned, the more often they attained a subbaccalaureate credential (in particular an associate's degree) and the less often they attained a bachelor's or higher degree by 2000 (table 2.32). Nevertheless, among the heaviest high school occupational coursetakers (those earning 4.00 or more occupational credits), more graduates aspired to a bachelor's degree than any other postsecondary goal (36 vs. 14–18 percent) (table 2.27); 70 percent of these heavy occupational coursetakers enrolled in postsecondary education by 2000 (table 2.29); and among those who enrolled, more graduates attained a bachelor's or higher degree than either an associate's degree or postsecondary certificate (25 vs. 7–15 percent) (table 2.32).

Turning to a cohort of students who began their postsecondary education in 1995–96, this report documents that the majority of credential-seeking undergraduates with career majors had attained a degree or were still enrolled 6 years later (table 3.42). Specifically, by 2001, 82 percent of career majors seeking a bachelor's degree and 60 percent of those seeking a subbaccalaureate credential had attained a credential or were still enrolled. A greater percentage of career majors seeking certificates than those seeking a subbaccalaureate degree possessed characteristics associated with lower rates of postsecondary persistence and attainment, such as having parents who do not have a college degree (70 vs. 50 percent) and having themselves earned a GED rather than a regular high school diploma (18 vs. 9 percent) (table 3.41). Nevertheless, a larger percentage of career majors seeking certificates attained a postsecondary credential within 6 years compared with career majors seeking subbaccalaureate degrees (62 vs. 42 percent) (table 3.42).

Employment and Earnings Outcomes

The more occupational credits that male graduates of the class of 1992 earned in high school, the more often they worked full time in 2000 (table 2.38). No systematic relationship was detected, however, between the occupational credits that male graduates earned in high school and their full-time earnings in 1999 (table 2.39). Male graduates who were employed full time earned about \$31,000–\$33,000 in this year, regardless of their occupational coursetaking in high school. In contrast, the more occupational credits that male graduates earned in high school, the higher their part-time earnings were in 1999. The employment and earnings experiences of female graduates who took occupational coursework in high school were somewhat different: no systematic relationship was detected between the occupational credits that female graduates earned in high school and their rate of working full time in 2000. In addition, the more occupa-

tional credits that female graduates earned in high school, the lower their full-time earnings were in 1999, with female graduates who accumulated 4.00 or more occupational credits in high school earning about \$5,000 less in 1999 than their female classmates who took no occupational coursework in high school. In contrast, no systematic relationship was detected between the occupational credits that female graduates earned in high school and their part-time earnings as of this year. Thus, the only measurable associations between 1999 earnings and occupational coursetaking in high school were among part-time male employees (a positive association) and full-time female employees (a negative association). It was not possible to determine from the available data whether these differences in earnings were due to differing hourly wages or to differing amounts of time that full- or part-time graduates worked during 1999.

Among beginning postsecondary students in 1995–96, most subbaccalaureate career completers were employed full time by 2001 (86 percent) (table 3.46). Those who completed certificates in career fields were more often employed compared with those who attempted but did not complete career certificates (87 vs. 74 percent) (figure 3.3 and table 3.45). However, there were no measurable differences in the full-time employment rates of employed completers and non-completers at either the certificate (82–84 percent) or associate’s degree (90–91 percent) level (table 3.46).

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Appendix A—Technical Notes and Methodology

DATA USED IN THIS REPORT

This report uses a number of data collections conducted by the National Center for Education Statistics (NCES). These data collections are described below, organized by each level of education examined in the report.

Career and Technical Education (CTE) at the High School Level

Common Core of Data

The Common Core of Data (CCD), the U.S. Department of Education’s primary database on public elementary and secondary education in the United States, is a comprehensive annual, national statistical database of information concerning all public elementary and secondary schools (approximately 91,000) and school districts (approximately 16,000). Rather than a probability sample, the CCD collects information on all schools and districts.

The CCD consists of five surveys that state education departments complete annually, using their administrative records. The database includes general descriptive information on schools and school districts; data on students and staff, including demographics; and fiscal data, including revenues and current expenditures. Further information about the database is available at <http://nces.ed.gov/ccd/>.

Education Longitudinal Study of 2002

The Education Longitudinal Study of 2002 (ELS:2002) is the fourth major national longitudinal survey of high school students conducted by NCES. The three similar earlier surveys were the National Longitudinal Study of the High School Class of 1972 (NLS–72), the High School and Beyond Longitudinal Study of 1980 (HS&B:80), and the National Education Longitudinal Study of 1988 (NELS:88). Like its predecessors, ELS:2002 is designed to provide information to researchers, policymakers, and the public about high school students’ experiences and activities, and to track changes in these young people’s lives as they mature in the years after high school. ELS:2002 represents the base year for this longitudinal survey. Data from the stu-

dent and school files were used for this report to describe 10th-graders and their schools in spring 2002. For most analyses in this report, the sample was restricted to public schools and their students. The analysis samples included about 600 public and 200 private schools serving 10th-graders, and about 12,000 public and 3,000 private school 10th-graders.

The weighted response rate for student questionnaire completion was 87.5 percent, while the weighted response rate for the school administrator survey was 67.8 percent. For further details on the survey, see <http://nces.ed.gov/surveys/els2002/overview.asp> and Ingels et al. (2005).

High School Transcript Study, 1990, 2000, and 2005

The High School Transcript Study datasets for graduates in the classes of 1990, 2000, and 2005 (HSTS:1990, HSTS:2000, HSTS:2005) were used in this report to examine occupational CTE coursetaking by these cohorts, and in particular any changes that occurred over the 15-year period. The HSTS periodically collects information on courses completed and credits and grades earned during high school by the 12th-graders sampled for the National Assessment of Educational Progress tests. Only those 12th-graders who had graduated by early fall of the study year had their transcript data included in the HSTS. For additional information about HSTS:2000, see Roey et al. (2005). The technical manual for HSTS:2005 was not available in time to cite in this report, but the 2005 HSTS generally followed the same procedures as the 2000 study, as described in Roey et al. (2005).

Consistent methods for computing grade point averages across cases and for classifying courses were applied. High school courses vary by content and level, even those with similar course titles. Therefore, to compare the thousands of transcripts collected from schools included in the HSTS, and to ensure that each course is uniquely identified, a common course coding system, the Classification of Secondary School Courses (CSSC), was used. The 1998 Revision of the Secondary School Taxonomy (SST) (Bradby and Hoachlander 1999) was then used to assign each of the over 2,200 CSSC course codes to subject and program areas; the classification presented in exhibit 1.1 was based on this taxonomy.¹ The same classification was used for the HSTS:1990, HSTS:2000, and HSTS:2005 analyses.

