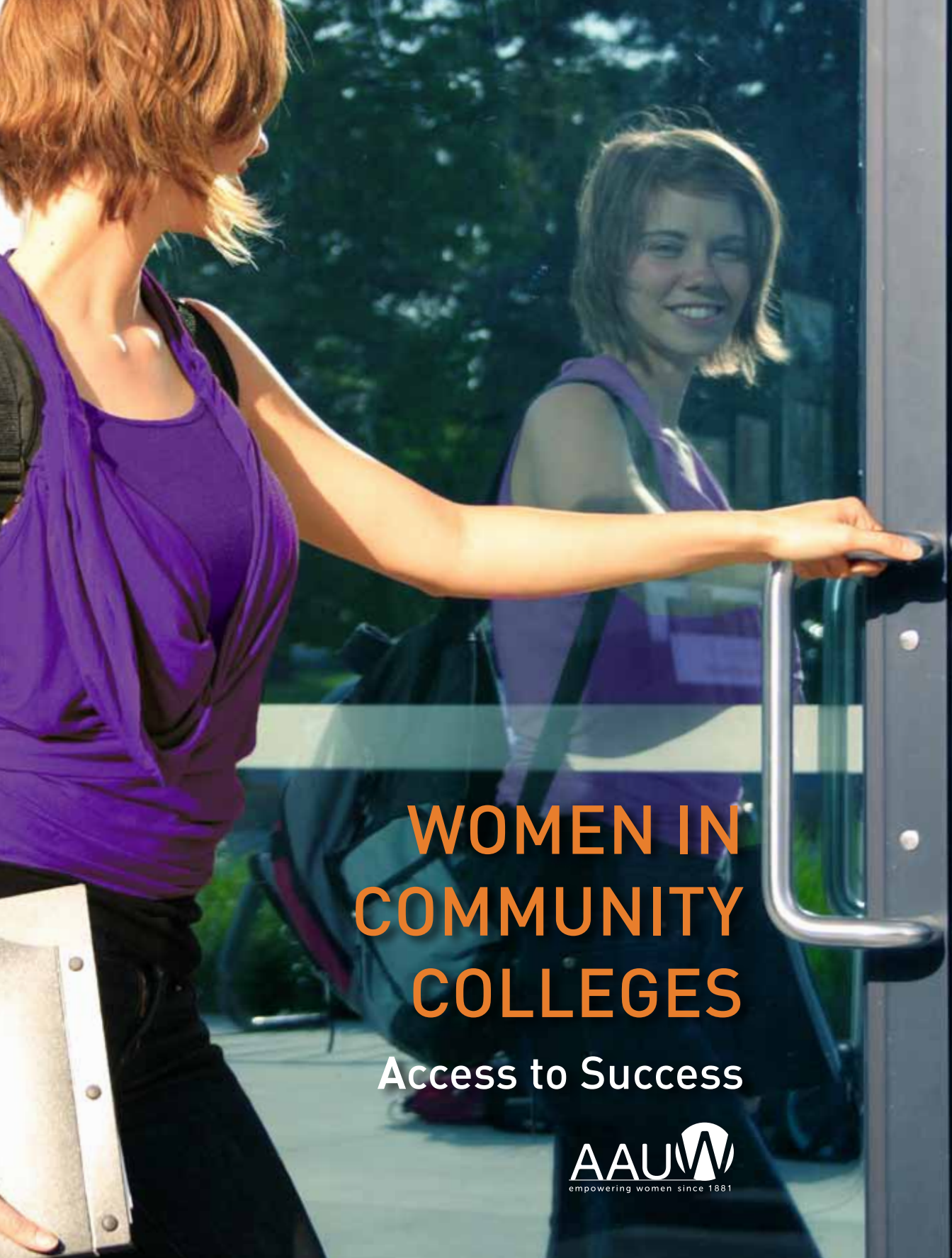

WOMEN IN COMMUNITY COLLEGES

Access to Success

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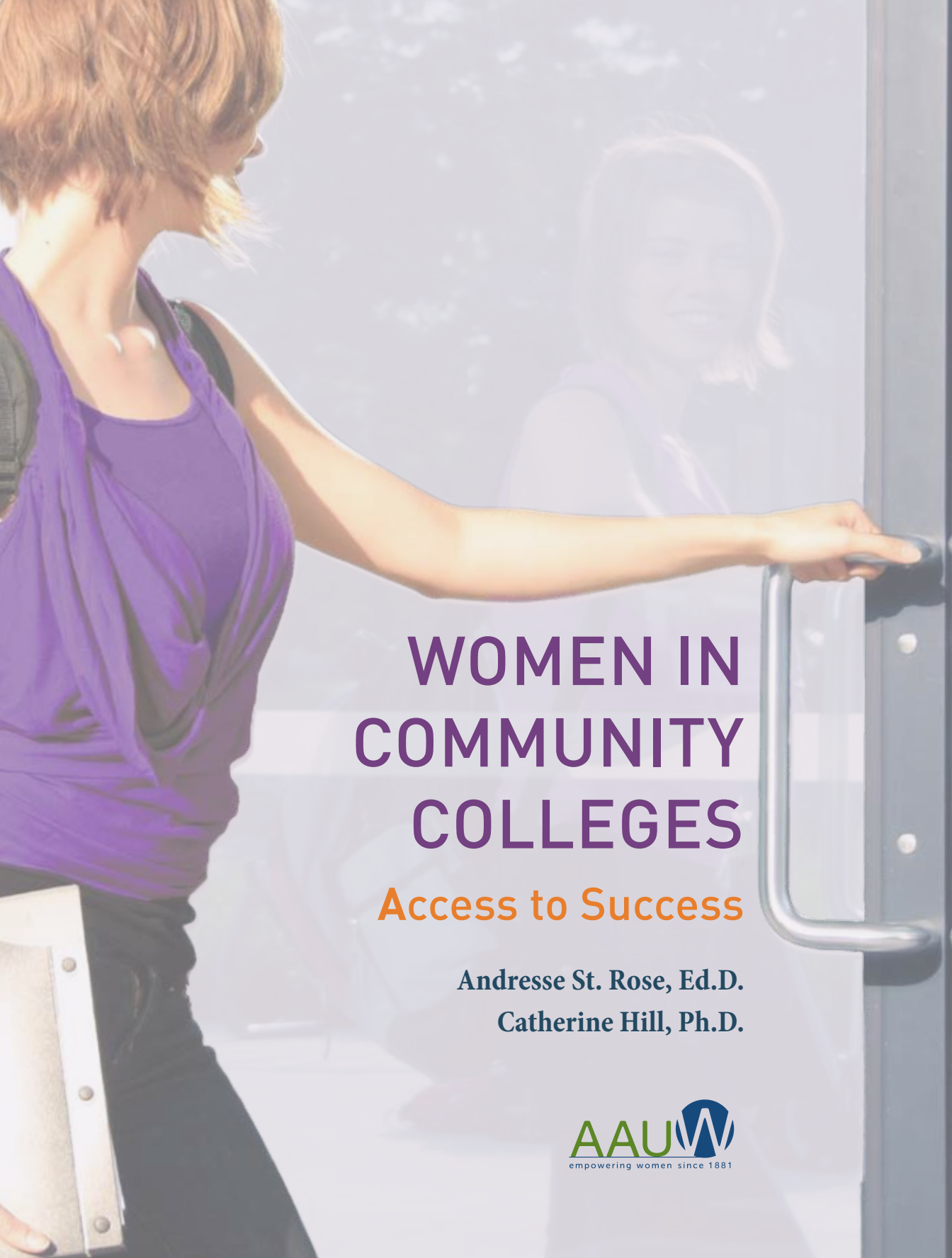

WOMEN IN COMMUNITY COLLEGES

Access to Success

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AAUW
empowering women since 1881

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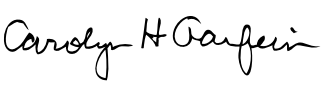
Foreword

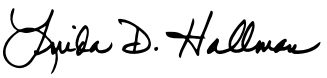
Community colleges open the door to opportunity for millions of Americans who want to pursue higher education and secure their economic futures. As an organization founded on the basic principle of making college accessible to women, the American Association of University Women (AAUW) has been a leading voice for women in education and the workplace for more than a century. *Women in Community Colleges: Access to Success* focuses on a segment of the higher education community that is too often overlooked: community colleges.

Millions of women attend community colleges to earn certificates or degrees or to prepare for transfer to a four-year institution. But too many of these women leave without achieving their goals. This report presents an overview of community college students today, their goals, and their realities. Two issues concern women in particular. First, the limited availability of on-campus child care has special importance for mothers, who are often the primary caregivers. Second, women remain underrepresented in high-demand, traditionally male fields such as science and technology. These fields offer opportunities for both women and men to secure their individual success and to contribute to the economic growth of the nation.

Women in Community Colleges: Access to Success is a call to action. From strengthening federal legislation to improving services on individual campuses, we must do more to ensure that women at community colleges can access, pursue, and achieve the educational and economic opportunities of the 21st century.



Carolyn H. Garfein
AAUW President



Linda D. Hallman, CAE
AAUW Executive Director

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Executive Summary

Higher education is essential to the productivity and innovation of the U.S. workforce, and ongoing economic challenges have only underscored this imperative. In 2009, President Barack Obama launched the American Graduation Initiative, a plan to dramatically increase the number of U.S. college graduates by targeting an often overlooked part of our national higher education system: community colleges. The president called on these institutions to produce an additional 5 million graduates by 2020, effectively requiring community colleges to double their graduation rates.

A college education opens the door to economic opportunity in the United States. College-educated workers earn higher wages and experience lower levels of unemployment than workers with less education do. At the same time, well-paying jobs that don't require a college degree are becoming increasingly scarce. Analysts predict that soon nearly 2 out of every 3 jobs will require some postsecondary

education. Despite some notable examples of people who have found fame and fortune without a college degree, individuals without a college education run the risk of being left behind in today's economy.

Women have responded to changes in the workforce and the economy by enrolling in colleges and universities in large numbers, where they now make up the majority of students. Community colleges have played an important role in this surge. In 2010, women made up 57 percent of the students at these institutions. Currently, more than 4 million women attend the nation's two-year public colleges, which is more than the number of undergraduate women attending either public or private four-year colleges and universities. Who are these women? About a quarter of them are mothers, and many have significant work, family, and caregiving responsibilities. Many of these women have limited financial resources and/or are academically underprepared. For these reasons, they are attracted to the flexible schedules, low cost, and open-door admissions of community colleges.

This report, *Women in Community Colleges: Access to Success*, is based on a review of the literature on community colleges, interviews with community college leaders, a review of program materials, and data from two federal sources: the Integrated Postsecondary Education Data System (IPEDS) and the Beginning Postsecondary Students (BPS) Longitudinal Study. Drawing on these resources, the report looks at two areas of particular importance to women: the challenges facing student parents and the opportunities available in nontraditional career fields, including science, technology, engineering, and mathematics (STEM). Finally, this study considers how community colleges can provide more women with a reliable path to opportunity and economic security.

