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GENDER EQUITY IN CAREER AND TECHNICAL EDUCATION

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INTRODUCTION

For girls who grew up prior to 1972, it was common to be told they could not take a woodworking or auto mechanics class—simply because they were girls. And boys were not allowed to take home economics classes or to study nursing—simply because they were boys. There was a clear delineation of what the roles of men and women were to be, and public policy intended to keep it that way. Fortunately, girls and boys of today have many more options open to them. But while options are present, so are pressures.

- In 1972, the majority of women did not work outside the home while children were young. Now, it is the exception to the rule for both parents not to be employed. Today, only 20.2% of married couple families have solely the husband working (U.S. Bureau of Labor Statistics [BLS], 2006).
- Balancing work and family has become a major pressure on parents, especially for the large number of single women-headed households. In 2005, 18% of families were maintained by single women (BLS, 2006).
- While choices are present, women continue to be predominantly employed in traditionally female occupations, thus earning far less than men. The median earnings of women working full time year-round was 77% of men's median earnings in 2005, the same as the wage gap in 2002 (National Committee on Pay Equity [NCPE], 2006).
- For many years, the welfare system sought to provide educational paths to recipients, usually single parents or displaced homemakers, recognizing that education is the route to living wage jobs. Today's welfare system is designed to put people to work, discouraging them from education. While they may work, they are frequently in low-paying jobs with no upward mobility or pathway out of poverty. Nearly three million full-time, year-round workers live below the poverty line, and since the current welfare law was put in place, child poverty has increased by 12%. (Ganzglass, 2006a)
- More jobs now require some postsecondary education, but not necessarily a four-year degree (U.S. Department of Commerce et al., 1999, as cited in Brand, 2003, p. 1). Two-thirds of America's young people do not obtain a four-year college degree, and at least 25% go to work directly after high school (U.S. Department of Education [ED], 2002, p. iv).
- The world has become a global economy, one with great competitiveness and demands for high-skilled workers. While enormous efforts are being made in countries such as China and India to develop a multiskilled workforce, the United States is stagnant when it comes to assuring that American women and girls, one of our most valuable resources, are encouraged to develop their full capacity.
- In recent years, federal financial support for education, employment training, and welfare programs has been cut dramatically.

A quality career and technical education system can play a major role in better utilizing ***all*** of America's citizens. Gender roles continue to change and expand in contemporary America and are made more complex through the intersection of race, ethnicity, national origin, language ability, disability, age, class, and sexual orientation. The combining of work and family roles challenges young people today. Teachers, counselors, and parents are preparing students for these changes through career and technical education (CTE).

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For the past 20 years, "vocational education" (as it used to be called) has been saddled with the image of being a program for non-college-bound and special education students. This has occurred despite the efforts of educators, with the assistance of active business and industry advisory committees, to continually update vocational education until it essentially evolved into tech prep[1] programs for postsecondary transition. During the implementation of the federal Perkins Act of 1984, educators made great strides in integrating academic and technical skills into the vocational education curriculum, and many vocational education courses began to fulfill academic graduation and college entrance requirements. Yet parents, academic teachers, administrators, community members, and legislators continued to define vocational education as they had experienced it. To battle this outdated image, the vocational education community began to use the term "career and technical education" during the early 1990s to name the system of secondary and postsecondary programs across the country that were preparing students for advanced training and careers.

Career and technical education (CTE) prepares both youth and adults for full participation in a spectrum of college opportunities, meaningful work, career advancement, and active citizenship (Association for Career and Technical Education [ACTE], 2006a, p. 1). CTE is offered in middle schools, high schools, two-year community and technical colleges, as well as other postsecondary schools. The subject areas most commonly associated with CTE are (a) agriculture (food and fiber production and agribusiness), (b) business (accounting, business administration, management, information technology, and entrepreneurship), (c) family and consumer sciences (culinary arts, management, and life skills), (d) health occupations (nursing, dental, and medical technicians), (e) marketing (management, entrepreneurship, merchandising, and retail), (f) technology (production, communication, and transportation systems), and (g) trade and industrial (skilled trades such as automotive technician, carpenter, and computer numerical control technician; ACTE, 2006b).

Over 95% of high school students take at least one CTE course, and about one quarter of high school students take a concentration of three or more related CTE courses before they graduate from high school (National Assessment of Vocational Education [NAVE], 2004). Participation in CTE at the postsecondary level is high as well—nearly one third of all postsecondary students are enrolled in sub-baccalaureate vocational programs (NAVE, 2004)—and as many as 40 million adults engage in short-term postsecondary occupational training (ACTE, 2006b). CTE participation rates have grown significantly in just a short period. Nationwide, over 15.1 million students were enrolled in CTE in 2004—an increase of 57% from the 9.6 million enrolled in 1999 (ED, 2005).

Students with concentration in CTE study more and higher level math (Stone & Aliaga, 2002) and increased their 12th-grade test scores on the National Assessment of Educational Progress by 4 more scale points in reading and 11 more scale points in math than students who took little or no CTE coursework (NAVE, 2004). CTE students enter postsecondary education at approximately the same rate as all high school graduates (Center on Education Policy and American Youth Policy Forum, 2000), but CTE concentrators are more likely to obtain a degree or certificate within two years, despite the fact that they are more likely to be employed while in school (National Center for Education Statistics [NCES], 2000).

This chapter is limited to addressing CTE programs from Grades 7–12 and two-year CTE associate of arts degree programs. Other programs related to gender equity in CTE are covered in greater depth elsewhere in this volume (see chapter 12, "Gender Equity in Mathematics," chapter 13, "Gender Equity in Science, Engineering, and Technology" and chapter 30 "Improving Gender Equity in Postsecondary Education")

This chapter first provides an overview of the federal public policy history related to gender equity in CTE, and then summarizes the current data on gender equity in CTE. A brief review of the root causes of gender *in*equity in CTE, both within and outside the control of educators, is followed by a discussion of strategies currently in place. The chapter continues by highlighting four excellent CTE gender-equity programs and concludes with recommendations for public policymakers, local schools and communities, and researchers.

Career, in its broadest sense, means "life path," and thus includes all the roles a person plays throughout life (Super, 1980). Career choice is, therefore, a lifelong pursuit. There is no one career choice; rather, there are multiple choices along the way. These choices are based on what people learn and what experiences they have. The best choices are those that give satisfaction and pleasure to each individual and, at the same time, allow the individual to make a contribution to society. Ideally, every person should match her or his job choice with personal talents and interests, consistent with economic opportunities and role priorities, and then strive to achieve individual career goals (Farmer, Seliger, Sidney, Bitters, & Brizius, 1985).

The key gender-equity challenge for CTE is the elimination of sex bias and stereotyping that leads to limiting students' career choices. The primary emphasis of gender equity in CTE has been to encourage men and women and boys and girls to explore nontraditional career[2] choices and to make career decisions based on their own personal interests, skills, and talents, regardless of their gender. Secondarily, this emphasis has the potential to (a) increase the diversity of the workforce, (b) improve gender equity in earnings, (c) maximize the use of an individual's talents, and (d) increase the United States' ability to compete in a global economic marketplace.

HISTORICAL BACKGROUND OF GENDER-EQUITY POLICIES AFFECTING CAREER AND TECHNICAL EDUCATION

The Federal Vocational Education Act (VEA)—1976

Without doubt, the signing of Title IX legislation in 1972 led to major policy changes in vocational education. Prior to the

[1]Tech prep combines at least 2 years of secondary education and 2 years of postsecondary education in a nonduplicative sequential course of study that leads to an associate's degree or certificate.

[2]Nontraditional careers are those where one gender is less that 25 percent of the individuals employed in that occupation.

nondiscrimination language of Title IX, the vocational education system was purposefully sex segregated; education institutions could, and did, legally deny girls and women entry into training deemed "inappropriate" for females, and visa versa for males. Title IX ended these restrictions and made them illegal. The 1976 amendments to the Vocational Education Act (VEA) and the Carl D. Perkins Vocational Education Act of 1984 (Perkins Act) started a new era in career and technical education, because, among other goals, they intended to dismantle sex segregation in CTE.

While Congress had provided funding for vocational education since the Smith-Hughes Act of 1917, it was only following passage of Title IX that, with the help of advocacy groups who believed it was time for gender equity to be addressed in vocational education, major changes were made in the reauthorization process. In addition to providing limited funding to address equity, the 1976 amendments to the VEA mandated a full-time sex equity coordinator (SEC) be appointed in each state to coordinate sex equity work in CTE. Ten functions were identified in the regulations that were issued in October 1977 (ED 3 C.F.R §104.73, as cited in National Alliance for Partnerships in Equity [NAPE], 2004, pp. 11–13):

- Take action necessary to create awareness of programs and activities in vocational education designed to reduce sex bias and sex stereotyping in all vocational education programs, including assisting the State Board in publicizing the public hearings on the State plan;
- Gather, analyze and disseminate data on the status of men and women students and employees in vocational education programs of the state;
- Develop and support actions to correct problems brought to the attention of the personnel, including creating awareness of the Title IX complaint process;
- Review the distribution of grants and contracts by the State board to assure that the interests and needs of women are addressed in all projects assisted under this Act;
- Review all vocational education programs (including work-study programs, cooperative vocational education programs, apprenticeship programs, and the placement of students who have successfully completed vocational education programs) in the state for sex bias;
- Monitor and implement laws prohibiting sex discrimination in all hiring, firing, and promotion procedures within the State relating to vocational education;
- Assist local education agencies and other interested parties in the State in improving vocational education opportunities for women;
- Make available to the State Board, the State Advisory Council, the National Advisory Council on Vocational Education, the State Commission on the Status of Women, and Commissioner, and the general public, including individuals and organizations in the State concerned about sex bias in vocational education, information developed under this section;
- Review the self-evaluations required by Title IX; and
- Review and submit recommendations with respect to overcoming sex bias and sex stereotyping in vocational education programs for the five-year State plan and its annual program plan prior to their submission to the Commissioner for approval.

The 1976 Act also gave special attention to the growing needs of widows and divorced women, referred to as "displaced homemakers," for programs that would help them gain marketable skills and become employed and self-sufficient. States were encouraged to provide modest funding for initial programs through the federal monies provided to them.

The Carl D. Perkins Vocational Education Act of 1984

The Perkins Act of 1984 continued the mandate for a sex equity coordinator and added a 3.5% set-aside from each state's basic CTE grant to be used for sex equity programs and services and an 8.5% set-aside for single parent and displaced homemaker programs and services. It was clear in this legislation that in addition to displaced homemakers, there were growing numbers of single parents, many of them never married, who needed help with vocational education to gain employment and success. The funding provisions amounted to more than $100 million focused on gender equity, primarily for women, a very significant change in federal legislation.

The Carl D. Perkins Career and Applied Technology Education Act of 1990

In 1990, the Perkins Act was reauthorized with continued mandates for a full-time SEC and set-asides of 3% for sex-quity programs and 7% for single parent and displaced homemaker programs (with an additional .5% at each state's discretion for either of these programs). States were required to offer a broad range of services to CTE students including career guidance and counseling, childcare, transportation, tuition assistance, mentoring, and job training, development, and placement.