This report followed the sample selection criteria outlined in the NCES publication, *Procedures Guide for Transcript Studies* (Alt and Bradby 1999). Specifically, samples were restricted

¹ The Secondary School Taxonomy (SST) was first developed in 1987, and revised in 1998. It was revised again in 2007 (Bradby 2007), although not in time for the analysis stage of this report. Thus, this report relies on the 1998 version of the SST. The 2007 revision reassigned some occupational coursetaking into different occupational categories, but did not move CTE courses out of the CTE curriculum, nor move non-CTE courses into the CTE curriculum. Therefore, applying the 2007 SST to the data presented in this report would not alter the overall participation rate in CTE (as measured by percentage of students taking a CTE course) nor the average credits earned in CTE.

to public high school graduates who earned regular or honors diplomas, earned 16 or more total credits in high school, and earned more than zero credits in English. See Alt and Bradby (1999) for the rationale behind this approach, which involves excluding transcripts that are likely to be incomplete or otherwise unreliable. After applying the stated selection criteria, the analysis samples included about 16,500 public high school graduates in 1990, 19,000 public high school graduates in 2000, and 24,000 public high school graduates in 2005. Further information about the database is available at <http://www.nces.ed.gov/nationsreportcard/hsts/>.

National Education Longitudinal Study of 1988

The National Education Longitudinal Study of 1988 (NELS:88) is the third major longitudinal study of secondary school students sponsored by NCES. The two studies that preceded NELS:88, the National Longitudinal Study of the High School Class of 1972 (NLS-72) and the High School and Beyond Longitudinal Study of 1980 (HS&B:80), surveyed high school seniors (as well as sophomores, in HS&B) through high school, postsecondary education, work, and family formation. NELS:88 was designed to provide longitudinal data about critical transitions experienced by young people as they develop, attend school, and embark on their careers.

Unlike its predecessors, NELS:88 began with a cohort of roughly 25,000 8th-grade students. Four follow-up surveys were conducted with the original cohort in later years. This report relied on data from the second and fourth follow-ups. The second follow-up, conducted in 1992, added students to the sample to make it representative of all 12th-graders in that year. Detailed information from the students' high school transcripts was also collected, including courses completed, credits earned, and grades. As with the HSTS analyses, courses were coded using the CSSC and the 1998 SST, and the sample was restricted to public high school graduates who earned regular or honors diplomas, earned 16 or more total credits in high school, and earned more than zero credits in English. After applying these selection criteria, the sample used in the report included about 7,300 public high school graduates.

In 2000, the fourth (and final) NELS:88 follow-up occurred. By this time most of the student participants had been out of high school for 8 years. The 2000 survey focused on postsecondary enrollment and completion, transitions into the labor force, and family formation. For those who had enrolled in any postsecondary education, postsecondary transcripts were collected from each institution attended. This report uses data from the NELS High School Transcript Study (HSTS) and NELS Postsecondary Education Transcript Study (PETS) as well as the base-year survey and the fourth follow-up survey. Further information about the study is available at <http://nces.ed.gov/surveys/nels88/>.

Schools and Staffing Survey

The Schools and Staffing Survey (SASS) includes data collected from K–12 school districts, schools, principals, teachers, and library media centers in the United States. One SASS table appears in this report (table 2.15). It is based on the Public School Questionnaire from the 2003–04 SASS and reports the number and percentage of public high schools that offer career academies. It was determined during preparation of this report that SASS, which is a primary source of national data on K–12 teachers and schools, undercounted area CTE schools serving high school students. The 1999–2000 SASS described only 43 percent of the universe of area CTE schools, while the 2003–04 SASS described only 64 percent of this universe. The magnitude of the undercount of high school CTE teachers—due to the undercount of area CTE schools—is not known. The NCES Technical Review Panel for Career/Technical Education Statistics recommended in 2006 that NCES not present data on high school CTE teachers based on existing SASS surveys. Steps are being taken to improve the coverage of area CTE schools—and thus high school CTE teachers—in the 2007–08 SASS survey. Further information about the survey is available at <http://nces.ed.gov/surveys/SASS/>.

Career Education at the Postsecondary Level

Beginning Postsecondary Students Longitudinal Study: 1996–2001

The base-year sample for the 1996 Beginning Postsecondary Students Longitudinal Study (BPS:96) was drawn from the sample for the 1995–96 National Postsecondary Student Aid Study (NPSAS:96), a nationally representative survey of all postsecondary students in the United States who attended institutions of various levels (less-than-2-year, 2-year, or 4-year undergraduate, or graduate/professional schools). NPSAS:96 students who enrolled in postsecondary education for the first time in 1995–96 formed the BPS sample, which was surveyed in 1995–96 and re-interviewed in 1998 and 2001.

Some 12,100 students were eligible for BPS:96/01 participation, and over 10,400 responded to the interview. The institutional response rate for BPS:96/01 was 91.1 percent and the student response rate was 83.6 percent, for an overall rate of 76.1 percent (weighted). Nearly all students who were interviewed completed the entire interview. For more information on this BPS cohort and study methods, see Wine et al. (2002).

This report limited BPS students examined to those who had earned a high school diploma or its equivalent (such as a general educational development [GED] certificate) and who reported in 1995–96 that their goal was a certificate, an associate’s degree, a bachelor’s degree, or transfer

to another institution—termed “credential-seekers.” Thus, 24 percent of all BPS students were omitted from this study: 17 percent because of “missing” or “don’t know” responses to the question about credential goals; 6 percent because they had no credential goal; and 1 percent because they did not have a high school diploma or equivalent. Beginning postsecondary students were classified for this report as either subbaccalaureate or baccalaureate, based on their first institution and initial credential goal. Subbaccalaureate students were those who enrolled first at a less-than-4-year institution or enrolled at a 4-year institution but were seeking less than a bachelor’s degree at that institution or planning to transfer downward to a less-than-4-year institution. Baccalaureate students were those who initially enrolled at a 4-year institution and were seeking a bachelor’s or higher degree at that institution or planning to transfer to another 4-year institution. Further information about the study is available at <http://www.nces.ed.gov/surveys/bps/>.

Integrated Postsecondary Education Data System

The Integrated Postsecondary Education Data System (IPEDS) is NCES’s core data collection on postsecondary education. IPEDS is a single, comprehensive system of annual surveys that encompass all identified institutions whose primary purpose is to provide postsecondary education—it is a universe survey. Completing IPEDS is mandatory for all institutions that participate or have applied to participate in any federal financial assistance program authorized by Title IV of the Higher Education Act of 1965. The IPEDS for 2004–05 collected data from Title IV eligible 4-year, 2-year, and less-than-2-year postsecondary institutions.

