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# Research-Based Strategies for Nontraditional Program Improvement

Joint Special Populations Committee  
Conference

Sacramento, CA

Wednesday, December 1, 2010

The logo for the STEM Equity Pipeline project is located on the left side of the slide. It features a vertical banner with a background image of a person wearing safety glasses and a blue hard hat. The text "STEM Equity pipeline" is written in a stylized font, with "STEM" in purple, "Equity" in white, and "pipeline" in a cursive-like font. At the bottom of the banner is the NSF logo, which is a gold sunburst with "NSF" in the center.

# STEM Equity Pipeline Goals

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

# Defining STEM

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



# Model



**National Advisory Board**  
Advice and Resources Dissemination

**Extension Services Group**  
Professional Development, Technical Assistance, Consulting, Best Practices

**State Teams**  
Professional Development  
Technical Assistance

**Local Educators**  
Process Improvement  
Best Practices Implementation

**National Advisory Board**

**Extension Services Group**

**State Teams**

**Local Educators**

**(VLC) Virtual Learning Community**  
Evaluation and Customer Service  
Feedback, Online Courses, Webcasts, Website, Listserv, Resources, Links

# State Teams

- 5 states in year one
  - California
  - Missouri
  - Illinois
  - Oklahoma
  - Wisconsin
- 2 states in year two
  - Iowa
  - Minnesota
- 2 States in year three
  - New Hampshire
  - Ohio
- 2 States in year four
  - Texas
  - Georgia





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# STEM Case Study

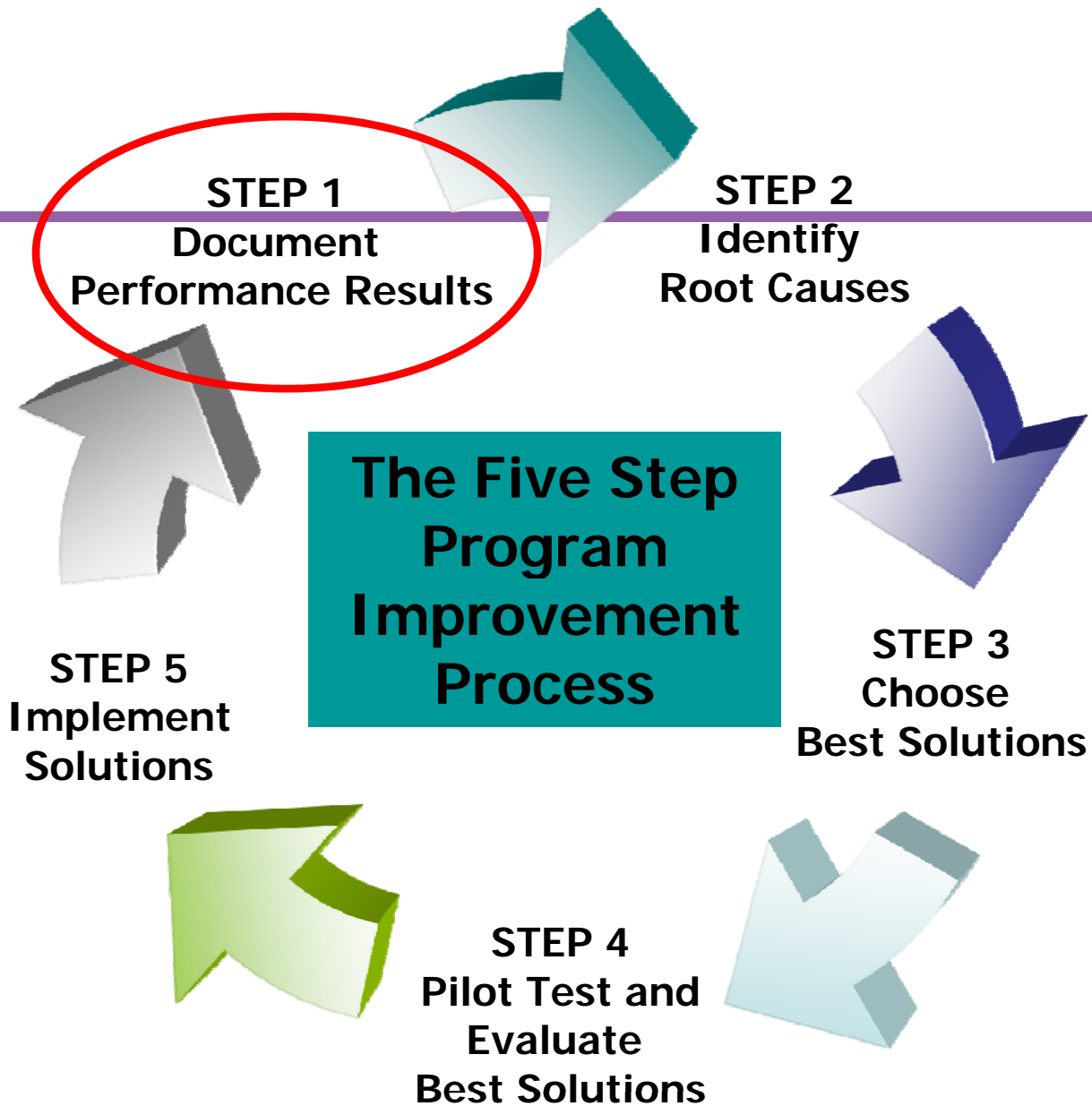
Funded by a grant from the National Science Foundation, GSE/EXT: STEM Equity Pipeline Project, Grant No. HRD-0734056  
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# Case Study - Read Page One

