



**Let's Talk and Take Action:
A breakout session in
"Latinos in STEM" at
The Ohio Latino Talent and
Leadership Conference**

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Agenda

- Introductions
- Review Needs and the Outcomes of this discussion
- Discussion including important insights from recent research
- Next Steps to stay connected and engaged
- Resources to help us to learn more



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Needs

- Companies want more Latinos and Latinas in STEM professions
- Students are not accessing these jobs at the rate we would like to see
- Talented Latinos and Latinas are not pursuing STEM pathways to the extent they could
- Students may have a limited perspective of STEM jobs



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Outcomes for Today

- To have a clearer picture of the big issues and insights from current research;
- To walk away with some new ideas for strategies that could be implemented by an employer and/or a college;
- To be further engaged in this important discussion; and
- To have at least one new connection that will help in moving forward



The STEM Equity Pipeline™

- A research- and evidence-based institutional improvement process to increase the participation, retention, completion, and ultimate job placement of women and other under-represented students in high wage, high tech, high demand STEM jobs.



The National Alliance for Partnerships in Equity

- a consortium of state and local agencies, corporations, and national organizations committed to the advancement of equity and diversity in classrooms and workplaces
- State and Affiliate institutional membership levels (see folder)
- www.napequity.org



NAPE's Lines of Business

National Alliance for Partnerships in Equity

Professional Development

Provide tools and curricula for educators through conferences, presentations, webinars, and formal training

Research and Evaluation

Develop reports. Identify research-based promising practices. Provide input to others' research.

Technical Support

Develop tools and resources for education agencies. Provide consulting services. Offer expertise on issues pertaining to access, equity, and diversity.

Public Policy and Advocacy

Work with federal agencies. Educate legislators on career equity and diversity issues. Develop policy briefs. Alert membership to legislative or policy issues.



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Professional Development for Educators: STEM (including CTE) Access, Equity, Diversity

STEM Equity Pipeline™

Program Improvement Process for Equity in STEM

Institutional program that improves enrollment, retention & completion of girls & under-represented populations in STEM courses

STEM Equity Teacher Training

Training teachers to use pedagogy that improves enrollment, retention & completion of girls & under-represented populations in STEM courses

STEM Equity Counselor Training

Coaching counselors to encourage girls and under-represented populations in STEM careers

Tools & Resources

Tools to support teachers' & counselors' learning and assist their students, e.g., camps, partner orgs, books

The Education Foundation supports NAPE's professional development
LOB with funding and resources.



STEM Equity Pipeline Goals

- Build formal education's capacity to provide high quality professional development on gender equity in STEM education
- Institutionalize implemented strategies by connecting outcomes to existing accountability systems
- Broaden the commitment to (gender) equity in STEM education

Funded by The National Science Foundation HR Directorate, Gender in Science and Engineering Program



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- **Total jobs:** STEM occupations will grow from 6.8 million to 8 million total jobs by 2018.
- **Job openings:** STEM occupations will provide 2.4 million job openings through 2018, including 1.1 net new jobs and 1.3 replacement jobs due to retirement.
- **Postsecondary education:** 92% of STEM jobs will be for those with at least some postsecondary education and training.
- **Equity:** Diversion of women and minorities is compounded by other factors.
 - For women and minorities, STEM is the best equal opportunity employer.
 - Although pay gaps exist between minorities and Whites/Asians and women and men in STEM, they are smaller than in other occupations.
- **Shortages:** We face a chronic shortage in STEM competencies as the demand for STEM talents grows outside traditional STEM jobs.

Source: The Georgetown University Center on Education and the Workforce (2011) . *STEM*.



STEM Jobs

- “STEM degree holders enjoy higher earnings, regardless of whether they work in STEM or non-STEM occupations.” (p.1)
- “STEM workers enjoy large earnings...most predominately for workers with less than a college degree.”(p.3)
- Nearly one-quarter (23 percent) of STEM workers have an associates degree or some college

U.S. Department of Commerce (2011). *STEM: Good jobs now and for the future*. ESA Issue Brief #03-11. Washington, D.C.



