STEM Outreach to Girls: Ensuring Equity in Schools

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2015 STEM Symposium
October 30, 2015, Anaheim, California
Today’s Agenda

- STEM Workforce
- Stereotype Threats
- Stereotype Transmitters
- Gender Equity
- Education Equity
- Quality Schooling Framework
- Resources
STEM Workforce: Law Protection

- Executive Order (E.O. 11246) signed by LBJ, Sept. 24, 1965 and subsequent amendments mandate federal contractors to ensure equal employment opportunities.
Equal Employment Opportunities

An employer cannot discriminate on the basis of race, color, religion, sex, or national origin.
Office of Federal Contract Compliance Programs (OFCCP)

Federal contract compliance:
• Affirmative Action Planning
• Compensation Analysis
• Hiring Practices Analysis
STEM Workforce: Gender Employment Disparity

Figure 1. Gender Shares of Total and STEM Jobs, 2009

STEM Workforce: Gender Compensation Disparity

STEM Workforce: Pipeline

Women earn more degrees than men.

Women are less represented in the STEM pipeline

The Classic Salary Equation

Salary = function of \{education, experience\}

Education \uparrow

Experience \uparrow

= Salary

However

Women’s more education \neq More $$$
Why the Model Does not Fit?

Let’s discuss other factors
Why the Model Does not Fit?

- Choices
- Upward mobility
- Motherhood or family leave
- Other subjective factors
STEM Choice

- The biggest impact factor of this equation is “choices.”
- 14% vs. 21% (of STEM compensation gap vs whole workforce in 2011).
- Girls choosing STEM in schools would greatly improve compensation gap later.
Choice for STEM

Against odds…
Five Minutes Activity

- Introduce yourself to the person next to you
- Share an experience you encountered involving a stereotype about girls and STEM
- Pick a reporter
- Share with the people at your table
Stereotype Threats

• Gender-related math & science attitudes
• Women’s abilities in math and science
• Academic sexism
Stereotype Transmitters
Research Findings

- Math-proficient women disproportionately prefer careers in non-math-intensive fields and are more likely to leave math-intensive careers as they advanced;
- More men than women score in the extreme math-proficient range on gatekeeper tests;
- Women with high math competence are disproportionately more likely to have high verbal competence, allowing greater choice of professions;
- In some math-intensive fields, women with children are penalized when time comes for promotions.
STEM Outreach to Girls

Differential gendered outcomes in the real world result from differences in resources attributable to choices, whether free or constrained, and that such choices could be influenced and better informed through education if resources were so directed.
Gender Equity

• New economy demands new skills
  – Technology skills for careers and future success
    – Former U.S. Secretary of Education Richard W. Riley

• Girls deserve a choice
  – A choice comes from having knowledge and skills
    – Carol Bartz, Former CEO of Yahoo and Autodesk
Impact Factors on Choices

• Cultural and social context of family and community (environment³)
• Education attainment (opportunity)
• Personal aspiration (personality)
Girls in Schools

Environment & Opportunity for girls in STEM
Quality Schools

ALL children learn and thrive
Quality Schooling Framework

http://www.cde.ca.gov/qs

• California’s Quality Schooling Framework (QSF) is a conceptual model for gauging and supporting a school’s effectiveness.

• QSF provides resources and tools for School and District Planning and Implementation.
The QSF Supports Planning and Implementation

- Curriculum
- Assessment
- Professional Learning
- Resource Alignment
- Instruction
- Family & Community
- Equity
- Leaders
- Teachers
- Culture & Climate
- Students Learning & Thriving
Education Equity

Equity

Fair outcomes, treatment, and opportunities for all students.

Ensuring equity in education is a necessary component in narrowing the achievement gap. Teachers and school leaders ensure equity by recognizing, respecting, and attending to the diverse strengths and challenges of the students they serve. High-quality schools are able to differentiate instruction, services, and resource distribution to respond effectively to the diverse needs of their students, with the aim of ensuring that all students are able to learn and thrive.

Definition

"Any goal of competitiveness and excellence must start with equity or be doomed to fail." (1)

Students come to school with diverse backgrounds, abilities, talents, and challenges. Schools ensure equity by recognizing, respecting, and acting on this diversity. A common misconception is that equity means that all students are treated equally in all situations. In fact, high-quality schools have the capacity to differentiate instruction, services, and resource distribution to respond effectively to the diverse needs of their students, with the aim of ensuring that all students benefit equally.
“Any goal of competitiveness and excellence must start with equity or be doomed to fail.”

Students come to school with diverse backgrounds, abilities, talents, and challenges. Schools ensure equity by recognizing, respecting, and acting on this diversity. A common misperception is that equity means that all students are treated equally in all situations. In fact, high-quality schools have the capacity to differentiate instruction, services, and resource distribution to respond effectively to the diverse needs of their students, with the aim of ensuring that all students benefit equally.
Six Goals of Equity in Education

Research and best practices in high-quality, effective schools reveal six goals for education equity.

