



## OHIO STEM EQUITY PIPELINE WORKSHOP

July 29, 2015, 12:30-3:00 p.m.  
Ohio ACTE, Columbus, Ohio  
Ben Williams, Ph.D., Director of Special Projects





National Alliance for Partnerships in Equity

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## Objectives for Today

- Components of The Ohio STEM Equity Pipeline
- Effective practices from the field (new and updates)
- Future plans
- Tools and Resources
- Discussion

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## Who Is NAPE?




**National Alliance for Partnerships in Equity**

Professional Development	Research and Evaluation	Technical Support	Public Policy and Advocacy
Provide tools and curricula for educators through conferences, presentations, webinars, and formal training	Develop reports. Identify research-based promising practices. Provide input to others' research.	Develop tools and resources for LEAs. Provide consulting services. Offer expertise on access, equity, and diversity issues.	Work with federal agencies. Educate legislators on equity and diversity issues. Develop policy briefs. Alert membership policy issues.

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## NAPE's Professional Development Suite of STEM Equity Programs




**STEM Equity Pipeline™**

PIPE-STEM™ Project	STEM Equity Teacher Training	STEM Equity Counselor Training	Tools & Resources
Working with institutional leaders (administrators, dept heads, etc.) to improve enrollment, retention, and completion of girls and under-represented populations in STEM courses	Training teachers to use pedagogy that improves enrollment, retention, and completion of girls and under-represented populations in STEM courses	Coaching counselors to encourage girls and under-represented populations in STEM careers	Tools to support teachers' and counselors' learning and assist their students, e.g., camps, partner orgs, books

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## STEM Equity Pipeline™ Goals


- Build formal education capacity**
  - high quality professional development
  - gender equity in STEM education
- Institutionalize implemented strategies**
  - connect outcomes to existing accountability systems
- Broaden commitment –**
  - gender equity in STEM education



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## Ohio Department of Education Phase One: FY12-FY13

- Provided mechanism to address low accountability measures (6S1 and/or 6S2)
- Contracted with Columbus State CC
- Eight PIPESTEM™ Projects (4 in FY12; 4 in FY13)
- Train the Trainer Program September 2011
- State Conferences (two presentations a year)
- Technical Assistance



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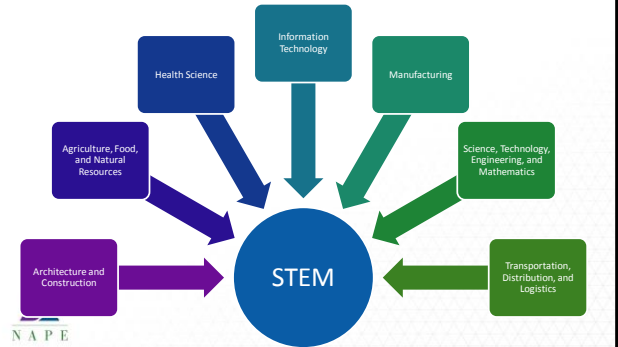
## Who was at the table?

- Career Center/CTE Director
- CTE instructors
- High School Guidance Counselor(s)
- College partner(s): Community College with articulated pathways; four year partner(s)
- Middle School counselor
- Business & Industry representative
- Co-facilitator (in some cases)



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## STEM's Seven Career Clusters



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US Dept. of Ed., Office of Vocational and Adult Education STEM Transitions Project - [www.p21.org](http://www.p21.org)

## Perkins Act Accountability

- Core indicators on Nontraditional CTE
- Participation in CTE programs preparing students for nontraditional fields (6S1/5P1)
- Completion of CTE programs preparing students for nontraditional fields (6S2/5P2)



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## Data Collection

*Disaggregation required in Perkins IV*

Gender	Race/Ethnicity	Special Populations
<ul style="list-style-type: none"> <li>• Male</li> <li>• Female</li> </ul>	<ul style="list-style-type: none"> <li>• American Indian or Alaskan Native</li> <li>• Asian or Pacific Islander</li> <li>• Black, non-Hispanic</li> <li>• Hispanic</li> <li>• White/non-Hispanic</li> </ul>	<ul style="list-style-type: none"> <li>• Underrepresented gender students in a nontraditional CTE program</li> <li>• Single parent</li> <li>• Displaced homemaker</li> <li>• Limited English proficiency</li> <li>• Individuals with a disability</li> <li>• Economically disadvantaged</li> </ul>