During the implementation of the 1990 Perkins Act, the term "gender equity" became more commonly used than "sex equity." Between 1984 and 1998, an average of $100 million per year was spent on programs primarily serving women and girls with the goals of eliminating sex bias in vocational education and assuring that single parents and displaced homemakers had access to vocational education that led to careers with a living wage. Each state had numerous programs serving displaced homemakers and single parents (including teen parents) in place between 1985 and 1999. In addition, hundreds of programs worked to eliminate sex bias in vocational education and provided nontraditional occupational opportunities.

The Carl D. Perkins Vocational and Technical Education Act of 1998

Major changes again occurred in the 1998 reauthorization of the Perkins Act, when Congress stripped the funding for gender equity and the requirement for a state sex equity coordinator, thereby eliminating the majority of provisions encouraging gender-equity programming in CTE. Many traditional vocational educators and state officials had resented the fact that more than 10% of the state basic grant was to be spent on gender equity. Their objections, in addition to increasing political pressure

from the right wing and the conservative Republican takeover of the U.S. House of Representatives, resulted in the legislative changes. In addition, the term "gender equity" became a political liability. The debate on gender-equity policy refocused on nontraditional occupations and the access of men and women to these careers. The 1998 reauthorization included few provisions that supported students pursuing nontraditional training and employment, and folded these students, as well as single parents and displaced homemakers, into the definition of "special populations." The funding that had supported gender equity (more than $100 million annually) was given to the states to use at their discretion for other CTE purposes.

In the fall of 2000, only one year after the full implementation of the 1998 Perkins Act, the Vocational Education Task Force of the National Coalition for Women and Girls in Education (NCWGE) surveyed more than 1,500 programs across the country that had received funds under the gender equity set-asides in Perkins. This was done to determine how the 1998 changes in the federal law affected the students they worked with and their own ability to provide services (National Coalition for Women and Girls in Education [NCWGE], 2001). While NCWGE experienced tremendous difficulty locating programs that were still in existence, over one third of the respondents to the survey painted a dismal picture of the effects of the 1998 Perkins policy changes. More than half of the programs reported that their funding had decreased and they predicted additional funding cuts in the future. Seventy-one percent reported services to students had significantly decreased. Nearly half reported that students' unmet needs had increased, and one third reported declining program support from State and Local Educational Agencies.

Only two sources of potential funding for former "gender-equity" programs remained in the 1998 version of the law: (a) states were required to reserve $60,000 to $150,000 of "state leadership" funds to provide services to students pursuing nontraditional training and employment, and (b) states could opt to reserve 10% of the basic state grant for local education agencies to support state-level priorities such as programs serving single parents, displaced homemakers, and students pursuing nontraditional training. The cap on state leadership funds made little sense, especially in larger states with more students to serve; for instance, $150,000 would have a greater impact on gender equity in Delaware than California. From 2000 to 2004 the average annual amount of state leadership funds spent on gender equity was $4,212,000 compared to over $100,000,000 each year prior to the 1998 reauthorization. In addition, only two states took advantage of the option to reserve 10% of local funds for single parents, displaced homemakers, and students pursuing nontraditional careers and only did so for a few years.

1998 *Perkins Accountability Measures*

The only other major equity initiative in the 1998 Perkins Act was an accountability measure, which required states to report student enrollment in and completion of programs that are nontraditional for both genders. State education agencies each year must report to the United States Department of Education (ED), Office of Vocational and Adult Education (OVAE) data on the performance of students in CTE on each of the four indicators of performance. These indicator include,

1. Academic and technical skill attainment.
2. Completion of a CTE program.
3. Placement in employment, military, or postsecondary education.
4. Participation in and completion of nontraditional training and employment programs.

Nontraditional training and employment is defined in the Perkins Act as "occupations or fields of work, including careers in computer science, technology, and other emerging high skill occupations, for which individuals from one gender comprise less than 25% of the individuals employed in each such occupation or field of work." Based on this definition, states had to identify CTE programs that prepare students for these occupations, and were required to set benchmarks for their performance starting in 1999. States then negotiated with the ED, Office of Vocational and Adult Education (OVAE) annual performance measures for the participation and for the completion of students in nontraditional CTE programs.

States report in their Consolidated Annual Report (CAR) the numbers and percentages of underrepresented students participating (enrolled) in nontraditional CTE programs and the numbers and percentages of underrepresented students completing nontraditional CTE programs. In addition, states are also required to disaggregate data by gender, race/ethnicity, and special population status for each of the four core indicators of performance as well as the enrollment report. (This data can be found at www.edcountability.net.) Special populations include,

- Individuals with disabilities;.
- Economically disadvantaged students, including foster children.
- Individuals preparing for nontraditional training and employment.
- Single parents, including single pregnant women.
- Displaced homemakers.
- Individuals with barriers to educational achievement, including individuals with limited English proficiency.

Although, this might sound like a rich and robust data source, the Perkins accountability system has been fraught with inconsistencies and data quality issues: states have different definitions for program participant, concentrator, and completer; different programs identified as nontraditional; and different methods of collecting the data, ranging from individual student record systems to classroom-based reporting. States have significant difficulty reporting on the numbers of single parents and displaced homemakers in CTE programs, as this data is self-reported due to federal privacy laws and there is no other proxy for the data source. Needless to say, comparing state-to-state data or trying to draw any significant or reliable national conclusions from the data is somewhat suspect or even impossible. The data, however, is extremely valuable for within-state comparisons and for use to inform local program improvement efforts. As of 2006, the OVAE was leading an initiative with the states to improve data quality and stan-

dardize definitions and measures to improve the Perkins national accountability system.

As of 2004, only two states, Massachusetts and North Dakota, have met their negotiated performance measures for nontraditional participation and completion at both the secondary and postsecondary level every year since the implementation of the 1998 Perkins Act (Peer Collaborative Resource Network [PCRN], 2006). Congress expected that this accountability tool would encourage states to take steps to improve gender equity. Without targeted funding, however, a mechanism to hold local educational agencies accountable, and stronger federal sanctions or incentives for states, progress has been at a standstill at best. On a positive note, advocates have greater access to this information, because states are now required to collect and report data about nontraditional CTE.

The Carl D. Perkins Career and Technical Education Improvement Act of 2006

In the summer of 2006, S. 250, the reauthorization of the Perkins Act (Perkins IV), was passed and signed into law. While the bill, to a large extent, replicates the 1998 Act, it adds a new requirement that use of local funds include preparation of special populations, including single parents and displaced homemakers, for high-skill, high-wage occupations that lead to self-sufficiency. The Congressional conference report defines "self-sufficiency" as "a standard of economic independence that considers a variety of demographic and geographic factors, as adopted, calculated, or commissioned by a local area or state." The term occurs in several places in Perkins III, including local plan requirements.

While some changes were made to the core indicators in the Perkins Act, the core indicators measuring gender equity were retained. The indicators continue to require both secondary and postsecondary schools receiving Perkins funds to be held accountable for increasing the participation and completion of underrepresented gender students in CTE programs that prepare for nontraditional careers. Because of the work done during Perkins III to develop valid and reliable data reporting processes and state accountability systems, states should be better equipped to set accurate benchmarks and negotiate appropriate performance measures based on historical data trends. This will be especially important for these two core indicators related to gender equity as states have had mixed success with meeting their performance measures set during Perkins III.

The new law requires continued disaggregation of data by special populations, including disparities and gaps in performance. This requirement is a means to assure that attention continues for students participating in nontraditional occupational training. National requirements include conducting an evaluation and assessment of the extent to which CTE prepares students, including special populations, for employment in high-skill, high-wage occupations (including those requiring math and science skills) or for participation in postsecondary education. Additionally, the law contains language supporting a stronger assessment of the performance of special population students and the impact of core indicators of performance on CTE in the National Assessment of Vocational Education (NAVE). This may lead to more and better evaluation of the impact of CTE on special populations, including the identification of best practices and outstanding local programs.

The most significant change from Perkins III to Perkins IV is the requirement that local recipients must negotiate performance measures on each of the core indicators with the state, increasing local accountability. Local education agencies (LEA) will be required to meet 90% of each locally adjusted performance measure annually in the first year of funding. If they fail, they must write an improvement plan to address the failing measure. If they fail to show any improvement in the second year, then the state can withhold federal funds during the third year. If they show improvement in the second year, but fail to meet the 90% threshold, they must continue to operate under the improvement plan. Should they not meet at least 90% of the measure in the third year, the state can again withhold funding.

Since there is significant data that shows states have *not* met the performance measures with the federal government, it is clear that the new accountability requirements will result in the need for greater care on the part of LEAs in negotiating performance measures and achieving them. Since the fourth core indicator relates to gender equity, there is the likelihood of more specific efforts to actually achieve the negotiated performance measures.

In order for the requirements and stronger language in Perkins IV to be effective, the equity community should encourage the U.S. Department of Education to be diligent in carrying out the intent of the law with regard to special populations. States are required to consult with representatives of special populations in development of their state plans. Because of the additional requirements in the law regarding these populations, Perkins IV may actually strengthen the manner in which CTE moves toward true gender equity.

From the 1970s on, women and girls have benefited from the strong advocacy by women's organizations especially on their behalf with regard to federal career and technical education legislation. The National Coalition for Women and Girls in Education has played a major role. The following organizations have been especially prominent in advocating for women and girls in CTE: American Association of University Women (AAUW), National Women's Law Center (NWLC), Wider Opportunities for Women (WOW), Women Work, and the National Alliance for Partnerships in Equity (NAPE).

NAPE is unique among these advocates in that it was established as a consortium of State Departments of Education in 1990 with the goal of assisting within the education community and systems in providing technical assistance to move gender equity forward. During Perkins III, NAPE worked consistently with the National Association of State Directors of Career Technical Education Consortium and the Office of Adult and Vocational Education, U.S. Department of Education, on performance measures and standards.

Title IX and the U.S. Department of Education Office for Civil Rights

Title IX of the Education Amendments of 1972 prohibits sex discrimination in any educational program or activity that receives federal financial assistance (e.g., all public middle and secondary

schools, and almost all postsecondary schools and even proprietary technical training schools whose students receive federal grants or loans). In 1979, the agency that became the Department of Education implemented regulations for interpreting and enforcing Title IX. These regulations require, among other things, that each recipient of federal financial assistance

1. Designate a Title IX coordinator to ensure compliance with the law (34 CFR §106.8).
2. Adopt and publish policies and procedures for resolving complaints of discrimination (34 CFR §106.8) and harassment.[3]
3. Refrain from segregating courses by sex (34 CFR §106.34) and from discriminating on the basis of sex in guidance counseling (34 CFR §106.36).
4. Take steps to ensure that disproportionate enrollment of students of one sex in a course is not the result of discrimination (34 CFR §106.36).

These regulations also established the requirement that the ED Office for Civil Rights (OCR) undertake a compliance review or investigation of discrimination whenever a "report, complaint or any other information indicates a possible failure to comply" with Title IX (34 CFR §100.7, incorporated into the Title IX regulations by CFR §106.71).

