InfoBrief
NCSES National Center for Science and Engineering Statistics

April 2015 ■ NSF 15-317

Characteristics of the College-Educated Population and the Science and Engineering Workforce in the United States

by John Finamore and Beethika Khan[1]

The number of college graduates in the United States nearly doubled between 1993 and 2013, from 29 million to 55 million, according to the National Survey of College Graduates (NSCG). The number of college graduates with degrees in science and engineering (S&E) fields grew faster than the number of college graduates with degrees in non-S&E fields. Additionally, in 2013, about 1 in 10 college graduates were employed in an S&E occupation, and this proportion has remained largely unchanged since 1993. Women accounted for more than one-half of the college graduate population in the United States in 2013. However, women constituted only 29% of those employed in S&E occupations.

Educational Background and Labor Market Conditions

Overall, slightly more than one-fourth (27%) of the college-educated population in 2013 held degrees only in S&E fields of study. An additional 14% held degrees in at least two of the following: S&E, S&E-related, and non-S&E (table 1). Nearly half (49%) of the employed college graduates with degrees only in S&E fields worked in an S&E or S&E-related occupation in 2013. Among individuals with degrees only in S&E fields who were employed outside of S&E, the majority (62%) reported that their job was related to their S&E degree. This suggests that the application of S&E knowledge and skills is widespread across the U.S. economy and not just limited to occupations classified as S&E. The extensive use of S&E expertise in the workplace is also evident from the 18 million college graduates reporting in 2013 that their jobs required at least a bachelor's degree level of technical expertise in one or more S&E fields. This number is about three times as large as the number of college graduates employed in an S&E occupation in 2013 (6 million).

In 2013, the median annual salary for college graduates in the United States was $58,000 (table 2). Within the college graduate population, education and employment in an S&E or S&E-related field has a significant impact on salary. Individuals earned more if they were employed in an S&E or S&E-related occupation ($80,000 and $65,000, respectively) than in a non-S&E occupation ($51,000). Similarly, salaries were higher for those who completed their highest level of degree in an S&E or S&E-related field of study ($65,000 for both fields) than for those who completed their highest degree in a non-S&E field of study ($52,000).[2]

Individuals with advanced degrees generally earn higher salaries. Among individuals employed in an S&E occupation, median salaries tend to be highest among those with a doctorate. Among those employed in an S&E-related or non-S&E occupation, median salaries are highest among individuals whose highest degree is at the level of a professional degree. The relatively high salaries among professional degree holders employed in S&E-related or non-S&E occupations are driven primarily by medical practitioners and lawyers, respectively. Nearly three-fourths of college graduates employed in S&E-related occupations whose highest degree is a professional degree work as a diagnosing or treating practitioner (74%). A similar proportion of college graduates employed in non-S&E occupations whose highest degree is a professional degree work as a lawyer or judge (74%).

TABLE 1. College graduates, by field of degree, occupation, and labor force status: 1993, 2003, and 2013

(Percent distribution)

Field of degree, occupation, and labor force status	1993	2003	2013
All college graduates (thousands)	29,017	40,620	55,244
S&E occupations	10.8	11.3	10.4
S&E-related occupations	11.8	12.7	13.6
Non-S&E occupations	59.5	56.2	55.3
Not employed	17.9	19.8	20.6
S&E degrees only (thousands)	7,225	10,107	14,790
S&E occupations	30.3	30.6	27.5
S&E-related occupations	9.0	9.1	11.1
Non-S&E occupations	42.5	40.9	40.3
Not employed	18.2	19.5	21.0
S&E-related degrees only (thousands)	2,440	3,546	4,896
S&E occupations	6.1	4.9	4.3
S&E-related occupations	57.0	57.1	56.9
Non-S&E occupations	21.2	20.8	20.4
Not employed	15.7	17.2	18.4
Non-S&E degrees only (thousands)	15,742	21,399	28,087
S&E occupations	2.7	3.4	2.8
S&E-related occupations	3.3	3.7	4.2
Non-S&E occupations	74.7	71.5	71.7
Not employed	19.2	21.5	21.3
Degrees in two or more of the following fields: S&E, S&E-related, non-S&E (thousands)	3,610	5,568	7,471
S&E occupations	10.4	10.9	9.4
S&E-related occupations	23.8	25.6	25.2
Non-S&E occupations	52.8	47.8	46.4
Not employed	13.0	15.7	19

S&E = science and engineering.

