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Ohio STEM Equity Pipeline Project

How to improve nontraditional participation and completion – The Ohio STEM Equity Pipeline Project

Spring 2010

Expanding Options for Women and Girls in Science, Technology, Engineering and Math

Observations from FY2009 Perkins Report for CSCC

- Disparities in performance/attainment based on demographics:
  - Gender (primarily females in nontraditional programs, defined as those with 25% or fewer of that gender in the workforce)
  - Students of Color
    - African American
    - Hispanic
    - Asian American
  - Special Populations
    - Single parents
    - Economically disadvantaged
    - Limited English Proficiency

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Females

- Significantly lower Nontraditional Participation (5P1)
  - 9.95% as opposed to an average of 27.57% (Males at 47.01%, carrying the group)
  - Only 364 or 3,658 students in nontraditional programs are women
- Significantly lower Nontraditional Completion (5P2)
  - 4.77% as opposed to an average of 20.31% (Males at 50.29%, carrying the group even more
  - Only 32 out of 671

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Students of Color

- Aside from "Student Placement" (4P1) and Nontrad indicators, African American students had significantly lower percentages in all other indicators:
  - Technical Skill Attainment (56.18% as opposed to 72.83%)
  - Credential, Certificate or Degree (28.88% as opposed to 38.89%)
  - Student Retention or Transfer (62.59% as opposed to 65.28%)

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Special Populations

- Single Parents
  - Technical Skill Attainment (56.42% as compared to 72.83%
  - Credential, Certificate or Degree (32.83% as compared to 38.89%)
  - Student Retention or Transfer (62.59% as compared to 65.28%)
  - Nontraditional Participation (19.90% as compared to 27.57%)
  - Nontraditional Completion (14.21% as compared to 20.31%)

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Special Populations continued

- Economically disadvantaged
  - Credential, Certificate or Degree completion (2P1) 35.80% as compared to 38.89%
  - Student Placement (4P1) 78.28% as compared to 79.50% (negligible difference)
  - Nontraditional Completion (5P2) 19.47% as compared to 20.31% (negligible)

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Special Populations continued

- **Limited English Proficiency**
  - Credential, Certificate or Degree Completion (2P1) 34.07% as compared to 38.89%
  - Student Placement (4P1) 61.29% as compared to 79.50%
  - Note: Total denominator only 31 students

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Concerns and Goals for Columbus State

- Better understand what is causing this disparity between women and men in nontraditional programs
- Increase access to "high wage, high demand and high tech" careers for underrepresented groups

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Ohio STEM Equity Pipeline Project

- National Science Foundation (NSF) grant-funded project through The National Alliance for Partnerships in Equity (NAPE)
- Purpose:
  - Increase access, participation, degree completion, and job placement for women in STEM fields
  - Particular emphasis on affecting Perkins Nontraditional measures for secondary and postsecondary students (of particular interest to Columbus State and the state)
- Begun Autumn 2009

Ohio Team participated in recent NAPE Professional Development Institute and National Conference in Washington, D.C.

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STEM Equity Pipeline Goals

- Build the capacity of the formal education community
- Institutionalize the implemented strategies by connecting the outcomes to existing accountability systems
- Broaden the commitment to gender equity in STEM education

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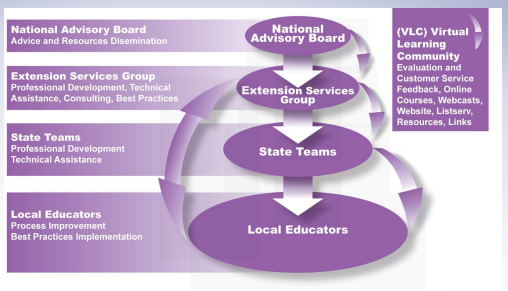
Model



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State Teams

- 5 states in year one
  - California
  - Missouri
  - Illinois
  - Oklahoma
  - Wisconsin

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State Teams

- 2 states added in year 2
- 3 states added in year 3
- 3 states added in year 4
- 13 states over the life of the grant

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Ohio Plan

- Pilot 3-4 community colleges and their feeder programs for career and technical secondary education
- Use 5-Step Process as outlined in the STEM Equity Pipeline – see NAPE webpage at http://www.stemequitypipeline.org/

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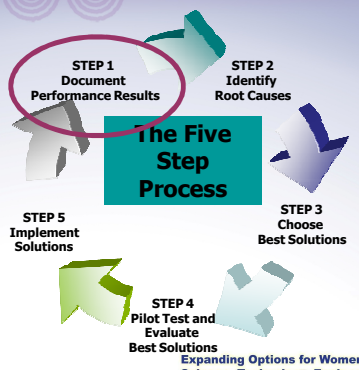

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Perkins Act Accountability

Core Indicators on Nontraditional CTE

- Participation in CTE programs preparing students for nontraditional fields (**5P1**)
- Completion of CTE programs preparing students for nontraditional fields (**5P2**)

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Nontraditional Fields

Occupations or fields of work, including careers in computer science, technology, and other current and emerging high skill occupations, for which individuals from one gender comprise less than 25 percent of the individuals employed in each such occupation or field of work.