Also in 1979, after the decision in the Adams *v.* Califano case finding continuing unlawful discrimination in vocational education programs, the ED released the "Vocational Education Guidelines for Eliminating Discrimination and Denial of Services on the Basis of Race, Color, National Origin, Sex and Handicap", hereafter referred to as the "Guidelines for Vocational Education Programs" (U.S. Department of Education, Office for Civil Rights, 1979). The guidelines emphasize that schools must offer CTE without regard to sex. Counseling activities, promotional and recruiting efforts, internships, and apprenticeships must be provided to all students without discrimination on the basis of sex.

The Title IX regulations and "Guidelines for Vocational Education Programs" impose requirements on schools that were intended to help eliminate sex discrimination against and harassment of students in nontraditional CTE. Perhaps the most important Title IX regulation for students in these highly sex-segregated CTE courses is the requirement that schools take steps to ensure that disproportionate enrollment of students of one sex in a course is not the result of discrimination. An important feature of the 1979 "Guidelines for Vocational Education Programs" is for state education agencies to have oversight responsibilities by collecting, analyzing, and reporting civil rights data, conducting compliance reviews, and providing technical assistance. The guidelines also provided that states conduct a Methods of Administration (MOA) review of school districts and postsecondary institutions receiving federal vocational education funds to assure that issues of discrimination were being addressed. The continued patterns of disproportionate enrollment demonstrated by concrete data and the evidence of discrimination suggest that schools must do a better job of complying with this regulation.

Unfortunately, lack of enforcement has limited both the MOA's and Title IX's effectiveness in eliminating sex discrimination in CTE. In recent years, rather than focusing specifically on sex discrimination in a separate MOA/Title IX review process, states have consolidated gender-equity reviews into whole school improvement reviews, often decreasing the emphasis on this issue. When the National Women's Law Center (NWLC) called on the federal government to enforce Title IX by investigating patterns of sex segregation in 2002, the OCR refused, even though federal law directs the OCR to conduct such investigations when information suggests noncompliance. The federal government's refusal to investigate patterns of sex segregation is troubling given the substantial disparities in enrollment that persist in high school CTE today, over 30 years after Title IX became law. For more information on Title IX and other federal legislation mentioned in this chapter, see chapter 5, "The Role of Government in Advancing Gender Equity in Education."

Temporary Assistance for Needy Families

Because of the focus of Perkins on single parents and displaced homemakers, Perkins-funded CTE equity programs have a long history of collaborating with the welfare system. In 1988, the Job Opportunities and Basic Skills (JOBS) Act was passed. It stressed the importance of education and training for welfare recipients. In the summer of 1996, when welfare legislation was up for reauthorization, Congress passed and President William J. Clinton signed the "Personal Responsibility and Work Opportunity Reconciliation Act of 1996" (welfare reform), radically transforming the nation's welfare system. This law reflected a "work first" philosophy, which intended to decrease welfare rolls by placing recipients in jobs—any job—as quickly as possible. Access to career and technical education, once a means to educating welfare recipients to access high-skill, high-wage occupations that might move them off assistance, became dramatically limited. The 1996 law limited a recipient's participation in CTE to 12 months and restricted 70% of a state's caseload from participating. These restrictions and the elimination of the set-asides discussed above resulted in a dramatic reduction in welfare recipients' participation in CTE (NCWGE, 2001).

Temporary Assistance for Needy Families (TANF), often referred to as "welfare," provides assistance and work opportunities to needy families by granting states the federal funds and wide flexibility to develop and implement their own welfare programs. In the Deficit Reduction Act of 2005, signed by President George W. Bush on February 8, 2006, TANF was reauthorized through 2010. The basic TANF block grant was authorized for $16.5 billion in federal funds (see www.aft.hhs.gov). TANF does not fund CTE programs directly; rather, its work requirement rules and participation rates impact the ability of single parents and displaced homemakers receiving welfare to access job training.

The 2006 TANF reauthorization did not overhaul TANF work participation standards. It maintained the "work first" philosophy, continued to restrict participation in CTE to 12 months, limited states' caseload in CTE to 30%, and maintained work participation

[3]Further guidance from the Department of Education in 1997 and 2001 regarding sexual harassment made clear that each school's (district's) antidiscrimination policies must include provisions for resolving complaints about sexual harassment.

rates at 50% for all families and 90% for two-parent families; however, the reauthorization made three significant changes that will make it more difficult for states to meet their participation rates:

1. Work participation standards are reduced only for caseload reductions that occur based on data from FY 2005;
2. Families in state-funded "Separate State Programs" will be counted in the work participation rate; and
3. The U.S. Department of Health and Human Services (HHS) is required to develop standards for states to define work activities and verify work participation (Congressional Research Service [CRS], 2006).

If states don't meet these participation rates, they could expect a 5% reduction in their state block grant and be required to have a higher maintenance of effort (state funding for welfare support). In FY 2004, 41 states/territories had participation rates below 50%, with the average around 32%. In addition, the Congressional Research Service's preliminary estimates indicate that in FY 2004, just over 5% of families in TANF and separate state programs participated in CTE, secondary education, or GED preparation (teen parents) (Ganzglass, 2006b). Although this could be interpreted as an incentive to purge state welfare roles even further, some advocates see this as an opportunity for states to increase their participation rates by encouraging recipients to access CTE as a work activity.

States *do* have the opportunity to maximize the use of CTE as a work activity. They can do this by making full use of their "allowance" for CTE (and teen parent school attendance), which allows them to place almost one third of all families that are counted toward the 50% rate in CTE. For states to do this, they must be willing to spend money on career and technical education. Because of severe budget cuts in many states in recent years, funding for education for welfare recipients has been significantly reduced.

Only time will tell the impact of these changes in TANF, but research shows that when welfare recipients gain employment skills, they are far more likely to achieve self-sufficiency.

Workforce Investment Act

The Workforce Investment Act (WIA), last reauthorized in 1998, is the federal investment in the U.S. Department of Labor's job training system. In FY 2006, $4.0 billion was appropriated for WIA programs. Funding for WIA is allocated to each state's Workforce Investment Board and distributed to Local Workforce Investment Boards to implement local workforce development programs. In many local workforce development areas, the provider of this job training is the CTE program at the local secondary school, area career technical center, or community college.

Despite increased need for services, from 2000–2003 there was a 14-percentage-point decline in the number of low-income, disadvantaged adults receiving training. The number of workers trained under WIA has declined significantly when compared to the preceding program, the Job Training Partnership Act (JTPA). Thirty-four percent fewer individuals received training under WIA in Program Year 2002 than under the JTPA in Program Year 1998. The tiered system, instituted in 1998, in which job seekers had to pass sequentially through core and intensive services before receiving access to training services, resulted in many who needed training stuck in core services, like job search, rather than preparing themselves with the skills that the labor market demanded.

The United States has more than 7.3 million displaced homemakers and 13.6 million single mothers—all of whom can use training that will enable them to attain self sufficiency (Women Work!, 2005). During the reauthorization of the Perkins Act in 1998, then House Education and Workforce Committee Chairman, Representative William Goodling (R-PA), promised the gender-equity community that single parents and displaced homemakers would be better served under WIA's dislocated worker program than with gender-equity provisions to serve them in the Perkins Act. When WIA was reauthorized in 1998, displaced homemakers were included in the definition of dislocated workers, giving states the option of using dislocated worker funds to serve displaced homemakers. The reality is that Representative Goodling's promise was never fulfilled, as very few states have taken advantage of this option.

THE CURRENT STATUS OF GENDER EQUITY IN CTE

High School

The National Women's Law Center recently conducted a study of high school (Grades 9–12) CTE enrollment in 12 states[1] and found evidence of pervasive sex segregation (National Women's Law Center [NWLC], 2005a) In these states, females represent more than five out of six students enrolled in courses in traditionally female fields, but just 1 out of every 6 students in traditionally male courses (NWLC, 2005a, p. 4).

As demonstrated in Figure 20.1, girls are greatly overrepresented in courses in traditionally female fields—most noticeably in cosmetology, where 98% of students are female (NWLC, 2005a, p. 5). In both Arizona and Washington, only nine boys are enrolled in cosmetology courses in the entire state, compared to 561 and 340 girls, respectively (NWLC, 2005a, p. 5). Across the 12 states, girls also make up 87% of childcare students and 86% of students in health-related courses (70% when nutrition-related courses are included; NWLC, 2005a, p. 5). In Illinois, just 651 boys, compared to 7,731 girls, are enrolled in childcare courses (NWLC, 2005a, p. 5). In New Jersey, all 40 nursing students are female (NWLC, 2005a, p. 5).

Conversely, girls are severely underrepresented in fields that are nontraditional for their gender (NWLC, 2005a, p. 6). On average, girls represent just 14% of the total of all CTE students in the traditionally male fields of agriculture, precision production, engineering, construction and repair, and automotive service (NWLC, 2005a, p. 6). In many specific courses within these broader categories, girls are participating at even lower rates—and sometimes not at all (NWLC, 2005a, p. 6). For example, no girls are en-

[1]Arizona, California, Massachusetts, Michigan, Mississippi, Missouri, New Jersey, North Carolina (2003–2004 school year), Florida, Illinois, Maryland (2002–2003 school year), and Washington (2001–2002 school year).

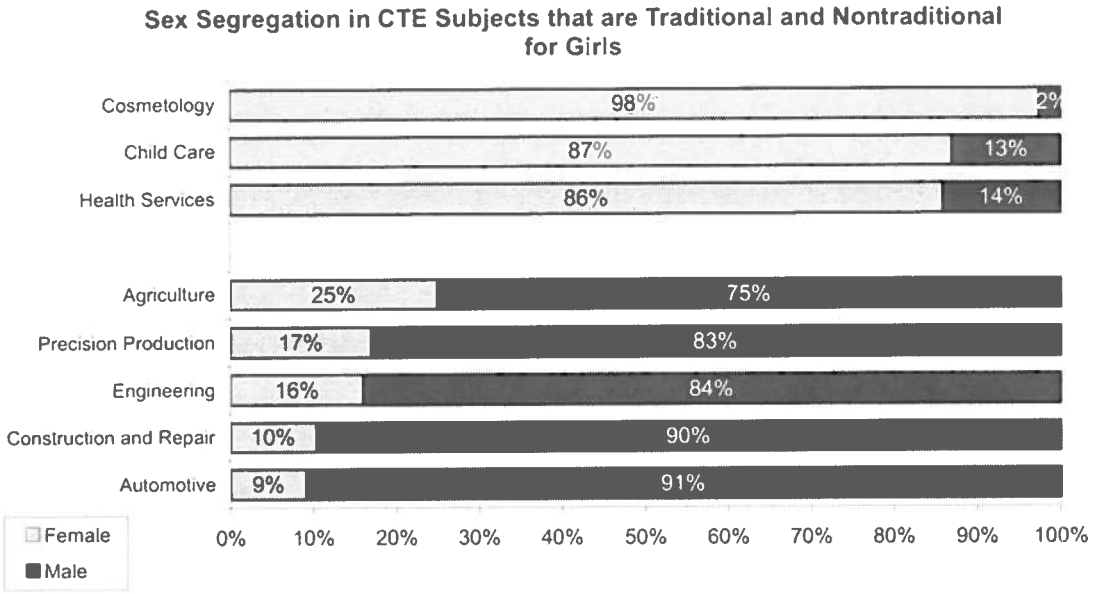

FIGURE 20.1 Sex segregation in CTE by gender.

rolled in electrician courses in Illinois, masonry courses in Missouri, or plumbing courses in North Carolina (NWLC, 2005a, p. 6). According to 2004 data, just one girl in the entire state of Florida was pursuing plumbing, and only one was learning electronic equipment installation in New Jersey (NWLC, 2005a, p. 6).