IPEDS consists of institution-level data that can be used to describe trends in postsecondary education at the institutional level, as well as the state or national levels or both. Data are collected from approximately 9,900 postsecondary institutions, including the following: baccalaureate or higher degree-granting institutions, 2-year institutions, and less-than-2-year institutions (i.e., institutions that generally award occupationally specific credentials that are terminal or are creditable toward a formal 2-year or higher degree). Each of these three categories is further disaggregated by control (public, private not-for-profit, private for-profit), resulting in nine institutional categories or sectors. This report focused on Title IV eligible postsecondary institutions that awarded postsecondary certificates, associate’s degrees, and bachelor’s degrees in 2005, including about 6,600 such institutions. Further information about IPEDS is available at <http://nces.ed.gov/ipeds/>.

National Postsecondary Student Aid Study

Data from the National Postsecondary Student Aid Study (NPSAS) were obtained from the 1989–90 (NPSAS:90), 1999–2000 (NPSAS:2000), and 2003–2004 (NPSAS:04) surveys. NPSAS is a comprehensive nationwide study designed to determine how students and their families pay for postsecondary education and to track demographic and other characteristics of those enrolled. NPSAS surveys a nationally representative sample of all students in postsecondary education institutions, including undergraduate, graduate, and first-professional students.

Students attending all types and levels of institutions are represented in NPSAS, including public and private not-for-profit and for-profit institutions, and institutions whose undergraduate programs are less-than-2-year, 2-year (mainly community colleges), or 4-year, and whose graduate programs vary in length. Part-time and full-time students enrolled in academic or vocational courses or programs at these institutions at any time during the year, and not concurrently enrolled in a high school completion program, are eligible for inclusion in NPSAS. Each NPSAS survey provides information on the cost of postsecondary education, the distribution of financial aid, and the characteristics of both aided and nonaided students and their families. To be eligible for NPSAS:04, students must have been enrolled at some time between July 1, 2003, and June 30, 2004.

To be eligible for inclusion in the NPSAS sample, an institution must have satisfied the following conditions: (1) offer education programs designed for persons who have completed secondary education; (2) offer academic, occupational, or vocational programs of study lasting 3 months or longer; (3) provide access to the general public; (4) offer instruction beyond correspondence courses; and (5) be located in the 50 states, the District of Columbia, or the Commonwealth of Puerto Rico.

The overall student response rate for NPSAS:04 was 72 percent (weighted, calculated by multiplying the institutional response rate by the student response rate). Further information about NPSAS:04 is available from Cominole et al. (2006); see also <http://nces.ed.gov/surveys/npsas/> for information about the NPSAS survey in general.

Postsecondary Students Described in the Report

In its analysis of NPSAS students, this report focused on credential-seeking undergraduates—those students seeking a postsecondary certificate, associate’s degree, or bachelor’s degree. The analysis samples included 44,000 credential-seeking undergraduates in 1990, 35,000 such students in 2000, and 72,000 in 2004. Students’ major fields were classified as academic, career, or other according to the following table.

Table A-1. Classification of majors as academic, career, or other: 1990, 2000, and 2004

MAJOR FIELD	1990	2000	2004
1. Academic			
Math	27 mathematics 279999 calculus	65 mathematics	19 Mathematics and statistics
Science	26 life science 40 physical science 4005 chemistry 400601 geology 4008 physics	64 biological sciences 74 physical sciences	18 Biological and biomedical sciences 25 Physical sciences 38 Natural sciences, other
Letters and Humanities	23 letters 230401 composition 230701 literature, American 230801 literature, English 16 foreign language 160501 German 160901 French 160905 Spanish 38 philosophy/religion 39 theology 3906 theological studies	61 letters 37 Spanish 39 other European foreign language 38 other non-European foreign language 71 philosophy 72 religious studies 73 clinical pastoral care	15 English language and literature/letters 12 Foreign languages and literatures 16 Liberal arts, sciences and humanities 23 Philosophy and religious studies 24 Theology and religious vocations
Social Sciences	42 psychology 45 social science 4502 anthropology 4510 political science 4511 sociology 4507 geography 4506 economics 05 ethnic studies 4508 history	06 American civilization 07 area studies 08 African-American studies 09 other ethnic studies 67 women's studies 75 psychology 79 anthropology/archeology 80 economics 81 geography 82 history 83 sociology 84 political science 85 international relations	4 Area, ethnic, and gender studies 27 Psychology 37 History 40 Economics 41 Geography 42 International relations and affairs 43 Political science and government 44 Sociology 45 Social sciences, other
Fine and Performing Arts	50 performing arts 5003 dance 5007 fine arts 5009 music	95 speech/drama 96 film arts 97 music 98 art history/fine art 99 fine and performing arts 91 commercial art 94 design	34 Visual and performing arts
General/Liberal Studies	24 general studies	62 liberal studies	55
2. Career			
Agriculture and Natural Resources	01 agricultural production 02 agricultural science 03 natural resources	01 agriculture 02 agricultural science 03 natural resources 04 forestry	1 Agriculture and related sciences 2 Natural resources and conservation

Table A-1. Classification of majors as academic, career, or other: 1990, 2000, and 2004—Continued

MAJOR FIELD	1990	2000	2004
Business and Marketing	06 business/management 602 accounting 603 banking/finance 07 business 706 secretarial 08 marketing	14 secretarial 15 business support 13 management, business, administration 10 accounting 11 finance 12 business/management systems 16 marketing/distribution	36 Business, management, and marketing
Health Care	17 allied health 170605 practical nursing 18 health sciences 1803 chiropractic 180401 dentistry 181001 medicine 1811 nursing 1812 optometry 1813 osteopathic medicine 1814 pharmacy 1815 podiatry 1824 veterinary medicine	43 nurse assisting 50 nursing 40 dental and medical technology 41 community/mental health 42 physical education/recreation 44 general/other health 45 audiology 46 clinical health 47 dentistry 48 medicine 49 veterinary medicine 51 health/hospital administration 52 public health 53 all other health	26 Science technologies/technicians 35 Health professions and related sciences 46 Residency programs
Personal and Consumer Services	12 consumer service 19 home economics 20 voc home economics 31 parks/recreation	23 cosmetology 24 other consumer services 54 dietetics 55 textiles 56 home economics 57 voc. home economics: child care 58 voc. home economics: other 69 leisure studies/parks/recreation	8 Personal and culinary services 13 Family and consumer/human sciences 22 Parks, recreation, and fitness studies
Public, Social, and Human Services	44 public affairs 4407 social work 25 library science	63 library/archival science 77 social work 78 public administration	17 Library science 29 Public administration and social services
Legal Services	220101 law 220103 legal assisting	59 paralegal 60 law	14 Legal professions and studies 39 Criminal justice
Protective Services	28 military science 43 protective services	66 military sciences 76 protective services	20 Military technologies 28 Security and protective services

