



# Research on Causes and Improvement Strategies for Perkins III Core Indicators: Example Models and Research Results



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## ***Second Draft***

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Point of view or opinions stated do not necessarily represent official Arizona Department Of Education position or policy.*

## Root and Indirect Causes for Nontraditional Participation (4S1 & 4P1)

Root (Direct) Causes	What the Literature Says
<p><b>Career guidance materials and practices</b></p>	<p><u>Theory:</u> Gender-biased career guidance practices can deter students from participating in nontraditional training programs</p> <p><u>Evidence:</u> Interest inventories are often used by guidance personnel to assist students in selecting career related coursework or majors in college. The Armed Services Vocational Aptitude Battery contains sections based on exposure to subject instead of aptitude. For example, one section tests knowledge of automotive components, systems, tools and repairs – a subject to which women have had little exposure (GAO 1999). Career counseling and recruitment that relies on gender stereotypes is still pervasive in the career and technical education system (NWLC 2002)</p>
<p><b>Access to and participation in math, science and technology</b></p>	<p><u>Theory:</u> Participation and success in math, science and technology courses is a gateway for participation in nontraditional careers for women.</p> <p><u>Evidence:</u> Female students do not have higher levels of math anxiety than males until the late junior high school/early high school period, at which time females begin exhibiting more math anxiety than their male counterparts (Monclair State Univ. 1997, Reilly 1992). Parents of females are more likely to report that mathematics is less important than other subjects and more difficult for females. Girls do not come to the mathematics classroom with the same experiences as boys and teachers call on boys an average of eight times more than they call on girls. A shrinking gender gap exists in standardized test results in mathematics, women are underrepresented in physics and engineering fields, and there is a new gender gap in technology (Gavin 2000). Although the gender gap in advanced placement computer science test performance has narrowed significantly from 1984-1996, the percentage of women taking the examinations has been consistently low (Stumpf &amp; Stanley 1997).</p> <p>In a recent study on the continuing female under-involvement in science, the following causes were found to be significant: teachers interact more often and in more detail with male students who tend to be more aggressive; female students have a more difficult transition through adolescence than male students; science as a discipline discourages females; society undervalues the role of women and sends mixed messages to females and there is an overall denial of gender biases in the educational system.(Graham 2001)</p> <p>Lack of participation of girls in mathematics and science classes limits participation of girls in registered apprenticeship programs for high skill, high wage occupations (Univ. of Central FL 1998).</p>

Root (Direct) Causes	What the Literature Says
<b>Instructional strategies</b>	<p><u>Theory:</u> Teachers are generally unaware of subtle and not so subtle gender-biased instructional strategies that influence student participation and success in school.</p> <p><u>Evidence:</u> Subtlety and complacency mask ongoing gender bias in today's classrooms (Sadker 1999). In a national survey in 1993 and 1994, the most time spent on gender equity in schools of education was two hours per semester. One-third of teacher education instructors surveyed spent one hour or less on the topic (American Institutes for Research 1998)</p>
<b>Nontraditional role models</b>	<p><u>Theory:</u> Nontraditional role models are a significant factor in a student's choice to pursue a nontraditional career.</p> <p><u>Evidence:</u> Interviews with women employed in trades revealed four significant factors that influenced their career choice: a perceived innate ability, a strong sense of self, a desire for independence, and access to role models, especially family (Greene &amp; Stitt-Gohdes 1997). Role models can come from family, community and the school. However, in a study with secondary school principals, nontraditional teacher role models were perceived more favorably for women than for men limiting the potential for nontraditional male role models in schools (Rolling 1996).</p>
<b>Early exposure</b>	<p><u>Theory:</u> Exposure to nontraditional careers needs to happen in elementary school to be effective.</p> <p><u>Evidence:</u> Recent research shows that early nontraditional experiences can have a lasting impact on women's career decisions (Kerka 2001). Gender stereotyping occurs early and schools have the potential to impact those stereotypes. In a study comparing second and sixth graders, second graders had significantly higher sex-stereotyping scores (Billings1992).</p>
<b>Curriculum materials</b>	<p><u>Theory:</u> Visual images of individuals in nontraditional careers can positively impact student participation.</p> <p><u>Evidence:</u> Visual representation of working individuals in textbooks, displays, videos and curriculum influence students gender stereotypes about career options. The way nontraditional careers are advertised and perceived has a significant impact on who pursues those opportunities (Kerka 2001).</p>
<b>Occupational choice</b>	<p><u>Theory:</u> Exposure of women to high skill/high wage occupations has the potential to close the gender gap in annual and lifetime earnings.</p> <p><u>Evidence:</u> The most important variable affecting earnings of both genders was not education but occupation. The implication was that narrowing the gender gap further would require breaking down gender barriers in certain high-paying occupations. Noble (1992) points out that to the majority of women, the relevant issue was being stuck on the "sticky floor" of low wage occupations. High school and postsecondary vocational-technical education has the potential to free women from the "sticky floor" by opening doors to high skill/high wage occupations (Gray 1993).</p>