People with lower levels of education in STEM make more than people with higher levels of education in non-STEM.

- 63 percent of Associate's degrees in STEM earn more than Bachelor's degrees in non-STEM occupations.
- 65 percent of Bachelor's degrees in STEM earn more than Master's degrees in non-STEM occupations.
- 47 percent of Bachelor's degrees in STEM occupations earn more than PhDs in non-STEM occupations.
- Certificate holders in engineering earn more than Associate's degree-holders in business and more than Bachelor's degree-holders in education.

Source: The Georgetown University Center on Education and the Workforce (2011) . *STEM*.



National STEM Initiatives increasing access and success

- Race to the Top
 - Ohio awarded \$400M

(http://en.wikipedia.org/wiki/Race_to_the_Top)
- Investing in Innovation
- Change the Equation
(<http://changetheequation.org/>)
- Educate to Innovate
 - White House Science Fair

Toldson, I.A. & Esters, L.L. (2012). *The quest for excellence: Supporting the academic success of minority males in science, technology, engineering, and mathematics (STEM) disciplines*. Washington, D.C.: Association of Public and Land-grant Universities.



Question One

What seem to be the key issues discouraging Latinos and Latinas from pursuing STEM careers?

* What do you think?



Review Research Summary

- *“Nontraditional Career Preparation: Root Causes and Strategies”*
- Authors: Lynn Reha, ICSPS; Mimi Lufkin, NAPE; Laurie Harrison, Foothill Associates
 - <http://www.stemequitypipeline.org/Resources/TheFiveStepProgramImprovementProcessTrainingResources.aspx>



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ROOT CAUSES: CAREER INFORMATION



Career Guidance Materials and Practices

- More than just brochures and posters
- Get beyond the images
- Beware of subtle messages
- Use of interest inventories
- Lack of understanding of careers
- Wage earnings information

Source: Reha, Lufkin, & Harrison (2009). *Nontraditional Career Preparation: Root Causes and Strategies*. NAPE



Early Exposure

- Most students pursuing a nontraditional career have had a friend or family member influence them
- Spark an interest that would otherwise not be evident
- Informal experiences supported by formal experiences
- The earlier the better



Source: Reha, Lufkin, & Harrison (2009). *Nontraditional Career Preparation: Root Causes and Strategies*. NAPE



Occupational Perception

- Job Satisfaction
- Career Family Balance
- Wage Potential
- Career Purpose



Source: Reha, Lufkin, & Harrison (2009). *Nontraditional Career Preparation: Root Causes and Strategies*. NAPE



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ROOT CAUSES: FAMILY



N A P E

Family Characteristics and Engagement

- Parents are the #1 influence of student college major and career choice
- Negative messages from people with emotional influence difficult to overcome
- Family role models
- There may be a strong cultural “push”/”pull” towards jobs that are traditional to gender roles

Source: Reha, Lufkin, & Harrison (2009). *Nontraditional Career Preparation: Root Causes and Strategies*. NAPE



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ROOT CAUSES: INTERNAL/INDIVIDUAL



Self-efficacy

- Attribution Theory
 - Girls more likely to attribute success to external factors and failure to internal factors
- Stereotype Threat
 - Being at risk of confirming a negative stereotype
- Locus of Control
 - When students feel they are in control of their lives and their futures they are more likely to select nontraditional options

Source: Reha, Lufkin, & Harrison (2009). *Nontraditional Career Preparation: Root Causes and Strategies*. NAPE



Social Attitudes

- Bias and Discrimination
 - Gender schema
 - Assumptions about gender from birth on
 - Accumulative Advantage
 - Members of a disadvantaged group have to accumulate more than 1% advantage to be considered the same as the advantaged group
 - Implicit bias
 - Unconscious associations

Source: Reha, Lufkin, & Harrison (2009). *Nontraditional Career Preparation: Root Causes and Strategies*. NAPE