Table A-1. Classification of majors as academic, career, or other: 1990, 2000, and 2004—Continued

MAJOR FIELD	1990	2000	2004
Computer Sciences	1102 computer programming 1103 data processing 11 computer science	20 computer programming 21 data processing technology 22 computer/information sciences	7 Computer and information sciences
Communications	904 journalism 09 communications 10 communications technology	17 journalism 18 communications 19 communications technology	5 Communication and journalism 6 Communications technologies/technicians
Engineering and Architectural Sciences	14 engineering 1408 civil engineering 141001 electrical engineering 1419 mechanical engineering 15 engineering technology 41 science technology 04 environmental design	05 architecture 86 city planning 31 electrical engineering 32 chemical engineering 33 civil engineering 34 mechanical engineering 35 other engineering 36 engineering technology	3 Architecture and related services 10 Engineering 11 Engineering technologies/technicians
Trade and Industry	46 construction 47 mechanics 48 precision production 49 transportation/moving	88 transportation mechanics 90 all other mechanics 87 construction 89 electronics 92 precision production 93 transportation	30 Construction trades 31 Mechanic and repair technologies 32 Precision production 33 Transportation and materials moving
Education	13 education 131201 adult/continuing education 131202 elementary education 131203 junior/high school education 131204 pre-elementary education 131205 secondary education	26 elementary education 27 secondary education 28 special education 29 physical education 30 other education 25 early childhood education	9 Education
3. Other			
Basic skills	32 basic skills	70 basic skills	
Other/Unspecified	999995 = uncodeable -1 = legitimate skip -9 = missing	68 interdisciplinary studies Other/missing/not reported	21 Multi/interdisciplinary studies

NOTE: The variables used to categorize students' majors are MAJORCODE (1990), MAJOR (2000), and MAJOR (2004).

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90, 1999–2000, and 2003–04 National Postsecondary Student Aid Study (NPSAS:90, NPSAS:2000, and NPSAS:04).

National Study of Postsecondary Faculty

NSOPF:93 Sample

The 1992–93 National Study of Postsecondary Faculty (NSOPF:93) provides a national profile of faculty at U.S. higher education institutions, including their professional backgrounds, responsibilities, workloads, salaries, benefits, and attitudes. The NSOPF:93 contained two major components: (1) a survey of institutional-level respondents in a stratified random sample of 974 higher education institutions in the United States (public and private; not-for-profit 2- and 4-year); and (2) a survey of a stratified random sample of 31,400 faculty and instructional staff in the sampled institutions. Both NSOPF:93 institutional and faculty respondents completed surveys that described their policies and activities during the 1992 fall term.

The institution survey collected information on topics including faculty composition, new hires, departures and recruitment, and retention and tenure policies; the faculty survey gathered information about the professional backgrounds, responsibilities, workloads, salaries, benefits, and attitudes of both full- and part-time faculty and staff. The response rate for the institution survey was 91 percent, and the response rate for faculty (adjusted by the institution participation rate) was 70 percent (weighted). All cases were weighted to compensate for unequal probability of selection into the NSOPF:93 faculty sample and to adjust for nonresponse. For more information on the NSOPF:93 cohort and study methods, see the methodology report by Selfa et al. (1997). See <http://www.nces.ed.gov/surveys/nsopf/> for information about the NSOPF survey in general.

NSOPF:99 Sample

The 1999 National Study of Postsecondary Faculty (NSOPF:99) continues the first two cycles of the NSOPF survey, conducted in 1988 and 1993; it was designed both to facilitate comparisons over time and to examine new faculty-related issues that emerged since the previous study in 1993. Since the 1993 study, the operant definition of “faculty” for NSOPF has included instructional faculty, noninstructional faculty, and instructional personnel without faculty status.

NSOPF:99 used a sample of 960 institutions and 28,576 faculty members, of whom 19,213 were found eligible for the survey. The sample was designed to allow detailed comparisons and high levels of precision at both the institution and faculty levels. In previous rounds of the study, the sample consisted of public and private not-for-profit 2- and 4-year (and above) higher education institutions. The NSOPF:99 sample represents all public and private not-for-profit Title IV-participating, degree-granting institutions in the 50 states and the District of Columbia. The insti-

tution sample included an expanded sample to ensure that there would be enough institutions from which to sample, based on an estimated 15 percent of institutions that were expected to decline to participate. In addition, four groups of faculty were oversampled: Blacks, Hispanics, Asian/Pacific Islanders, and full-time female faculty. The weighted institutional response rate was 88.4 percent, with 865 institutions responding to the survey. About 17,600 faculty members participated, with a weighted response rate of 91.6 percent. For more information on the NSOPF:99 cohort and study methods, see the methodology report by Abraham et al. (2002).

NSOPF:04 Sample

NSOPF:04 was designed both to facilitate comparisons over time and to examine new faculty-related issues that emerged since the previous study in 1999. NSOPF:04 used a sample of 1,070 institutions and 35,360 faculty members, of whom 34,330 were found eligible for the survey. The weighted institutional response rate was 84 percent, with 920 institutions responding to the survey. About 26,100 faculty members participated, with a weighted response rate of 76 percent. For more information on the NSOPF:04 cohort and study methods, see the methodology report by Heuer et al. (2005).

Postsecondary Faculty Described in the Report

The teaching faculty studied in this report are defined as all faculty and instructional staff who taught at least one class during the fall semester of the year studied, at public and private not-for-profit 2- and 4-year postsecondary institutions. The faculty cases retained for analysis include those who taught noncredit as well as for-credit courses at the included institutions, and those who taught full time or part time. Postsecondary teaching faculty are classified by the level of their postsecondary institution (4- or 2-year), rather than by the credential level of the students they taught. Teaching faculty were classified as career, academic, or “other” based on their principal teaching field as shown in the following table.