What should Samuel Johnson  
School District and Mead  
Community College do?



# STEP One – Document Performance Results

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- Understand the problem before you seek a solution
- Program level data analysis disaggregated by gender, race/ethnicity and special population
- Conduct a performance gap analysis
- Look at trends in the data – prefer at least three years
- Benchmark against leaders, peers, set your own benchmark





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# What data should SJSD and MCC collect to document their performance results?



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# Case Study - Read Page Two

What should Samuel Johnson  
School District and Mead  
Community College do now?



**STEM  
Equity  
pipeline**



A vertical banner on the left side of the slide. It features a close-up of a person wearing safety glasses and a blue headband. Below the person's face, the text "STEM Equity pipeline" is written in a stylized font. The background of the banner is a blurred image of a circuit board with glowing yellow and blue lines.

# STEP 2 – Identify Root Causes

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- Keep from fixating on the “silver bullet” strategy
- Identify the conditions or factors that cause or permit a performance gap to occur
- Search for most direct and highest impact causes
- Employ a systematic evidence-based process
- Formulate and test theories or hypotheses



# Root Cause Action Research

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





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# Case Study - Read Page Three

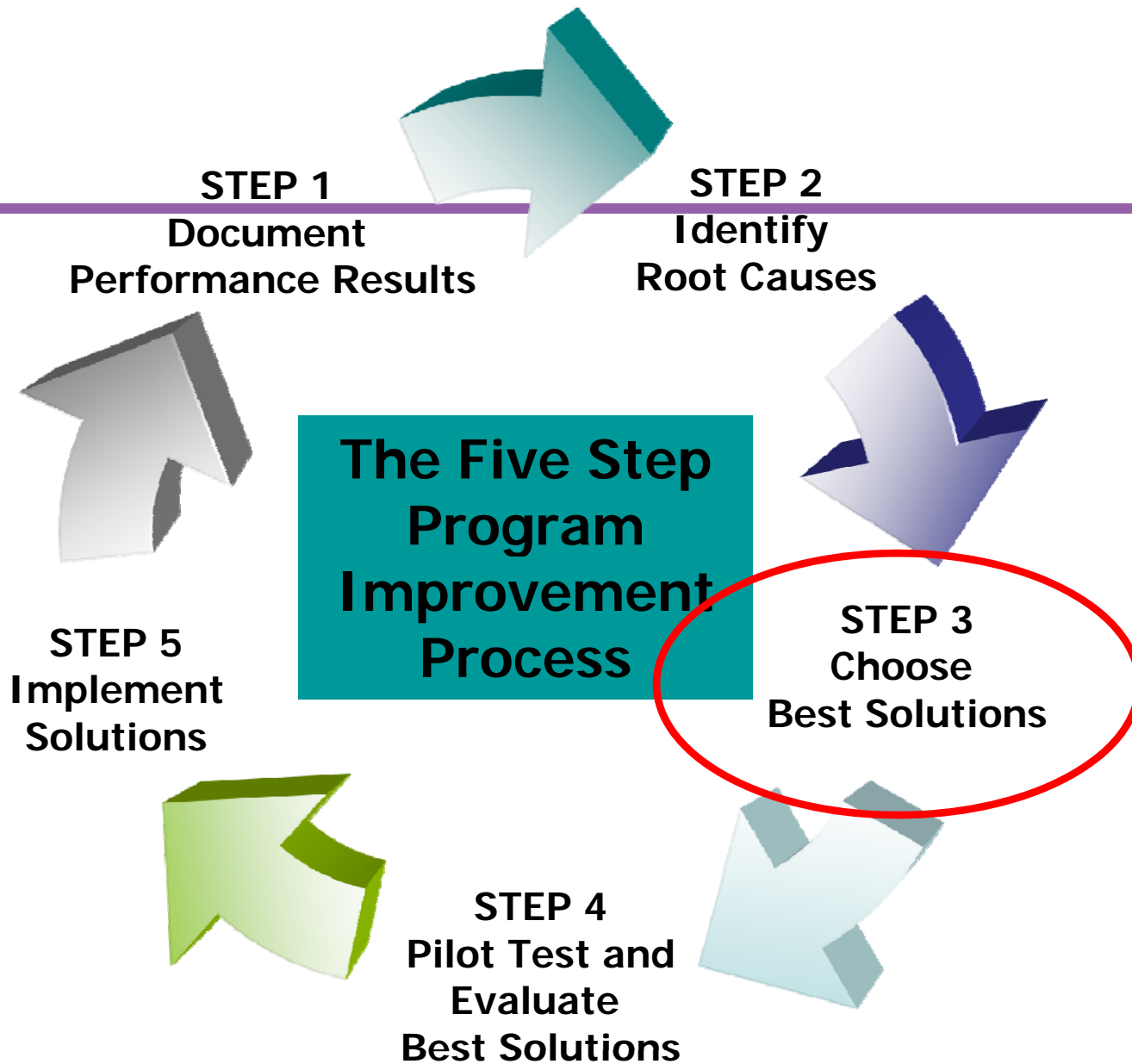
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**STEM  
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# STEP 3 – Choose Best Solutions