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*When are the intersections of equity important?*

## Data Collection

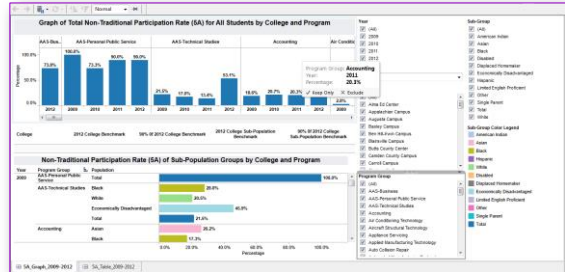
### Recommended Analysis

Current Context	Site Specific	Trends
<ul style="list-style-type: none"> <li>National level data</li> <li>State level</li> <li>Best performer in state</li> <li>Selected peer benchmark</li> <li>Set your own benchmark</li> </ul>	<ul style="list-style-type: none"> <li>District</li> <li>School/College</li> <li>Programs</li> </ul>	<ul style="list-style-type: none"> <li>At least 2 years</li> <li>Prefer 3-5 years</li> </ul>



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## Data Dashboard



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## Review Research Summary

### Nontraditional Career Preparation ROOT CAUSES & STRATEGIES

The goal of Nontraditional Career Preparation is to assist you in recruiting and enrolling more students into nontraditional careers through the most effective means possible. The data provided in "look first" in the research and is intended as a summary. Color and downloadable versions of the complete document are available on the NAPE website at [www.nape.org](http://www.nape.org).

ROOT CAUSE	THEORY	STRATEGIES
<b>Academic Proficiency</b> Most students who do not pass the state assessment are not prepared for nontraditional careers. Many students who do not pass the state assessment are not prepared for nontraditional careers.	<ul style="list-style-type: none"> <li>Target students who are not prepared for nontraditional careers.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> </ul>	<ul style="list-style-type: none"> <li>Target students who are not prepared for nontraditional careers.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> </ul>
<b>Access to and Participation in Nontraditional Career Preparation</b> Students who do not have access to nontraditional career preparation programs are not prepared for nontraditional careers.	<ul style="list-style-type: none"> <li>Identify and address barriers to access to nontraditional career preparation programs.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> </ul>	<ul style="list-style-type: none"> <li>Identify and address barriers to access to nontraditional career preparation programs.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> </ul>
<b>Curriculum</b> Students who do not have access to nontraditional career preparation programs are not prepared for nontraditional careers.	<ul style="list-style-type: none"> <li>Identify and address barriers to access to nontraditional career preparation programs.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> </ul>	<ul style="list-style-type: none"> <li>Identify and address barriers to access to nontraditional career preparation programs.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> </ul>
<b>Institutional Strategies</b> Students who do not have access to nontraditional career preparation programs are not prepared for nontraditional careers.	<ul style="list-style-type: none"> <li>Identify and address barriers to access to nontraditional career preparation programs.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> </ul>	<ul style="list-style-type: none"> <li>Identify and address barriers to access to nontraditional career preparation programs.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> </ul>
<b>School/Classroom Climate</b> Students who do not have access to nontraditional career preparation programs are not prepared for nontraditional careers.	<ul style="list-style-type: none"> <li>Identify and address barriers to access to nontraditional career preparation programs.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> </ul>	<ul style="list-style-type: none"> <li>Identify and address barriers to access to nontraditional career preparation programs.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> </ul>
<b>Support Services</b> Students who do not have access to nontraditional career preparation programs are not prepared for nontraditional careers.	<ul style="list-style-type: none"> <li>Identify and address barriers to access to nontraditional career preparation programs.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> </ul>	<ul style="list-style-type: none"> <li>Identify and address barriers to access to nontraditional career preparation programs.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> </ul>
<b>Family Characteristics</b> Students who do not have access to nontraditional career preparation programs are not prepared for nontraditional careers.	<ul style="list-style-type: none"> <li>Identify and address barriers to access to nontraditional career preparation programs.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> </ul>	<ul style="list-style-type: none"> <li>Identify and address barriers to access to nontraditional career preparation programs.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> <li>Provide additional academic support for students who are not prepared for nontraditional careers.</li> </ul>



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## Root Cause Analysis Through Action Research



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## PIPE-STEM™ Implementation Plan