Though nontraditional courses for women represent a large percentage of CTE course options in every state (57%, on average), only a very small proportion of young women are enrolled in these courses. On average, just 1 out of every 7 girls taking CTE courses is enrolled in a nontraditional course, and in no state is more than 1 in 4 girls taking CTE courses enrolled in a nontraditional course. Conversely, girls are preparing for traditionally female occupations at a disproportionately high rate. Boys are enrolled in traditional and nontraditional programs at rates comparable to those of girls: 41% are enrolled in traditionally male courses and 9% in courses nontraditional for males. While this figure also indicates sex stereotyping, girls' enrollment patterns have especially troubling consequences, economic, and otherwise. On average, nearly 1 in 3 girls in the CTE system is concentrated in traditionally female fields—ranging from a low of 20% of girls in Michigan to a high of 38% in Maryland.

Although lack of access to educational opportunities affects both genders, it is particularly troubling for women in today's economy. Discouraging young women from pursuing nontraditional training can limit their access to nontraditional jobs, which are more likely to be high paying than traditional jobs. As Figure 20.2 shows, male-dominated fields pay a median hourly wage of $18.04, while the traditionally female fields pay just $13.80 on average. This translates into a median annual salary of $37,520 for men and $28,695 for women—a $8,825 wage gap (BLS, 2005). In local labor markets, some of the most high-demand and high-wage jobs are nontraditional for women. In New Jersey, for example, network systems and data communications analysts are in very high demand and earn two to three times as much as those who work in the other four fastest growing occupations in the state. And among the 25 occupations with the highest percentage growth projected for 2004–2014 by the New Jersey Department of Labor, none of the five occupations with the highest hourly median wage are traditional for women (New Jersey Department of Labor, 2004).

Boys' and girls' low enrollment in nontraditional courses is neither due to low overall participation in CTE nor to a lack of nontraditional courses from which to choose. Rather, the magnitude of the enrollment disparities found in the research indicates that these patterns are not the product of unfettered choice alone, but rather that discrimination and barriers are limiting young men's and women's opportunities to pursue careers that are nontraditional to their gender. These barriers not only reinforce negative gender stereotypes, but also limit girls' opportunities to later pursue careers that often pay higher wages and offer better benefits and opportunities for advancement. As noted elsewhere, research regarding CTE and gender equity is very limited. Thus, there is more research available on the evidence of discrimination than on the mechanisms that produce it.

Additional high-school data is available on the ED Web site[5], where the Perkins accountability data is accessible by state. This accountability data includes (a) enrollment data, (b) performance measure data, including the participation and completion of underrepresented gender students in nontraditional CTE programs, and (c) summaries of the narratives from the states consolidated annual reports. Performance data is based on benchmarks set in 1999, when the accountability system was first put into place. Each year, states negotiate their annual performance measure with OVAE to set their performance goals for the year.

[5]Peer Collaborative Resource Network, available at http://edcountability.net.

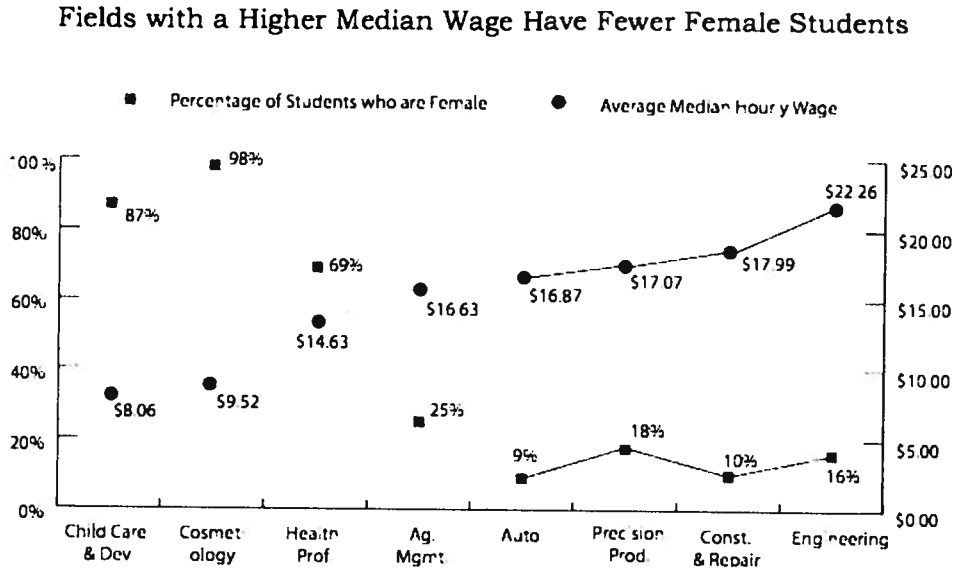

FIGURE 20.2 Female participation in CTE programs and in occupations by wage level.

High-school performance on the "fourth-core indicator" is poor at best. Only 18[6] states met their performance measure for "4s1" (secondary nontraditional participation), and only 17[7] states met their performance measure for "4s2" (secondary nontraditional completion) every year since the implementation of the 1998 Perkins Act. When disregarding the performance measure and only looking at an increase in performance over the time of implementation, however, 25[8] states increased performance on "4s1" and on "4s2" from program year 2000–01 to 2004–05.

Regardless, it is clear from both the National Women's Law Center report and the data reported to the OVAE that states and local educational agencies need assistance to increase the participation and completion of students pursuing nontraditional CTE programs.

Postsecondary

Unfortunately, data similar to that found in the NWLC study is not available for postsecondary CTE programs across the country. The most current data available to determine the status of postsecondary programs on increasing nontraditional enrollments is through the self-reported data submitted to the OVAE each year in the Perkins Consolidated Annual Reports. Mirroring secondary performance as described above, postsecondary performance on the fourth core indicator is also quite bleak. Only 13 states met their negotiated performance measure for "4p1" (postsecondary nontraditional participation) and only 10 states met their negotiated performance measure for "4p2" (postsecondary nontraditional completion) every year since the implementation of the 1998 Perkins Act. When disregarding the states-negotiated performance measure and only taking reported performance into account, however, 21 states increased their performance on "4p1" and 17 states increased their performance on "4p2" from Program Year 2000–01 to Program Year 2004–05. Needless to say, states, and local education agencies are struggling with increasing the participation and completion of underrepresented gender students in nontraditional CTE programs.[9]

In a study conducted as part of the National Assessment of Vocational Education (Bailey, Alfonso, Scott, & Leinbach, 2004) researchers analyzed the educational outcomes of subpopulations who are traditionally disadvantaged in postsecondary education. These subpopulations include (a) students who are economically disadvantaged, (b) students who are academically disadvantaged, (c) single parents, (d) students of nontraditional

[6]FL, IA, IN, KY, LA, MA, MI, ND, NE, NJ, NV, OH, OK, SC, VA, VT, WI, WY

[7]AK, CA, FL, GA, IA, ID, KS, MA, MI, ND, NE, NJ, OK, VA, VT, WI, WY

[8]For 4s1: AL, CA, CO, DC, FL, GA, ID, IL, IN, KS, MI, MT, NC, NE, NV, NY, RI, VA, VT and for 4s2: AL, AZ, CO, DC, IN, KS, NE, NH, NV, RI, SC, SD, UT, VT

[9]The states that have met or exceeded their negotiated performance measure for postsecondary nontraditional participation for each year of the Perkins Act are Alaska, Connecticut, Delaware, Georgia, Louisiana, Massachusetts, Minnesota, North Dakota, New Mexico, Oregon, Rhode Island, South Carolina, Vermont, Washington, Wisconsin, West Virginia, and Wyoming. Those that exceeded or met their negotiated performance measure for postsecondary nontraditional completion are Alaska, Arizona, Connecticut, District of Columbia, Delaware, Georgia, Louisiana, Massachusetts, Maryland, Minnesota, North Dakota, New Mexico, Rhode Island, South Carolina, South Dakota, and Virginia. The fact that between 2000 and 2003, only 32% of states have consistently met one of their nontraditional performance measures at the postsecondary level and only 20% have met both of their nontraditional performance measures indicates that much work needs to be done at the postsecondary level as well.

age, and (e) females in nontraditional occupational major. The following are significant findings about these students:

- Special populations tend to complete degrees less often than nonspecial population groups.
- Special population students in occupational majors generally do not have significantly different completion rates than their peers in academic majors (which contrasts the findings for nonspecial population students).
- Economically disadvantaged students in occupational programs are as likely to complete their degree goals as their economically disadvantaged academic peers.
- Females in nontraditional majors are just as likely to complete their expected degrees as their counterparts who are enrolled in more traditional majors.

In this same study (Bailey et al., 2004), an analysis of the enrollments of underrepresented gender students was also completed supporting similar results as found by the National Women's Law Center for high schools.

Postsecondary CTE leads to greater employment and earnings gains, especially for women receiving public assistance. A study comparing the employment and earnings of TANF recipients who participated in the California Work Opportunity and Responsibility to Kids (CalWORKS) program and other women students who exited California community colleges in 1999 and 2000 found that CalWORKS women increased their earnings substantially after college (Mathur, Reichle, Stawn, & Wiseley, 2004). By the second year out of school, median annual earnings of CalWORKS women with vocational associate degrees were approximately 25% greater than women without AA degrees. Those who participated in certificate programs that were at least 30 units long earned more than $15,000 their second year out than women without certificates. Data such as this demonstrates the value of postsecondary CTE for low-income women, especially single parents and displaced homemakers.

The evidence given here also indicates a strong need for postsecondary institutions to continue their gender-equity efforts to ensure the success of students pursuing nontraditional careers, as well as single parents and displaced homemakers.

NEED FOR GENDER EQUITY IN CTE

Despite the years of hard work and funding, we cannot yet report that gender equity in CTE has been achieved. All significant measures of success—research on career development, data on K–12 course enrollment and postsecondary training programs, or occupational earning figures for women and men—point to the need for more work in this arena. The benefit CTE gives students in the labor market is not generally taken advantage of by females. In 2000, females earned fewer units in CTE than did their male counterparts (NCES, 2004).