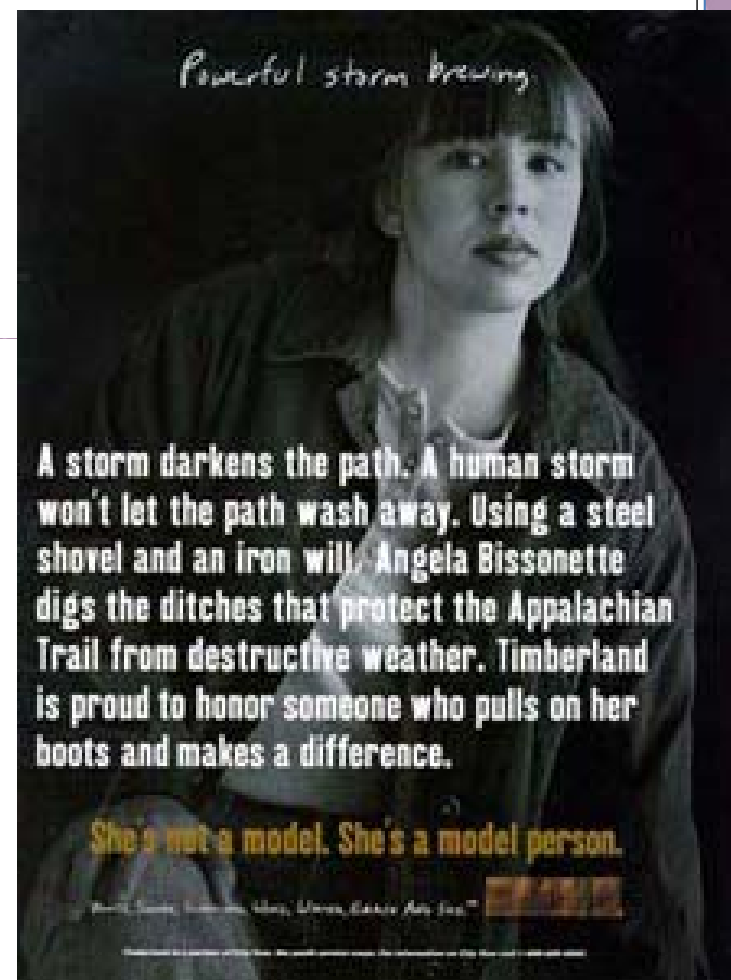
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ROOT CAUSES: SOCIETAL ISSUES



Media Representation

– About-face.org





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Student Attitudes/Peer Influence

- Adolescent social norms
- Fear of “looking dumb”
- Girls more concerned about appearances than boys
- Men more reference group independent
- Peer harassment or support
- Critical mass



Source: Reha, Lufkin, & Harrison (2009). *Nontraditional Career Preparation: Root Causes and Strategies*. NAPE



Nontraditional Role Models

- Strongest evidence in the research
- Need to see someone that looks like them in the career
- Family members are significant
- Teachers
- Mentors



Source: Reha, Lufkin, & Harrison (2009). *Nontraditional Career Preparation: Root Causes and Strategies*. NAPE



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OTHERS?



Question Two

What are successful practices to attract and retain Latino and Latina talent in STEM professions?

*Examples?



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SUGGESTIONS FOR EDUCATION INSTITUTIONS



Recruiting, Retaining, and Graduating Minority (Males) in STEM

- Protect and strengthen public schools
- Provide quality counseling and advisement for college-bound students in grade schools
- Implement a college-bound curriculum and advanced placement in all high schools
- Provide opportunity for minority (males) to participate in college tours

Toldson, I.A. & Esters, L.L. (2012). *The quest for excellence: Supporting the academic success of minority males in science, technology, engineering, and mathematics (STEM) disciplines*. Washington, D.C.: Association of Public and Land-grant Universities.



Recruiting, Retaining, and Graduating Minority (Males) in STEM

- Provide resources for students from lower socioeconomic backgrounds
- Protect and expand Pell grants and needs-based scholarships
- Reduce feelings of isolation among minority (males) on college campuses
- Provide resources for first-generation college students

Toldson, I.A. & Esters, L.L. (2012). *The quest for excellence: Supporting the academic success of minority males in science, technology, engineering, and mathematics (STEM) disciplines*. Washington, D.C.: Association of Public and Land-grant Universities.