NOTES: Percentages may not add to 100 due to rounding. College graduates include individuals with degrees at the bachelor's level or higher. Not employed includes unemployed individuals and individuals not in the labor force.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, National Survey of College Graduates.

In 2013, about one in three college graduates in the United States held an advanced degree beyond the level of a bachelor's degree (27% held a master's, 6% held a professional degree and 3% held a doctorate as their highest degree). Individuals employed in S&E occupations were more likely to have a doctoral degree than were those employed in non-S&E occupations (13% versus 2%).

Demographic Characteristics

Women remain underrepresented in S&E (figure 1) despite their increased representation in the college graduate population over the past 20 years (the share of women among college graduates rose from 46% in 1993 to 53% in 2013). Among college graduates who completed their highest level of degree in an S&E field of study, 41% were women. The gender disparity was higher among S&E doctorate holders than among S&E bachelor's or master's degree holders. For example, in 2013, women accounted for 41% of college graduates whose highest degree in S&E was at the bachelor's level; at the master's level, the share was 43%, and at the doctoral level, 32%. The gender disparity was more pronounced among workers in S&E occupations than among S&E degree holders—women accounted for only 29% of all workers in S&E occupations in 2013.

A majority of the college graduate population in the United States in 2013 was white (74.8%). Asians (8.4%), Hispanics (7.5%), and blacks (7.1%) constituted the next largest groups. American Indians or Alaska Natives (0.3%) and Native Hawaiians or Other Pacific Islanders (0.3%) accounted for very small segments of the college graduate population.[3] Relative to their overall representation among college graduates, Asians display high participation rates in S&E occupations (17.3%). Conversely, whites had participation rates in S&E occupations (69.9%) that were lower than their representation among college graduates. Blacks also had participation rates in S&E occupations (4.8%) that were lower than their representation among college graduates.

Other Highlights

The NSCG collects a wide range of information on the employment, education, and demographic characteristics of the nation's college graduate population. This section provides some additional examples of the type of data available through the NSCG.

Employment

In February 2013, the unemployment rate for all college graduates (4.3%)

TABLE 2. Median annual salary of employed college graduates in the United States, by level and field of highest degree, employment sector, and occupation: 2013

Level and field of highest degree and employment sector	All employed college graduates	Occupation		
		S&E	S&E-related	Non-S&E
All employed college graduates	58,000	80,000	65,000	51,000
Highest level of degree attainment				
Bachelor's	51,000	77,000	58,000	47,000
Master's	62,000	83,000	68,000	58,000
Doctorate	83,000	87,000	92,000	74,000
Professional	110,000	70,000	125,000	100,000
Field of highest degree				
S&E	65,000	81,000	65,000	50,000
S&E-related	65,000	73,000	71,000	49,000
Non-S&E	52,000	75,000	50,000	52,000
Employment sector				
Educational institutions	46,000	47,000	52,000	45,000
4-year colleges, medical schools, university-affiliated research institutes	50,000	45,000	62,000	46,000
2-year colleges, precollege, and other institutions	45,000	52,000	49,000	45,000
Government	65,000	78,000	71,000	60,000
Federal	80,000	90,000	83,000	76,000
State and local	56,000	66,000	61,000	53,000
Business or industry	62,000	87,000	72,000	53,000
For profit	69,000	90,000	76,000	60,000
Self-employed, not incorporated	30,000	43,000	58,000	30,000
Nonprofit	53,000	70,000	65,000	45,000

S&E = science and engineering.