Career Expectations: Gender Stereotypes and Family Responsibilities Limit Choices

Without continued efforts on the part of teachers, administrators, and parents to achieve gender equity in CTE, students will unconsciously limit their career choices. Career selection—and elimination—based on gender-role socialization begins early. Research on human development finds that children as young as ages six to eight years begin to eliminate career choices because they are the wrong sex type (Gottfredson, 1981). By early adolescence, students already have strongly defined gender-role expectations about work (Women's Educational Equity Act [WEEA] Resource Center, 2002); however, most career exploration programs do not begin until students' adolescence, well after stereotypes are already well established. (WEEA Resource Center, 2002).

In an inequitable environment, students will make career choices based on limited factors, including family and personal demographic characteristics. Parent education and occupation, social class, and such factors as acculturation and discrimination all affect how students develop their career expectations. "Additional structural factors, including limited opportunities, immediate financial or family needs, and, for some, the mobility of living as migrant or seasonal working families, have an even greater impact" (WEEA Resource Center, 2002, p. 2).

Family and personal demographic factors often contribute to highly sex-segregated career choices. Girls with low-socioeconomic-status parents have higher sex-stereotyping scores than girls with high-socioeconomic-status parents, while boys with low-socioeconomic-status parents have lower sex-stereotyping scores than boys with high-socioeconomic-status parents (Billings, 1992). Some research shows that for African American females, "early gender-role socialization is less sex-stereotyped [than for other girls] and that African American girls often experience more crossover between traditionally male and female roles and duties in the household" and may be more open to considering nontraditional careers (Wierzbinski, 1998, p. 1).

The need for continued work to promote gender equity is just as great at the postsecondary level. Perceived and real concerns about balancing work and other life responsibilities will continue to significantly limit women's career selection. While female college students now have career expectations equal to those of males, they still perceive role conflicts and see family issues such as raising children and lacking affordable, quality childcare as potential career barriers, concerns shared by few

TABLE 20.1 Females in Majors Nontraditional for their Gender Nontraditional Occupational Majors, NELS: 88-00

Occupational Majors		
Female Nontraditional Majors	Males	Females
Agriculture	80.9%	19.1%
Engineering	84.3%	15.7%
Engineering Technologies	80.9%	19.1%
Construction	88.3%	11.7%
Mechanics/Electronics	98.7%	1.3%
Precision Production	98.6%	3.2%
Male Nontraditional Majors		
Business Support/Secretarial	23.3%	76.7%
Consumer Services	8.9%	91.1%
Nursing/Nurse Assisting	17.8%	82.2%

Source: Bailey et al. (2004), Table E.1

men (American Association of University Women [AAUW] Educational Foundation, 1998; Alfeld et al., 2006). Spousal or significant-other support was found to be a major factor that differentiated the women who remained in their nontraditional occupation for more than two years from the women who left within two years or who never entered (Shanahan, Denner, Rhodes, & Anderson, 1999).

Course and Program Enrollment: Stubbornly Sex-Segregated

The need for continued efforts to achieve gender equity in CTE still exists because current data reveals persistent patterns of sex segregation in career exploration and preparation programs. The patterns, which can be dismantled at a local or state level with intense and focused attention, are consistent for high school and postsecondary CTE course and program enrollment.

In spite of the requirements of Title IX and the gender-equity provisions in the Perkins Act, pervasive sex segregation in high school CTE programs—with girls predominantly enrolled in "traditionally female" programs and boys primarily participating in "traditionally male" courses—still exists nationwide (NWLC, 2005a).

In 1980, sex segregation in vocational education was clear, with females representing 91% of students training as nursing assistants, 87% of those training as community health workers, and 92% of those training as cosmetologists and secretaries (Farmer et al., 1985). At the same time, males in vocational education were overrepresented in auto mechanics (96%), carpentry (96%), small-engine repair (96%), electrical technology (95%), welding (95%), appliance repair (94%), and electronics (90%; Farmer et al., 1985).

Twenty years later, a report conducted by the NWLC using state-level data from 12 selected states' data revealed the same pattern of sex segregation across the nation: female students make up 98% of students enrolled in cosmetology, 87% of students enrolled in childcare courses, and 86% of students enrolled in courses that prepare them to be health assistants (NWLC, 2005a, p. 5). Male students, in contrast, comprise 94% of the student body in training programs for plumbers and electricians, 90% of the students studying to be welders or carpenters, and 91% of those studying automotive technologies (NWLC, 2005a, p. 5)

In associate degree programs, women are almost four times as likely as men to major in health fields, and are also more likely to major in business and office fields (NCWGE, 2001, p. 8). In contrast, male students in associate degree programs are more than five times as likely to major in technical education and more than fourteen times as likely to major in trade and industry programs (NCWGE, 2001, p. 8).

Women and Men in the Workforce: Substantial Disparities

The need for gender-equity work within CTE continues because America's workforce remains sex-segregated and is not meeting the needs of real working men and women. For women, these needs often include salaries that allow them to support themselves and their families. Census data show there were more than 20.9 million displaced homemakers and single parents in 2003, a 39% increase from 1994. The people in this population subset are likely to be poor, unemployed, or working in low-wage jobs. In fact, nearly 30% are working in low-paying service jobs that offer few, if any, benefits (Women Work!, 2005).

A lack of programs that help women prepare for supporting themselves and their families persists. According to a 2002 report by the NWLC, "Title IX and Equal Opportunity in Vocational and Technical Education: A Promise Still Owed to the Nation's Young Women," the pervasive sex segregation of female students into traditionally female programs has a serious adverse impact on their economic well being. For example, students entering childcare fields will earn only a median salary of $7.43 per hour, and cosmetologists will earn a median salary of $8.49 per hour (NWLC, 2002, p. 2). By contrast, the median salary for students who become plumbers and pipe fitters is $18.19 per hour, and the top 10% of workers in that field will make $30.06 per hour (NWLC, 2002, p. 3). Similarly, electricians have a median salary of $19.29, and are eligible to earn up to $31.71 while progressing in the career tracks created in their field (NWLC, 2002, p. 3). In no case, moreover, does the amount earned by the top 10% of workers in the predominantly female fields of cosmetology, childcare, or medical assistant even begin to approach the ***median*** wages earned by those employed in predominantly male occupations (NWLC, 2002, p. 4). For example, the top 10% of childcare workers earn $10.71 per hour, which is 41% ***lower*** than the median amount earned by mechanical drafters (NWLC, 2002, p. 4).

Wage earnings for men and women are significantly different within the same occupation, which raises questions of pay equity. For example, in 2005, the median weekly earnings for men and women in construction trades were $606 and $504, respectively, and the median weekly earnings for men and women as registered nurses were $1,011 and $930, respectively (BLS, 2005). Another interesting phenomenon exists: wages increase when men enter traditionally female occupations and decrease when women enter traditionally male occupations. For example, once a male-dominated profession, veterinarians are inching closer to fifty-fifty on gender with veterinary school enrollments now at 71.4% female (Veterinary Economics, 2002); however, male veterinarians earn 20.7% higher pay than their female counterparts (Veterinary Economics, 2003). As more women enter the profession, the average wages continue to decline. These data suggest that, in addition to sex segregation in CTE programs, gender bias is alive and well in the workplace. Regardless, the benefits women may gain because of careers in nontraditional occupations merit ongoing gender-equity work in CTE and with employers to overcome the challenges they face.

Men in nontraditional careers also face consequences that adversely affect their well-being. Men who work in nontraditional career fields face institutionalized challenges to their sense of masculinity (Henson & Rogers, 2001) and often face intimidating behaviors and stereotypes that prevent their full participation (Thurtle, Hammond, & Jennings, 1998). Men in nontraditional careers may also face job-placement difficulties (Thurtle et al., 1998). For more information on workforce issues, see chapter 4, "Impact of Education on Gender Equity in Employment and its Outcomes."

The most important variable affecting earnings of both genders is occupation, not education. Noble (1992) noted that women

were stuck on the "sticky floor" of low-wage occupations. Mastracci (2004) described the occupational segregation among genders akin to creating a "pink collar ghetto," in which 65% of all working women are clustered into 20 of the lowest-paying occupations. Even among the women working in high-skill, high-wage, high-technology occupations (which are nontraditional by gender), women continue to cluster in the entry-level job titles. For example, five of the fastest growing occupations through 2012 are in the information technology industry (U.S. Department of Labor, 2002a). Women are making inroads into this emerging field; however, they are clustered into lower paying, lower skilled aspects of the industry, such as information processing, while the majority of the highest-paying specialties in the fastest-growing occupations, such as systems engineering, are held by men (U.S. Department of Labor, 2002b). Contrary to the "glass ceiling" phenomenon, where women are unable to rise to higher-level positions within male-dominated professions, a vastly different experience is noted for men in traditionally female occupations, such as nurses, elementary school teachers, librarians, and social workers. Hultin (2003) described an unequaled upward mobility of men in traditionally female-dominated professions as a "glass escalator," where men are quickly moved into higher-paying, more prestigious positions within the occupation.

PROBABLE CAUSES FOR THE LACK OF GENDER EQUITY IN CTE

Research shows that women and girls have made great educational progress in recent years. The gender gaps in math and science have been narrowed. Women surpass men in both bachelor and master degree achievement; however, it appears that these achievements are not being translated into nontraditional career choices that lead to high-skill, high-wage careers in science, math, engineering, and technology. What does research reveal about educational practices that are root causes for students choosing to follow a traditional or nontraditional career path? The causes are found not only in CTE itself, but also in the larger sphere of education and in societal stereotypes. They include (a) lack of early exposure to nontraditional occupations and role models; (b) student attitudes; (c) unsupportive career guidance practices and materials; (d) lack of encouragement to participate in math, science, and technology; (e) stereotyped instructional strategies and curriculum materials; (f) a chilly school/classroom climate that can result in student isolation; (g) lack of self-efficacy; and (h) limited support services (National Centers for Career and Technical Education [NCCTE], 2003).

Lack of Early Exposure to Nontraditional Occupations and Role Models

The American Counseling Association (1998) stressed the importance of early exposure to careers as a foundation for later career decisions. To be truly effective, exposure to nontraditional careers must be initiated in elementary school. Gender stereotyping regarding occupations occurs early, with children ages six to eight years beginning to eliminate careers because they were the wrong sex-type (Kerka, 2001). In fact, Billings (1992) studied perceptions of second and sixth graders and found that second graders have significantly higher sex-stereotyping scores than sixth graders. Schools have the potential to impact such stereotypes.

Nontraditional role models are a significant factor in a student's choice to pursue a nontraditional career. Many choose careers because they have been exposed to them through their interactions with others, or because they can personally identify with individuals in those fields. Interviews with women employed in the trades revealed four significant factors that influenced their career choice: (a) a perceived innate ability, (b) a strong sense of self, (c) a desire for independence, and (d) access to role models—especially family members (Greene & Stitt-Gohdes, 1997, as cited in NCCTE, 2003, p. 62). Role models can come from family, community, and the school. The lack of role models in nontraditional fields can have strong consequences in career development, particularly for minorities (Esters & Bowen, 2003).