National Alliance for Partnerships in Equity  
Education Foundation

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PIPESTEM Implementation Plan:

Institution: \_\_\_\_\_

Academic Year: \_\_\_\_\_

Team members:

Team coordinator:

Explore Results	These classes/program(s) will be the focus to increase the number of nontraditional (under-represented gender) students.
Program(s)	
Underrepresented gender, race/ethnicity or special population sub-group(s)	
Baseline data	
(e.g., 3 female students in Engineering Technology)	✓ <b>Implement Solutions</b>
SMART Goal	✓ <b>Document Performance Results</b>
(e.g., female students in first-year Electronic Engineering Technology from the current 5% to 25% by the next academic year)	

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## Ohio Department of Education Phase Two: FY14-FY15

- Six additional PIPESTEM Projects
- TA for original eight projects and new ones
- Conference Presentations
- Two Micromessaging Projects
- Counselor Training Initiative (+\$12,000)
- Additional Contract for Equity in STEM Grades 7-8 (Battelle Education Foundation)

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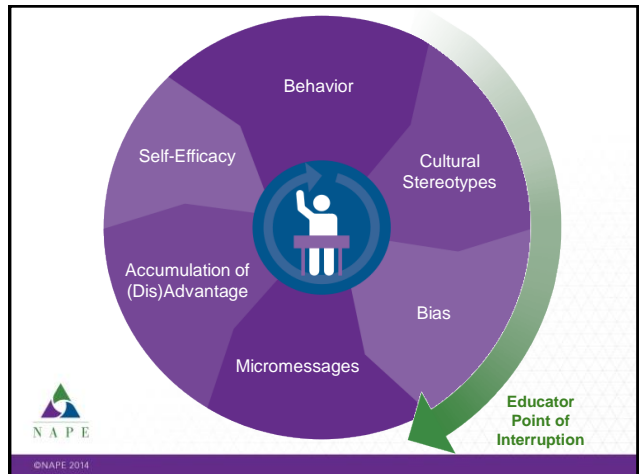
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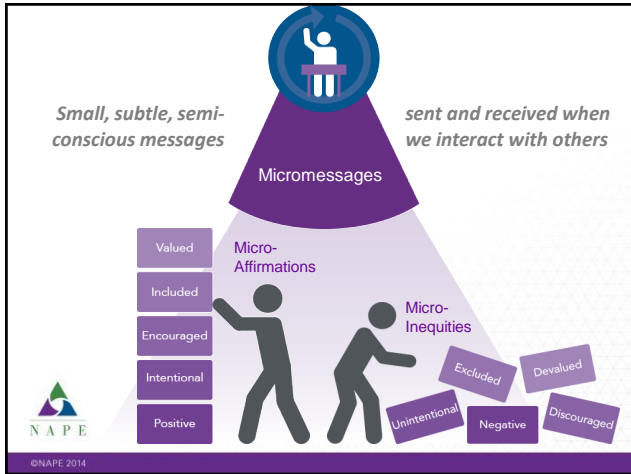
**NAPE's Professional Development Suite of STEM Equity Programs**

**STEM Equity Pipeline™**

<p style="text-align: center; background-color: #4CAF50; color: white; padding: 2px;"><b>STEM Equity for Educational Leaders</b></p> <div style="border: 1px solid purple; padding: 5px; text-align: center;"> <p>Program Improvement Process for Equity in STEM™</p> </div>	<p style="text-align: center; background-color: #4CAF50; color: white; padding: 2px;"><b>STEM Equity Teacher Training</b></p> <div style="border: 1px solid purple; padding: 5px; text-align: center;"> <p>Micromessaging to Reach and Teach Every Student™</p> </div>	<p style="text-align: center; background-color: #4CAF50; color: white; padding: 2px;"><b>STEM Equity Counselor Training</b></p> <div style="border: 1px solid purple; padding: 5px; text-align: center;"> <p>Focus on Counselors Initiative™</p> </div>	<p style="text-align: center; background-color: #4CAF50; color: white; padding: 2px;"><b>Tools and Resources</b></p> <div style="border: 1px solid purple; padding: 5px;"> <p style="font-size: x-small;">Webinars, on-line courses, reports, evaluation tools, current research, effective practice resources, and more!</p> </div>
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### Promising outcomes

Performance

Participation

Pipeline

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EARLY INTERVENTION

©NAPE 2015

gems  
girls exploring math and science

Developed by  
Jamie Squibb, PLTW Instructor  
Whitmer Career and Technology Center

