



**PEDAR**



U.S. Department of Education  
Institute of Education Sciences  
NCES 2005-169

# Gender Differences in Participation and Completion of Undergraduate Education and How They Have Changed Over Time

## Postsecondary Education Descriptive Analysis Reports

### Executive Summary

The complete report is available at

<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2005169>

February 2005

Katharin Peter  
Laura Horn  
MPR Associates, Inc.

C. Dennis Carroll  
*Project Officer*  
National Center for  
Education Statistics

**U.S. Department of Education**

Margaret Spellings  
*Secretary*

**Institute of Education Sciences**

Grover J. Whitehurst  
*Director*

**National Center for Education Statistics**

C. Dennis Carroll  
*Associate Commissioner*

The National Center for Education Statistics (NCES) is the primary federal entity for collecting, analyzing, and reporting data related to education in the United States and other nations. It fulfills a congressional mandate to collect, collate, analyze, and report full and complete statistics on the condition of education in the United States; conduct and publish reports and specialized analyses of the meaning and significance of such statistics; assist state and local education agencies in improving their statistical systems; and review and report on education activities in foreign countries.

NCES activities are designed to address high priority education data needs; provide consistent, reliable, complete, and accurate indicators of education status and trends; and report timely, useful, and high quality data to the U.S. Department of Education, the Congress, the states, other education policymakers, practitioners, data users, and the general public.

We strive to make our products available in a variety of formats and in language that is appropriate to a variety of audiences. You, as our customer, are the best judge of our success in communicating information effectively. If you have any comments or suggestions about this or any other NCES product or report, we would like to hear from you. Please direct your comments to:

National Center for Education Statistics  
Institute of Education Sciences  
U.S. Department of Education  
1990 K Street NW  
Washington, DC 20006-5651

February 2005

The NCES World Wide Web Home Page is: <http://nces.ed.gov>

The NCES World Wide Web Electronic Catalog is: <http://nces.ed.gov/pubsearch>

**Suggested Citation**

Peter, K., and Horn, L. (2005). *Gender Differences in Participation and Completion of Undergraduate Education and How They Have Changed Over Time* (NCES 2005-169). U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.

**For ordering information on this report, write:**

U.S. Department of Education  
ED Pubs  
P.O. Box 1398  
Jessup, MD 20794-1398

or call toll free 1-877-4ED-PUBS or order online at <http://www.edpubs.org>

**Content Contact:**

Aurora D'Amico  
(202) 502-7334  
[Aurora.D'Amico@ed.gov](mailto:Aurora.D'Amico@ed.gov)

## Executive Summary

---

Between 1970 and 2001, women went from being the minority to the majority of the U.S. undergraduate population, increasing their representation from 42 percent to 56 percent of undergraduates (Freeman 2004). Projections to 2013 indicate that women's undergraduate enrollment will increase to 8.9 million or 57 percent of the undergraduate population (Gerald and Hussar 2003, table 19). Consistent with these enrollment changes, women surpassed their male peers in educational expectations and degree attainment over the last 30 years (Freeman 2004). While in the aggregate, women have made great progress in gaining access to and completing postsecondary education, gender differences are not uniform across all groups (King 2000; Horn, Peter, and Rooney 2002). For example, among all undergraduates enrolled in 1999–2000, women made up 63 percent of Black undergraduates, 62 percent of students age 40 or older, and 70 percent of single parents (Horn, Peter, and Rooney 2002, table 3.1). The purpose of this study is to draw on several publications and postsecondary datasets to provide a detailed account of gender differences in undergraduate education. Specifically, the analysis examines gender differences in rates of participation and completion of undergraduate education, focusing on changes over time in college enrollment, associate's and bachelor's degree awards, and the demographic and enrollment characteristics of undergraduate men and women. The analysis also examines trends in high school academic preparation, postsecondary persistence and degree completion, and early labor market outcomes among bachelor's degree recipients.

The findings are based on data from the following studies:

- The Integrated Postsecondary Education Data System (IPEDS) and Current Population Survey (CPS);
- Three administrations of the National Postsecondary Student Aid Study (NPSAS:90, NPSAS:96, and NPSAS:2000), a cross-sectional survey of all postsecondary students enrolled in a given academic year;
- Two high school cohorts (the High School and Beyond Longitudinal Study and the National Education Longitudinal Study of 1988), representing high school graduates in 1982 (HS&B-So:80/92) and 1992 (NELS:88/2000);
- Two administrations of the Beginning Postsecondary Students Longitudinal Study, representing students who first began their postsecondary education in 1989–90 (BPS:90/94) and 1995–96 (BPS:96/01); and
- Two cohorts of college graduates (1992–93 and 1999–2000) from the Baccalaureate and Beyond Longitudinal Studies (B&B:93/97 and B&B:2000/01).