Student Attitudes

Attitudes and biases regarding the world of school and the world of work are based on social, familial, educational, and societal experiences. Socialization has a profound impact on the ways in which males and females think about potential occupations (Welty & Puck, 2001). Further, specific courses are associated with either femininity (e.g., humanities) or masculinity (e.g., technology; Welty & Puck, 2001). These student attitudes, shaped and influenced by complex and dynamic aspects of culture and society, can be positively influenced by targeted programming, which includes early exposure to nontraditional careers and role models (Multistate Academic and Vocational Curriculum Consortium [MAVCC], 2001).

Biased Career Guidance Materials and Practices

While students often get information about career decision making through the guidance process in their schools, gender-biased career guidance practices can deter students from participating in nontraditional training programs. Guidance personnel often use interest inventories and aptitude assessments to assist students in selecting career-related coursework or majors in college, and these assessments are sometimes a means through which gender bias is propagated. For example, the Armed Services Vocational Aptitude Battery (ASVAB) assesses exposure to a subject (e.g., tests knowledge of automotive components, systems, tools, and repairs—a subject to which women have little exposure), rather than general aptitude (General Accounting Office, 1999). For more information on these assessment issues see chapter 8, "Gender Equity in Testing and Assessment."

Gender stereotyping is also evident in the CTE career counseling and recruitment system. Some counselors may not advise

students on nontraditional careers because they incorrectly assume they will not be interested (NWLC, 2005a). Stereotypes and bias related to female students of color may be even greater with regards to technical and scientific fields (Ginorio & Huston, 2001). A report from the U.S. Commission on Civil Rights (2000) emphasized how important it is for teachers and counselors to encourage girls' participation in technical fields.

Lack of Encouragement to Participate in Math, Science, and Technology

Participation and success in math, science, and technology courses are gateways for participation in nontraditional careers for women, as well as in high-skill, high-demand occupations. Yet girls are still underrepresented in the preparation for these occupations. Social-psychological causes for this difference can be attributed to teachers' attitudes, beliefs, and behaviors; girls' beliefs and attitudes; current teaching practices for math and science; and the influence of parents and society (Clewell & Campbell, 2002). While significant progress has been made on closing the gap in mathematics, there still exists a perception that women are not as good as men at quantitative disciplines, and, at about middle-school age, girls tend to lose interest and confidence in math and science (National Science Foundation, 2003). While girls are taking more science and math courses at the high-school level, the gender gap in computer science advanced placement test takers has actually widened (Gavin, 2000). Relatively few girls are continuing on in engineering and other physical and quantitative disciplines at the postsecondary level, and even fewer are choosing careers in these fields (Clewell & Campbell, 2002), in spite of the fact that girls have narrowed the gap in skills and knowledge by high school graduation. The ***Handbook*** chapter 13, "Gender Equity in Science, Engineering, and Technology," provides more information on the progress and continued challenges in these areas.

Stereotyped Instructional Strategies and Curriculum Materials

In other chapters, the issue of instructional strategies is addressed comprehensively. These issues are magnified for teachers and students in CTE. For example, Annexstein (2003) reported that teachers often treat students differently in career and technical classrooms, including attributing boys' success in technology to talent while dismissing girls' success to luck or hard work, and having boys learn by doing while having girls sit and study their texts.

Similarly, curriculum materials with limited visual images of individuals in nontraditional careers can negatively impact student participation. Visual representation of working individuals in textbooks, displays, videos, and curricula influences students' gender stereotypes about career options (Kerka, 2001). The way nontraditional careers are advertised and perceived has a significant influence on students considering such careers. Curriculum materials should be evaluated prior to selection and distribution to ensure that they fairly represent the diversity of students (Northrop, 2002).

A Chilly School/Classroom Climate that Results in Student Isolation

Students who experience gender stereotyping, intimidating behaviors, or sexual harassment while in nontraditional CTE programs are less likely to complete the program. Often, nontraditional students have these experiences within the broader educational setting as well, giving clear messages that they do not fit the norm. Indirect messages from teachers and classmates about classroom fit with regard to physical environment (e.g., giving more physical assistance to girls, thereby conveying the assumption they are not strong enough to do the work), teacher-student interactions, and student-student interactions can create barriers to success in nontraditional programs (Sandler & Hoffman, 1992). The subtleties of the classroom environment, including the look and feel, send signals to students about how well they belong (Welty & Puck, 2001). Research suggests that a wide range of inequities in classrooms exists between student and teacher behavior; teachers, regardless of their gender, tend to ask male students three times as many questions as their female students (M. Sadker & D. Sadker, 1994). An alarming rate of student-to-student sexual harassment has been reported (American Association of University Women [AAUW], 2001). Success rates improve when efforts to create gender-equitable classrooms that engage all students are implemented (Ryan, 1999).

Women and girls engaged in nontraditional programs often have to overcome barriers in educational settings. Sanogo (1995) found that over 75% of female nontraditional students report that being the only girl in a class is difficult. Women often find male-dominated educational programs, where few women, if any, are enrolled, as competitive and unappealing. The lack of critical mass of female students is a great deterrent to completion of a nontraditional CTE program. Likewise, women tend to see the content itself as isolating. For example, women perceive use and benefit from technological pursuits when they are designed to perform a specific needed purpose, but men tend to enjoy technology as an interest independent of its application (Gurer & Camp, 2000). Programs that lack same-sex role models and/or same-sex instructors can produce feelings of isolation for men and women, even in otherwise equitable educational environments. Many nontraditional students do not want to be seen as a novelty, a pioneer, or a "token" (Milgram, 1997).

Lack of Self-Efficacy

Self-efficacy, referring to the expectation/belief that one can succeed in careers that are compatible with one's abilities, impacts the willingness of people to successfully pursue nontraditional careers. Traditionally, adult women express lower levels of self-efficacy with regard to math and science concepts (e.g., visual-spatial skills; Betsworth, 1997). Low levels of self-efficacy restrain the number of women entering and completing education and training programs in traditionally male-dominated industries. Margolis and Fisher (2003) described the difference between male and female attributions of failure. Males tend to attribute failure to external factors (e.g., the test was too hard), and females tend to attribute failure to internal factors (e.g., lack of

understanding of the material) and success to external factors, such as luck, identified in the research as the imposter phenomenon or syndrome (Clance & Imes, 1978). Interventions that deal with interest and confidence in nontraditional careers can be successful in mediating the effects of lack of self-efficacy (Betz & Schifano, 2000).

Limited Support Services

Students enrolled in nontraditional CTE programs who receive individualized support services, such as tutoring, mentoring, support groups, childcare, and transportation, are more likely to succeed. Research analyzing the success rates for students in nontraditional educational programs indicated that students who are offered, and who regularly access, supplemental support services have a higher rate of program persistence (Montclair State University, 1997). For example, male nursing students are more likely to be retained if same-sex role modeling is provided (Brady & Sharrod, 2003). Programs promoting gender equity in education through the provision of a comprehensive support system have been subjected to reduced or eliminated funding (NWLC, 2004; NCWGE, 2001). When Perkins was reauthorized in 1998, many states assumed that support services were no longer an allowable use of funds. Advocacy groups worked with OVAE and convinced them to release Program Memorandum-OVAE/DVTE 99-13, clarifying the allowable use of funds for this purpose (ED, Office of Vocational and Adult Education [OVAE], 1999) The ongoing provision of support services will allow students to focus on what's important—their education (Visher & Hudis, 1999).

STRATEGIES THAT CAN MAKE A DIFFERENCE

A discussion of the probable causes of the problems, as identified by the literature, is enlightening, but does not provide guidance as to what has been tried and proven to be successful in providing more equitable opportunities in career training and choice for both men and women. Breaking down the stereotypes and opening options based upon interest and skill rather than gender role stereotypes are the goals. Participation in and completion of training for nontraditional careers is the barometer for this change. The following strategies have indicated positive movement toward this larger goal. As with all initiatives that require lasting change, the process is slow and needs to be constantly reinforced.

Review Educational and Counseling Materials Used with Students

The removal of gender bias and the presentation of positive nontraditional images is often the first step toward providing an equitable experience for men and women in CTE. School publicity and curriculum materials often carry gender-bias messages that impact student career choices. Gender-biased career guidance expectations and practices are often major barriers to student participation in nontraditional programs. Checklists, such as one developed by the Wisconsin Department of Education, have been developed to review not only the career guidance practices, but also curricula (both materials and practices) to increase awareness of these gender practices. The evaluation of equity programs in Louisiana found that programs successful at retaining students in nontraditional career technical programs evaluated their materials for gender bias and stereotyping (University of Southwestern Louisiana, 1993).

Conduct Gender-Equity Professional Development with Teachers at All Levels

While CTE teachers certainly can benefit from professional development, teachers at all levels must become better aware of gender bias and stereotyping in curriculum materials and classroom instruction that create a negative effect on student course selection. Teachers need rigorous and ongoing professional development to learn and improve instructional strategies for working with nontraditional students. Succeeding at Fairness: Effective Teaching for All Students, Generating Expectations for Student Achievement (GESA), Student Achievement Grounded in Equity (SAGE), and The Equity Principal are research-based professional development models that have been effectively used to increase teachers' and administrators' (K–16) knowledge of equitable teaching practices and leadership skills (Grayson & Martin, 2003a, 2003b; ED, 2000).

Teacher behavior that perpetuates gender bias can influence student participation in courses and selection of further study in a particular career area (Graham, 2001). To encourage participation in nontraditional programs for both men and women, collaborations should be built among teachers in feeder schools and with programs and courses that lead to participation in nontraditional CTE programs (National School-to-Work Opportunities Office, 1996; Graham, 2001).

Implement and Model Gender-Fair Institutional Strategies

Schools that value nontraditional choices for their students and model gender equity in their institutional practices are more likely to have students participate in nontraditional programs. Sound institutional strategies include (a) inviting nontraditional representatives to participate on advisory committees, (b) hiring nontraditional instructors, (c) conducting workshops on nontraditional careers with students and staff, (d) providing grant incentives in Requests for Proposals, (e) purchasing materials portraying nontraditional students, and (f) collecting data that link occupations and gender (National School-to-Work Opportunities Office, 1996). Assessments have been developed, such as the Building Level Equity Assessment by the Midwest Equity Assistance Center (MEAC), that can be used to help schools conduct institution-wide evaluations of how well they are doing to promote gender equity (Midwest Equity Assistance Center [MEAC], 2000).

Increase Competence in Diversity and Sexual Harassment Prevention

Students are not likely to persist in an instructional environment where their contributions are not valued, they are being harassed, or they feel they are being treated unfairly. The literature identifies decreasing gender bias among administrators, faculty, and staff as a common strategy for retaining female students in math and science and nontraditional students in CTE programs (Markert, 1996; National School-to-Work Opportunities Office, 1996; University of Southwestern Louisiana, 1993; Ryan, 1999; Clark, 2000; Graham, 2001). For more information, see chapter 11, "Sexual Harassment: The Hidden Gender Equity Problem."