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## Program Overview

- 2-year program with hands-on math and science projects
- Girls followed for 7<sup>th</sup> and 8<sup>th</sup> grade, providing consistently and follow-through
- Activities performed during school day

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## GEMS 7<sup>th</sup> Grade – Initial Camp

### Camp:

- Camp Miakonda August 17-18, 2013
- One overnight trip for the 50 girls in both the fall and spring.
- STEM activities for fall overnight camp will include:
  - Giant Bubbles
  - Soda Geysers
  - Food Cars
  - Glow in the Dark Slime
  - Jewelry Making With UV Beads
  - Flashlights

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## GEMS 7<sup>th</sup> Grade – Quarterly Visits

### Staying Connected:

- Met with girls quarterly and performed a STEM activity.
- Met with groups of 12-15 quarterly.
- Quarter 1 – extracted DNA and made necklaces
- Quarter 2 – Made bubble gum
- Quarter 4 – Made slime

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## GEMS 7<sup>th</sup> Grade – Spring Camp

### Camp Miakonda May 24-25:

- Overnight
- STEM Activities performed
  - Solar Ovens
  - Cyanotype Photography
  - Periscopes
  - Car Races
  - Flower Dye

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## GEMS 8<sup>th</sup> Grade

Staying Connected (Similar to 7<sup>th</sup> Grade):

- Girls met quarterly and discussed how classes were going
- Q&A with math and science teachers at the high school to start to prepare them for their freshman year.
- Met with groups of 12-15 quarterly.
- Had planned to keep a blog/facebook/twitter to keep active in-between meetings.

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## GEMS 8<sup>th</sup> Grade

Camp:

- During January of the 8<sup>th</sup> grade year, the 50 girls will attend Camp Miakonda for one last time (before scheduling).
- This would be an opportunity to talk in depth with girls about what their interests would be for high school and what classes they could take that could steer them in the right direction. I could help girls with developing an educational plan that they could work through during high school that will help them in the direction they would like to go in for college.

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## Outcome this year

- 9/41 girls in first year Project Lead Way this fall (22%)
- Fall 2014: 0%
- Some challenges with attendance
  - GEMS – 2013/14 50 females**
  - GEMS - 2014/15 24 females**

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## MICROMESSAGING WITH FIFTH GRADERS

Rachel Lovely and Kelly Wood, [YouTube](https://www.youtube.com/watch?v=y7ZgOyOiO7o)  
<https://www.youtube.com/watch?v=y7ZgOyOiO7o>



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**PROJECT LEAD THE WAY  
AT MANSFIELD SENIOR  
HIGH SCHOOL**

Leslie Nielsen, PLTW Instructor


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### Results

- 2012-2013
  - Out of 220 students who took Gateway, 46 signed on for 9<sup>th</sup> grade PLTW
  - 40% females; 35% African American students (boys and girls)
- As of 2015
  - 14 students had worked their way through all 3 years of the program
  - 6/14 (43%) female; 2/3 of females were students of color
  - Of the 8 boys, nearly half were students of color

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**PATHWAY TOOLS AND  
EXPANSION OF DUAL  
ENROLLMENT**

Anita Eldridge, Morgan Local Schools

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**LUNCH AND LEARN,  
VANTAGE CAREER  
CENTER**

Mary Jo Wilhelm

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TO INCREASE THE PARTICIPATION, RETENTION AND COMPLETION RATE OF NONTRADITIONAL STUDENTS AT VANTAGE CAREER CENTER BY 10% IN PROGRAMS WHICH GIRLS ARE UNDERREPRESENTED LEADING TO A NONTRADITIONAL CAREER BY SEPTEMBER, 2015.