Recruiting, Retaining, and Graduating Minority (Males) in STEM

- Provide mechanisms to foster more personal and meaningful relationships with faculty members
- Provide support to develop time management and study skills
- Provide mechanisms to attend to students' physical, mental, and spiritual health

Toldson, I.A. & Esters, L.L. (2012). *The quest for excellence: Supporting the academic success of minority males in science, technology, engineering, and mathematics (STEM) disciplines*. Washington, D.C.: Association of Public and Land-grant Universities.



Recruiting, Retaining, and Graduating Minority (Males) in STEM

- Ensure that there is commitment from the highest level of the institution
- Gather the data needed to make informed decisions toward change
- Act to initiate changes in the academic processes
- Track outcomes by race, gender, and academic discipline

Toldson, I.A. & Esters, L.L. (2012). *The quest for excellence: Supporting the academic success of minority males in science, technology, engineering, and mathematics (STEM) disciplines*. Washington, D.C.: Association of Public and Land-grant Universities.



Recruiting, Retaining, and Graduating Minority (Males) in STEM

- Support and enhance minority serving institutions
- Provide students with structural and emotional support to pursue post-baccalaureate study

Toldson, I.A. & Esters, L.L. (2012). *The quest for excellence: Supporting the academic success of minority males in science, technology, engineering, and mathematics (STEM) disciplines*. Washington, D.C.: Association of Public and Land-grant Universities.



Opportunities available at all levels

For the next 47 million job openings:

- **33% will require a B.A. or better**
- **30% will require some college/ AA degree**
- **36% will require a HS degree or less**

From "Pathways to Prosperity to Report" Harvard University February 2011; Power Point Presentation by William Symonds, Project Director 11/30/10



Strategies to retain low income women and student parents in STEM in Community Colleges

- Actively recruit women and student parents
- Provide financial supports and child care services
- Improve and expand developmental education
- Provide strong counseling, advising and academic supports

Costello, C.B. (2012). Increasing opportunities for low-income women and student parents in Science, Technology, Engineering, and Math at Community Colleges. Washington, D.C.: Institute for Women's Policy and Research



Strategies to retain low income women and student parents in STEM in Community Colleges

- Create educational pathways (certificate, associates, bachelors)
- Improve curricula and instruction
 - Eliminate gender stereotypes and bias in the classroom

Costello, C.B. (2012). Increasing opportunities for low-income women and student parents in Science, Technology, Engineering, and Math at Community Colleges. Washington, D.C.: Institute for Women's Policy and Research



Question Three

What are the key issues that employers need to consider when developing strategies to increase the participation of Latinos and Latinas in STEM professions?



Reflections

- What one or two things you will do to continue the work started today?
- Who do you need to work with to help your organization to be more accessible to talented Latinos and Latinas?



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Resources

- www.stemequitypipeline.org; register to Participate
- www.napequity.org
- www.changetheequation.org
- Latino Start Up Alliance
(<http://latino.foxnews.com/latino/community/2012/09/24/hispanic-heritage-month-latino-startup-alliance-model-and-call-to-action/>)
- The Society of Hispanic Professional Engineers (SHPE)
 - <http://oneshpe.shpe.org/wps/portal/national>



Reports of Interest

- *Pathways to Prosperity* (Harvard 2011)
- *STEM* (Georgetown 2011)
- *Increasing opportunities for low-income women and student parents in community colleges* (Costello, 2012)
- *The quest for excellence: Supporting the academic success of minority males in Science, Technology, Engineering, and Mathematics (STEM Disciplines)* (Toldson & Esters, 2012)



Additional reports

- U.S. Department of Commerce (2011).
STEM: Good jobs now and for the future.
ESA Issue Brief #03-11. Washington, D.C.
- U.S. Department of Commerce (2011).
Women in STEM: A gender gap to innovation. ESA Issue Brief #04-11.
Washington, D.C.



Questions? Contact Information

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<http://www.stemequitypipeline.org/StateTeams/OH.aspx>

Thank you for your participation this afternoon!

National Alliance for Partnerships in Equity

www.stemequitypipeline.org

www.napequity.org