Table A-2. Classification of teaching fields as academic, career, or other: 1993, 1999, and 2004

TEACHING FIELD	1993	1999	2004
1. Academic			
Math	430 mathematics 440 statistics	390 mathematics/statistics	18 Mathematics and statistics
Science	391-400 biological sciences 411-420 physical sciences	391-400 biological sciences 411-420 physical sciences	Biological and biomedical sciences 25 Physical sciences
English/literature	291-300 English and literature, except 297 ESL	291-300 English and literature, except 297 ESL	12 English language and literature/letters
Humanities	311-320 foreign languages 480 philosophy and religion	311-320 foreign languages 440 philosophy 441 religion	14 foreign languages/literature/linguistics 24 Philosophy, religion & theology
Social Sciences	541-560 social sciences and history 510 psychology	541-560 social sciences and history 510 psychology	3 Area/ethnic/cultural/gender studies 20 Multi/interdisciplinary studies 26 Psychology 30 Social sciences (except psych) and history
Fine and Performing Arts	141-150 art, except 144 design	141-150 art, except 144 design	4 Arts—visual and performing
2. Career			
Agriculture and Natural Resources	101-110 agriculture and natural resources	101-110 agriculture and natural resources	1 Agriculture/natural resources/related
Business	164 business support 161 accounting 162 banking & finance 163 business administration/management 165 human resources development 166 organizational behavior 167 marketing & distribution 170 other business	164 business support 161 accounting 162 banking & finance 163 business administration/management 165 human resources development 166 organizational behavior 167 marketing & distribution 170 other business	6 Business/management/marketing/related

Table A-2. Classification of teaching fields as academic, career, or other: 1993, 1999, and 2004—Continued

TEACHING FIELD	1993	1999	2004
Health care	335 nursing 331 allied health technology & service 332 dentistry 333 health services administration 334 medicine, including psychiatry 336 pharmacy 337 public health 338 veterinary medicine 340 other health sciences	335 nursing 331 allied health technology & service 332 dentistry 333 health services administration 334 medicine, including psychiatry 336 pharmacy 337 public health 338 veterinary medicine 340 other health sciences	15 Health professions/clinical sciences 28 Science technologies/technicians
Personal and Consumer Services	350 home economics 621 personal services (e.g., barbering, cosmetology) 630 other consumer services	350 home economics 621 personal services (e.g., barbering, cosmetology) 630 other consumer services	13 family/consumer sciences, human sciences 23 Personal and culinary services
Public, Social, Human, Legal Services	380 library/archival science 490 theology 520 public affairs, including social work 370 law	380 library/archival science 442 theology 520 public affairs, including social work 370 law	16 Legal professions and studies 17 Library science 21 Parks/recreation/leisure/fitness studies 27 Public administration/social services
Protective Services	500 protective services	500 protective services	29 Security & protective services
Computer Sciences	201-210 computer sciences	201-210 computer sciences	8 Computer/info sciences/support tech
Communications and Design	181-190 communications 144 design	181-190 communications 144 design	7 Communication/journalism/comm. tech
Engineering and Architectural Sciences	121-130 architecture and environmental design 261-280 engineering 530 science technologies	121-130 architecture and environmental design 261-280 engineering 530 science technologies	2 Architecture and related services 11 Engineering technologies/technicians
Trade and Industry	601-610 construction trades 641-644 mechanics and repairers 661-670 precision production 681-690 transportation and material moving	601-610 construction trades 641-644 mechanics and repairers 661-670 precision production 681-690 transportation and material moving	9 Construction trades 18 Mechanical/repair technologies/techs 22 Precision production 31 Transportation & materials moving

Table A-2. Classification of teaching fields as academic, career, or other: 1993, 1999, and 2004—Continued

TEACHING FIELD	1993	1999	2004
Education	241-250 teacher education including: 241 pre-elementary 242 elementary 243 secondary 244 adult and continuing 245 other general teacher education 250 teacher education in specific subjects 221 general education 223 bilingual/cross-cultural 224 curriculum & instruction 225 education administration 226 education evaluation & research 227 educational psychology 228 special education 229 counseling/personnel 230 other education	241-250 teacher education including: 241 pre-elementary 242 elementary 243 secondary 244 adult and continuing 245 other general teacher education 250 teacher education in specific subjects 221 general education 223 bilingual/cross-cultural 224 curriculum & instruction 225 education administration 226 education evaluation & research 227 educational psychology 228 higher education 229 special education 230 counseling/personnel 231 other education 470 physical education	10 Education
3. Other			
Basic Skills/ESL	222 basic skills 297 English as a second language (ESL)	222 basic skills 297 English as a second language (ESL)	
Other/Unspecified	450 military studies 460 multi/interdisciplinary studies 900 other Missing/not specified	900 other Missing/not specified	32 Other

NOTE: The variables used to categorize teaching fields are X04A12 (1990), Q16CD2 (2000), and X11Z14 (2004).
SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993, 1999, and 2004 National Study of Postsecondary Faculty (NSOPF:93, NSOPF:99, and NSOPF:04).

Adult Work-Related Coursetaking

National Household Education Surveys Program: 2003 and 2005

The National Household Education Surveys Program (NHES) is a set of telephone surveys conducted on a periodic basis. The 2003 Adult Education for Work-Related Reasons Survey

(AEWR-NHES:2003) and the 2005 Adult Education Survey (AE-NHES:2005) are surveys in this set. Data collection for the AEWR-NHES:2003 took place from January through April 2003 and for the AE-NHES:2005 from January through April 2005. Both samples were selected using random digit dialing (RDD) methods, and are nationally representative of all civilian, noninstitutionalized adults in the 50 states and the District of Columbia who are age 16 or older and not enrolled in grades K–12. The data for both surveys were collected using computer-assisted telephone interviews (CATI). For a complete discussion of the methodology for each survey, see the user’s manual in Hagedorn et al. (2006).

In both NHES surveys, the samples were selected using a multiple stage sampling framework. The first stage of sample selection was the generation of a list-assisted RDD sample of telephone numbers, with areas with high percentages of Black and Hispanic residents sampled at higher rates than those in areas with low percentages of Black and Hispanic residents. In the second stage, the sampled telephone numbers were classified as mailable or nonmailable depending on whether they could be matched to a mailing address in the white pages telephone directory or other databases. During the survey interview, a set of household screening items was administered to an adult member of the household. (A screener was used to collect information on household composition and interview eligibility.) Household members were enumerated, the adult education participation status of each adult (age 16 or older, not in high school) was determined, and the sample of adults was selected according to the survey’s sample design.