Root (Direct) Causes	What the Literature Says
<p><b>Self efficacy</b></p>	<p><u>Theory:</u> The strength of a girl or woman’s self-efficacy (i.e., expectations or beliefs that one can successfully perform a given behavior) is directly related to the pursuit and achievement of a career that is compatible with her abilities. A weak or strong self-efficacy will also determine how a woman copes with and manages internal and external career-related barriers.</p> <p><u>Evidence:</u> In adult working women, high-ability women had a tendency to underestimate a number of their abilities including their ability to learn and their verbal and spatial skills and aptitude. (Betsworth 1997). Behavior and behavior change are mediated primarily by expectations of personal efficacy. Low self-efficacy may prevent an individual from attempting to perform a task even if he or she is relatively certain that performance of the task would lead to desired outcomes (Hackett and Betz 1981)</p>
<p><b>School climate</b></p>	<p><u>Theory:</u> Students who are surrounded by a school environment supportive of nontraditional choices and who are exposed to nontraditional career options are more likely to select to participate in nontraditional career areas.</p> <p><u>Evidence:</u> AAUW commissioned three reports on positive school climate for girls and the impact it can have on the achievement of girls. They recommend that the issues of gender equity be visible and integral to the public debate which lends legitimacy to the issue and contributes to the success of girls (Research for Action 1996)</p>
<p><b>Attitude</b></p>	<p><u>Theory:</u> Schools can impact student attitudes, biases and stereotyping regarding their potential career aspirations.</p> <p><u>Evidence:</u> To change social attitudes regarding women’s needs and abilities regarding technology, El Paso Community College established the Women in Technology (WIT) program. The WIT program engaged in community outreach efforts and more than doubled its female enrollment in technical fields after 10 years (DiBenedetto 1999).</p>

### Causes Outside Control for Nontraditional Participation (4S1 & 4P1)

External Conditions/ Constraints	What the Literature Says
<b>Family demographic characteristics</b>	<p><u>Theory:</u> Family and personal demographic characteristics determine the gender (male or female), financial (household income) and cultural (race, ethnicity) background and biases that impact career choice.</p> <p><u>Evidence:</u> Traditional sex role stereotyping was manifested in students who participated in a schools' free lunch program, most of whom were male and Hispanic (Morgison 1995). Girls with low socio-economic status parents had higher sex-stereotyping scores than girls with high socio-economic status parents, while boys with low socio-economic status parents had lower sex-stereotyping scores than boys with high socio-economic status parents. Neither family structure nor level of parent education was significantly related (Billings 1992).</p>
<b>Peer influence</b>	<p><u>Theory:</u> Peer influence is a significant factor in affecting a student's course selection and career choice.</p> <p><u>Evidence:</u> For women, the influence of a significant other was a distinguishing factor between students who expected to enter a desired occupation and those who expected to enter occupations more traditional than they desired (Davey &amp; Stoppard 1993). In contrast enrollment in nontraditional courses tends to improve when students recruit their friends or participate in these courses in groups (Ingle 2000).</p>
<b>Media representation</b>	<p><u>Theory:</u> Public image, media and advertising impacts student's consideration of or participation in nontraditional careers.</p> <p><u>Evidence:</u> The way nontraditional careers are advertised and perceived by the public has a significant impact on who pursues these opportunities (Kerka 2001).</p>
<b>Wage potential</b>	<p><u>Theory:</u> Earnings potential has a positive influence on women considering nontraditional careers and may be a negative influence on men considering nontraditional careers.</p> <p><u>Evidence:</u> This holds true for most nontraditional occupations except nursing. Men choose nursing for many reasons including job security and salary (Boughn 1994). Salary was found to be one of the factors of satisfaction for women entering nontraditional occupations (Stenberg 1991).</p>
<b>Attitudes</b>	<p><u>Theory:</u> Students develop biased attitudes about nontraditional careers from a variety of sources outside the school.</p> <p><u>Evidence:</u> In a survey of undergraduate students, women expected deviation from occupational gender stereotypes to be personally costly, whereas men did not (Yoder 1996). Male students pursuing traditional careers tended to endorse toughness, homophobic attitudes, and restrictive emotionality compared to male students pursuing nontraditional careers (Jome &amp; Tokar 1998).</p>