**Goal 1**

*Quality schools will produce comparably high academic achievement and other positive outcomes for all students on all achievement indicators.*

This first equity goal is overarching: school leaders will provide and target every opportunity and resource to obtain comparably high academic and other positive outcomes for every student on all achievement indicators. Fulfillment of the remaining goals contributes to high outcomes for all students. Given that achievement gaps are an expression of inequity, comparably high achievement for all students across all indicators (including but not limited to attendance/absence rates, promotion/retenion rates, and graduation/drop-out rates) serves as evidence of equity leading to excellence.

**Goal 2**

*Quality schools will provide equitable access and inclusion for all students.*

This goal refers to eliminating disproportion, which is the under- and over-representation of various student groups in special education, gifted and talented programs, such as “gateway” classes as algebra and geometry honors and advanced
Six Goals of Equity in Education (Cont.)

Goal 1

Quality schools will produce comparably high academic achievement and other positive outcomes for all students on all achievement indicators.
Six Goals of Equity in Education (Cont.)

Goal 2

Quality schools will provide equitable access and inclusion for all students.
Six Goals of Equity in Education (Cont.)

Goal 3

Quality schools will treat all students equitably.
Six Goals of Equity in Education (Cont.)

Goal 4

Quality schools will distribute resources equitably to meet the needs of all students.
Six Goals of Equity in Education (Cont.)

Goal 5

Quality schools will provide equitable opportunities to learn for all students.
Goal 6

Quality schools will be responsible and accountable for the academic success of all students.
Resources
Resources (Cont.)

• Tools
• Promising practices
• Research
## Effective STEM Programs for Adolescent Girls

<table>
<thead>
<tr>
<th></th>
<th>Techbridge</th>
<th>Girls to Techbridge</th>
<th>Access for Young Women</th>
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<tbody>
<tr>
<td><strong>Age Level</strong></td>
<td>Grades 5-12</td>
<td>Middle school</td>
<td>Grades 7-12</td>
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<tr>
<td><strong>Location</strong></td>
<td>California</td>
<td>13 states</td>
<td>Queens, NYC</td>
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<td><strong>Facilitators</strong></td>
<td>Teachers and Techbridge program</td>
<td>Girl Scout council, volunteer staff</td>
<td>Social workers &amp; youth worker</td>
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<td></td>
<td>coordinators</td>
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<tr>
<td><strong>Program Duration</strong></td>
<td>One to six years</td>
<td>One day to one year</td>
<td>One to six years</td>
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<td><strong>Subject Emphasis</strong></td>
<td>Engineering, science, technology</td>
<td>Engineering, science</td>
<td>Leadership skills, science, math, technology</td>
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<td><strong>Setting</strong></td>
<td>Afterschool program in schools</td>
<td>Resident and day camp, after school</td>
<td>After school program in schools or</td>
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<td>program in schools, Girls scout</td>
<td>community centers with a community</td>
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<td>troop meeting, large-scale council</td>
<td>based summer component</td>
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<td>event</td>
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<td><strong>Special Features</strong></td>
<td>Hands-on activities, interactions</td>
<td>Hands-on activities, interactions</td>
<td>Leadership activities, including a</td>
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<td>with role models, career</td>
<td>with role models, career</td>
<td>girl-led research conference; science</td>
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<td>explorations, field trips</td>
<td>exploration</td>
<td>and math tutoring; college visits</td>
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Recommendations

• Improving confidence
  – Teaching girls their academic abilities are malleable
  – Giving girls prescriptive and informational feedback

• Increasing interest
  – Providing high-achieving female role models
  – Creating an inquisitive environment in math and science
  – Making spatial skills training available to girls
African American Girls and Educational Opportunity

- A lack of STEM course offerings in low-income schools disproportionately attended by students of color
- Stereotypes attached to both race and gender that discourage African American girls from pursuing STEM education and opportunities
African American Girls and Educational Opportunity\textsuperscript{7} (Cont.)

- A call to action for educational equity
  - to develop and implement culturally responsive interventions to support the educational and career success of African American girls and women
More about QSF
What is QSF?

QSF is where California leaders find timely tools, promising practices and authentic research for planning, resource allocation and successful implementation at the local level.
QSF Supports and Assists Many Programs

LCAP

Title I School Plan

CAASSP

Title III

California Standards
Help Make the QSF Timely, Relevant, and Useful

- Review the posted resources on the QSF Web page at www.cde.ca.gov/qs

- Provide feedback and nominate tools, practices, or research at QSF@cde.ca.gov
Key Takeaways and Your Questions

- Girls and STEM is an equity issue linking to financial security and family stability.
- What are the barriers for girls in STEM?
- Schools play an important role to secure girls “a seat at the table.”
- What can I do to ensure equity?
Endnote


Endnote (Cont.)


Endnote (Cont.)

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