Student parents need child care to succeed in community colleges.

Community colleges present an attractive option for mothers of young children, in part because they offer flexible schedules and low tuition. Unfortunately, limited access to child care disrupts the educational path of many mothers. Although more mothers enroll in community colleges than in four-year institutions, fewer than half of all community colleges offer on-campus child care, and available slots do not typically meet student demand. Student parents consistently cite child care responsibilities as a chief reason for dropping out of community college before completing a degree or certificate. Supporting the educational and professional success of mothers must include increasing the availability of affordable child care. Fortunately, some community colleges are already developing support systems for student parents (see chapter 4).

Women need better information and support to enroll and earn degrees in nontraditional and STEM fields.

Community colleges offer a wide range of programs, including employment-focused occupational programs, academic pro-

grams in the liberal arts, and both occupational and academic programs in STEM fields. Despite this scope, women tend to pursue traditionally female occupations such as nursing, education, and cosmetology and are underrepresented in STEM fields. For example, women make up the vast majority of registered nurses but just a fraction of engineering technicians, automotive service technicians and mechanics, carpenters, and electricians. With the exception of nursing and other health-related fields, jobs in traditionally female occupations typically offer lower wages and fewer opportunities for career advancement than math and science fields requiring a comparable level of education.

Gender stereotypes and a lack of information and support are some of the barriers to women's participation in STEM and other nontraditional fields in community colleges. These challenges are not insurmountable, but institutions must actively intervene to help close the gender gap in these fields. Women are actually more likely than men to attend community college at some point on their way to earning a bachelor's degree in STEM, so increasing women's participation in STEM at community colleges could also help address the gender gap in STEM among bachelor's degree recipients. Some educational programs are already taking on this challenge to recruit and support women in math and science career paths (see chapter 5).

More than ever before, women are relying on community colleges for higher education and workforce preparation. This report recommends policies and practices to help women succeed in community colleges. In particular, we find that child care is a critical issue for student mothers. Women also need more support for pursuing opportunities in STEM and other male-dominated fields. But our ability to measure the extent to which these efforts can help improve outcomes for women is limited. The major federal data source on higher education students currently does not report outcomes for part-time students, who make up a majority of community college students and who are primarily women. To provide better support for these students, we must address the limitations of our current data collection and reporting systems.

With increased attention and improved outreach to women students, the nation's community colleges can build on their legacy of providing educational opportunity to all. The issues this report addresses are of particular concern to women at community colleges, but improving outcomes for women will benefit everyone. Moreover, many of the interventions that support female students will help male students as well. When women have the resources they need to be successful, they can better contribute to the well-being of their families, their communities, and society as a whole.

1 No Longer the "Other College"

Millions of students enroll in community colleges every year, yet two-year public institutions have often been overlooked in discussions of U.S. higher education. The American Graduation Initiative brought community colleges into the spotlight in 2009 with its goal of producing an additional 5 million college graduates by 2020 (Obama, 2009). But who are these students? Compared with previous generations, the current community college population is more racially diverse. Students represent all ages and income backgrounds, and most work while attending school part time. The majority of students are women, including more than a million mothers who take care of their families in addition to balancing school and work. Because community colleges are critical to helping the United States once again become the world leader in higher education, we need to understand and support the students who attend these schools.

Community colleges are an American invention.

Community colleges are a "uniquely American social invention" (League for Innovation, 2010). Unlike private and public four-year institutions, which use grades, test scores, and other criteria to determine admissions, most community colleges have open-door admissions policies. Originally created as "junior colleges" to provide the first two years of a four-year college education, community colleges have evolved in response to changing social and economic needs. In addition to preparing students to transfer to four-year institutions, community colleges today offer associate degrees and certificate programs, remedial and developmental education, career and technical education (formerly called vocational education), customized or "contract" courses to meet the needs of local employers, adult basic education classes, English courses for speakers of other languages, noncredit recreational courses, and dual enrollment opportunities for high school students (Cohen & Brawer, 2008; Kasper, 2002–03). A few community colleges even offer bachelor's degrees (Mullin, 2011; Kolesnikova, 2009).

THE GROWTH OF COMMUNITY COLLEGES

The nation's first community college, Joliet Junior College, was founded in Joliet, Illinois, in 1901. Since then, more than 1,000 community colleges have been established across the country, enrolling a third (34.5 percent) of all higher education students in the United States. While remarkable, the growth of community colleges has not been steady but, rather, has coincided with significant increases in the demand for higher education. For example, one major expansion occurred when the GI Bill paid for returning soldiers' tuition after World War II; another came in the 1960s and 1970s, when more women and students of color entered higher education in response to changing social and economic needs (Kane & Rouse, 1999). Enrollment also surged with the most recent economic crisis, as laid-off workers sought retraining and as some college-bound students passed over more expensive four-year colleges and universities in favor of two-year schools.

Community colleges do not adhere to a single standard model. Funded mainly by state and local governments, they have developed and function differently from one state or region to the next. California boasts more than 100 community colleges, whereas Vermont and Rhode Island have only one each. In recent years, nearly every state has seen demand for community colleges grow but funding decrease because of economic woes. Faced with shrinking education budgets, some community colleges have increased tuition, laid off staff, reduced or eliminated programs and courses, capped enrollment, and reduced student services. Thus, just as more students look to community colleges, the support services they need to be successful may be cut back.

A third of all higher education students attend community college.

When most people think about college, they picture 18-year-olds living away from home in residence halls at a four-year institution. But in reality, a third of all higher education students,[1] including 40 percent of undergraduates, attend community colleges (see figure 1).

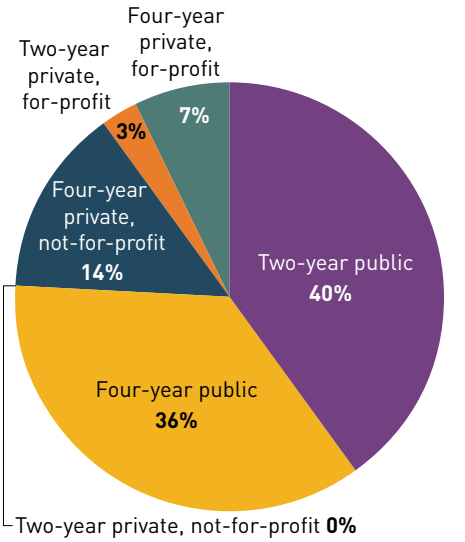
More women enroll in community colleges than in any other sector of higher education.

Women make up the majority of students in all sectors of higher education, including community colleges. More than 4 million women attend community colleges, which is more than the number of undergraduate women attending either public or private not-for-profit, four-year institutions (see figure 2). These 4 million women include more than 1 million mothers, of whom half are married and half are unmarried (Miller et al., 2011).[2] The number of unmarried or single parents among undergraduate students has nearly doubled in the last 20 years (Goldrick-Rab & Sorenson, 2011).

Community college students are racially diverse.

Overall, students of color make up a larger share of the student body at community colleges compared with four-year public and four-year private, not-for-profit institutions. Hispanic and Latino students attend community colleges in especially large numbers, making up 17 percent of the student body (see figure 3). More than half of all Hispanic undergraduate students attended a community college in 2010.

FIGURE 1.
U.S. Undergraduate Enrollment, by Institutional Type, Fall 2010[3]



Women outnumber men across all races/ethnicities at community colleges, and women of color represent a significant portion of this population. Three out of 10 women at community colleges are either African American or Latina, compared with only a quarter of female undergrads at public, four-year institutions. Although the gender gap in enrollment favors women overall, it varies by race/ethnicity. The gap is largest for African American community college students, 63 percent of whom are women.

FIGURE 2.
U.S. Undergraduate Enrollment, by Gender and Institutional Type, Fall 2010[4]

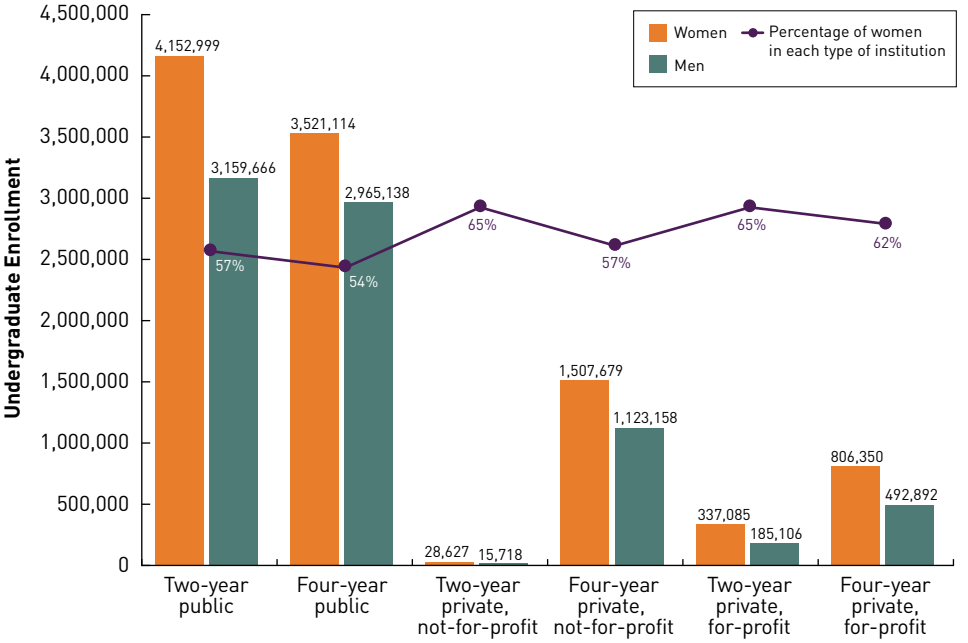


FIGURE 3.
U.S. Undergraduate Enrollment, by Race/Ethnicity and Institutional Type, Fall 2010[5]

