THE COMMUNITY COLLEGE BACKGROUND OF SCIENCE & ENGINEERING BACHELOR’S AND MASTER’S DEGREE RECIPIENTS

INTRODUCTION
An April 2004 report issued by the National Science Foundation, Division of Science Resources Statistics (SRS), investigated the role of two-year colleges in the educational experiences of more than 903,000 science and engineering (S&E) students who received bachelor’s and master’s degree recipients in the United States in 1999 and 2000. This CSM Research Brief summarizes the findings of this NSF report entitled, “The Role of Community Colleges in the Education of Recent Science and Engineering Graduates,” (NSF 04-315).

Data are from the National Science Foundation’s 2001 National Survey of Recent College Graduates, available at: www.nsf.gov/sbe/srs/snsrg/start.htm The survey questionnaire asks graduates who have received bachelor’s or master’s degrees in science or engineering fields whether they have ever attended a community college. The data collected do not distinguish between graduates who attended community college by taking one course and those who were enrolled full time or completed an associate’s degree. The NSF questionnaire can be accessed at: http://srsstats.sbe.nsf.gov/docs/nsrcg01.pdf

Figure 1
S&E Bachelor's and Master's Degree Recipients, By Attendance at Community College and Field of Highest Degree

<table>
<thead>
<tr>
<th>Field</th>
<th>Attendance at Community College</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life Science</td>
<td>46%</td>
</tr>
<tr>
<td>Social Science</td>
<td>45%</td>
</tr>
<tr>
<td>Computer &amp; Math Sciences</td>
<td>42%</td>
</tr>
<tr>
<td>Engineering</td>
<td>40%</td>
</tr>
<tr>
<td>Physical Science</td>
<td>37%</td>
</tr>
<tr>
<td>All Degree Fields</td>
<td>44%</td>
</tr>
</tbody>
</table>

Legend:
- Life Science (172300)
- Social Science (n=423700)
- Computer & Math Sciences (n=115000)
- Engineering (n=151200)
- Physical Science (n=41100)
- All Degree Fields (n=394200)
In addition to the published findings of the SRS report, additional data was obtained from the NSF's Scientists and Engineers Statistical Data System (SESTAT). The 2004 NSF report provided only national data regarding the two-year educational experiences of S&E graduates. The SESTAT database contained information from an earlier study for S&E graduates by geographic region of the U.S. This allows for a comparative regional analysis of S&E degree recipients.

SESTAT is a comprehensive and integrated system of information about the employment, educational and demographic characteristics of scientists and engineers in the United States. SESTAT currently contains data from three NSF-sponsored demographic surveys. The NSF surveys provide compatible data which have been merged into a single integrated data system. These samples represent statistically about 13 million persons with science and engineering degrees. Additional information about SESTAT is available at: www.nsf.gov/sbe/srs/nsf99337/start.htm

**FINDINGS**

- Nationally, 44% of all S&E degree recipients attended a community college. [See Figure 1]

- Discipline Area. Bachelor's and master's degree recipients in the life and social sciences are more likely to have attended a community college than other discipline areas. However, these differences are relatively minor:
  - Life and related sciences – 46%
  - Social and related sciences – 45%
  - Computer and math sciences – 42%
  - Engineering – 40%
  - Physical and related sciences – 37%

- Regional Variations. There are significant variations by geographic region within the United States. Those geographic regions with the largest number of two-year institutions have the largest proportion of bachelor's and master's degree recipients. The extremely large proportion of Pacific region degree holders attending community colleges is also explained by the cooperative articulation and transfer agreements between California's three segments of public higher education. [See Table 1]
  - Pacific – 66%
  - West South Central – 56%
  - Mountain – 48%
  - South Atlantic – 43%
  - West North Central – 41%
  - East South Central – 39%
  - East North Central – 36%
  - Middle Atlantic – 33%
  - New England – 25%

- A.A./A.S. Degree Completion Rates. What proportion of S&E degree recipients who attended community college earn an associate's degree?
  - Overall, slightly less than one-quarter (28%) of S&E degree recipients who attended a two-year institution also completed associate's degree requirements [See Figure 2]
Figure 2
Proportion of S&E Bachelor's and Master's Degree Recipients Who Attended a Community College AND Whether They Received an Associate's Degree

- Completed Associate's Degree, 28%
- Did Not Complete Associate's Degree, 72%

Figure 3
Reasons for Attending a Community College As Reported by S&E Degree Recipients

- Transfer: 74%
- Gain further knowledge: 50%
- Personal interest: 40%
- Prepare for college while in high school: 39%
- Save money: 37%
- Earn associate's degree: 28%
- Career advancement: 26%
- Change academic field: 15%
- Part of high school A.P. program: 13%
Reasons For Attending Community College. The vast majority of S&E graduates do not attend community colleges in order to earn an associate’s degree. Reasons cited by S&E graduates in an earlier NSF study were as follows [See Figure 3]:

- Complete transfer credits toward a bachelor’s degree – 74%
- Gain skills and knowledge in an academic or occupational field – 50%
- Personal interest – 40%
- Concurrent high school enrollment – 39%
- Financial reasons – 37%
- Earn associate’s degree – 28%
- Career advancement – 26%
- Change academic or occupational field – 15%
- High school AP course offered at community college – 13%

CONCLUSION

More than 40% of recent S&E graduates attended a community college at some point in their lives. For those receiving degrees from colleges and universities in the Pacific region, this figure increases to 66%. These data clearly indicate the significant role that community colleges play in the education of science and engineering graduates.

There are many interesting questions that the NSF study did not attempt to answer. For example, how many S&E graduates who attended a two-year institution were first generation college students? To what extent did these S&E graduates first enroll in a community college to complete remedial level mathematics and/or English coursework? How many low-income adults initially began their academic studies only because of the affordability of a community college education?

The NSF report findings strongly affirms the role of community colleges in improving the educational and economic opportunities for a very large proportion of the nation’s bachelor’s and master’s degree holding population. The community colleges continue to increase enrollment and serve as an essential component of the nation’s higher education system. Since the community colleges serve a large proportion of the most disadvantaged of postsecondary students, it is crucial that we continue the policies and practices that have contributed to the successes described in this report.

Footnote:

The NSF geographic categories are as follows:

New England
Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont

Middle Atlantic
New Jersey, New York, Pennsylvania

East North Central
Illinois, Indiana, Michigan, Ohio, Wisconsin

West North Central
Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota

South Atlantic
Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia

East South Central
Alabama, Kentucky, Mississippi, Tennessee

West South Central
Arkansas, Louisiana, Oklahoma, Texas

Mountain
Montana, Wyoming, Idaho, Nevada, Colorado, New Mexico, Arizona and Utah

Pacific
Alaska, California, Hawaii, Oregon, Washington, U.S. Pacific Territories

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