NOTES: Salaries are rounded to the nearest $1,000. Educational institutions include public and private institutions. College graduates include individuals with degrees at the bachelor's level or higher.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, National Survey of College Graduates: 2013.

was much lower than that for the overall labor force (8.1%).[4] The business sector was the largest employer of college graduates in the United States, employing 68% of the college-educated population, followed by academic institutions (22%) and government (10%).

Among female college graduates, teaching and professional services (e.g., health care, counseling, financial services, legal services) were the most frequently cited primary work activities (22% and 20%, respectively). In contrast, managing or supervising people or projects was most frequently cited among male college graduates (19%).

Of the college graduates that were employed in both 2010 and 2013, 28% reported a change in employer or job field during this time period. The most frequently cited reasons for a job change were pay or promotional opportunities and working conditions (e.g., hours, equipment, or working environment).

Training

In 2013, about 28 million college graduates in the labor force reported participating in work-related training within the past 12 months. Among those who attended training, most did so to improve skills or knowledge in their current occupational field. Others did so for licensure or certification in their current occupational field or because training was required or expected by their employer.

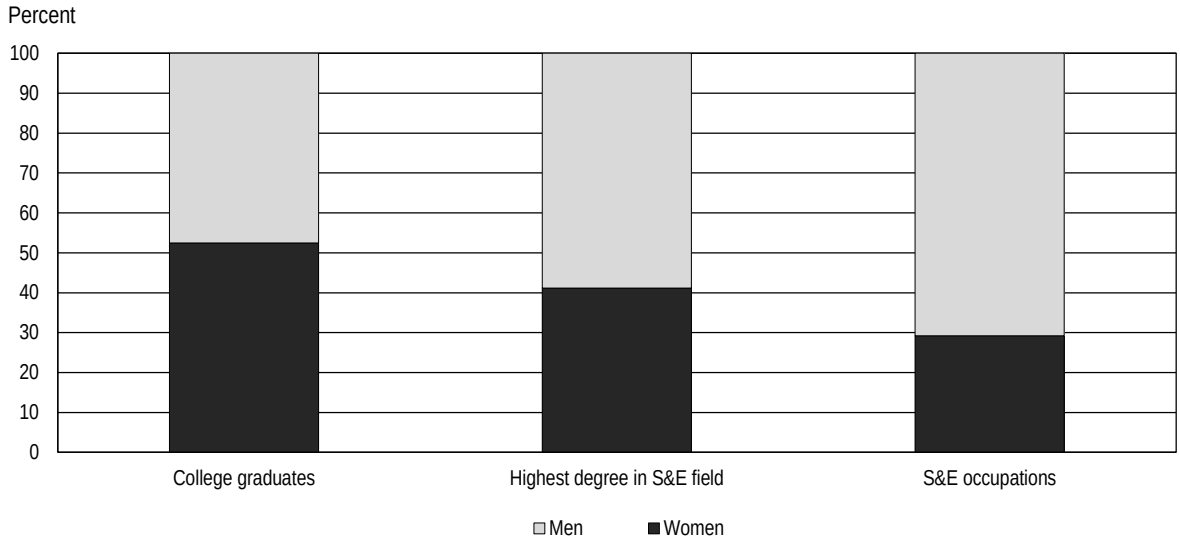
Community College Attendance

About 46% of college graduates reported having taken courses at a community college. The most frequently cited primary reason for taking community college courses was to earn credits for a bachelor's degree.

College-Related Debt

Of the 55 million college graduates, 46% reported having borrowed money

FIGURE 1. College graduates, persons with the highest degree in a science and engineering field, and workers in science and engineering occupations, by sex: 2013



S&E = science and engineering.

NOTE: College graduates include individuals with degrees at the bachelor's level or higher.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, National Survey of College Graduates: 2013.

to finance their undergraduate education. Of the 20 million college graduates with a graduate degree, a similar proportion reported having borrowed money to finance their graduate degrees. However, there is a sizeable difference between the degree levels in the proportion borrowing larger amounts. About 9% of those borrowing to finance undergraduate degrees reported borrowing over $50,000 whereas 26% of those borrowing to finance graduate degrees reported borrowing over $50,000.