Invite, Involve, and Educate Parents

Parents are the first to introduce a student to a career, and they have the strongest influence on student course selection and career choice (Ferris State University, 2002). Parents are often one of the strongest influences on students pursuing nontraditional careers. Greene and Stitt-Gohdes (1997) found that positive role models, especially family members, often contribute to an individual's decision to pursue a nontraditional career.

Other parents may allow a student to explore a nontraditional career, but may not support a student pursuing one as a permanent career choice. Lack of support can be somewhat attributed to misinformation about a career as well as sex bias and stereotyping. This can be overcome through parent education and exposure to accurate career information. Parents who are employed in a nontraditional occupation should be invited to serve as role models to the students and their parents.

Provide Nontraditional Role Models, Mentors, and Job Shadowing

Students need to see others like themselves participating in a career to believe they can do it, too. Ongoing exposure to nontraditional role models and mentors and job exposure with an individual in a nontraditional career are overwhelmingly presented in the nontraditional training and employment literature as a common and successful strategy for recruiting and retaining students in nontraditional careers (Montclair State College, 1991; Foster & Simonds, 1995; Florida State Dept. of Education, 1996; National School-to-Work Opportunities Office, 1996; Markert, 1996; Clark, 2000; Gavin, 2000). The use of Internet online e-mentoring has expanded the reach of mentoring relationships. The opportunity for mentor and mentee to communicate via e-mail and the Internet can expand the potential for additional communication. E-mentoring programs have been used very successfully in the STEM fields with girls and women engineers and scientists. In a 2003 evaluation of MentorNet, an online mentoring program for diversity in engineering and science, over half the students reported increased confidence that they are in the right major and can succeed in their field of study (Barsion, 2004).

Conduct Middle-School and Pretechnical Training Programs

Overwhelmingly, the research indicates that early nontraditional experiences and exposure to nontraditional careers positively affects student potential for pursuing a nontraditional career (Markert, 1996; Education Development Center, Inc., 1996; Kloosterman, 1994; Van Buren, 1993; Kerka, 2001). Many of the strategies discussed concerning parent education and student exposure in the curricula are more effective if used at the earliest grades possible, but especially at the middle-school grades.

Pretechnical training programs, at all educational levels, that introduce students to nontraditional careers (a) give them hands-on learning opportunities, (b) relieve math anxiety, (c) develop support groups, and (d) expose students to nontraditional role models, thereby encouraging participation in CTE programs. When compared to a control group, students attending a gender-equity program had significantly higher levels of career and lifestyle self-efficacy and indicated greater knowledge of nontraditional careers and training opportunities. Nontraditional students perceived greater encouragement to explore nontraditional classes and had significantly higher occupational attractiveness scores (Fox Valley Technical College, 1991; Mewhorter, 1994; Read, 1991).

Conduct Targeted Recruitment Activities

Nontraditional students must be recruited into nontraditional programs. Students do not believe they are welcome unless specifically invited to explore and supported to overcome their own gender bias and stereotyping. Successful recruitment strategies include (a) creating career-technical programs to reach all students, (b) presenting career clusters in a way that shows how career pathways can align with interests, (c) giving students multiple opportunities to explore both traditional and nontraditional careers, and (d) helping students overcome stereotypes of appropriate jobs for their gender (Clark, 2000). In the fall of 1995, 7 of 95 students in the undergraduate program in computer science at Carnegie Mellon University were women. In 2000, 54 of 130, or 42%, were women. In a research study conducted during this period, a substantial part of the success of the program was attributed to recruitment efforts to get women to apply, enroll, and persist (Margolis & Fisher, 2002). The lack of a pipeline opening (entry) is often the limiting factor to increasing the participation and completion of students in nontraditional careers.

Collaborate with Community-Based Organizations and Business

Many community-based organizations have nontraditional career exposure programs for young girls (e.g., Girls, Inc.®, American Association of University Women, YWCA, Girl Scouts, Take Our Daughters and Sons to Work). Working with community-based organizations to expose students to nontraditional careers has been identified as one successful strategy for teachers to use

as a means of increasing enrollment of students in nontraditional training programs (University of Southwestern Louisiana, 1993).

Businesses have a vested interest in helping students develop the skills required for employment in their industry. Intel Corporation, in cooperation with Boston's Museum of Science and the Massachusetts Institute of Technology Media Lab, has started an after-school program, Computer Clubhouse, for female and minority students with adult mentors to learn more about computer technology (Brunner, 2000). Cisco, Inc. has started a gender initiative for recruiting women into the Cisco Networking Academies (Cisco Systems, Inc., 2000). Training programs that partner with corporations have dramatic benefits for low-income women. An example of this strategy would be the Nontraditional Employment for Women (NEW) program that places students into occupations with an average starting wage of $12/hour (National Organization for Women |NOW| Legal Defense and Education Fund, 2001).

Conduct Nontraditional Student Support Groups, Peer Counseling, and a Continuum of Support Services

Students are more likely to complete programs if they feel they are supported and are part of a peer group. These strategies are also more likely to improve a student's self-efficacy. Several studies of effective programs have identified successful retention strategies as those that include access to nontraditional student clubs and team support systems, and participation in math clubs, competitions, and after-school programs (Foster & Simonds, 1995; Silverman, 1999; Gavin, 2000). Students who participated in nontraditional support programs experienced increased self-esteem (Montclair State University, 1997). Chapter 7, "The Treatment of Gender Equity in Teacher Education," provides additional valuable information.

Students who face barriers in addition to those of gender need comprehensive support services to complete their CTE programs. Nontraditional training programs that work with populations with multiple barriers and offer a complete array of support services boast higher success rates. These support services include tutoring, childcare, transportation, and tuition assistance.

EXAMPLES OF IMPLEMENTATION OF EFFECTIVE STRATEGIES

During the years of implementation of the Perkins Act equity provisions, investment in research and development and in quality evaluation was inconsistent. Very limited research was done on effective programs. The following programs have been identified through rigorous evaluations and reviews. Each program was reviewed for evidence of success and effectiveness, a strong research base, educational significance, and the ability to be replicated in other settings. All selection criteria can be found in the references indicated for each program. These successful programs have implemented many of the strategies addressed above. Unfortunately, effective programs like these may very well no longer be used because of lack of funding.

Ohio Department of Education, Orientation to Nontraditional Occupations for Women (ONOW) Program, Ohio

The U.S. Department of Education's Gender-Equity Expert Panel selected the ONOW program as its only Exemplary Gender-Equity Program (ED, OERI, 2001). First implemented in 1987 using Perkins gender-equity set-aside funds, the ONOW program was designed to assist socioeconomically disadvantaged women and incarcerated women to explore and successfully enter high-wage careers in nontraditional fields in which they have been underrepresented, such as skilled construction (e.g., welding, carpentry), manufacturing (e.g., machine trades, production technician), transportation (e.g., automotive technology, truck driving, delivery), protective services (e.g., emergency medical services, fire fighters, highway patrol), and high-tech (e.g. Web design, drafting). The purpose of the program was to help participants overcome multiple barriers and become economically self-sufficient. It also sought to increase the numbers of women enrolled in nontraditional vocational education programs, to decrease the numbers of women on welfare in Ohio and to reduce the recidivism rate of women offenders. Participants attended eight-week training sessions, in which they received hands-on experience using applied math and science and worked with hand and power tools. The program also addressed concerns of physical fitness, employability skills, and self-esteem. Between 45 and 75 women were served at each program site per year. In addition, each ONOW coordinator participated in training designed to reduce or eliminate bias and increase sensitivity to diversity.

A five-year longitudinal study by Ohio State University showed higher wages for those who entered nontraditional employment, and confirmed that 70% of the respondents continued to be employed. At the time of the study, 76% of the participants who had been on public assistance when accepted for the program were working full time, completely off of public assistance, and earning an average of $9.38 per hour.

Minot Public Schools CTE Programs, Minot, North Dakota

Three nontraditional career exploration programs sponsored by the Minot Public Schools (MPS) received the Highest Recognition from the 2005 Programs and Practices That Work: Preparing Students for Nontraditional Careers Project (NWLC, 2005b). Over a three-year period, MPS sponsored two careers and skills awareness days (Diva Tech and Define Your Dreams) and one technology camp (Technology on the Go). Over the three years that these programs were offered at MPS High School, enrollment in classes that were nontraditional for students' gender increased by 32%.

The MPS DIVA Tech program was a daylong event targeted at girls in Grades 8–12. It provided students with hands-on opportunities to explore nontraditional areas offered in the MPS trades and technology curriculum, including auto tech, welding, and information technology. Each student selected several hour-long laboratory experiences and used the skills learned to create a take-home project. Classroom instructors and female student assistants served as helpers and role models in

the labs. Professionals who hold jobs that are nontraditional for their gender gave a workshop and answered questions relating to occupational responsibilities, training requirements, salaries, benefits, and barriers in the workforce. In addition, a school career counselor described the nontraditional course available for girls in the upcoming school year and answered questions.

Define Your Dreams, targeting seventh- and eighth-grade students, brought together female professionals and students to help young women realize the importance of math, science, and problem-solving skills in daily life and careers. Students explored nontraditional careers in hands-on workshops and learned about nontraditional course options for their four-year high school plans.

Complementing the two career days, Technology on the Go took girls in grades 8–11 on a three-day field trip. Guided by female professionals, students explored local businesses, coal mines, and electrical and manufacturing plants. Throughout the tours, students were encouraged to take photographs that they used to design their own publications at the end of the program.

Illinois Center for Specialized Professional Support, Illinois State University,

The NTO *Look, Illinois*

Selected as the 2006 winner of the Programs and Practices That Work: Preparing Students for Nontraditional Careers Project (NWLC et al., 2006), the NTO Look is a project of the Illinois Center for Specialized Professional Support at Illinois State University and administered through funds from the Carl D. Perkins Act of 1998. The NTO Look encourages secondary and postsecondary educational institutions to partner in order to implement and strengthen their nontraditional programs. The partnerships must base their program and research on the practices that work in recruiting and retaining students in nontraditional programs; set realistic long-term and short-term goals; design and implement activities to meet those goals; and evaluate the effectiveness of the program. In the implementation phase of each site's project, the NTO Look provides each partnership with professional development, technical support, specialized resources, and financial assistance.

An important element of the NTO Look is its self-assessment requirement. Each project must complete a self-study and consider accompanying research prior to designing its activities. The NTO Look Self-Study systematically assists educational organizations in identifying strengths and challenges and leads them through a series of questions that results in the development of a strategy that has a greater potential for successfully meeting their goals. Nearly 80% of the Illinois community colleges participated in the NTO Look, and similar projects sponsored by the Illinois Center or Specialized Professional Support (ICSPS). In 2005, Illinois' postsecondary system achieved its negotiated performance level for the Perkins fourth core indicator for the first time and has credited NTO Look as one of two factors contributing to its improvement.

Minneapolis Public Schools, High Tech Girl's Society, Minnesota

Recipient of the 2006 Honorable Mention Award for the Programs and Practices That Work: Preparing Students for Nontraditional Careers Project (NWLC et al., 2006), the High Tech Girl's Society (HTG'S) was launched in 2003 to increase the representation of girls in traditionally male-dominated, high-tech courses such as aviation, engineering, and information technology. The program serves a population that is primarily low-income girls of color. Preliminary data show that 79% of the HTG'S participants are students of color, which is almost 7 percentage points higher than the district average.