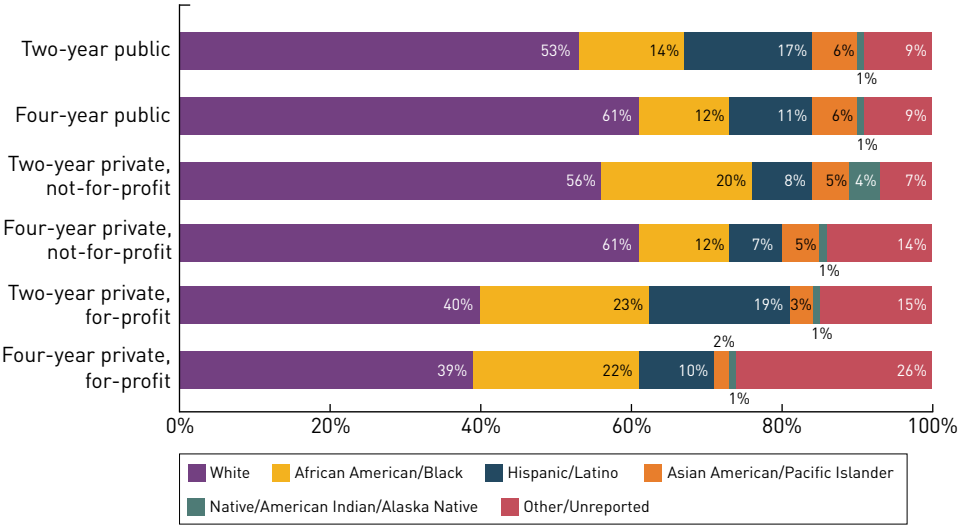
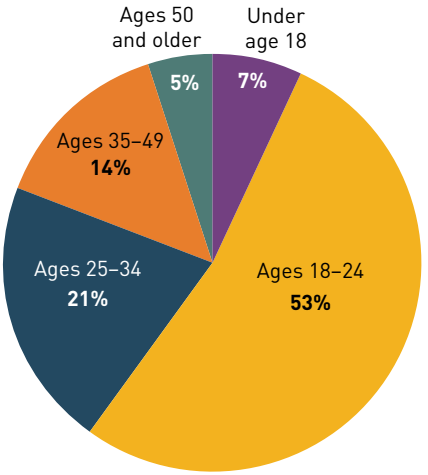


FIGURE 4.
Students Enrolled in U.S. Community Colleges, by Age, Fall 2009[6]

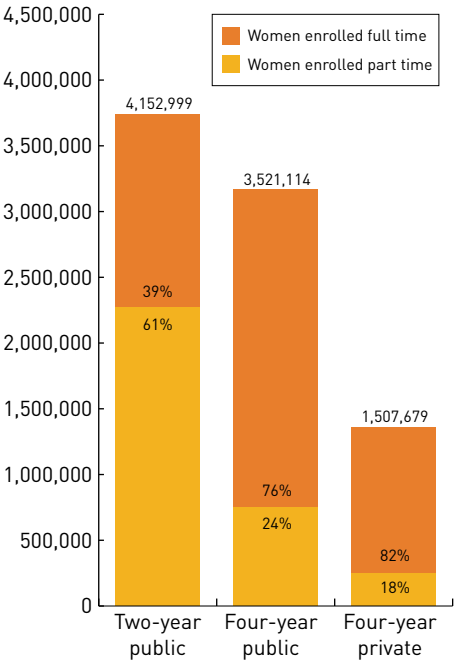


Students of all ages and income backgrounds attend community colleges.

Historically, community colleges have attracted older or nontraditional age students—that is, students over age 24—but younger or more traditional age students are enrolling in community colleges in larger numbers. In 2009, more than half (53 percent) of community college students were between the ages of 18 and 24 (see figure 4).

Students ages 25–34 form the next largest group, followed by those ages 35–49. Only 5 percent of community college students are over age 50. Women make up the majority of students in all age groups but are especially well represented among students over the age of 35.

FIGURE 5.
Percentage of Undergraduate Women Enrolled Full and Part Time, by Institutional Type, Fall 2010[7]



The majority of female community college students attend school part time.

Women at community colleges are more likely to attend school part time compared with their female peers at four-year institutions (see figure 5). In 2010, 61 percent of women at community colleges were part-time students compared with less than a quarter (24 percent) of female students at four-year public institutions and just 18 percent of female students at four-year private institutions. Women are also more likely than men to attend community college part time. Undoubtedly,

part-time attendance gives many women the flexibility they need to manage their work and family responsibilities while pursuing their education. Most community college students work, and 41 percent work full time, which may necessitate part-time attendance (Horn & Nevill, 2006). Additionally, students often switch between full- and part-time enrollment (Clery, 2010).

Why do students choose community college?

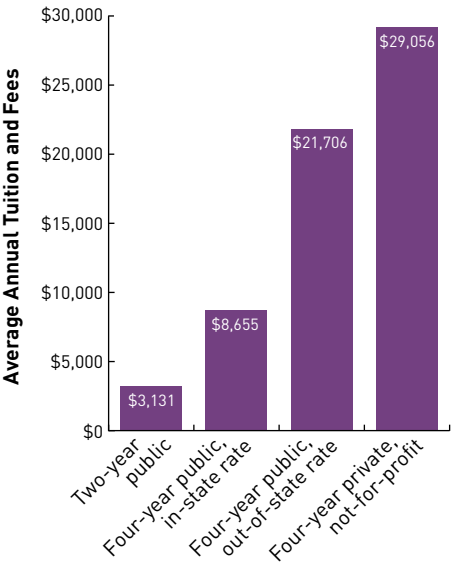
Affordability

In the past, the relatively low tuition at community colleges compared with four-year institutions helped make higher education more accessible for low-income students (see figure 6). Today, students from all income backgrounds are choosing community colleges as concerns about rising college costs and student debt increase. According to the U.S. Department of Education's Beginning Postsecondary Students (BPS) survey, students who enrolled in a community college in 2003–04 cited affordability as one of the top two reasons for their decision (U.S. Department of Education, 2011). Nearly two-thirds (63 percent) of older students and 73 percent of recent high school graduates cited affordability as a key deciding factor (Radford & Tasoff, 2009).

Location and program offerings

More than 80 percent of community college students in the BPS survey cited location or proximity to family as a reason they enrolled in their institution (Radford & Tasoff, 2009). Many students value being able to go to school close to home and work, and for the many mothers who attend community college, being near their children is especially important.

FIGURE 6.
Average Annual Full-Time Tuition and Fees, by Institutional Type, 2012–13[8]



In addition to appreciating the convenience of going to school close to home and work, students at community colleges can choose from a range of occupational and academic programs. The wide selection appeals to students with different levels of preparation and interests. Students who want to prepare or retrain for specific careers can enroll in an occupational program. Students can also earn associate degrees in any number of disciplines, including science and engineering, and students who want a bachelor's degree can start out at a community college on the way to a four-year institution.

Chapter 1 Notes

1. There were more that 21 million higher education students, including undergraduate, graduate, and first professional (e.g., law, business, medicine) students, in the United States in 2010, and 18.3 million were undergraduate students, including 7.3 million community college students.
2. In 2008, there were 3.9 million student parents with dependent children across all postsecondary institutions, including for-profit, two-year or less, and non-degree-granting institutions (Miller et al., 2011).
3. These data include institutions that grant associate or higher degrees and participate in Title IV federal financial aid programs. *Source*: AAUW analysis of U.S. Department of Education, 2010.
4. These data include institutions that grant associate or higher degrees and participate in Title IV federal financial aid programs. *Source*: AAUW analysis of U.S. Department of Education, 2010.
5. The Asian American/Pacific Islander category was created by combining the Asian and Native Hawaiian or other Pacific Islander categories. The other/unreported category includes students who identify as two or more races or as non-U.S. citizens and those whose race/ethnicity is unknown or unreported. Totals may not equal 100 because of rounding. These data include institutions that grant associate or higher degrees and participate in Title IV federal financial aid programs. *Source*: AAUW analysis of U.S. Department of Education, 2010.
6. Students whose age is unknown or unreported are not included. These data include institutions that grant associate or higher degrees and participate in Title IV federal financial aid programs. *Source*: AAUW analysis of U.S. Department of Education, 2009.
7. Total full-time women enrolled for credit includes undergraduate students enrolled for 12 or more semester credits, 12 or more quarter credits, or 24 or more contact hours a week each term. Total part-time women enrolled for credit includes undergraduate students enrolled for 11 semester credits or less, 11 quarter credits or less, or less than 24 contact hours a week each term. *Source*: AAUW analysis of U.S. Department of Education, 2010.
8. These are enrollment-weighted average prices. Charges reported by colleges with larger full-time enrollments are weighted more heavily than those of institutions with smaller enrollments. *Source*: Baum & Ma, 2012, figure 1.

2 An Open Door to Opportunity

Enrolling in community college is the first step on an educational path that can lead in many directions. In contrast to students at four-year institutions, who typically plan to earn a bachelor's degree, students enroll in community college for a variety of reasons and often have multiple goals that can change over time and with circumstances. Students may enroll in remedial education to improve their math and reading skills, pursue academic or occupational programs to earn an associate degree or a certificate, or prepare to transfer to a four-year institution and ultimately complete a bachelor's or other advanced degree.

Women at community colleges want to improve their job skills and earn a degree.

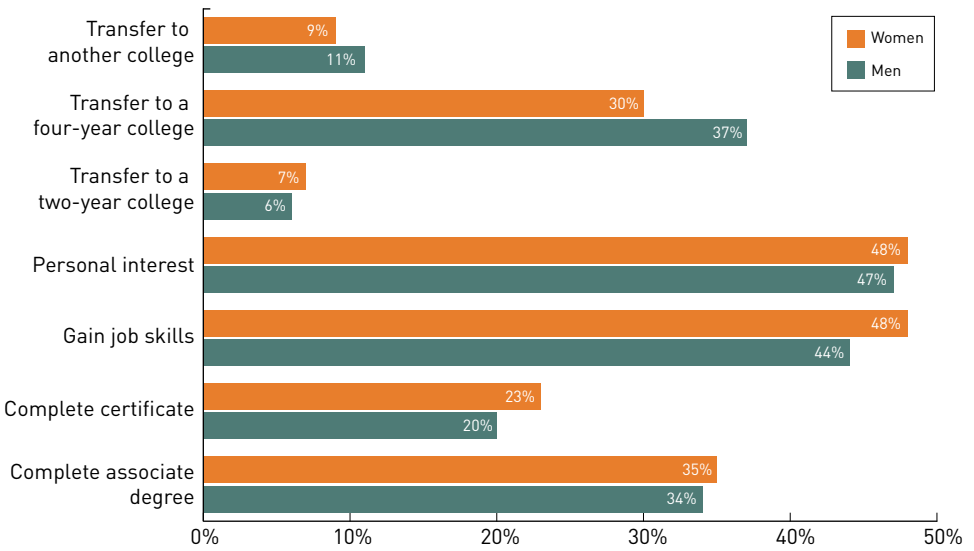
For women and men, gaining job skills and pursuing a personal interest are two of the most common reasons for attending community college. According to the Beginning Postsecondary Students (BPS) survey, completing an associate degree or

certificate and transferring to a four-year institution are also popular reasons for enrollment (U.S. Department of Education, 2011).[1] Women are slightly more likely than men to say that they want to improve their job skills and plan to complete a certificate or an associate degree. Nearly half (48 percent) of women want to improve their job skills, more than a third (35 percent) plan to complete an associate degree, and nearly a quarter (23 percent) want to complete a certificate. Men are more likely than women (37 versus 30 percent) to say they plan to transfer to a four-year college or university (see figure 7).

Women can improve their earnings by completing a degree or certificate.