This analysis examines differences according to gender and changes over time using standard *t*-

tests to determine statistical significance. Statistical significance is reported at  $p \leq 0.05$ .

## Trends in Postsecondary Enrollment and Degree Awards

Nearly 14 million undergraduates were enrolled in degree-granting institutions in 2001 (U.S. Department of Education 2004, table 189). Between 1980 and 2001, women increasingly represented the majority of undergraduates, from 52 percent in 1980 to 56 percent in 2001.<sup>1</sup> Women also made up a majority of students awarded associate's and bachelor's degrees over the same period. The number of associate's degrees awarded to women increased from approximately 228,000, or 55 percent of associate's degrees awarded, to 357,000, or 60 percent of associate's degrees awarded (table 1-A and figure 2-A). Likewise, the number of bachelor's degrees awarded to women increased from 465,000, or 50 percent of degrees awarded, to 742,000, or 57 percent of bachelor's degrees awarded (tables 1-B and 2-B).

The aggregate gender differences in degree awards largely reflect differences in the majority or White student population. However, examining the associate's and bachelor's degrees awarded by race/ethnicity reveals similar patterns. That is, by 2001, women of all racial/ethnic groups (excluding nonresident aliens) earned a majority of the degrees awarded. In particular, Black women earned two-thirds of both associate's degrees and bachelor's degrees awarded to Black students (figures 2-A and 2-B). Hispanic and American Indian women were awarded 60 percent or more of associate's and bachelor's degrees conferred to Hispanic and American Indian

undergraduates, while Asian women earned 57 percent of associate's degrees and 55 percent of bachelor's degrees conferred to Asian students. Enrollment projections to 2013 indicate that women will continue to outpace men in completions in the foreseeable future (Gerald and Hussar, tables 26 and 27).

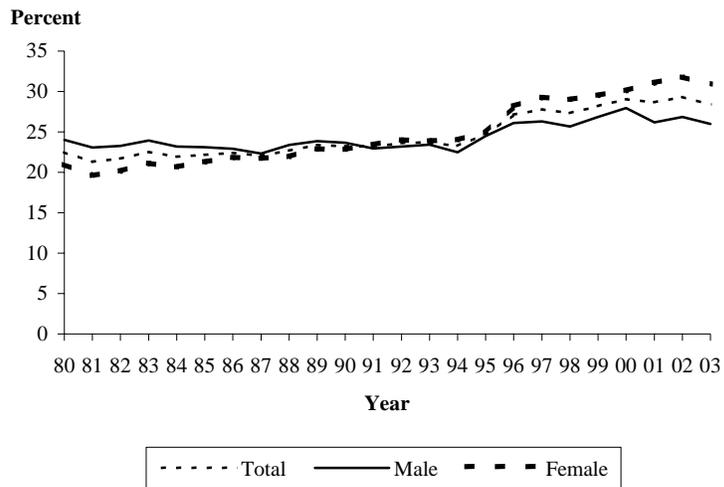
## Changes in Undergraduate Student Profiles and Enrollment Characteristics

Over the past decade, women have generally been overrepresented among older students and adult students with families. In 1999–2000, for example, they accounted for roughly 60 percent of all students older than 29 years (table 2). However, between 1989–90 and 1999–2000, women began to increase their representation among students typically considered traditional (i.e., students who enroll in college full time immediately after graduating from high school). This growth is reflected in the increase in the percentage of students who were women among students ages 18–23 (from 53 to 55 percent), dependent students, who are typically under age 24 (from 52 to 53 percent), and independent students who had never married and had no children (from 48 to 50 percent).

These changes are also reflected in patterns of degree attainment for the younger U.S. population (i.e., 25- to 29-year-olds) over the past two decades. While the percentage of men in this age group with a bachelor's degree or higher increased from 24 to 26 percent, the percentage of women with this level of attainment increased from 21 to 31 percent (figure A). So, while 25- to 29-year-old women began the 1980s with a smaller percentage

---

<sup>1</sup> Calculated from U.S. Department of Education 2004, table 189.