The HTG'S implements a rigorous academic and technical curriculum through after-school, hands-on learning activities, tours, seminars, and other related school activities. The club works in cooperation with college, universities, and business partners to provide mentoring and counseling as well. Mentoring is essential to the program, and the HTG'S connects the girls with women who are employed in high-tech careers, and gives opportunities to meet and network with other young women with similar interests in Minneapolis high schools. The program has found that field trips to colleges and worksites, and related networking, mentoring, and teacher training activities, have helped girls to become leaders in traditionally male-dominated classes. Their presence and success and advocacy with friends have encouraged other girls to enroll in and complete programs.

The participation of girls in nontraditional classes in Minneapolis Public Schools has been increasing since the inception of the HTG'S. In 2002, male students made up 61% of students enrolled in high-tech courses, while female students made up only 39%. By 2004–05, male students comprised just over 56% of students, and female students comprised just under 44%. Moreover, female enrollment in high-tech classes increased by as many as 6 times in some cases, including increased female participation in male-dominated classes like engineering, IT, construction, and auto technology. A survey of 2005–06 "High Tech" girls indicated that they will take more math and science—and harder math and science—than is required through Minneapolis Public Schools' minimum graduation requirements.

RECOMMENDATIONS

The programs described above are examples of the effectiveness of the use of Perkins funds for gender-equity activities in improving opportunities for CTE students, especially women and girls. During the years the set-aside funds were in place, a growing number of educators and students gained an understanding of the importance of gender equity, even if they were not themselves involved in nontraditional CTE. The funding helped support change and create change, even when many traditional CTE instructors did not welcome that change. The loss of gender-equity funds has meant the loss of valuable programs, less support services for women (especially low-income women), and less emphasis on changing the status quo.

In retrospect, a major challenge to accomplishing the intent of the gender-equity provisions of the Perkins Act over its many years was the Department of Education's lack of leadership to require standardized program evaluations and data collection so that true measurement of the national impact of programs could be done. Instead, states set their own standards with the result that apples were compared to oranges on the national level. In addition, the National Center for Research in Vocational Education refused to conduct research related to gender equity under Perkins. Had more quality research been done and evaluation standards been set, the overall achievements in gender equity within CTE would have been documented and might have been much greater.

The recommendations that follow are based on the limited research available, the experience of gender-equity experts in CTE, and the effects changes in public policy, both positive and negative, have had over the past 20 years on gender equity in CTE. They are primarily based on assumptions that substantial equity can be achieved by increasing women's participation in high paying nontraditional occupations and by creating a more inclusive climate within schools and the CTE classroom. The authors of this chapter share the belief that all occupations should be valued with real availability for both men and women. See chapter 4, "Impact of Education on Gender Equity in Employment and its Outcomes."

Recommendations for Federal and State Policymakers

Federal and state policymakers should increase efforts to make the public aware of the provisions of the Title IX regulations that are directly relevant to CTE and to enforce these regulations. The public primarily associates Title IX with the progress that has been made in the participation of females in athletics, and does not realize that Title IX also affects educational programs in any educational institution that receives federal funds.

1. Federal policymakers should increase the number and frequency of OCR-conducted compliance reviews in CTE programs—utilizing Title IX and its implementing regulations, as well as the "Vocational Education Guidelines for Eliminating Discrimination and Denial of Services on the Basis of Race, Color, National Origin, Sex and Handicap"—to ensure that all CTE programs provide equal access and opportunity for all students.
2. Federal policymakers should restore the full-time sex/gender-equity coordinator position in the state departments of education, along with budgets and program responsibility to provide technical assistance and professional development to local education agencies to help them meet the core indicators of performance and succeed in serving special population students.
3. States and accrediting institutions should establish policies that mandate gender-equity training and competence for all educators involved in counseling and in CTE. Teachers and counselors should be expected to change their behaviors as well as their perceptions, attitudes, and interests as they relate to sex stereotyping.
4. Federal policymakers should use the Perkins accountability data collected by the states and reported to OVAE to inform practice and improve programs to advance gender equity in CTE.
5. Federal policymakers should provide support and technical assistance to states to help them improve their performance on the fourth core indicator (participation in and completion of nontraditional training and employment programs) and to evaluate disaggregated special populations data to drive program improvement efforts. In addition to working with career and technical education administrators, the federal policy makers should work with Title IX coordinators in all types and levels of institutions receiving federal financial assistance to implement this regulation.
6. States should use the flexibility given them in the Perkins Act to fund state and local gender-equity initiatives that are data driven and focused on results. This will require states to make gender equity in CTE a priority in their Perkins State Plan.
7. Federal policymakers should provide funding (via new legislation, Perkins, WEEA, Elementary and Secondary Education Act, Higher Education Act, etc.) for research and development to promote gender equity in CTE activities and implementation funding to school districts for the purpose of evaluating the effectiveness of their gender-equity activities in these areas.
8. Federal and state policymakers should strengthen programs and increase funding for programs that work with employers to improve working conditions, climate, discrimination, and pay equity for women and men in nontraditional careers (such as the U.S. Department of Labor's Women's Bureau).
9. Federal and state policymakers should pay more attention to categorical programs that are not entitlements. Programmatic funding that doesn't foster institutional change is short lived. Funding mechanisms need to be designed that have a lasting impact. The lives of hundreds of thousands of women and girls (and men in nontraditional careers) benefited from the set-aside programs.
10. Federal policymakers must include specific and clear language in a reauthorized Perkins that requires the conducting of significant and rigorous research on the elimination of sex bias and stereotyping in CTE and on the identification of practices that are proven to increase the participation and completion of students in nontraditional CTE programs.
11. Federal policymakers should recognize the intersection of Perkins, WIA, and TANF regarding the provision of support services for women in high-skill, high-wage, high-demand careers and make it a priority for funds to be used for this purpose from any federal sources.
12. Federal policymakers should recognize the value of education and training in reducing poverty and should increase access to education and training for participants in the TANF and WIA programs.

Recommendations for Researchers

1. Researchers should conduct research on how states are holding local educational agencies accountable for their compliance with state and federal civil rights laws through Title IX

reviews, OCR Memorandum of Agreement compliance reviews, and other monitoring and technical assistance efforts.
2. Researchers should conduct research on effective strategies for increasing the participation and completion of underrepresented students in nontraditional CTE programs.
3. Researchers and evaluators should compare different approaches to achieving gender-equity goals (e.g., program length, instructional presentation approaches, single-sex education, primary age of influence, types of role models) to inform local school decision makers as well as national policymakers.
4. Researchers should design longitudinal studies that follow students who participated in nontraditional CTE programs in high school to determine the impact of these experiences on postsecondary success, workforce participation, and career selection.
5. Researchers should conduct research on women in the 21st century workforce and what education reform efforts need to be supported to help reduce workplace bias.
6. Researchers should conduct research on the impact of preservice and in-service education with CTE teachers in gender equitable instructional methods on student achievement, course selection, postsecondary transition, college major selection, and career entrance.
7. Researchers should examine social security and retirement program reforms and their impact on women's long-term economic security based on career participation and career selection.
8. Researchers should continue to test theories of career development and update them to reflect the world of rapidly changing environments, personal values, and needs. Education needs a dynamic view of career development theory, one that evolves with changing environments and needs and that purposefully attends to increasing gender equity. What is true in one decade may not describe the situation in the next.

Recommendations for Educators and School Administrators

1. Educators and administrators at all levels should continue the emphasis on reducing career stereotypes. The evidence presented indicates that gender-equitable programs can change students' beliefs and attitudes, but little evidence has been provided that indicates the programs have resulted in changes in their personal interests in nontraditional careers. We recommend support for programs that provide K–12 students with experience in nontraditional careers. These experiences may provide the basis for personal interest in these careers and for more gender-free career choices at a later age.
2. Middle-school educators and administrators should take advantage of the fluid quality of this developmental stage and require both boys and girls to explore a wide array of CTE programs. Middle schools need to make a special effort to offer gender-equitable programs that allow students to explore nontraditional CTE programs in a safe and supportive environment with teachers and role models who prove that nontraditional choices are successful ones. Such experiences provide the basis for a sense of competence and self-efficacy necessary for making wise choices in high school and beyond.
3. High-school students should be required to take a course in career and life planning that includes the development of an education and career development plan. Students should be encouraged to continue to explore options, pursue their interests, and develop new skills to broaden their future choices rather than narrow them.
4. High-school educators and administrators should provide students enrolled in CTE with the support services necessary for increased enrollments in nontraditional courses and programs. Such support services include orientation of students to nontraditional CTE programs, supportive behaviors by teachers and students with nontraditional students who represent a minority in these classes, and tutoring and financial support for services such as childcare, transportation, books, tuition, uniforms, tools, etc.
5. Nonsexist career guidance and counseling should be integrated into all instructional strategies so that educators can take advantage of "teachable moments" and expose students to the advantages and benefits of a particular career choice.
6. Career guidance and counseling processes must include career exploration that provides accurate and realistic information about earning potential and economic self-sufficiency based on family composition and desired residence location.
7. While a curriculum that encourages boys and girls to learn more about nontraditional careers and behaviors is essential, teachers and counselors should be careful not to discourage students from choosing the more traditional careers and behaviors. To truly expand life options is to increase students' freedom to choose based on interest rather than on gender or social class.
8. Educators should ensure that career education materials are representative of a broad range of social classes and minorities. Materials are frequently focused on white, middle-class students, to the exclusion of poor and minority students. Increasing life options for all students may require a curriculum sensitive to the person growing up in poverty or coming from an environment with different values and customs.
9. Educators and administrators should address gender equity as an institution-wide priority by making an overt effort to support students' nontraditional choices, providing career guidance and counseling that highlights the positive aspects of nontraditional career selection especially for women and girls, taking affirmative actions to hire CTE teachers that are nontraditional role models, and recognizing students of the underrepresented gender who succeed in nontraditional CTE programs.
10. Educators and administrators should take a proactive role in educating parents about nontraditional career options for their sons and daughters. With parents being the primary influencers of students' career choice, they play a key role in assuring students have all available options for their future.

Recommendations for Teacher Education and Accreditation Organizations

1. Teacher preparation institutions should include gender equity and multicultural education as part of the teacher education preservice program.
2. Teacher accreditation institutions should review gender-equity competencies for teacher educators in CTE and multicultural education, and include the competencies in the teacher certification requirements.
3. Teacher accreditation should include gender equity and multicultural education in state accreditation requirements and self-studies.
4. Teacher associations should include gender equity in their strategic goals and should develop grant programs to fund activities within the associations. Associations should develop professional support systems for teachers of nontraditional CTE courses to share best practices and exchange strategies. In addition, support systems should be put in place for those teachers who themselves are nontraditional role models in nontraditional CTE programs to provide them with a forum for personal and legal support.

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