Increasingly, jobs require some postsecondary education, including associate degrees and certificates, and as figure 7 shows, nearly half of female community college students enroll to improve their job skills. Enrolling in occupational or career and technical education (CTE) is a primary way for women to gain job skills in specific occupations. Women make up 61 percent of all CTE students who want to earn either a certificate or an associate degree, across all institutional types (U.S. Department of Education, 2008). Overall,

FIGURE 7.
Reasons First-Time Undergraduates Give for Enrolling in Community Colleges, by Gender, 2003–04[2]



earning an associate degree or a certificate can boost labor force participation and salaries. Community college students who first enrolled in 2003–04 and completed either an associate degree or a certificate in any field by 2009 were more likely to have jobs, work full time, and earn a higher median salary than their peers who started community college but did not complete either an associate degree or a certificate (Ifill & Radford, 2012).

A community college education is an especially good investment for students who study technical, health or science, and math subjects—fields that offer the highest economic returns. Compared with workers who have a high school education, women who receive an associate degree see a 22 percent average increase in earnings, whereas men who receive an associate degree see an average 13 percent increase in earnings (Belfield & Bailey, 2011). The higher returns for women are due in part to their concentration in health fields like nursing, which offer relatively high salaries for two-year degree holders. But women are underrepresented in other fields, like STEM, which also offer high salaries and growth opportunities. In 2012, 91 percent of registered nurses were women, but women accounted for just 27 percent of computer support specialists and 1.2 percent of automotive service technicians and mechanics (U.S. Department of Labor, 2012a).

Women in traditionally female fields earn less than men in traditionally male fields do.

Although women earn the majority of associate degrees and certificates awarded by community colleges, they are concentrated in lower-wage, lower-skill fields. Certificates are popular among students and are the fastest-growing award in higher education. Many certificate programs require a year or less to finish, so students can complete them relatively quickly and become qualified for available jobs (Belfield & Bailey, 2011). In 2010 some of the most popular certificate programs for women were in health care, child care/education, and cosmetology. Men were more likely than women to earn certificates as welders, electricians, and heating/AC/ventilation (HVAC) and automotive technicians—jobs that offer much higher wages than those popular among women (with the exception of health care jobs). In 2010, the median hourly wage was $17.04 for welders, $23.20 for electricians, and $17.21 for automotive technicians. In contrast, the median hourly wage was $9.28 for child care workers and $10.82 for cosmetologists and hairstylists (U.S. Department of Labor, 2012b). So although women earn the majority of certificates that community colleges award, their underrepresentation in scientific and technical occupations reduces the likelihood that their education will bring the expected payoff.

Many community college students plan to transfer to a four-year institution.

Community colleges also continue to fulfill their original mission of preparing students to transfer to four-year institutions. According to the BPS survey, when first-time community college students in 2003–04 were asked about their degree goal, 81 percent said they wanted to earn at least a bachelor's degree (Horn & Skomsvold, 2011). Starting at a community college and transferring to a four-year college or university to complete a bachelor's degree can save students thousands of dollars. A recent estimate by the American Association of Community Colleges found that the 203,000 students who began at a community college and transferred to either public or private four-year institutions between 2003 and 2011 collectively saved $22.5 billion (in inflation-adjusted 2011 dollars) (Mullin, 2012).

Community colleges offer an entry point to a bachelor's degree in STEM.

The returns on education also vary by field of study for bachelor's degree holders. Individuals with bachelor's degrees in STEM earn more, on average, than non-STEM bachelor's degree holders. Interestingly, women who pursue bachelor's degrees in STEM are more likely than their male counterparts to attend community college at some point on the path to their degree (Tsapogas, 2004). Although it is not clear why this is a more popular path for women, community colleges likely offer them other benefits in addition to the potential savings. Academically underprepared students who lack basic math or science skills can enroll in remedial courses before attempting college-level courses. Women who may not have taken or had access to advanced courses in math and science in high school can take those courses in community college at low cost. In a study on women in STEM at two community colleges in Washington state, women reported that the community college classroom had a friendly culture once they got to know their classmates, in contrast to the climate for women in STEM at four-year institutions (Starobin & Laanan, 2008). Additionally, first-generation students who may be overwhelmed by or lack information about the admissions process at four-year institutions may find the less-stringent community college admissions process a viable first step on the path to a bachelor's degree in STEM (Rivera, 2010). Offering affordability, access, and academic support, community colleges provide a worthwhile option for women in STEM and many other fields.

Chapter 2 Notes

1. Some community college students do not plan to complete a certificate or degree or transfer but take select courses to learn specific skills.
2. *Source:* Frehill Advanced Research analysis of U.S. Department of Education, 2011. Students could indicate multiple reasons.

3 Barriers to Success

Community colleges provide access to higher education to millions of students who probably would not have pursued higher education otherwise. But access to college does not guarantee success, and many community college students never achieve their educational goals. Nearly half of community college students do not earn a certificate or associate degree or transfer to a four-year institution within six years (U.S. Department of Education, 2011). Such low completion rates threaten the educational aspirations of the millions of women who depend on community colleges—and who attend in significantly higher numbers than men do. Reducing the barriers to graduation and, in particular, providing support services that consider women's roles as mothers and breadwinners are critically important to increasing the success of women at community colleges.

Data on community colleges may misrepresent student outcomes.

Community colleges nationwide are answering the call to help increase the number of college graduates, but knowledge of community college student outcomes is limited, primarily because the main federal data source on higher education student outcomes does not adequately serve community colleges (Committee on Measures of Student Success, 2011).

The Integrated Postsecondary Education Data System (IPEDS) has at least two major shortcomings that make it inadequate for reporting completion rates for community college students. First, IPEDS reports graduation or completion rates only for full-time, first-time degree- or certificate-seeking students who begin in the fall, which excludes a majority of community college students (Offenstein & Shulock, 2009). Second, IPEDS does not adequately record student transfer rates. Community college students who complete an associate degree or certificate before transferring to a four-year institution are counted as graduates but are not included in the IPEDS transfer count, which results in an underestimation of transfer rates (Offenstein & Shulock, 2009; Mullin, 2011). Additionally, IPEDS does not distinguish between community college students who transfer from one two-year institution to another (lateral transfers) and those who transfer from a community college to a four-year institution (vertical transfers). Although lateral transfers should be tracked, they produce a different outcome from vertical transfers, and IPEDS should distinguish between the two (Offenstein & Shulock, 2009).

These reporting issues mean, for instance, that a woman who completes an associate degree at a community college on her way to a bachelor's degree is not counted in the IPEDS results as a successful transfer, a significant oversight when we consider that more than 4 million women attend community colleges. As a result, the transfer rate of community college students may be underestimated. Without receiving sufficient credit for their graduates, community colleges may have difficulty earning the support they need to continue serving students—especially women, who make up the majority of students.

Other data sources overcome some of the problems with IPEDS, but they also have limitations. The BPS study includes outcomes for both part-time and full-time students, but data are based on a sample and not a survey of institutions, unlike IPEDS, which draws on the entire higher education population and thus allows for different kinds of analyses. The National Student Clearinghouse has undertaken a data collection effort to improve outcome measures for higher education, including new data services based on an unduplicated head count of students at colleges and universities. More than 3,000 colleges and universities representing 96 percent of all student enrollments, at last count, participate in the Clearinghouse. The Clearinghouse provides a fuller picture of students over time as they transfer from

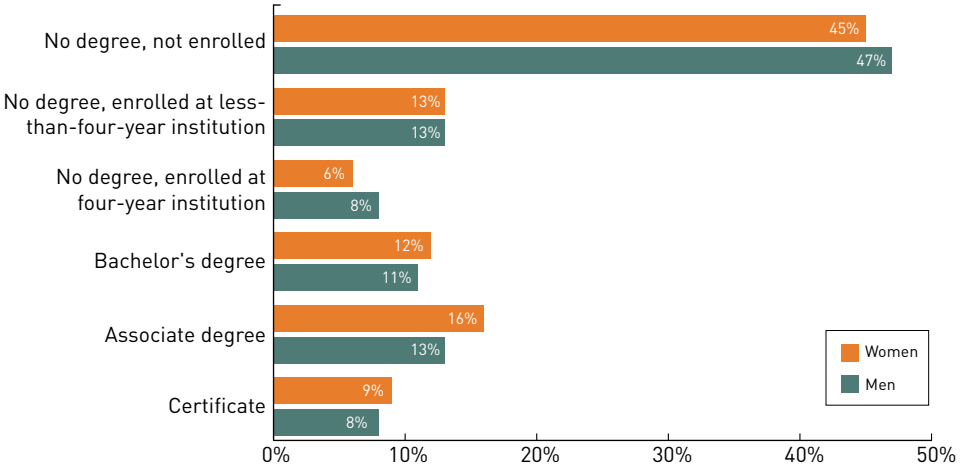
school to school and fluctuate between full-time and part-time student status. At this juncture, the Clearinghouse does not disaggregate college student outcomes by gender or by race/ethnicity. Improving and standardizing state record keeping are the first steps toward fully articulated, national data on community college students.

Improving the data on student outcomes is also critical to evaluating existing and future programs at community colleges, and efforts to improve IPEDS are already under way. Recommended revisions to IPEDS from the U.S. Department of Education's Committee on Measures of Student Success include reporting outcomes for part-time students and expanding the transfer rate criteria to include students who earn a degree or certificate before transferring and those who do not (Committee on Measures of Student Success, 2011). These changes could substantially improve the value of IPEDS for analyzing community college student outcomes.

Many community college students do not achieve their goals.

Although the majority of community college students intend to earn a certificate or degree or transfer, nearly half do not achieve their goal, even after several years (see figure 8). According to the BPS survey, almost half (46 percent) of students who enrolled in a community college in 2003 had not earned a degree or certificate and were no longer enrolled in college six years later. Slightly more than a third of students who enrolled in a community college in 2003–04 had earned a degree or certificate, and one-fifth of students were still enrolled at either a two-year or a four-

FIGURE 8.
Highest Degree Attained and Enrollment Status in 2009 of First-Time Undergraduates Who Enrolled in a Community College in 2003–04, by Gender[1]



year institution six years later in 2009. Gender differences in outcomes were small; women were slightly more likely than men to have completed an associate degree, and men were slightly more likely to be enrolled at a four-year school compared with women. Among women, 12 percent had a bachelor's degree, 16 percent had an associate degree, and 9 percent had a certificate six years after they first enrolled in community college.

Transfer rates are also relatively low. By 2009, 12 percent of women and 11 percent of men who started at a community college six years before had earned a bachelor's degree (see figure 8). Additionally, 6 percent of women and 8 percent of men were still enrolled at a four-year college or university, giving an estimated transfer rate of 18 percent overall. These data are in line with other estimates of the national two- to four-year transfer rates, which range from 15 to 25 percent. A 2009 analysis by the National Center for Higher Education Management Systems used data from the National Student Clearinghouse on a cohort of students who began college in 2002 to estimate a national four-year transfer rate of about 15 percent (Ewell & Kelly, 2009). A more recent analysis by the Clearinghouse indicated that about 25 percent of students who began at a two-year institution in 2006 had transferred to a four-year institution by summer 2011—a percentage that suggests transfer rates are better than those reported using IPEDS data (Hossler et al., 2012).