Foreign-Born Individuals

Foreign-born individuals (including naturalized U.S. citizens and non-U.S. citizens) accounted for 15% of the college graduate population and 27% of persons employed in S&E occupations in the United States in 2013. Among college graduates who completed their highest level of degree in an S&E field of study, 22% were foreign born. The proportion of foreign-born individuals is higher among advanced degree holders. For example, 17% of college graduates whose highest degree in S&E is at the bachelor's level were foreign born, compared with 38% of those whose highest degree in S&E is a doctorate.

Definitions and Classifications

College graduates are defined as individuals who have earned a degree at the bachelor's level or higher. This InfoBrief uses information from the NSCG on an individual's occupation to examine college graduates employed in S&E, S&E-related, and non-S&E occupations. The NSF classification of S&E occupations includes biological, agricultural, and environmental life scientists, computer and mathematical scientists, physical scientists, social scientists, engineers, and postsecondary teachers in these S&E fields. The NSF classification of S&E-related occupations includes health-related occupations, S&E managers, S&E precollege teachers, S&E technicians and technologists, architects, actuaries, and postsecondary teachers of these S&E-related fields. All other occupations are classified as non-S&E occupations. For more information on the occupation categories collected on the NSCG, see http://ncsesdata.nsf.gov/docs/occ03maj.html.

In addition, this InfoBrief uses information from the NSCG on an individual's degree field to examine college graduates educated in S&E, S&E-related, and non-S&E fields of study. The NSF classification of S&E degree fields includes biological, agricultural, and environmental life sciences, computer and mathematical sciences, physical sciences, social sciences, and engineering. The NSF classification of S&E-related degree fields includes health fields, science and math teacher education, technology and technical fields, architecture, and actuarial

science. All other fields of study are classified as non-S&E fields. For more information on the degree field categories collected on the NSCG, see http://ncsesdata.nsf.gov/docs/ed03maj.html.

Data Sources and Limitations

Data presented here are from the 2013 NSCG, sponsored by the National Science Foundation, National Center for Science and Engineering Statistics. The NSCG surveyed approximately 100,000 individuals representing the college-educated population residing in the United States as of February 2013 with at least one degree earned before January 2012. For further survey information, please visit the NSCG website (www.nsf.gov/statistics/srvygrads).

The NSCG is the central component of NSF's Scientists and Engineers Statistical Data System (SESTAT). Because the NSCG covers the entire college graduate population residing in the United States, it provides information on individuals educated or employed in S&E fields as well as those employed or educated in non-S&E fields. The SESTAT is created by integrating data on scientists and engineers from the NSCG and the Survey of Doctorate Recipients (SDR). The SESTAT data provide a comprehensive picture of individuals educated or employed in S&E fields and serve as the official NSF source for estimates of the college-educated S&E workforce. For more information on SESTAT, see www.nsf.gov/statistics/sestat.

The estimates in this InfoBrief are based on responses from a sample of the population and may differ from actual values because of sampling variability or other factors. As a result, apparent differences between the estimates for two or more groups may not be statistically significant. All comparative statements have undergone statistical testing and are significant at the 90% confidence level unless otherwise noted. In this report, the variances of estimates were calculated using the successive difference replication method.

Data presented in this InfoBrief are now available through the data tool for SESTAT at http://sestat.nsf.gov/sestat/sestat.html. The 2013 NSCG public use data files are available at http://sestat.nsf.gov/datadownload. Data from these sources are also included in reports, such as *Science and Engineering Indicators* and *Women, Minorities, and Persons with Disabilities in Science and Engineering,* and in data tools, such as Science and Engineering State Profiles. For more information, please contact the authors.

Notes

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2. There is no significant difference between the median salaries of workers in non-S&E occupations and of those who completed their highest degree in a non-S&E field.

3. There is no significant difference between the proportion of American Indians or Alaska Natives and the proportion of Native Hawaiian or Other Pacific Islanders in the college graduate population.

4. Bureau of Labor Statistics civilian unemployment rate; available at http://data.bls.gov/timeseries/LNU04000000, accessed 10 March 2014.

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