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Document Performance Results

Understand the problem completely before you seek solutions

- How do you analyze performance data?
- What questions should be addressed?
- What tools and methods can be used to present and analyze data?
- How should data quality problems be considered in analyzing data?

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Data Collection
Disaggregation required in Perkins IV

Gender
- –Male
- –Female

Race/Ethnicity
- –American Indian or Alaskan Native
- –Asian or Pacific Islander
- –Black, non-Hispanic
- –Hispanic
- –White- non-Hispanic

Special Population
- –Underrepresented gender students in a nontraditional CTE program
- –Single Parent
- –Displaced Homemaker
- –Limited English Proficiency
- –Individuals with a Disability
- –Economically Disadvantaged

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Recommended Analyses

Comparisons
- •State performance level
- •Best performer in state
- •Selected peer benchmark
- •Set your own benchmark

Trends
- At least 2 yrs
- Prefer 3-5 yrs

Site specific
- Statewide
- District
- School/College
- Programs

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Perkins Accountability Resources

- Peer Collaborative Resource Network
  - www.edcountability.net
- National Alliance for Partnerships in Equity
  - Growing Pains
  - Nontraditional SOC/CIP Crosswalk for Males and Females
  - www.napequity.org
- Your State Agency Website

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Poll

Have you used your Perkins data to identify gaps in performance for students pursuing nontraditional careers?

1. I do this all the time
2. I have tried with some success
3. I have tried with no success
4. I don't have access to the data

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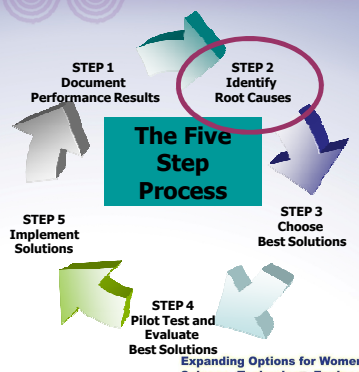

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Why Search for Root Causes?

Keep from fixating on the "silver bullet" strategy

- Identify the conditions or factors that cause or permit a performance gap to occur
- Direct cause (i.e. instructional practice)
- Indirect cause (i.e. teacher training)

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How to Identify Root Causes

- Search for most direct and highest impact causes
- Employ a systematic evidence-based process
- Formulate and test theories or hypotheses
- Draw on current research and evaluation
- Use multiple methods and data sources
- Likely to find multiple causes

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Identify Potential Causes

- Analyzing Student Data
- Reviewing Research Literature
- Reviewing Program/Institutional Evaluations and Effectiveness Reviews
- Conducting Focus Groups
- Brainstorming
- Peer Benchmarking
- Interviews
- Surveys

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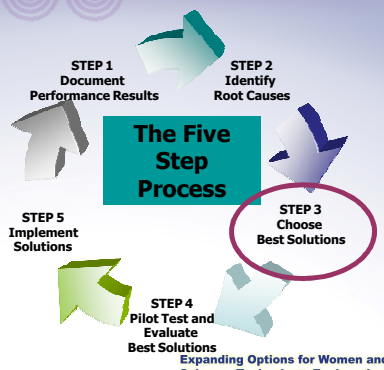

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Choose Best Solutions

Don't be too quick to adopt best practices before getting the facts straight

- How do you identify possible strategies and model practices?
- How do you evaluate strategies and models?
- How do you compare and assess alternative solutions and make a decision?

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Find and Evaluate Solutions

- Failure is expensive
- Build consensus among staff and stakeholders
- Get full support and commitment
- Select full range of choices – be creative
- Implement systematic analysis

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Identify Potential Strategies and Models

- Review What Others Propose
  - NSF- New Formulas for America's Workforce
- Benchmark Peers and Leading Performers
  - Programs and Practices That Work
  - Best Practices in STEM Education
  - EEES Best Practices
- Develop Your Own Solutions

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Poll

How are you feeling about the Five-Step Program Improvement Process?

1. Excited – This sounds like it could really help us be more effective!
2. Curious – I want to know more!
3. Frustrated – I need to track down our Perkins data
4. Overwhelmed – I'll let someone else handle this!

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