Taken altogether, slightly more than half (54 percent) of first-time college students who enrolled in community college in 2003 achieved a successful outcome by 2009. At this rate of degree completion and transfer, only half the students who enter community college for the first time in academic year 2013–14, for instance, will have graduated or transferred successfully by 2020—falling well short of the American Graduation Initiative goal of producing 5 million additional community college graduates by that date. Simply getting students in the door is not enough as long as so many students never see the benefits of their education. Some of the major barriers to graduation affect women and men equally, while others are particularly significant for women.

Why don't students graduate?

Much research and discussion surround the possible factors that affect the outcomes community college students achieve. Community college leaders and advocates point out that student background inevitably plays a role in student outcomes, and, as described earlier, the community college student population is far more diverse than that of four-year institutions. Others acknowledge that, although community colleges do educate a diverse mix of students, institutional factors also play a role in student outcomes. But research findings suggest that the most significant reasons students drop out relate to low academic preparation, college costs

and limited financial aid, work and family responsibilities, and institutional factors such as limited information and guidance and difficulty transferring to a four-year institution (Attwell et al., 2011; Hilliard, 2011).

Low academic preparation

The open-door admissions policy of most community colleges allows students with various levels of academic preparation to enroll. Academically talented students do choose community colleges,[2] but the low success rate of remedial education at community colleges means that students unprepared for college-level work are at risk for dropping out. Students may be eager to begin classes only to learn, from prerequisite placement tests, that they need either remedial or developmental education or have been assigned to adult basic education to improve their reading, writing, and math skills. Although the intention is to help students eventually succeed in their college-level courses, the evidence on the effectiveness of developmental education is mixed (Roper, 2009). Community college students who successfully completed developmental education in math had long-term education outcomes similar to those of students who did not require developmental education (Bahr, 2008). But, unfortunately, many community college students never complete their assigned courses in developmental education and drop out of school before completing any college-level work (Bailey & Cho, 2010).

College costs and limited financial aid

Community colleges offer the lowest tuition in higher education, $3,131 per year on average for a full-time student (Baum & Ma, 2012), but many students still struggle to pay for their education. Recent research finds that financial aid is one of the most important factors related to community college student success (Attwell et al., 2011), and community college students rely heavily on financial aid, especially federal awards like the Pell Grant, to cover costs.[3] More than a third (36 percent) of the more than 9 million Pell Grant recipients in 2010–11 attended community colleges (U.S. Department of Education, 2012a, table 6A), but many community college students who are eligible for Pell Grants never apply (Kantrowitz, 2009).

To apply for a Pell Grant, students have to complete the Free Application for Student Aid (FAFSA), but more than half (56 percent) of all community college students did not complete it in the 2007–08 academic year (Kantrowitz, 2009). The FAFSA is a complicated form, and the difficulty involved in completing it may be a deterrent for students. When asked why they did not apply for financial aid, community college students made up the majority of students who said that they thought they either were not eligible for aid or would not need it and that completing the FAFSA was too much work (Kantrowitz, 2011). Without financial aid, students often work long hours to make ends meet. The majority of community college students work

full time and attend school part time, which reduces their chances of successfully completing their program and earning a certificate or degree.

Work and family responsibilities

Work. A third obstacle to community college students' success is the demand on their time and the difficulty of juggling multiple responsibilities. Almost 8 out of 10 community college students work, and 41 percent work full time (Horn & Nevill, 2006, table 5.1). Although working while in school can prepare students for future careers, working full time can adversely affect attendance and academic performance (Education Commission of the States, 2004). Working full time or even part time also often necessitates part-time enrollment, which is associated with lower levels of persistence and degree attainment compared with full-time enrollment even after we control for student background factors like gender and race/ethnicity and academic preparation (Chen, 2007). Part-time students are also less likely than

AAUW WORKS TO IMPROVE PELL GRANT FUNDING

One of the major federal contributions to higher education, the Pell Grant program provides grants to low-income students enrolled in degree or certificate programs. More than three-quarters (77 percent) of community college Pell Grant recipients had an annual family income of $30,000 or less, and more than a third of Pell recipients who were classified as independent with dependent children attended a community college in 2010–11 (U.S. Department of Education, 2012a, tables 6A and 6D). Therefore, any cuts or changes to the Pell Grant program could have a tremendous impact on community college students.

AAUW has supported various efforts over time to make the Pell Grant program serve community college students better. One change to the program that could help community college students would be to award year-round grants, since many community college students attend classes during the summer. This expansion of the Pell program was put in place for one school year but then ended in 2011 (Quizon, 2011), a change AAUW opposed.

Another way to support community college students would be to increase the income protection allowance used to determine eligibility for financial aid, which would help financially independent students keep more of their income. In academic year 2012–13, the maximum Pell Grant according to the U.S. Department of Education Federal Student Aid website was $5,550, but even a modest income can reduce the amount of a student's financial aid package. Unfortunately, the current income protection allowance does not adequately reflect the actual cost of living for independent or parenting students.[4] AAUW supports increasing the income protection allowance to address the needs of self-supporting and parenting students.

full-time students to be eligible for federal student aid. As discussed in chapter 1, women are more likely than men to enroll part time, and 6 out of every 10 women at community colleges were part-time students in 2010.

Family. The demands of family responsibilities can be a significant barrier to enrolling and remaining in school for all student parents but especially for women, who generally devote more time to caregiving than men do. A majority of parents report spending 30 hours or more a week on caregiving, and mothers report spending more time on caring for dependents than fathers do. More than two-thirds (68 percent) of mothers attending community college provide 30 or more hours of caregiving weekly, compared with 42 percent of fathers (Miller et al., 2011). Caregiving responsibilities reduce the time student parents spend on homework or studying.

Additionally, student parents are more likely to be low-income compared with their non-parent peers and therefore are more likely to have to work to support their families as well as pay for college. Having access to reliable and affordable child care helps student parents stay in school, but community colleges are less likely than four-year public colleges and universities to provide this service. Chapter 4 explores this issue in more detail and profiles an Arkansas initiative that offers some strategies on how community colleges can better serve mothers who need child care while in school.

Limited information and guidance

For many students, community college is their first college experience, and the new environment can be overwhelming and hard to navigate; some students drop out because they feel lost and do not know where to find help (Karp & Bork, 2012). First-generation college students or older students may be especially unfamiliar with campus culture, as well as the various offices and services available to them. Four-year institutions almost universally offer orientation programs for new students, but most community colleges do not.

The lack of information and guidance at community colleges perhaps hurts students most when they are choosing a program of study. Confronted with many options and little guidance, students may struggle with how to select a program of study and a degree goal. A recent study suggests that community college students want more information about "what programs and credentials prepare them for which jobs and careers" and are relying on their institutions for that kind of information and guidance (Public Agenda, 2012). But that information can be difficult to get, and without guidance, many students will simply rely on personal preferences or choose fields with which they are familiar —even if there are limited employment options in those fields. At least one major consequence of this behavior is that students choose fields that are traditional for their gender, which results in women continuing to earn a majority of degrees and certificates in traditionally female fields

that are less likely to lead to high-paying jobs that can support a family (Carnevale et al., 2012). Chapter 5 further explores the role of community colleges in increasing women's representation in traditionally male-dominated fields.

Difficulty transferring to a four-year college or university

The low tuition and fees of community colleges make them an attractive starting point on the way to a bachelor's degree for any student trying to manage costs. Although this can be a successful strategy, transfer students reported that poor academic advising led them to take courses that were ineligible for transfer and that poor alignment between two- and four-year programs and course scheduling difficulties at the community college all delayed their progress (Packard et al., 2011).[5] Women face challenges associated with the transfer process in general, as well as challenges that are specific to STEM, such as stereotypes and limited encouragement and support to pursue STEM. One California program (see chapter 5) has had success in creating a more reliable path from community college to a four-year institution for students, women and men, seeking bachelor's degrees in STEM majors.

Overall, community college transfer and graduation rates are low, especially compared with those at four-year schools. The open-door access and diversity of students with a range of goals at community colleges mean that many students are underprepared for college-level work, are unsure of their plans, and face other barriers to staying in school through graduation. Even when community colleges are successful, the weaknesses of IPEDS obscure their achievements.

Chapter 3 Notes

1. Estimates include students enrolled in Title IV eligible postsecondary institutions in the 50 states, the District of Columbia, and Puerto Rico. *Source:* Frehill Advanced Research analysis of U.S. Department of Education, 2011.
2. Ten percent of first-time community college students in 2003–04 who took an admissions test earned scores between 1140 and 1600 where 1600 was the maximum score (Mullin, 2012).
3. Only 10 percent of community college students took out federal loans (subsidized and unsubsidized Stafford loans) in 2007–08, compared with 42 percent of four-year public students, 55 percent of four-year private not-for-profit students, and 88 percent of for-profit students (Baum et al., 2009).
4. The income protection allowance is the amount of a student's income that is excluded when determining the expected family contribution for financial aid purposes. For 2012–13, the income protection allowance was $6,000 for a dependent student, $9,330 for an independent student who was single or married to another student, and $14,960 for a student who was married to a nonstudent. AAUW supports raising the income protection allowance to $9,000 for dependent students and $12,000 for independent students. These increases more realistically reflect the cost of living.
5. In some cases, indecision can also be a problem for students who want to transfer to a four-year college or university and earn a bachelor's degree since the longer students take to decide if they will transfer the less likely it is that all their credits will transfer.

4 Meeting the Needs of Student Mothers

More than 1 million mothers attended community colleges in 2008. The low tuition, proximity to home and family, and range of program offerings make community colleges attractive to mothers who want to pursue their education. Mothers juggle child care and other family responsibilities along with work and school, and the competing demands on their time and money make it difficult for them to complete a certificate or degree or transfer to a four-year college or university. Single and low-income mothers are especially likely to drop out of school or to "stop out" for long stretches due to time and money constraints. For student mothers, the lack of affordable, high-quality child care emerges as a major barrier to success. As the number of student parents—especially mothers—in higher education increases, policies that make it easier for women to manage school, family, and work responsibilities can help them stay enrolled through graduation.

TABLE 1.
Reported Availability of On-Campus Child Care, by Institutional Type, 2010[1]

	Community Colleges	Four-Year Public Institutions	Four-Year Private, Not-for-Profit Institutions
Institutions with on-campus child care	528	387	146
Institutions without on-campus child care	560	294	1,448
Percent of institutions with on-campus child care	48.5%	56.8%	9.2%

Community colleges have led the way in serving student parents, especially mothers.