## Improvement Strategies for Nontraditional Participation (4S1 & 4P1)

Improvement Strategy	Root Causes Addressed	What the Literature Says
<p><b>Review career guidance materials and practices for gender bias and nontraditional exposure and support</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Career guidance materials and practice</li> <li><input type="checkbox"/> Occupational choice</li> <li><input type="checkbox"/> Access to and participation in math, science and technology</li> </ul>	<p><u>Theory and Models:</u> Gender-biased career guidance expectations and practices are a major barrier to student participation in non-traditional programs. Use checklists developed for reviewing career guidance practices (Wisconsin Model for Sex Equity in Career and Vocational Education, Gender Equity Tip Sheets, Project SERVE, University of Missouri).</p> <p><u>Evidence:</u> The use of this model with schools using a technical assistance model over 7 years was highly successful (Riley 1997).</p>
<p><b>Invite, involve and educate parents</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Access to and participation in Math, Science and Technology</li> <li><input type="checkbox"/> Nontraditional role models</li> <li><input type="checkbox"/> Early exposure</li> <li><input type="checkbox"/> Self-efficacy</li> <li><input type="checkbox"/> Attitudes</li> <li><input type="checkbox"/> Occupational choice</li> </ul>	<p><u>Theory and Models:</u> Parents are the first introduction a child has to a career and they have a strong influence on student course selection and career choice.</p> <p><u>Evidence:</u> Recommendations for parents include: (1) create at-home activities that involve hands-on problem solving, such as blocks and tinker toys; (2) engage in daily math routines such as determining the appropriate tip to leave at a restaurant or determining unit prices for items at the grocery store; (3) visit museums of science and explore the contributions mathematics has made to scientific discovery; (4) collaborate with teachers in flexible and creative ways to make sure students are challenged and energized in mathematics; (5) encourage participation in math clubs and competitions; (6) explore varied careers in mathematical fields; and (7) provide female role models (Gavin 2000).</p>
<p><b>Conduct middle school programs</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Career guidance materials and practice</li> <li><input type="checkbox"/> Early exposure</li> <li><input type="checkbox"/> Self-efficacy</li> <li><input type="checkbox"/> Attitudes</li> </ul>	<p><u>Theory and Models:</u> Early exposure to nontraditional careers will increase the potential for a student to pursue a nontraditional career and decrease their own notions of sex bias and stereotyping.</p> <p><u>Evidence:</u> 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).</p>

Improvement Strategy	Root Causes Addressed	What the Literature Says
<p><b>Provide role models and mentors</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Nontraditional role models</li> <li><input type="checkbox"/> Self-efficacy</li> </ul>	<p><u>Theory and Models:</u> Students need to see others like themselves participating in a career to believe they can do it too.</p> <p><u>Evidence:</u> Nontraditional role models and mentors 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 &amp; Simonds 1995, Florida State Dept. of Education 1996, National School-to-Work Opportunities Office 1996, Markert 1996, Clark 2000, Gavin 2000).</p>
<p><b>Conduct targeted recruitment activities</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Career guidance materials and practice</li> <li><input type="checkbox"/> Access to and participation in math, science and technology</li> </ul>	<p><u>Theory and Models:</u> Nontraditional students must be recruited into nontraditional programs. Students do not perceive they are welcome unless specifically invited to explore and supported to overcome their own gender bias and stereotyping.</p> <p><u>Evidence:</u> Successful recruitment strategies include creating career-technical programs to reach all students, presenting career clusters in a way that shows how career pathways can align with interests, giving students multiple opportunities to explore both traditional and nontraditional careers, and helping students overcome stereotypes of appropriate jobs for their gender (Clark 2000).</p>
<p><b>Conduct pre-technical training program</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Career guidance materials and practice</li> <li><input type="checkbox"/> Access to and participation in math, science and technology</li> <li><input type="checkbox"/> Nontraditional role models</li> <li><input type="checkbox"/> Instructional strategies</li> <li><input type="checkbox"/> Self-efficacy</li> <li><input type="checkbox"/> Attitudes</li> </ul>	<p><u>Theory and Models:</u> Pre-technical training programs that introduce students to nontraditional careers, give them hands on learning opportunities, relieve math anxiety, develop support groups, and expose students to nontraditional role models.</p> <p><u>Evidence:</u> When compared to a control group, students attending a gender equity program had significantly higher levels of career and life-style 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). Students who participated in the gender equity program indicated a decrease in mathematics anxiety as measured by the MARS-e test for math anxiety (Montclair State Univ. 1997).</p>