**Figure A. Percentage of 25- to 29-year-olds with a bachelor's degree or higher, by gender: March 1980–2003**

NOTE: The Current Population Survey (CPS) questions used to obtain educational attainment were changed in 1992. In 1994, the survey instrument for the CPS was changed and weights were adjusted. For more information, see <http://www.bls.census.gov/cps>.

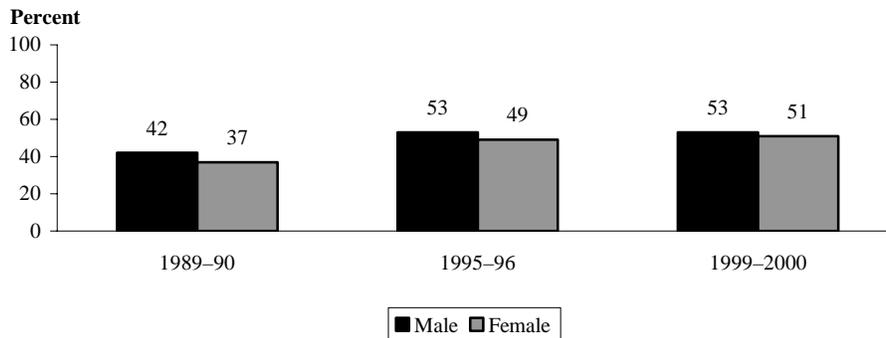
SOURCE: U.S. Department of Education, National Center for Education Statistics. (2002). *The Condition of Education 2002* (NCES 2002–025), indicator 25; and U.S. Department of Commerce, Bureau of the Census, March Current Population Surveys, 1981–2003.

with a bachelor's degree, by the mid-1990s, this trend had reversed.

In addition, as shown in figure B, it appears that women closed the gender gap for another characteristic of traditional students: full-time attendance. In 1989–90, men were more likely than women to attend full time (42 vs. 37 percent), but by 1999–2000, a statistical difference could not be detected in the gender distribution of full-time students (53 vs. 51 percent). In other words, both men and women increased their likelihood of attending full time, but the increase for women was greater.

While women have increased their representation among younger, full-time students, who tend to be more successful in completing a college degree, women continue to represent 60 percent or more of students with characteristics that place them at a disadvantage in succeeding in postsecondary education (table 2). In particular, women make up 60 percent of students in the lowest 25 percent income level, 62 percent of students age 40 or older, 62 percent of students with children or dependents (among married or separated students), and 69 percent of single parents. All of these characteristics are associated with lower rates of persistence and completion in postsecondary education (e.g., Berkner, He, and Cataldi 2002).

**Figure B. Percentage of undergraduates attending full time, by gender and year enrolled: 1989–90, 1995–96, and 1999–2000**



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90, 1995–96, and 1999–2000 National Postsecondary Student Aid Studies (NPSAS:90, NPSAS:96, and NPSAS:2000).

## Preparation, Persistence, and Progress Through Undergraduate Education

### *High School Academic Preparation and Subsequent Attainment*

A comparison of 1982 and 1992 high school graduates who entered postsecondary education by the end of their second year out of high school revealed a shift in the high school academic preparation of men and women.<sup>2</sup> Between the two cohorts, women closed some existing gender gaps in academic preparation and, in some cases, even surpassed men. For example, the percentage of

men who fell in the highest 20 percent on an indicator measuring the academic intensity of high school courses taken decreased from 33 percent to 26 percent, while the percentage of women at the same level increased from 25 percent to 29 percent and, effectively, closed the gender gap (table A).<sup>3</sup> That is, among 1982 high school graduates who went on to college, men were more likely than women to score at the highest academic intensity level, but no gender difference was evident among their 1992 counterparts.

Similar patterns were observed for other indicators of high school academic preparation. Among 1992 high school graduates, both young men and women who went on to postsecondary education were more likely to take an advanced mathematics course in high school (including

<sup>2</sup> The 1982 and 1992 high school graduate cohorts from the HS&B and NELS longitudinal studies were analyzed because they provide comprehensive and comparable measures of high school academic preparation among high school graduates who enrolled in college. More recent data from the 2000 High School Transcript Study reported in Freeman (2004) indicate young women were more likely than young men to take advanced placement (AP) courses and to take the AP exams. The same study also reported that among 2001 high school seniors, young women were more likely than their male peers to report definite plans to graduate from a 4-year college.