## Retention Strategy – Lunch & Learn

- \* Quarterly meetings
- \* 45 minutes (11:30-12:15)
- \* Captive Audience (lunchtime)
- \* Feed them pizza
- \* Contact non-traditional alumni/community members to speak for 15 minutes
- \* Partner with YWCA, 4-H, AAUW, NAWIC



## Successful because it provides students with...

- \* Support during the school day @ minimal cost
- \* Connections with other non-trad students
- \* A vision for their future
  - \* Continuing education, Adult Ed information
- \* Important networking opportunities
  - \* Guest speakers, committee members, other teachers and staff who attended



## Why we think our numbers increased...

- \* When we visited sophomores, we challenged them to try something they were interested in even if it was non-traditional
- \* Girls SAW other girls in the programs when they visited on Sophomore Day – user friendly
- \* Social media & newspaper articles
- \* Manufacturing upswing

## Easy to Implement

- \* *Begin by contacting recent successful non-trad alumni for guest speakers*
- \* *Check local newspapers for promotions of women in non-trad careers*
- \* *Work with partners and committee members*
- \* *Paid for pizza lunches with Community Relations \$\$\$*

## Enrollment in programs which girls are underrepresented leading to a nontraditional career:

FY 11				FY 15			
Program	Total	Females	%	Program	Total	Females	%
Ag & Industrial Power Tech	21	0	0.0%	Ag & Industrial Power Tech	46	1	2.3%
Auto Body	26	3	11.5%	Auto Body	21	7	33.3%
Auto Tech	31	1	3.2%	Auto Tech	15	0	0.0%
Bldg & Grounds	17	1	5.8%	Bldg & Grounds	8	0	0.0%
Carpentry	14	1	7.1%	Carpentry	15	2	13.3%
Electricity	24	0	0.0%	Electricity	12	1	8.3%
Industrial Mechanics	26	0	0.0%	Industrial Mechanics	33	0	0.0%
Network Systems	28	0	0.0%	Network Systems	44	7	15.9%
Precision Machining	25	2	8.1%	Precision Machining	25	1	4.0%
Welding	31	1	3.2%	Welding	41	2	4.8%
<b>TOTAL</b>	<b>243</b>	<b>9</b>	<b>3.7%</b>	<b>TOTAL</b>	<b>201</b>	<b>21</b>	<b>10.4%</b>



SCHOOL COUNSELOR TRAINING FOR NONTRADITIONAL STEM/CTE PATHWAYS: A NEW INITIATIVE




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[www.napequity.org/counselors](http://www.napequity.org/counselors)

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## Kudos Cards

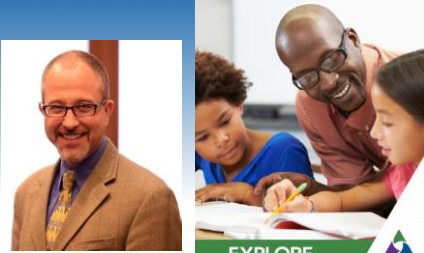



[Napequity.org/counselors](http://Napequity.org/counselors)

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STEM Equity Pipeline Complimentary Webinar Series | May 29, 2015, 1 PM EST

## EXPLORE NONTRADITIONAL CAREERS: A TRANSFORMATIONAL TOOLKIT FOR EDUCATORS AND COUNSELORS ACROSS THE CTE AND STEM PIPELINE


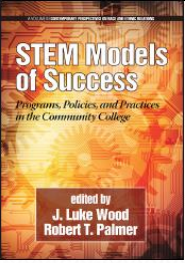
National Alliance for  
Partnerships in Equity

**EXPLORE**  
Nontraditional Careers

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## Publications on Ohio Work

March 2015 Techniques      STEM Models of Success (2014)

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## CONSTRUCTION ADVISORY COMMITTEE

Pat Huston and Linda O'Connor, Ohio Department  
of Education




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# EQUITY IN CTE FY16- FY17

Tom Reed, PhD, ESCCO




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## NAPE Products & Services

- Professional Development
- Custom Webinars
- National Summit
- Career & the Nontraditional Toolkits
- Infographic Wall Art
- Consulting Services

napequity.org



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## Virtual Learning Community

[Napequity.org](http://Napequity.org); [stemequitypipeline.org](http://stemequitypipeline.org)



National Alliance for Partnerships in Equity  
*The Equity Professionals*

Search:

Professional Development | Public Policy | STEM Equity | Resources


**NATIONAL SUMMIT FOR EDUCATIONAL EQUITY**  
Solving the Education Equation: Access, Equity, and Diversity | April 12-14, 2016 | The Woods, Alexandria, VA

Save the Date!  
The National Summit for Educational Equity (formerly the Professional Development Institute) will take place on April 12-14, 2016, in Alexandria, VA.

PROJECTS




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“Never doubt that a small group of thoughtful committed people can change the world.

Indeed, it is the only thing that ever has.”

Margaret Mead



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Thank you for your  
participation!



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