Improvement Strategy	Root Causes Addressed	What the Literature Says
<p><b>Collaborate with community based organizations</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Nontraditional role models</li> <li><input type="checkbox"/> Instructional strategies</li> <li><input type="checkbox"/> Curriculum materials</li> <li><input type="checkbox"/> Self-efficacy</li> </ul>	<p><u>Theory and Models:</u> Many community-based organizations have nontraditional career exposure programs for young girls (Girls Inc, American Association of University Women, YWCA, Girl Scouts, Take Our Daughters to Work).</p> <p><u>Evidence:</u> Working with community-based organizations to expose students to nontraditional careers was identified as one of the successful strategies in increasing enrollment of students in nontraditional training programs (University of Southwestern Louisiana 1993)</p>
<p><b>Conduct professional development with teachers at all levels</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Curriculum materials</li> <li><input type="checkbox"/> Access to and participation in math, science and technology</li> <li><input type="checkbox"/> Instructional strategies</li> <li><input type="checkbox"/> Attitudes</li> </ul>	<p><u>Theory and Models:</u> Increase teacher awareness of gender bias and stereotyping in curriculum materials and classroom instruction that creates a negative effect on student course selection.</p> <p><u>Evidence:</u> Teacher behavior that perpetuates gender bias can influence student participation in courses and selection of further study in a particular career area (Graham 2001) Recruitment strategies include working with teachers in feeder schools, programs and courses that lead to participation in nontraditional career and technical education programs. (National School to Work Opportunities Office 1996, Graham 2001)</p>
<p><b>Implement and model gender-fair institutional strategies</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> School climate</li> <li><input type="checkbox"/> Attitudes</li> </ul>	<p><u>Theory and Models:</u> 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.</p> <p><u>Evidence:</u> Institutional strategies include: nontraditional representatives on advisory committees, hiring of nontraditional instructors, conducting workshops on nontraditional careers with students and staff, providing grant incentives in RFP's, purchasing materials portraying nontraditional students, collecting data that link occupations and gender. (National School-to-Work Opportunities Office 1996)</p>



