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Building Collaborative Partnerships: The Expanded Ohio STEM Equity Pipeline Project

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Relevance of PIPE-STEM

• Unprecedented growth in STEM initiatives
• Urgency and opportunity for economic development in (insert name of state)
• Remaining gaps in educational completion at the certificate, associates, and bachelors degree levels

Relevance continued

• Continued underrepresentation of females in high wage, high skill, and high demand fields
• Breakthrough models are those with clear career pathways and “career architecture”

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.

Why Do We Need to Encourage Students to Choose STEM Careers?

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

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

Source: The Georgetown University Center on Education and the Workforce

STEM majors earn more, in any field they choose.

Source: The Georgetown University Center on Education and the Workforce
2011 STEM Report from The Georgetown University Center on Education and the Workforce

- 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: Division 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, 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.

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Purpose of today’s workshop

- Learn about the Ohio STEM Equity Pipeline Project and its structure
- Learn about how the new PIPE-STEM Model is being used and its benefits
- Learn about how states can use the PIPE-STEM Model to foster collaborative relationships across the educational and career pipeline

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

Ohio Plan

- Pilot at three community colleges and thier feeder programs for career and technical secondary education: Currently:
  - Dayton – Ponitz Career and Technical Center to Sinclair Community College
  - Cincinnati – STEM Pipeline from Elementary School through College
  - Marietta – Secondary pipeline into the Associate of Science program at Washington State Community College
- ODE Expansion launched August 2, 2011

Ohio’s investment in expanding and building capacity

- Ohio Department of Education Expansion – 8 sites over two years
- Train the Trainer Pilot
- Work with schools needing improvement
- Document growth through data (Perkins)
How sites were selected

- CTPDs who had not met Nontraditional Target(s)
- Discussion which would be a good “fit”
- “Field Agents” discussed with directors of CTE and superintendents
- See handout (FY12 Site Memo)

Next steps

- Conversation to answer questions
- Discussion of composition of team
- Orientation Meeting Scheduled
- Data Memo and Template shared

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)

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

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

ORGANIZE Module Objectives

- Organize a PIPE-STEM Team
- Collect and submit data to NAPE for analysis
- Orientation to NAPE, STEM Equity Pipeline and PIPE-STEM
- Expand team member’s knowledge
STEM Equity Pipeline
Program Improvement Process For Equity™

Who is 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)

Train the Trainer Pilot

- Eight members of the State Leadership Team volunteered in SU’11
- Trained 9/26-9/27 at Columbus State (trainers: Mimi Lufkin and Courtney Reed-Jenkins)
- Focus on Root Causes
- Provide additional feedback, thoughts, ideas, and resources

Data used

- Participation
- Completion
- Demographics
- Refer to Template
How does your agency define STEM?

Defining STEM

- Science, Technology, Engineering and Math
- Agriculture, Food and Natural Resources
- Health Science
- Information Technology
- Manufacturing
- Transportation, Distribution and Logistics
- Architecture and Construction

Common areas of focus

- Engineering (Project Lead the Way)
- Information Technology
- Manufacturing Technology
- Construction Technology
- Health Sciences (for males)

STEM Pipeline Spreadsheet

- Capture the “Pipeline” as a snapshot across articulated pathways of focus
- Easier to see patterns based on gender and/or race/ethnicity, if data available
- Requires planning and “distillation” of data

Data “Distillation”

- Raw data – Demographic/Participant/Completion
- Data Analysis by Program
- Articulated Pathways (Discussion)
- Pipeline Spreadsheet for use in Day One Training (Refer to Examples)

Reactions?

- Audience?
- Marquita Riepenhoff, Site Lead for the Scioto County Career and Technical Center ODE Site (FY12-FY13)
STEM Equity Pipeline
Program Improvement Process For Equity™

Prioritize Root Causes

Select root causes that:
- Have the strongest theory and evidence to support them
- Focus on direct causes of performance gaps
- Address the most critical needs
- Provide the best opportunity to have high impact on performance
- Are supported by stakeholders who will help develop and implement solutions

Confirming your hypotheses

• Conduct a root cause analysis
  - Conduct equity audit
    • School environment: physical space, support services
    • Curriculum & instruction
    • Publicity (website, recruitment materials, etc.)
  - Interview students
    • Who drop out of nontraditional programs
    • Who stay in nontraditional programs
    • Who never choose
  - Conduct focus groups
    • Teachers of nontraditional programs
    • Parents
    • Business/Industry/Advisory committee members
  - Refer to Next Steps Memo

Review Research Summary

• “Nontraditional Career Preparation: Root Causes and Strategies”
  - Authors: Lynn Reha, ICSPS; Mimi Lufkin, NAPE; Laurie Harrison, Foothill Associates

Confirming your hypotheses

• 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
Create The PIPE-STEM Implementation Plan

- Fill in throughout the process (but iterative) Example
- Initial Data
- Root Cause Analysis
- Hypotheses
- Findings
- Goals and Strategies
- Evaluation (Formative and Summative)

Pipe-STEM Expectations

- Work as a Team
- Gather and Analyze Data
- Integrate PIPE-STEM with other STEM initiatives and local work
- Implement a Plan
- Evaluate and Report Results

Create your Team’s PIPE-STEM Timeline

- Phase I - ORGANIZE Module with Orientation
- Phase II - EXPLORE and DISCOVER Modules
- Phase III - SELECT AND ACT Modules

STEM Equity Pipeline Program Improvement Process For Equity™
“Share”

- Communications with “Leadership Team”
- Regular Updates at Perkins Coordinators Meetings (AU and SP)
- Presentations at Local, Regional and National Conferences
- Team Participation in NAPE PDI
- Ohio ACTE Post-Conference Workshop: “Effective Practices in Recruiting and Retaining Nontraditional Students in STEM CTE Programs” (August 2012)

Effects of this new model

- “Organize/Orientation” critical to successes
- More meaningful and comprehensible data
- Breaking down of silos and collaboration between educational partners and Business & Industry
- www.stemequitypipeline.org (Ohio)

My goal (using a different diagram)

Reflections on Today’s Workshop

Questions?

Contact Information

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Thank you!
National Alliance for Partnerships in Equity
www.stemequitypipeline.org
www.napequity.org