In the AE-NHES:2005, screening surveys were completed with 58,140 households, with a weighted unit screener response rate of 67 percent. A total of 8,904 adults completed the interview, for a weighted unit response rate of 71 percent and an overall estimated unit response rate (the product of the screener unit response rate and the adult interview unit response rate) of 48 percent. In the AEWR-NHES:2003, screener interviews were completed with 32,049 households, with a weighted unit screener response rate of 65 percent. The weighted unit response rate was 76 percent and the overall estimated unit response rate was 49 percent.

In the AE-NHES:2005 interview, information was collected from 8,904 adults, and in the AEWR-NHES:2003 interview, information was collected from 12,725 adults. In both years, adults were asked about their demographic characteristics, participation in the past 12 months in educational activities (educational activities taken for work-related reasons in AEWR-NHES:2003), and labor force participation. The only person eligible to respond to this interview was the sampled adult. Multiple attempts were made to complete interviews with targeted adults not available at the time of selection, and interviews were conducted in either English or Spanish. See <http://www.nces.ed.gov/nhes/> for information about the NHES studies.

STATISTICAL PROCEDURES

This report describes various characteristics of career and technical education participants, including sex, race/ethnicity, and prior academic achievement, among others. It should be remembered that, while each of these characteristics is examined separately, there may be collinearity among them. For example, participation patterns for the different racial/ethnic groups may be related to their differing prior academic achievement. The report does not employ any statistical procedures to attempt to determine which characteristics are most strongly related to participation in career and technical education or to isolate the independent contribution of different characteristics to participation patterns.

It is important when reading NCES reports to remember that they are descriptive in nature. That is, they are limited to describing some aspect of the condition of education and may suggest ideas to be further examined. Readers are cautioned against making unwarranted causal inferences from simple cross tabulations. It is never the case that a simple cross tabulation of any variable with a measure of educational achievement is proof that differences in the variable are a cause of differential educational achievement or any other outcome.

Two types of statistical procedures were used in this report: testing differences between means (or percentages) and testing linear trends. Each procedure is described below. Note that significance testing was not conducted for data from universe surveys such as CCD and IPEDS, which represent the full population of interest rather than a sample.

Differences Between Means

The descriptive comparisons were tested in this report using Student's t statistic. Differences between estimates are tested against the probability of a Type I error,² or significance level. The significance levels were determined by calculating the Student's t values for the differences between each pair of means or percentages and comparing these with published tables of significance levels for two-tailed hypothesis testing.

Student's t values may be computed to test the difference between estimates with the following formula:

$$t = \frac{E_1 - E_2}{\sqrt{se_1^2 + se_2^2}} \quad (1)$$

² 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.

where E_1 and E_2 are the estimates to be compared and se_1 and se_2 are their corresponding standard errors. This formula is valid only for independent estimates. When estimates are not independent, a covariance term must be added to the formula:

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

where r is the correlation between the two estimates.³ This formula is used when comparing two percentages from a distribution that adds to 100. If the comparison is between the mean of a subgroup and the mean of the total group, the following formula is used:

$$t = \frac{E_{sub} - E_{tot}}{\sqrt{se_{sub}^2 + se_{tot}^2 - 2p se_{sub}^2}} \quad (3)$$

where p is the proportion of the total group contained in the subgroup.⁴

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 t statistic.

A second hazard in reporting statistical tests is the possibility that one can report a “false positive” or Type I error. In the case of a t statistic, this false positive would result when a difference measured with a particular sample showed a statistically significant difference when there is no difference in the underlying population. Statistical tests are designed to control this type of error, denoted by alpha. The alpha level of .05 selected for findings in this report indicates that a difference of a certain magnitude or larger would be produced no more than one time out of 20 when there was no actual difference between the quantities in the underlying population. When we test hypotheses that show t values at the .05 level or smaller, we treat this finding as rejecting the null hypothesis that there is no difference between the two quantities. Failing to detect a difference, however, does not necessarily imply the values are the same or equivalent.

With an alpha level set at .05, each additional comparison made using a particular dataset increases the likelihood that a Type 1 error will occur. In other words, it becomes more likely that

³ U.S. Department of Education, National Center for Education Statistics. (1993). *A Note from the Chief Statistician, no. 2.*

⁴ Ibid.

at least one of the estimated differences measured will appear significant merely by chance. This report made no adjustments for multiple comparisons.

Linear Trends

While many descriptive comparisons in this report were tested using Student's *t* statistic, some comparisons across categories of an ordered independent variable used a test for a linear trend across all categories, rather than a series of tests between pairs of categories. In this report, when differences among percentages of a dependent variable were examined relative to an ordered independent variable, an Analysis of Variance (ANOVA) was used to test for a linear relationship between the two variables. To do this, ANOVA models included orthogonal linear contrasts corresponding to successive levels of the independent variable (e.g., to test whether participation in work-related courses increased as the education level of the adult increased). The squares of the standard errors, the variance between the means, and the unweighted sample sizes were used to partition the total sum of squares into within- and between-group sums of squares. These were used to create mean squares for the within- and between-group variance components and their corresponding *F* statistics, which were then compared with published values of *F* for a significance level of .05.⁵ Significant values of both the overall *F* and the *F* associated with the linear contrast term were required as evidence of a linear relationship between the two variables. Means and standard errors were calculated by standard statistical software. Unweighted sample sizes were provided by NCES through a restricted-use data license agreement.

⁵ More information about ANOVA and significance testing using the *F* statistic can be found in any standard textbook on statistical methods in the social and behavioral sciences.

Appendix B—Glossary

This glossary describes the variables used in this publication. In the index below, variables are generally organized according to the chapter in which they are first presented. Within each chapter section, the variables are presented in alphabetical order.

GLOSSARY INDEX

CHAPTER 1: INTRODUCTION

Adult work-related course
Career and technical education (CTE)

School-based enterprise
School type
Work-based learning

CHAPTER 2: CAREER AND TECHNICAL EDUCATION AT THE HIGH SCHOOL LEVEL

Area CTE schools
Career academy
Career major or pathway
Career plan
Community service
Cooperative education
Credit
Dual credit
Four-year college-preparatory coursework
Individualized Education Program (IEP)
Internship
Job shadowing
Limited English proficient (LEP)
Locale
Mentoring
National School Lunch Program (NSLP)
New Basics
Occupational concentrator
Occupational credits
Occupational education
Occupational programs
Professional license
Region

CHAPTER 3: CAREER EDUCATION AT THE POSTSECONDARY LEVEL

Career education/career field of study
Credential
Level of institution
Level of offering
Sector of institution
Subbaccalaureate
Title IV eligible

CHAPTER 4: ADULT WORK-RELATED COURSETAKING

Employer financial support
Employment status
Hours of coursetaking
Months employed
Number of courses taken
Occupation
Provider type
Topic of instruction
Work-related courses

Chapter 1: Introduction

Adult work-related course is defined as courses outside formal education programs that adults take in order to acquire, maintain, or upgrade their workforce skills. These courses can include employer-provided training, postsecondary courses (other than those taken as part of a degree

program), professional or technical licensing or certification courses, and other types of work-related courses.