## Root and Indirect Causes for Nontraditional Completion (4S2 and 4P2)

Root (Direct) Causes	What the Literature Says
<b>Classroom climate</b>	<p><b>Theory:</b> Students who experience gender stereotyping, intimidating behaviors or sexual harassment while in nontraditional career and technical education programs are less likely to complete the program.</p> <p><b>Evidence:</b> Students who are of the underrepresented gender experience stereotypes and intimidating behaviors preventing full participation (Thurtle 1998). Even with increased awareness of gender equity issues the research suggests that boys and girls are treated differently in many classrooms (Younger, Warrington, Williams 1999). In a study examining the reasons why female students in an industrial technology class were not completing, female students attributed their lack of success to not finding the class relevant, being treated unfairly; and adhering to gender stereotypes. When efforts to create a gender equitable classroom that engaged all students were implemented, the female completion and success rates improved (Ryan 1999). The job and training experiences of women employed in a skilled trade were surveyed. 48.8% believed that sexual harassment remains a significant problem and 80.5% had seen at least one woman receive unwanted sexual attention (Shaw 1998).</p>
<b>Support services</b>	<p><b>Theory:</b> Students enrolled in nontraditional career and technical education programs that receive support services (i.e., tutoring, mentoring, support groups, child care, transportation) are more likely to succeed.</p> <p><b>Evidence:</b> A majority of nontraditional employment programs have similar components and indicate greater success rates with students who access support services than in programs where these services are not provided (Montclair State Univ. 1997).</p>
<b>Student isolation based on gender</b>	<p><b>Theory:</b> When underrepresented gender students participate in the same program they are more likely to succeed.</p> <p><b>Evidence:</b> When nontraditional participants enroll individually, they are less likely to integrate effectively into the social structure, more likely to suffer decreased performance, and more likely to drop out. Change is carried in cohorts, not in single individuals (Ingle 2000)</p>
<b>Role models</b>	<p><b>Theory:</b> Providing access to nontraditional role models and mentors in a student's nontraditional career field increases retention and success.</p> <p><b>Evidence:</b> Interviews with women employed in trades revealed four significant factors that influenced their career choice: a perceived innate ability, a strong sense of self, a desire for independence, and access to role models, especially family (Greene &amp; Stitt-Gohdes 1997).</p>

Root (Direct) Causes	What the Literature Says
<p><b>Instructional strategies</b></p>	<p><u>Theory:</u> Gender-biased instructional and support strategies is one of the major factors for students dropping out of nontraditional career and technical education programs.</p> <p><u>Evidence:</u> Female students are more successful in classrooms where cooperative learning is addressed and teachers recognize a variety of learning styles and capitalize on students' strengths. Alternative assessments including integrated performance tasks, journals, portfolios, and pictorial explanations are valid ways of demonstrating understanding of and allow females to showcase their talent more effectively than they can on traditional tests (Gavin 2000).</p>
<p><b>Self-efficacy</b></p>	<p><u>Theory:</u> Students with high self-efficacy are more likely to complete nontraditional programs.</p> <p><u>Evidence:</u> Self-efficacy is negatively correlated to career choices, particularly nontraditional. The higher an individuals sense of self the more likely they are to choose a nontraditional career. (Montclair State Univ. 1997). A perceived innate ability, strong sense of self and desire for independence are all factors that are influential in a student's choice of a nontraditional career (Greene &amp; Stitt-Gohdes 1997).</p>

### Causes Outside Control for Nontraditional Completion (4S2 and 4P2)

External Conditions/ Constraints	What the Literature Says
<p><b>Spousal/significant other support</b></p>	<p><u>Theory:</u> Women in nontraditional training programs are more likely to dropout if they do not have the support of their spouse and/or significant other.</p> <p><u>Evidence:</u> Spousal or significant other support was found to be a 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, Rhoads, Anderson 1999)</p>

### Improvement Strategies for Nontraditional Completion (4S2 and 4P2)

Improvement Strategy	Root Causes Addressed	What the Literature Says
<p><b>Evaluate all school materials for gender bias and positive nontraditional images</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Classroom climate</li> <li><input type="checkbox"/> Instructional strategies</li> </ul>	<p><u>Theory and Models:</u> School publicity and curriculum materials often carry gender-bias messages that impact student career choices. Checklists and tips have been developed to increase schools awareness of these gendered practices (Wisconsin Model for Sex Equity in Career and Vocational Education, Gender Equity Tip Sheets, Project SERVE, University of Missouri).</p> <p><u>Evidence:</u> In an evaluation of equity programs in Louisiana programs that were successful at retaining students in nontraditional vocational education programs evaluated materials for gender bias and stereotyping.</p>
<p><b>Increase teacher and administrator quality and equity-capacity through professional development</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Classroom climate</li> <li><input type="checkbox"/> Instructional strategies</li> </ul>	<p><u>Theory and Models:</u> Teachers need rigorous and ongoing professional development to learn and improve instructional strategies for working with nontraditional students. Generating Expectations for Student Achievement (GESA) and The Equity Principal are research-based professional development models that have been effectively used to increase teachers’ and administrators’ knowledge of equitable teaching practices and leadership skills (Grayson 1998)</p> <p><u>Evidence:</u> Through studies conducted in mathematics programs, teaching strategies that are effective in raising the achievement of females have been identified. These strategies include cooperative learning versus competitive learning and the need for teachers to recognize a variety of learning styles and capitalize on students’ strengths. Alternative assessments including integrated performance tasks, journals, portfolios, and pictorial explanations are mentioned as valid ways of demonstrating understanding and allowing females to showcase their talents more effectively than they can on traditional tests (Gavin 2000, Graham 2001, Ryan 1999).</p>