<sup>3</sup> High school academic intensity is a composite measure of students' highest level of mathematics, total mathematics credits, total Advanced Placement courses, total English credits, total foreign language credits, total science credits, total core laboratory science credits, total social science credits, and total computer science credits. For more information, see Adelman, Daniel, and Berkovits (2003).

**Table A. High school academic intensity of 1982 and 1992 high school graduates who entered postsecondary education within 2 years, by gender**

Gender	Bottom 20 percent	Lower middle 20 percent	Middle 20 percent	Upper middle 20 percent	Top 20 percent
1982 high school graduates					
Male	9.6	12.7	17.9	26.8	33.0
Female	11.4	14.8	22.5	26.7	24.6
1992 high school graduates					
Male	9.3	18.4	17.3	28.9	26.1
Female	9.1	16.4	22.3	23.2	29.0

NOTE: Includes 1982 high school graduates who entered postsecondary education by December 1984 and 1992 high school graduates who entered postsecondary education by December 1994. High school academic intensity is a composite measure of students' highest level of math, total mathematics credits, total Advanced Placement (AP) courses, total English credits, total foreign language credits, total science credits, total core laboratory science credits, total social science credits, and total computer science credits. For more information, see Adelman, C., Daniel, B., and Berkovits, I. (2003). *Postsecondary Attainment, Attendance, Curriculum, and Performance* (NCES 2003–394). Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School and Beyond Longitudinal Study of 1980 Sophomores (HS&B-So:80/92) and National Education Longitudinal Study of 1988 (NELS:88/2000).

calculus and precalculus) and have a 3.50 or higher grade point average (GPA) in high school than their 1982 counterparts (tables 8 and 9). Nonetheless, women closed the existing gender gap in the highest mathematics course taken (14 percent of men and 13 percent of women had taken calculus), and in both cohorts, women were more likely to have a 3.5 or higher GPA than their male peers (e.g., in 1992, 21 percent of women vs. 15 percent of men had GPAs of 3.5 or higher).

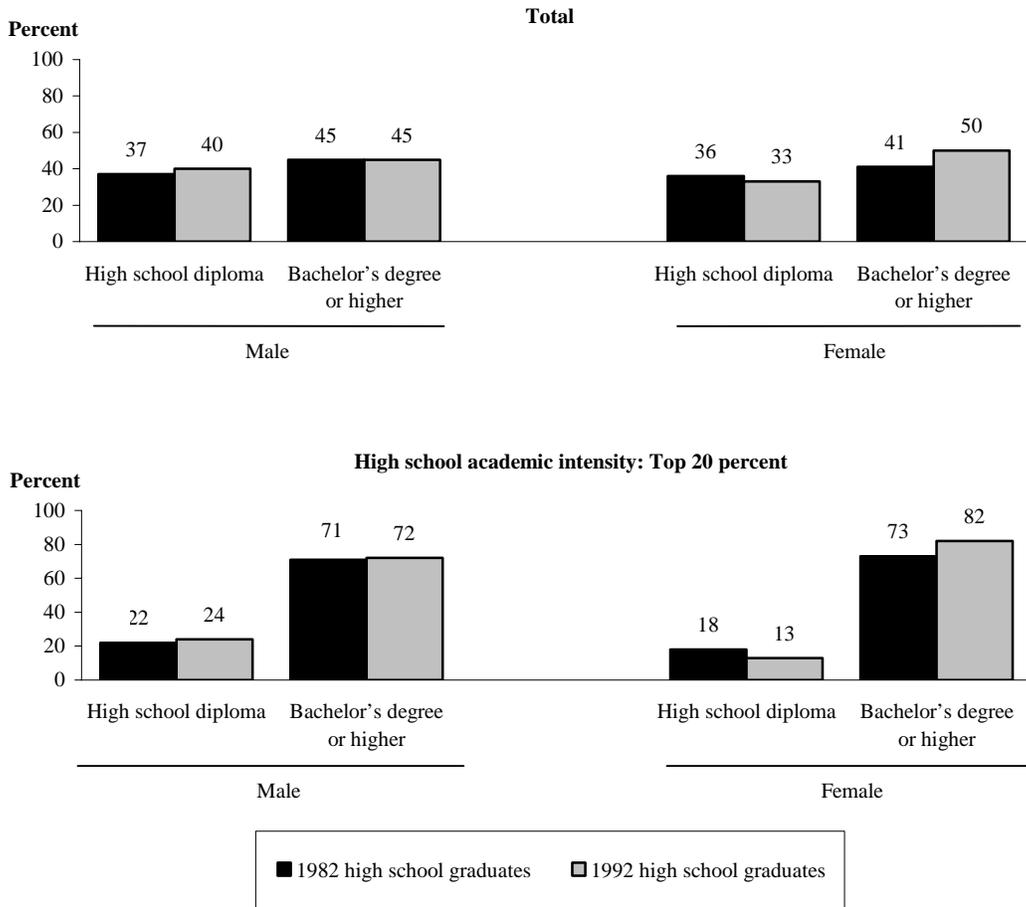
Between 41 and 50 percent of male and female 1982 and 1992 high school graduates who went on to postsecondary education by the end of their second year out of high school had earned a bachelor's degree or higher, and 33–40 percent had not attained more than a high school diploma (figure C and table 11).<sup>4</sup> For both cohorts, 45 percent of men had attained a bachelor's degree or higher. For women, there was an increase between