Career and technical education (CTE) is defined somewhat differently at the secondary, postsecondary, and adult levels:

High school/secondary CTE encompasses family and consumer sciences education, which prepares students for roles outside the paid labor market; general labor market preparation, which teaches general employment skills such as word processing and introductory technology skills; and occupational education, which teaches skills required in specific occupations or occupational clusters.

Postsecondary career education describes career-related postsecondary programs at the certificate, associate's degree, and bachelor's degree levels. (At the postsecondary level, "CTE" refers specifically to subbaccalaureate career programs.) For purposes of this report, postsecondary career education is defined as formal undergraduate programs designed to impart relevant knowledge and skills that relate to the requirements of specific occupations or careers. In contrast, academic education is defined as formal undergraduate programs designed to impart knowledge and skills that represent the accumulated knowledge base in a subject area. Career education instruction typically involves less theory, more application, and a narrower focus than what is taught in academic programs, while academic instruction is typically designed to be comprehensive, theoretical, and independent of specific labor market requirements.

Adult work-related coursetaking includes formal courses and training that adults participate in to acquire, maintain, and upgrade their workforce skills (see *Adult work-related course*).

Chapter 2: Career and Technical Education at the High School Level

Area CTE schools provide career and technical education part time to students who receive all or most of their academic instruction at their home high school. Area CTE schools typically serve multiple high schools.

Career academy is a multiyear high school program in which the curriculum integrates academic and CTE courses, organized around one or more broad career themes.

Career major or pathway specifies the academic and CTE courses to be taken by a student.

Career plan is a written plan of study based on the student's career interests.

Community service refers to school-arranged volunteer opportunities for students that support their local community.

Cooperative education refers to work experiences that are part of CTE courses and for which students can earn course credit.

Credit is a standard coursetaking measure at the high school level, awarded when a student successfully completes a course. One credit is equivalent to a Carnegie unit, or one course that meets for one period per day for one year.

Dual credit refers to a course or program where high school students can earn both high school and postsecondary credits for the same course.

Four-year college-preparatory coursework is defined in this report as earning 4.0 or more credits in English; 3.0 or more credits in mathematics at the algebra 1 or higher level; 2.0 or more credits in biology, chemistry, or physics; 2.0 or more credits in social studies with at least 1.0 credit in U.S. or world history; and 2.0 or more credits in a single foreign language.

Individualized Education Program (IEP) refers to an education program that is developed for students with disabilities to meet their special needs.

Internship is a work experience arranged by the school, but not necessarily part of a CTE class.

Job shadowing teaches students about a job by having students follow the schedule of a person who holds that job.

Limited English proficient (LEP) refers to students who are in an English as a Second Language instructional program.

Locale refers to the metropolitan status of the school, assigned using 2000 Decennial Census data. A three-level categorization is used in these tables: urban (large or midsize central city), suburban (large or small town or urban fringe of a large or midsize city), and rural (rural area).

Mentoring refers to school-arranged matches with an adult in a career area who can give advice and support to students.

National School Lunch Program (NSLP) is a federal program that provides free or reduced-price lunches to students based on the student's household income.

New Basics are core academic coursetaking standards that include 4 years of English and 3 years each of mathematics, science, and social studies.

Occupational concentrator is a student who earns 3.0 or more credits in any one of the 18 occupational program areas defined under Occupational Programs below. Due to small sample sizes, occupational concentrators were defined in some analyses as graduates who earned 3.0 or more credits in any of the following 10 broad program areas: agriculture, business (comprised of business management and business services), marketing, technology and communications (comprised of communications technology, computer technology, and other technology), trade and industry (comprised of construction, mechanics and repair, transportation, materials production, print production, and other precision production), health care, childcare and education, protective services, food service and hospitality, and personal and other services.

Occupational credits are high school credits earned for courses taken in the 18 occupational program areas identified below. One credit is equivalent to a Carnegie unit, or one course that meets for one period per day for one year.

Occupational education teaches skills required in specific occupations, occupational clusters, or careers. At the high school level, occupational education is a subset of CTE and consists of the occupational programs identified below. At the postsecondary level, occupational education is a term used sometimes in place of CTE to describe subbaccalaureate career programs.

Occupational programs consist of one or more high school courses in the following 18 occupational areas identified in the High School Transcript Studies (HSTS): agriculture, business management, business services, child care and education, communications technology, computer technology, other technology, construction, food service and hospitality, health care, marketing and distribution, materials production, mechanics and repair, print production, other precision production, public and protective services, personal and other services, and transportation. In the Education Longitudinal Study of 2002 (ELS:2002), school administrators reported on occupational programs in the following 16 areas: agriculture, business, child care and education, communications technology, computer technology, other technology, construction, food service and hospitality, health care, marketing, mechanics and repair, personal services, precision production, public and protective services, transportation, and other (unspecified) occupational programs.

Professional license was defined by responses to the following question, “Have you received a professional license or professional credential since leaving high school? For example, these might be a real estate or cosmetology license, teacher’s certificate or networking engineering credential. Do not consider certificates provided for the completion of academic programs at postsecondary schools.”

Region is the geographic region in which the school is located. Northeast includes CT, ME, MA, NH, NJ, NY, PA, RI, and VT; Midwest includes IL, IN, IA, KS, MI, MN, MO, ND, NE, OH,

SD, and WI; South includes AL, AR, DC, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, and WV; and West includes AK, AZ, CA, CO, HI, ID, MT, NV, NM, OR, UT, WA, and WY.

School-based enterprise is a business run by students or teachers from a school.

School type is defined in the Education Longitudinal Study of 2002 (ELS:2002) based on the school administrator’s report, and was collapsed for this report into the following categories (only public schools included in analyses):

Full-time CTE high school: Full-time technical or vocational schools

Comprehensive high school served by an area CTE school: Comprehensive public schools (not including magnet school or school of choice) that are served by an area or regional vocational school/center (part time or part day)

Other comprehensive high school: Comprehensive high schools that are not served by an area or regional vocational school/center

Work-based learning provides supervised learning activities for students that occur in paid or unpaid workplace assignments, and for which course credit is awarded.