Improvement Strategy	Root Causes Addressed	What the Literature Says
<p><b>Increase competence in diversity and sexual harassment prevention</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Classroom climate</li> <li><input type="checkbox"/> Instructional strategies</li> </ul>	<p><u>Theory and Models:</u> Students will not persist in an instructional environment where their contributions are not valued, they are being harassed or they do not feel they are being treated fairly.</p> <p><u>Evidence:</u> Decreasing gender bias is identified in the literature as a common strategy for retaining female students in math and science and nontraditional students in career and technical education programs (Markert 1996, National School-to-Work Opportunities Office 1996, Vocational Curriculum Resource Center of Maine 1993, University of Southwestern Louisiana 1993, Ryan 1999, Clark 2000, Graham 2001).</p>
<p><b>Conduct nontraditional student support groups and peer counseling</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Support services</li> <li><input type="checkbox"/> Student isolation based on gender</li> <li><input type="checkbox"/> Instructional strategies</li> <li><input type="checkbox"/> Role models</li> <li><input type="checkbox"/> Self-efficacy</li> </ul>	<p><u>Theory and Models:</u> 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.</p> <p><u>Evidence:</u> In a group of studies of effective programs, retention strategies identified included: access to nontraditional student clubs and team support systems and participation in math clubs, competitions, and after school programs (Foster &amp; Simonds 1995, Silverman 1999, Gavin 2000). Students who participated in nontraditional support programs increased their self-esteem (Montclair State Univ. 1997).</p>
<p><b>Provide nontraditional role models, mentors, and job shadowing</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Role models</li> <li><input type="checkbox"/> Self-efficacy</li> </ul>	<p><u>Theory and Models:</u> Ongoing exposure to nontraditional role models and mentors and job exposure with an individual in a nontraditional career are effective strategies for retaining students in nontraditional career and technical education programs.</p> <p><u>Evidence:</u> The research consistently indicates that role models are an effective strategy for retention (Foster &amp; Simonds 1995, Florida State Dept. of Ed. 1996, Markert 1996, National School-to-Work Opportunities Office 1996, Clark 2000, Gavin 2000).</p>
<p><b>Invite, involve and educate parents</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Role models</li> <li><input type="checkbox"/> Self-efficacy</li> </ul>	<p><u>Theory and Models:</u> Parents are often one of the strongest influences on students pursuing nontraditional careers. Parents may allow a student to explore a nontraditional career but may not support a student pursuing one as a permanent career choice. Involve parents who are employed in a nontraditional occupation as role models with their sons/daughters and with other students at the school.</p> <p><u>Evidence:</u> Lack of support by parents can be somewhat attributed to misinformation about a career as well as sex bias and stereotyping that can be overcome through parent education and exposure to accurate career information. Role models, particularly family members, often contribute to an individual's decision to pursue a nontraditional career (Greene &amp; Stitt-Gohdes 1997)</p>

Improvement Strategy	Root Causes Addressed	What the Literature Says
<p><b>Provide a continuum of support services</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Support services</li> </ul>	<p><u>Theory and Models:</u> Students with additional barriers beyond gender need additional support services to complete.</p> <p><u>Evidence:</u> Nontraditional training programs that work with populations with multiple barriers and offer comprehensive support services boast higher success rates. These support services include tutoring, child care, transportation, and tuition assistance.</p>
<p><b>Invite, involve and educate business</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Role models</li> <li><input type="checkbox"/> Instructional strategies</li> </ul>	<p><u>Theory and Models:</u> Businesses have a vested interest in wanting to help 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 (Bruner 2000). Cisco Inc. has started a gender initiative for recruiting women in to the Cisco Networking Academies. (Cisco, Inc. 2001)</p> <p><u>Evidence:</u> Training programs that partner with corporations have dramatic benefits for low-income women. For example, The Nontraditional Employment for Women (NEW) program, who uses this strategy, places students into occupations with an average starting wage of \$12/hour (NOW Legal Defense and Education Fund 2001)</p>