In 2008, nearly 2 million student parents attended community colleges, and more than half of them (1.3 million) were mothers (Miller et al., 2011). Single, low-income mothers disproportionately attend community colleges (Women Employed, 2012). Getting a college education is one of the most reliable paths out of poverty for single and low-income mothers, and having a college-educated mother also improves educational outcomes for children (Goldrick-Rab & Sorensen, 2011). Mothers are often highly motivated to succeed so that they can support their families, but time spent caregiving can adversely impact women's ability to enroll and stay in school.

Child care is important for the success of student mothers.

In general, women are more likely than men to provide caregiving, and they spend more time on caregiving than men do. In 2011, women reported spending more than four hours (4.4) per day, on average, caring for children or other household members, compared with three hours (3.2) for men (U.S. Department of Labor, 2011).
The situation for mothers at community colleges does not differ substantially from the national picture. An analysis of data from the Community College Survey of Student Engagement found that more than two-thirds (68 percent) of student mothers reported spending 30 or more hours a week caring for dependents compared with 42 percent of student fathers (Miller et al., 2011). Time spent caregiving can take away from time for homework and studying and can make scheduling and commuting to class a challenge. Across all sectors of higher education, student parents are more likely to drop out compared with their non-parenting peers, most often citing caregiving responsibilities and lack of financial resources (Miller et al., 2011). Providing affordable child care thus emerges as a critical strategy for helping student mothers succeed at community college.

Child care is a high priority for student parents, but it is limited at community colleges.

A year of child care can cost more than a year of college at a four-year public institution on average, ranging from $4,650 to as much as $18,200, putting it far out of reach for most single and low-income mothers (National Association of Child Care Resource and Referral Agencies, 2011). On-campus child care can be more affordable, but not all institutions have child care centers, and those that do offer a limited number of slots for children of student parents. In 2010, just 528 community colleges (fewer than half of all community colleges nationwide) offered on-campus child care (see table 1). About 57 percent of public four-year colleges and universities and just 9 percent of private four-year institutions had on-campus child care.

Despite growing demand, the share of community colleges with on-campus child care has decreased over time (Miller et al., 2011). At the same time, funding for the major federal campus child care program, Child Care Access Means Parents in School (CCAMPIS; see below), fell from $25 million in 2001 to just $16 million in 2012 (U.S. Department of Education, 2012b).

Arkansas is helping low-income mothers get through college.

With limited federal funding from CCAMPIS and increasing numbers of student parents on campus, some community colleges are taking the lead in addressing one of the main challenges these students face on the road to graduation. The Career Pathways Initiative (CPI) is a program for low-income parents[2] offered at all 22 community and technical colleges in Arkansas. In 2011, more than 9,000 students were enrolled in the program. The average student age was 31, nearly 60 percent were single parents, and the overwhelm-

THE NEED FOR ON-CAMPUS CHILD CARE

The Campus Childcare Access Means Parents in School (CCAMPIS) amendment to the Higher Education Act of 1965 provides funding for colleges and universities to establish and support on-campus child care centers or to subsidize child care for low-income students. CCAMPIS aims to increase access to postsecondary education for low-income student parents by providing high-quality, affordable, and accessible child care services. Colleges and universities can use CCAMPIS funds to establish or support on-campus child care programs and to provide before- and after-school activities. Institutions that receive CCAMPIS funds must submit annual performance reports to the U.S. Department of Education. The success of the CCAMPIS program is measured by the persistence and degree completion rates of students who use the CCAMPIS-supported child care services at the institution.

ing majority (90 percent) were mothers. Since it began in 2005, CPI has helped put thousands of low-income parents—mostly mothers—on the path to work and better-paying jobs. The program, which builds on the existing "welfare to work" model, is designed to help poor and low-income parents achieve academic and workplace success through academic advising, tutoring, and job placement assistance. Helping students find affordable child care while they are enrolled in college is a priority of the program.

The Arkansas Department of Higher Education runs the Career Pathways Initiative, which is funded with federal dollars through the Arkansas Temporary Assistance for Needy Families (TANF) grant. In 2011, the program received $13 million in TANF funds, bringing the six-year total to more than $60 million (Arkansas Department of Higher Education, 2011). These funds pay for staff and instructors and provide direct student support services like child care and transportation vouchers, tuition, and other educational expenses. The TANF funds also ensure that CPI participants do not pay tuition and that they receive additional assistance for basic necessities. The community colleges provide in-kind contributions for classrooms, labs, and instructors.

Because 90 percent of CPI students in Arkansas are mothers and many are single, obtaining child care is essential for them to be able to attend school. CPI appoints advisers on each of the state's 22 community and technical college campuses to help student parents find child care. Since on-campus child care at community colleges is often limited, CPI refers students to off-campus child care in the community and helps cover the costs. The CPI advisers work with government agencies like the Division of Child Care and the Arkansas Department of Human Services to coordinate child care assistance. These advisers know their local child care providers and

AAUW LOBBIES FOR EDUCATION AND TRAINING FOR WOMEN ON WELFARE

The TANF program, part of the Personal Responsibility, Work, and Family Protection Act (authorized through September 2013), is itself a source of federal funding for low-income women pursuing higher education and career training. AAUW has repeatedly urged Congress to change the way TANF defines education, arguing that the 12-month limit on career and technical educational training should be increased to 24 months and that TANF should continue to include postsecondary education as training. AAUW also believes that states should again be able to apply for waivers to fund programs that expand educational opportunities, including those that use education to help individuals find good jobs. The Career Pathways Initiative in Arkansas demonstrates how existing federal programs like TANF can help schools create robust programs with real resources for students.

work closely with students to ensure that their application process goes smoothly.

Improving outcomes for student mothers

Outcomes for CPI students compared with those of other Arkansas community college students suggest that the program is effective in helping students earn degrees and certificates. For example, among students who enrolled at an Arkansas community college in fall 2010, almost 40 percent withdrew by the next year, compared with only about a quarter of CPI students. To date, thousands of students, most of whom are mothers, have enrolled and completed more than 17,000 certificates and associate degrees through the CPI program. The majority of the awards earned are employability or career readiness certificates,[3] which is the minimum postsecondary award available through the program. Hundreds of students also earn technical certificates and associate degrees each year. Almost half of all awards earned by students in the CPI program are in health care, followed by business administration and manufacturing technology, which are all high-demand fields in Arkansas. Furthermore, according to state records, 60 percent of CPI completers in 2010 found jobs, and 85 percent were still employed six months later (Arkansas Department of Higher Education, 2011).

Challenges and opportunities

Funding is a major challenge for the CPI program. The pool of parents who meet the eligibility requirements in Arkansas is large, so funding is capped at $1,500 per student for up to 18 months. As demand for the program increases, eligibility requirements may tighten to limit enrollment. Such changes would deny access to many mothers who could benefit from the program's extensive support services—including affordable child care. Limited funding also limits the number of staff hired to provide case management and student support.

Although the accessibility, low tuition, and flexible schedules that community colleges offer are beneficial, mothers still face barriers to achieving their educational goals. A critical barrier is the limited availability of affordable, high-quality, conveniently located child care. Community colleges can do more to support mothers by providing on-campus child care. Promising interventions like the Career Pathways Initiative in Arkansas suggest that this goal is attainable and that providing essential support for mothers makes them more likely to enroll, stay in school, and achieve their education and career goals.

Chapter 4 Notes

1. Institutions that did not indicate whether they had on-campus day care services were few and are not included in the total. These date include institutions that grant associate or higher degrees and participate in Title IV federal financial aid programs. *Source*: AAUW analysis of U.S. Department of Education, 2010.
2. Participants must be either current or past recipients of federal or state low-income assistance programs (TEA cash assistance, food stamps, ARKids, or Medicaid) or have earnings at or below 250 percent of the federal poverty level. A family of three at 250 percent of the federal poverty level would have a gross annual income of $47,725 (U.S. Department of Health and Human Services, 2012).
3. Employability certificates focus on teaching basic skills, including computer literacy and soft skills (communication and other interpersonal skills) for the workplace (Arkansas Department of Higher Education, 2011).

5 A Path to Careers in Nontraditional Fields and STEM

The number of science, technology, engineering, and mathematics (STEM) jobs is expected to grow nearly twice as fast as that of non-STEM jobs in the next decade, with opportunities for graduates at all levels of education. Community colleges offer a range of programs, but even with so many options, women remain concentrated in traditionally female fields like nursing, education, and cosmetology and underrepresented in STEM fields. Women's low participation in STEM limits their access to the benefits these fields offer, including higher-paying jobs and more opportunities for growth compared with other fields. Women often lack information about opportunities in STEM and other nontraditional fields at community colleges. Stereotypical ideas about what constitutes appropriate work for women, a lack of support for women entering nontraditional fields, and women's limited awareness of and experience in these fields also emerge as critical barriers to women's participation and success. Community colleges enroll the majority of undergraduate

women in higher education, so they have an opportunity to increase women's participation in nontraditional fields, including STEM, by actively addressing the barriers women face in pursuing these fields and transferring to four-year institutions.

Community colleges offer students the preparation they need.

Community colleges offer a range of programs in both occupational and academic subjects. Students can pursue career and technical education (CTE) fields such as health care, manufacturing, and personal and consumer services; academic fields such as liberal arts; or STEM fields that include both occupational and academic subjects, such as math, science, and computer and information technology (Horn & Li, 2009). Students can earn a certificate or an associate degree in an occupational or STEM field, earn an associate degree in liberal arts, and/or transfer credits earned at a community college toward a bachelor's and more advanced degrees at a four-year institution.

Nontraditional and STEM fields have earning power.

As discussed in chapter 2, women who earn a certificate or an associate or higher degree have higher average earnings than women with less education, but economic payoff varies by field of study. Scientific, technical, health, and math fields offer the highest economic returns. Unfortunately, except for health fields, where women dominate, these top-paying fields are nontraditional for women. The U.S. Department of Labor defines nontraditional occupations for women as those where women make up less than 25 percent of workers. In 2010, women made up nearly half the total U.S. workforce (48 percent)

TABLE 2.
Associate Degrees Conferred by Community Colleges in Select Programs, by Gender, 2009–10[1]

Major	Women	Men
Health professions and related programs	84,526	15,778
Education	11,577	2,877
Computer and information sciences	3,359	10,860
Engineering technologies	2,628	15,629
Personal and culinary services	2,500	1,560
Mechanic and repair technologies/technicians	785	11,332
Mathematics and statistics	317	690
Engineering	282	1,902
Construction trades	210	3,073

TABLE 3.
Certificates Conferred by Community Colleges in Select Programs, by Gender, 2009–10[2]

Major	Women	Men
Health professions and related programs	112,775	28,354
Personal and culinary services	12,697	3,603
Education	4,624	973
Computer information sciences	4,555	10,191
Engineering technologies	2,283	13,668
Mechanic and repair technologies/technicians	2,049	36,768
Construction trades	665	15,442
Engineering	25	178
Mathematics and statistics	2	13

but less than a quarter (24 percent) of the STEM workforce (Beede et al., 2011).[3] In 2012, 1.8 percent of electricians, 1.2 percent of automotive service technicians and mechanics, and 4.8 percent of welders, solderers, and brazers were women (U.S. Department of Labor, 2012a). Not only do these occupations offer higher wages compared with traditionally female occupations, but they also typically offer more opportunities for growth and advancement. Increasing women's participation in STEM and nontraditional fields would improve women's prospects for work and help close the gender pay gap.