Chapter 3: Career Education at the Postsecondary Level

Career education/career field of study refers to undergraduate instruction at the certificate, associate’s degree, and bachelor’s degree levels designed to impart relevant knowledge and skills that relate to the requirements of specific occupations or careers. Career fields of study at the postsecondary level include the following 11 career fields described in the report: agriculture and natural resources; business and marketing; communications and design; computer sciences; education; engineering and architectural sciences; health care; personal and consumer services (e.g., cosmetology, culinary arts); protective services (e.g., fire protection, corrections); public, social, human, and legal services (legal services is sometimes described separately); and trade and industry (construction, mechanics and repair, precision production, and transportation). See appendix A for more detail on the classifications used in the report.

Credential refers to the following undergraduate certificates and degrees awarded by postsecondary institutions:

- *Certificate:* An award granted for the successful completion of a postsecondary program of study. Certificates typically require the equivalent of less than 2 academic years of full-time college-level study, with some requiring less than 1 full-time equivalent

lent year. These certificates are usually awarded in a career education field and may cover the same coursework as an associate's degree, but without the general education requirements. Only undergraduate certificates are included in the report.

- *Associate's degree*: A degree granted for the successful completion of a subbaccalaureate program of study, usually requiring the equivalent of at least 2 but less than 4 full-time academic years of college-level study.
- *Bachelor's degree*: A degree granted for the successful completion of a baccalaureate program of study, usually requiring the equivalent of at least 4 but not more than 5 full-time academic years of college-level study.

Level of institution refers to a postsecondary institution's operational organization and the level of instruction it provides. Level of institution refers to the highest level of credential (postsecondary certificate or degree) awarded by the institution—4-year or higher (4-year), 2-year or higher but less than 4-year (2-year), and less-than-2-year.

Level of offering refers to the level of undergraduate credential awarded by an institution. Some tables in this report present statistics on all levels of undergraduate credentials that an institution awards (i.e., all offering levels), while other tables present only the highest level of undergraduate credential awarded (i.e., the highest level of offerings).

Sector of institution for postsecondary institutions is determined based on whether the institution is operated by publicly elected or appointed officials and derives its primary support from public funds (public institution) or by privately elected or appointed officials and derives its major source of funds from private sources (private institution). A second distinction, between private for-profit (or proprietary) and private non-profit institutions, is also included in some of the tables.

Subbaccalaureate refers to postsecondary programs and credentials that are below the bachelor's degree level.

Title IV eligible postsecondary institutions meet the criteria for participating in the federal student financial aid program, as specified in Title IV of the Higher Education Act. A Title IV eligible postsecondary institution must be one of the following: (1) an institution of higher education (with public or private, nonprofit control), (2) a proprietary institution (with private for-profit control), or (3) a postsecondary vocational institution (with public or private, nonprofit control). In addition, it must meet the criteria in the Higher Education Act for acceptable legal authorization, acceptable accreditation and admission standards, eligible academic program(s), administrative capability, and financial responsibility.

Chapter 4: Adult Work-Related Coursetaking

Employer financial support questions were asked of participants who were working at the time that they were enrolled in courses. Participants were considered to have received employer financial support if their employer paid for either (1) part or all of a course’s tuition, fees, books, and materials, or (2) the participant’s salary during coursetaking.

Employment status indicates the respondent’s labor force status within the past week or month prior to the interview. Adults are classified as working full-time (35 hours or more weekly), working part time (less than 35 hours weekly), unemployed and looking for work, and not in the labor force.

Hours of coursetaking is based on the full roster of 20 courses that respondents could list as having taken during the 12 months prior to the interview. Each respondent who reported participating in a particular work-related course was asked to delineate the number of classroom hours they attended each course in the 12 months prior to the interview.

Months employed indicates the number of months respondents worked during the 12 months prior to the interview. Respondents who had not worked in the 12 months prior to the interview are treated as missing.

Number of courses taken includes up to 20 courses that respondents reported they had participated in during the 12 months prior to the interview.

Occupation indicates the respondent’s employment status and occupation during the 12 months prior to the interview. Respondents who had not worked in the 12 months prior to the interview are treated as missing. Information on occupations is provided by the respondents and was coded according to the Standard Occupational Classification (SOC) used by the federal government to classify occupations. The occupations were organized as specified below:

- Professional and managerial
 - Executive, administrative, managerial
 - Engineers, surveyors, and architects
 - Natural scientists and mathematicians
 - Social scientists, social/religious workers, and lawyers
 - Teachers: college, university, and other
 - Teachers, except postsecondary institution
 - Health diagnosing and treating practitioners
 - Registered nurses, pharmacists, dieticians, and therapists
 - Writers/artists/entertainers/athletes
 - Health technologists and technicians

- Sales, service, and clerical
 - Technologists and technicians, except health
 - Marketing and sales
 - Administrative support, including clerical
 - Service Miscellaneous

- Trades and labor
 - Agricultural, forestry, and fishing
 - Mechanics and repairers
 - Construction/extractive
 - Precision and production working
 - Transportation and material moving

Provider type was collected through a series of questions that asked who provided the instruction for each course in which the respondent participated. For respondents who indicated in a separate question that their employer was the instructional provider, the employer overrode the other types of instructional providers.

Topic of instruction was asked of all respondents who participated in a work-related course and was coded into nine topic areas:

- Basic education
 - Personal awareness/improvement
 - Physical education and leisure
 - Basic education

- Business
 - Business marketing
 - Real estate and insurance
 - Marketing management
 - Accounting and finance
 - Business management
 - Business administrative support
 - Business computer software
 - Public administration and services
 - Other business

- Computer science
 - Computer science and systems

- Education
 - Education

Health

- Health sciences
- Allied health
- Self-health and personal health
- Other health

Science

- Agriculture and natural resources
- Engineering and related technologies
- Science
- Mathematics

Social sciences and services

- Social sciences and social studies
- Law
- Psychology
- Religion and philosophy
- Informal religion/Bible study
- Other religion and Bible study

Vocational trades

- Vocational and personal services
- Home economics
- Other vocational and personal services

Other

- Liberal arts/general studies
- English language and literature
- Foreign languages
- Communications
- Protective services/military science
- Fine and performing arts
- Interdisciplinary
- Indeterminable/other/unknown

Work-related courses are defined in both the 2003 and 2005 National Household Education Surveys Program (NHES) as any formal courses or training (hereafter, *courses*) taken in the 12 months prior to the interview that had an instructor present and that were taken mainly for work-related reasons. Respondents indicated whether each course in which they participated was taken mainly for work-related reasons or mainly for personal reasons; courses listed as taken mainly for work-related reasons or equally for both reasons were counted as work-related courses.