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- Don't be too quick to adopt best practices before getting the facts straight
- 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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# Nontraditional Career Preparation: Root Causes and Strategies

[www.stemequitypipeline.org](http://www.stemequitypipeline.org)



**STEP 1**  
**Document**  
**Performance Results**

**STEP 2**  
**Identify**  
**Root Causes**

**The Five Step**  
**Program**  
**Improvement**  
**Process**

**STEP 3**  
**Choose**  
**Best Solutions**

**STEP 5**  
**Implement**  
**Solutions**

**STEP 4**  
**Create an**  
**Evaluation Plan**



# Sample Summative Outcomes

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“As a result of all these efforts 82% of senior females are registered for a senior level math course with 55% of the senior females enrolled in an advanced level math course for 2009-2010, up from 15% in 2007-2008.”

Bement High School  
New Look Project  
Illinois



# Sample Summative Outcomes

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**“Our *enrollment for the science adventure week this year has increased to 50% females where last summer we only had 3 females (all employee children).* Our efforts in the STEM equity project has definitely paid off. ”**

Carrie Dassow,  
Plymouth High School  
Wisconsin



# Sample Summative Outcomes

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“ Since 2007 Crowder Career Technical Center has tripled the number of students participating in CTE programs nontraditional for their gender. This increase can be attributed to the work we have done as a result of our participation in the STEM Equity Pipeline Project’s Five Step Program Improvement Process.”

Janet Reppert,  
MCCE Facilitator,  
Crowder College Technical Education Center  
Missouri



# Sample Summative Outcomes

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One teacher was looking at filling an instructional aide and chose a female who was just as qualified as a male and as a result, over two years, the number of females in the program increased from 4 to 15. The teacher attributed the change to the hiring of the female aide. The decision to choose a female aide by this teacher was the result of participation in the 5-step process.

Anonymous response to  
external evaluation interview

# Sample Summative Outcomes

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After implementing the Focus Your Future activity our PLTW female enrollment increased from 8 to 24 in one semester. We learned about this research-based activity from participating in a NAPE webinar.

Brad Hill

Anne Arundel Public Schools





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



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- State Teams
- Resources
- Professional Development



Register to Participate

Upcoming Events

NAPE Website

NAPE Ed Foundation Website



### Upcoming Events

For more events go to the [STEM Equity Pipeline Calendar](#)

- October 21-22, 2010**

**National Girls Collaborative Project Conference 2010**  
 Hyatt Regency Washington on Capitol Hill  
 400 New Jersey Avenue, NW  
 Washington, D.C., USA 20001  
[\(More Information\)](#)
- October 23-24, 2010**  
 10:00am-5:30pm

**USA Science & Engineering Festival**  
 Don't miss the Expo on the National Mall  
 Over 1500 hands-on science and engineering activities  
 More than 50 stage shows on four stages  
 A free event for all ages  
[\(More Information\)](#)
- October 20-22, 2010**

**PLTW Welcomes STEM Education's Best and Brightest to Washington, DC**

(Show More Information...)

### State Team Happenings

- October 25, 2010** Ohio Onsite Pilot Site Meeting
- October 18, 2010** Moms Night Out for STEM in Iowa  
[\(More Information\)](#)
- Other Satellite Events Around the Nation  
[\(More Information\)](#)

### News

Search



# Resources for Educators

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[www.stemequitypipeline.org](http://www.stemequitypipeline.org)

- Experts
- State Team pages
- Resources
  - Pipeline Press
  - Online data base of web-based resources
  - Training modules



# Resources for Educators

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[www.stemequitypipeline.org](http://www.stemequitypipeline.org)

- Professional development
  - Event Calendar
  - Archived Webinars
  - Online Courses
  - Promising Practices
  - Five Step Program Improvement Process
  - Professional Development Tools



# Contact Us

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