Women can pursue nontraditional fields and STEM at community colleges.

Gender segregation in the workforce is related to patterns that begin at school. For instance, in community colleges, women earn the majority of certificates and associate degrees in personal and culinary services, education, and health care. In contrast, men dominate STEM-related fields, making up three-quarters of occupational or CTE sub-baccalaureate[4] students in computer and information services, engineering, manufacturing, construction, repair, and transportation, across all institutions (U.S. Department of Education, 2008). In 2009–10, women earned a small share of associate degrees and certificates in STEM and STEM-related fields (see tables 2 and 3).

Research suggests that community colleges can be a good training ground for women interested in entering STEM and STEM-related CTE fields. While not all community college students are academically underprepared, women who want to improve their math and science skills can do so at a community college at low cost. Others use community colleges as a

pathway to a four-year degree in a STEM major. Among STEM degree recipients, women were more likely than men to attend a community college at some point on the path to a bachelor's or master's degree in STEM (Tsapagos, 2004). Despite the opportunities available to women who pursue nontraditional fields at community colleges, research suggests that barriers to these opportunities persist.

Women lack information about opportunities in nontraditional fields, including STEM.

Women are often unaware of opportunities in nontraditional fields early in their community college careers (Packard et al., 2010; Starobin & Laanan, 2008), but information plays a key role in recruiting women to technical fields (Mastracci, 2003). A survey by Women Employed (2004), an advocate for women's economic advancement, found that women in low-wage jobs were more likely to consider information technology (IT) as a possible career path after learning more about salaries, entry-level positions, and training opportunities. But even after women learn about these opportunities, misconceptions about STEM career options remain a barrier. For example, some women in the survey thought that IT was too solitary a work environment and did not realize that IT jobs are available in fields like education and health care. Others were concerned about isolation and not having other women as role models or support, which reduced the likelihood of women committing to nontraditional or STEM fields. Additionally, women may not have a great deal of experience in or exposure to working with cars or computers, for instance, before enrolling in community college. This lack of experience is also a barrier to women's participation in nontraditional and STEM fields.

Women face gender stereotypes and bias in nontraditional fields.

Gender stereotypes often plague women in STEM at community colleges, just as they do women at four-year institutions. Unfortunately, studies suggest that CTE programs may inadvertently reinforce these stereotypes. Some programs use assessment tests that are more accurate at predicting men's educational abilities and interests than those of women (Armstrong, 2000). In fields like welding and auto mechanics, for example, these tests can state that individuals should be physically fit and able to lift heavy objects, and women are advised not to select these fields because it is presumed that they do not possess those characteristics (Lester, 2010).

Stereotypes about women's ability in math also affect women in community colleges, and even women with strong science and math backgrounds reported receiving little encouragement and support to pursue science and math fields (Starobin & Laanan, 2008). Studies show, however, that the community college environment may provide an advantage in building women's confidence in math. Although some women enter community college math courses underprepared, they later report

increasingly positive attitudes toward math. For instance, women who entered their program feeling anxious about taking higher-level math courses said that their confidence grew as they persevered and improved (Starobin & Laanan, 2008).

Familial and institutional support are crucial.

Encouragement and support from family, peers, and faculty also play an important role in helping women in STEM persist on the path to a degree (Reyes, 2011; Packard et al., 2010). Some women receive conflicting messages or a lack of emotional and financial support from their families, who may not understand the demands of college work or who may doubt that women have the academic skills to succeed in technical fields (Reyes, 2011; Starobin & Laanan, 2008). Lack of familial support is often compounded by a lack of institutional support. Poor academic and financial aid counseling, for example, can delay transfers for community college students and increase overall cost. If a student takes courses that are not accepted by the four-year school to which she wishes to transfer, she may have to take additional coursework at her four-year institution, a drain on both time and money (Packard et al., 2011; Lester, 2010; Starobin & Laanan, 2008).

California community colleges are building a foundation for women in STEM.

The hallmark "open door" of community colleges is only a first step. Full access goes beyond admission to educating women about all their options, including nontraditional fields. Two approaches from California promise to increase the participation of women in nontraditional occupations and STEM. One works to increase the number of community college students who transfer and earn bachelor's degrees in STEM, and the other focuses on increasing women's participation in nontraditional career and technical education programs.

California has the largest community college sector in the country, with more than 100 community colleges serving almost 2 million students. Strong institutional connections between the state's community colleges and four-year institutions dictate a clear transfer protocol.

The Mathematics, Engineering, Science Achievement Community College Program

Founded in 1993, the Mathematics, Engineering, Science Achievement Community College program (MCCP) serves students at 36 community colleges in California. The program aims to increase the number of educationally disadvantaged community college students in STEM, many of whom are lower-income and first-generation students. Funded by state and corporate partners, MCCP has 13 components (see sidebar, page 36) and focuses on supporting community college students from their first enrollment until they successfully transfer to a four-year institution. Although the program does not specifically target women, several key program components address significant barriers facing women in STEM at community colleges.

MCCP has successfully put many women and underrepresented community college students on the path to a bachelor's degree in STEM. The program enrolls less than 1 percent of the entire California community college population, but in 2010 it produced 8 percent of all California transfer students in STEM. More than 553 students, including more than 200 women, transferred to either California State University or the University of California system. About 40 percent of the 3,500 participating students in 2010 were women.

Peer support. Creating a sense of community and a support system for students are top priorities for MCCP. Strong institutional support is especially important for first-generation students, whose families typically have little experience with college to guide them (Reyes, 2011). To foster peer support, the program creates learning communities of students who take their math and science courses together in a cluster, which facilitates relationships among students and with faculty. Learning communities have been shown to improve student performance, especially in the first year of college, and to promote student engagement and feelings of belonging (Scrivener & Coghlan, 2011).

Academic support and tutoring. Providing students with academic support is also an important component of MCCP. Having limited math skills or experience can deter women from pursuing STEM fields, as can a lack of confidence in their ability to learn math and science. Underrepresented students are less likely to have access to advanced courses in math and science in high school, limiting their later educational options (AAUW, 2010). But MCCP does not reject students with limited math preparation—in fact, most MCCP students begin college math with

13 COMPONENTS OF THE MATH, ENGINEERING, SCIENCE ACHIEVEMENT COMMUNITY COLLEGE PROGRAM

1. A dedicated student study center
2. A dedicated full-time director on each campus
3. Academic advising
4. Academic excellence workshops
5. Early introduction into STEM careers through internships and summer research programs
6. Professional development and enrichment activities
7. Student clustering or learning communities
8. An orientation course
9. Tutoring
10. A campus council
11. A database
12. Co-curricular STEM-related clubs
13. A liaison with K–12 schools involved with the program

introductory algebra. The program provides academic tutoring and advising and closely monitors student progress.

Transfer support. Inadequate support for students seeking to transfer to four-year institutions can delay transfers and increase costs if, for example, students take courses that are not accepted at the destination institution. MCCP ensures that students receive expert academic advising and guidance on the path to transferring, with counselors on each campus devoted to assisting STEM students with the transfer process. Together, counselors and students develop individual, multi-year plans that are reviewed and updated regularly to ensure transfer success. Counselors also determine which credits will transfer and help students keep track of transfer requirements.

Challenges. MCCP provides a model for increasing women's participation in STEM at community colleges and among transfers who go on to earn a bachelor's degree in those fields. Overall, women made up 38 percent of MCCP transfers in 2010 and more than half of transfer students in life sciences and mathematics. Less than one-fifth of transfers in engineering, physics, and earth science were women, however, which is similar to the proportion of women in these same fields at four-year institutions. These numbers indicate that much more still needs to be done to encourage women's participation in STEM overall and fields like engineering in particular.

The CalWomen Tech Program

The CalWomen Tech program is a second model for recruiting and retaining women in scientific and technical fields at community colleges. The project focuses on outreach to and recruitment of women, addressing gaps in skills and improving the culture in classrooms to promote women's participation in STEM-related CTE fields. Started in 2006 by the California-based Institute for Women in Trades, Technology, and Sciences (IWITTS) with an initial $2 million grant from the National Science Foundation (NSF), the program currently operates at eight California community colleges and is expanding with additional support (a $1 million five-year grant) from the NSF. CalWomen Tech is based on two central beliefs: first, that most educators and employers are eager to recruit and retain women in STEM; and second, that educators and employers don't know how to do that effectively and lack the time and resources to figure it out on their own. The program assists community colleges that are interested in promoting gender equity by providing prepackaged or turnkey solutions proven to encourage women's recruitment and retention in science and technology programs. Federal legislation like the Perkins Act has echoed this goal (see sidebar, page 38).

Recruiting women in nontraditional fields. The CalWomen Tech program focuses on active outreach and recruitment to increase women's participation in nontraditional career education fields

at community colleges. Women are often unaware of opportunities to study STEM-related CTE fields or may believe that these fields are not suitable for them. As a result, the program's promotional materials feature women in STEM-related fields to send the message that women can and are welcome to participate in these fields at the community college. The community colleges may not be able to create their own marketing materials, so IWITTS provides customized recruitment materials for all the institutions that are part of the program, including creating "women in technology" websites for all involved colleges. These materials include information on salaries, job prospects, postgraduate career placement, and working environment in nontraditional fields. Each website features successful women at each school, along with information on their family background, personal stories, and testimonials about their work. All these materials communicate to other women that they too can successfully pursue a science or technical field.

Working with IWITTS as part of the CalWomen Tech program helped the computer networking and information technology program at the City College of San Francisco attract more female students. In 2006, just 19 percent of students in the program were women, so the staff decided to implement an outreach campaign. The CalWomen Tech project leaders gave presentations to the college counseling staff on how to recruit women into the program. The counselors also received customized recruitment brochures and posters to distribute as part of their regular practice when meeting with students.

THE PERKINS ACT: FEDERAL SUPPORT FOR WOMEN IN NONTRADITIONAL CAREERS

The Carl D. Perkins Vocational and Technical Education Act is the federal law that funds career and technical education programs at secondary and postsecondary institutions across the country. The 2006 law, known as Perkins IV, contains gender equity provisions intended to increase the number of women in nontraditional careers. The provisions require federally funded state and local institutions to promote gender equity and hold them accountable for students' participation and completion rates in programs nontraditional for their gender. Federally funded institutions must disaggregate their data by gender, race/ethnicity, and special population status such as single parents and displaced homemakers. Schools that do not meet preset performance goals must implement improvement plans or face sanctions or loss of funding. The law's gender equity provisions signal that career and technical training is critical to ensuring women's access to the education and career preparation they need to be competitive in the global economy. The Perkins Act is due for reauthorization, and AAUW supports continuing the accountability measures for student success in nontraditional fields in Perkins V.