the 1982 and 1992 cohorts in the percentage earning a bachelor's degree or higher (41 vs. 50 percent). As a result, among those 1992 high school graduates who had entered postsecondary education by December 1994, women were more likely than men to have earned a bachelor's degree or higher (50 vs. 45 percent), and men were more likely to have earned no more than a high school diploma (40 vs. 33 percent).

These relationships held even among students who fell in the highest 20 percent on the academic intensity indicator (i.e., students who are expected to go on to college and to have been academically prepared to succeed once there). So, in addition to women improving their academic preparation with respect to men, even among students who were better prepared academically in high school and had entered college, women were more likely than men to attain a bachelor's degree.

<sup>4</sup> For the 1982 cohort, degrees were determined in 1992, or 10 years after enrollment, while for the 1992 cohort, degrees were determined at the time of the last follow-up in 2000, or 8 years after enrollment.

**Figure C. Among 1982 and 1992 high school graduates who entered postsecondary education within 2 years, percentage whose highest attainment was a high school diploma and percentage who attained a bachelor's degree or higher, by high school academic intensity and gender: 1992 and 2000**



NOTE: Includes 1982 high school graduates who entered postsecondary education by December 1984 and 1992 high school graduates who entered postsecondary education by December 1994. High school academic intensity is a composite measure of students' highest level of mathematics, total mathematics credits, total Advanced Placement courses (AP), total English credits, total foreign language credits, total science credits, total core laboratory science credits, total social science credits, and total computer science credits. For more information, see Adelman, C., Daniel, B., and Berkovits, I. (2003). *Postsecondary Attainment, Attendance, Curriculum, and Performance* (NCES 2003-394).

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School and Beyond Longitudinal Study of 1980 Sophomores (HS&B-So:80/92) and National Education Longitudinal Study of 1988 (NELS:88/2000).

### ***Postsecondary Persistence and Degree Completion***

Comparing students who first began their postsecondary education in 1989–90 with those who first enrolled 6 years later in 1995–96, Horn and Berger (2004) found that roughly two-thirds of students in both cohorts had either completed a postsecondary credential or were still enrolled 5

years after beginning college. The overall degree completion rate was lower for the 1995–96 cohort than for their 1989–90 counterparts, but there was an increase in the percentage of students who had not yet completed a degree but were still enrolled in a 4-year institution 5 years after they had begun. Among 1989–90 beginning students, 65 percent of women had completed a degree or certificate or were still enrolled 5 years later,

compared with 62 percent of men (table 12). Among 1995–96 beginning students, women were more likely than men to complete a degree or certificate within 5 years (49 vs. 44 percent). However, when students who were still enrolled after 5 years were included in the outcome, no difference could be detected between men and women (64 and 65 percent, respectively, had completed a degree or were still enrolled), suggesting that men in the second cohort may be taking longer than women in their effort to complete a degree.

### **Early Labor Market Outcomes Among Bachelor’s Degree Recipients**

The majority of 1992–93 and 1999–2000 bachelor’s degree recipients were employed 1 year after graduation (over 85 percent; table 15). However, for both cohorts of college graduates, men were more likely than women to be working full time, while women were more likely than men to be working part time. For example, among 1999–2000 bachelor’s degree recipients, 81 percent of men versus 74 percent of women were working full time, and 9 percent of men versus 13 percent of women were working part time. Over the period studied, the unemployment rate for men did not change statistically (4.8 to 5.9 percent), while it increased for women (from 4.4 to 6.3 percent).<sup>5</sup> Still, for the most recent cohort, no difference could be detected between men and

women in the unemployment rate for bachelor’s degree recipients.