Within two years of active outreach and recruitment, women's enrollment in the computer networking and information technology program increased to 33 percent—a 14-percent bump. By 2010 (when the original funding for the project ended), women still made up a third of students in the IT program.

Bridging the gender gap. The CalWomen Tech program also addresses gaps in knowledge and experience to increase women's participation in nontraditional fields. Women often have fewer opportunities than men to work with cars or computers, for example, so they may be less familiar than men are with certain tools (Lent et al., 2002). The automotive technology program at Evergreen Valley College (EVC) created opportunities for women to work with tools as part of a successful effort to increase women's confidence and boost their participation in the program. Although the automotive technology program at EVC was popular, enrolling more than 100 students, only a handful were women.

The CalWomen Tech project leaders at EVC developed an entry-level course, Auto Repair for the Layperson, and actively promoted it using customized materials that featured women. The purpose of the course was to attract women (and men), pique their interest, and encourage them to explore automotive technology as a possible career in a low-risk environment. Nine women who took the course subsequently enrolled in the introductory automotive technology course the following semester—the largest number of women ever to enroll at one time. Within two years, female retention in the automotive technology program increased from 58 to 88 percent—a 30 percent increase. During the same period, the male completion rate also improved from 61 to 86 percent—a 25 percent increase. So-called bridge courses like the auto repair class help students close the gaps in their knowledge and also provide a more supportive classroom culture, which is critical to increasing female enrollment, according to the CalWomen Tech program. The low-risk environment shifts the focus of these classes to nurturing interest and bringing students into the program rather than "weeding out" inexperienced students.

Community colleges enroll many women students who represent a largely untapped pool of talent for STEM and other nontraditional occupations. These institutions already play an important role in educating many STEM degree recipients, but they could play an even greater role by actively reaching out and marketing to more women to increase women's participation in these fields in postsecondary education and in the workforce. Using learning communities and bridge courses, improving classroom climate, and establishing effective academic advising all help address the barriers that women face in entering male-dominated fields at community colleges.

Chapter 5 Notes

1. *Source:* AAUW analysis of U.S. Department of Education, 2010. Program categories are as defined by the U.S. Department of Education.
2. *Source:* AAUW analysis of U.S. Department of Education, 2010. Program categories are as defined by the U.S. Department of Education.
3. There are many definitions of STEM. Here STEM jobs include professional and technical support occupations in computer science and mathematics, engineering, life and physical sciences, and STEM managers. Social science and education jobs, as well as health and medical professions, are not included.
4. Sub-baccalaureate refers to postsecondary degrees of less than four years usually awarded by a community college or technical school, including associate degrees and certificates.

6 Recommendations

More than 4 million women attend community colleges, but these schools can do more to help women succeed. First, many student mothers struggle to find affordable, high-quality child care—a support service they rely on to stay enrolled, complete their classes, and graduate. Second, women's low participation in nontraditional fields means that many women are missing out on opportunities to improve and secure their economic future. The American Graduation Initiative goal to produce 5 million additional community college graduates by 2020 presents an opportunity, a call to action to improve the success of women at community colleges by ensuring that they have the support they need to balance their roles as mothers and students and to pursue fields where they are underrepresented such as the high-growth sectors of science, technology, engineering, and mathematics. These efforts will help to ensure that success is also part of the story of women at community colleges, but that goal requires action on many levels. Federal and state policy

makers, community college leaders, faculty, and program managers all have a role to play in providing resources, instituting programs and practices, and creating an environment to support student success. Better data collection and reporting are also essential to supporting community colleges and their students. Without information about all students at community colleges, it is hard to make good decisions, and this problem affects policy makers from Congress to campus. Our current data collection system is not well suited to the realities of two-year colleges and their students. Only with a full account of student outcomes will we know whether our efforts have been successful.

Support student parents.

Student parents routinely report that having access to affordable and reliable child care is critical to helping them stay in school through graduation, but more than half of all community colleges do not offer this service. The limited availability of on-campus child care at community colleges is a barrier to student parents, one that disproportionately affects women, who are more likely to be primary caregivers. Increasing the availability of child care to meet the needs and demands of the growing population of student parents who attend community colleges is critical to supporting their success. With better access to child care services, student parents find it easier to manage the demands of caregiving, increasing their chances of enrolling in school and remaining enrolled through graduation. AAUW makes the following recommendations for supporting student parents at community colleges.

- **Assess the current demand for child care at community colleges.**
  Student parents disproportionately enroll in community colleges, but less than half of the nation's community colleges offer on-campus child care for students. All community colleges, but especially institutions that do not offer these services, should assess the demand for on-campus child care to determine if they are meeting students' needs and, if not, how best to meet that demand.

- **Apply for a Child Care Access Means Parents in School (CCAMPIS) grant.**
  Institutions that do not offer on-campus child care services should apply for a CCAMPIS grant from the federal government and use the funds to develop on-campus child care facilities or child care subsidy programs. Campuses can also use CCAMPIS funds to expand outreach to ensure that all student parents can take advantage of these services.

- **Develop a referral system with local child care providers.**
  In some cases, meeting the demand for child care may have to extend to the wider community. Community colleges can collaborate with off-campus child care providers to offer reduced-cost or subsidized services to current students to meet demand.

- **Assign staff to work with student parents.** Having a staff person or department whose primary responsibility is to work with student parents sends the message that supporting them is an institutional priority. This person or office can coordinate services for student parents, including monitoring on-campus child care services.

- **Support student parent groups.** Community colleges can help support student parents by developing a campus support system or network among these students. This can take the form of a student organization, a support group, or even a play group.

- **Increase funding for CCAMPIS.** Congress should increase funding for CCAMPIS, which has declined over time, and modify the funding formula so that community colleges are not disadvantaged compared with four-year institutions.

Increase the number of women in nontraditional fields, including STEM.

Many women enroll in community colleges to gain skills that will pay off in the job market. But women are still concentrated in relatively low-paying, traditionally female fields that leave them unprepared to compete for the fast-growing and better-paying jobs in STEM and STEM-related fields. Women often have limited experience in and awareness of these fields, they may be held back by external and internalized social stereotypes, and they may lack support to enter and persevere in these fields. Increasing outreach to women, improving advising services, and creating supportive learning environments can help increase women's participation and success in STEM fields at community colleges. AAUW makes the following recommendations for increasing the number of women who enroll and earn certificates and associate degrees in nontraditional fields, as well as the number of women who transfer to four-year institutions to earn bachelor's degrees in STEM.

- **Recruit more women into nontraditional fields and STEM fields.** Active outreach to and recruitment of women students is needed in nontraditional fields and STEM at community colleges. Many women may not initially express an interest in nontraditional or STEM fields, but community colleges can enhance outreach and marketing to women in these fields by developing recruitment materials that feature women and help demystify unfamiliar fields for women students. Recruitment materials should also include information on job opportunities, earnings, and educational requirements for nontraditional and STEM fields.

- **Ensure that institutional practices such as academic and career advising do not reinforce stereotypes or promote discrimination of women.** Academic advisers are a key point of contact for students, and academic advising promotes student success. Academic and career advisers, includ-

ing faculty, can play a major role in increasing women's participation in fields where they are underrepresented. Academic advisers should be educated about occupational segregation, gender bias, and the importance of promoting nontraditional careers to women and men.

- **Develop educational and career pathways to help students navigate STEM curricula.** Program directors can map course and program requirements so that students have a clear path to earning a degree and entering a career in STEM. Career pathway maps should also include examples of the kinds of jobs and wages students can expect from the degree they plan to earn. Research suggests that this kind of information can help motivate students to persist until they achieve their goal.

- **Use creative instructional approaches, like learning communities, to support students.** Learning communities can foster women's success in STEM. Learning communities provide much-needed peer support, create a sense of community, and help promote feelings of belonging among students. Women who have support and feel like they belong in STEM fields are more likely to stay in these fields. Introductory courses that require little or no experience in technical fields are a good way to attract students and nurture their interest.

- **Expose women in nontraditional fields to role models and mentors.** Research suggests that women who persevere in nontraditional fields must be resilient, despite the barriers they face. Successful women in nontraditional and STEM fields can serve as role models and mentors for female students, offer suggestions and strategies for success, and reinforce the message that women can be successful in these fields.

- **Partner with local employers to connect students to available opportunities.** Students depend on their schools for information about which programs and credentials prepare them for various jobs and careers. Local employers can share information with community colleges on the skills they need, job openings, and wage information, which community colleges can then use to decide which programs and courses will be useful to students.

- **Engage students in reviewing transfer requirements early and often in their college career.** Educating students about the requirements for transferring to four-year institutions early in their college careers is critical to keeping that option open and minimizing student expense. This information may be especially important for students in STEM, where the required sequence of courses can be more rigid than in other subjects.

- **Develop and implement transfer policies that link community colleges and four-year institutions in each state.**
  State policies that link two- and four-year institutions reduce the burden on individual students to navigate the transfer process. Research suggests that community college students are more likely to earn bachelor's degrees in states with policies that include common course numbering across two- and four-year institutions, automatic transfer of associate degrees, and shared statewide general education core requirements in contrast to community college students in states without similar policies (Gross & Goldhaber, 2009).

- **Strengthen the gender equity provisions of the Perkins Act.**
  Institutions and states must be held accountable for women's and girls' participation in and completion of career and technical education programs. Congress should maintain the gender equity provisions of the Perkins Act to continue to promote the success of students in nontraditional fields. Holding institutions accountable for students' participation and completion rates is the best way to ensure that they provide the full range of programming necessary to fight women's persistent underrepresentation in nontraditional fields. These measures help ensure that women have access to, participate in, and earn degrees in STEM fields that make them more competitive in the workforce.

Conclusion

In the last century, community colleges have taken on an increasingly important role by providing millions of women and men with access to higher education. A strong education system is central to building an educated workforce and to establishing the United States as a nation that values and benefits from equal access to opportunity. Community colleges play a vital role in preparing women to be part of the educated workforce, especially since these institutions attract and enroll a more diverse student population compared with four-year colleges and universities. Without community colleges, many fewer women, student parents, low-income students, African Americans, and Latinos would have the opportunity to pursue higher education. Maintaining this commitment to providing open access requires that community colleges address the challenges facing their students. In particular, community colleges need to be more attuned to women's lives and needs. Investing in on-campus child care, encouraging women's participation in science and technology, and demanding transparent and accessible information for all students bolsters the entire educational system as well as the economic vibrancy of the country. When women have the resources, support, and tools they need to reach their fullest potential, they are strong contributors not only to the economic well-being of their families but also to the sustained value of the greater community.

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