Among bachelor’s degree recipients who were employed full time 1 year after graduation in 1994 and 2001, women earned lower average annual salaries than men in both cohorts. On average, women earned \$5,100 less than men or 84 percent of male salaries in 1994, and \$6,800 less or 83 percent of male salaries in 2001 (in constant 2001 dollars) (tables B and 16). Moreover, in 2001, 31 percent of men earned \$45,000 or more, compared with 12 percent of men in 1994. In contrast, 14 percent of women earned \$45,000 or more in 2001, compared with 7 percent in 1994. Thus in both 1994 and 2001, proportionally more men earned salaries of \$45,000 or higher than women.

Even when controlling for undergraduate field of study, men earned higher average annual salaries than women in at least one-half of the fields examined. For example, in both cohorts, men who majored in engineering, mathematics, and science fields earned higher average full-time annual salaries than women who majored in these fields (\$33,300 vs. \$27,900 in 1994 and \$45,200 vs. \$34,200 in 2001). In other words, in 1994 women with degrees in these fields earned, on average, \$5,400 less than men, or about 84 percent of what men earned, and 7 years later in 2001, women earned \$11,000 less or 76 percent of what men earned. Additionally, in 2001, men who majored in fields related to humanities and social/behavioral science or health, vocational/technical, and other technical/professional fields earned higher annual average salaries than their female counterparts, while such a difference was not detected in 1994.

---

<sup>5</sup> The unemployment rate is constructed to approximate the definition of the unemployment rate used by the Bureau of Labor Statistics. That is, the rate is calculated as the number of people who are unemployed divided by all those who are in the labor force (unemployed plus those who are working; respondents who are out of the labor force are excluded from the calculation). The rate includes unemployed (with or without benefits) for 1992–93 bachelor’s degree recipients and includes unemployed and waiting to report to work or laid off for 1999–2000 bachelor’s degree recipients.

**Table B. Average annual salary of 1992–93 and 1999–2000 bachelor’s degree recipients who were employed full time, by undergraduate field and gender: 1994 and 2001**

Gender and undergraduate field of study	Average annual salary (in constant 2001 dollars)	
	1994	2001
Total		
Male	\$32,500	\$39,400
Female	27,400	32,600
Business/management		
Male	33,600	42,300
Female	29,900	39,000
Education		
Male	35,100	29,600
Female	21,900	28,100
Engineering, mathematics, and sciences <sup>1</sup>		
Male	33,300	45,200
Female	27,900	34,200
Humanities and social/behavioral science		
Male	27,300	34,600
Female	26,500	29,400
Health, vocational/technical, and other technical/professional fields		
Male	35,400	38,100
Female	30,300	34,300

<sup>1</sup>Sciences include life sciences, physical sciences, and computer/information science.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1993/97 and 2000/01 Baccalaureate and Beyond Longitudinal Studies (B&B:93/97 and B&B:2000/01).

## Conclusions

Over the past two decades, the rates at which women have enrolled in undergraduate education and attained college degrees increased faster than those of men. Part of this increase may be related to an increase in the percentage of traditional students who were women. However, women are still overrepresented among nontraditional students such as adult students with families, students in the lowest income level, and students age 40 or older.

When looking at changes in high school academic preparation among 1982 and 1992 high school graduates who entered postsecondary education within 2 years of high school completion, women had closed some existing

gender gaps and, in some cases, surpassed men over the 10-year period. Also, in the later cohort, among students who had higher levels of high school academic preparation, women were more likely than men to earn a bachelor’s degree—a difference not found in the earlier cohort. In other words, women not only narrowed the gender gap in high school academic preparation, but even among those best prepared to enter college, women were more likely than men to attain a bachelor’s degree.

Even though women have surpassed men in some aspects of academic preparation and college persistence and attainment, as of 2001, their full-time earnings were lower than those of men. Even when controlling for undergraduate field of study,

men earned higher salaries than women in several fields—including the combined field of mathematics, science, and engineering, as well as the field comprising humanities, and social and

behavioral sciences—indicating that some of the gains women made in postsecondary education may not be realized off campus.