



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

## GOALS

Build the capacity of the formal education community to implement research based approaches proven to increase the participation and completion of females, including those with disabilities, in STEM education

Institutionalize the implemented strategies by connecting the outcomes to existing accountability systems, and

Broaden the commitment to gender equity in STEM education

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## Project Description

The STEM Equity Pipeline is working with eleven states (CA, GA, IA, IL, NH, OH, OK, MN, MO, TX, and WI) over 5 years to increase the knowledge of research based practices in gender equity in STEM of individuals who conduct professional development with STEM educators. The project provides professional development resources, technical assistance and training in the implementation of the Five Step Program Improvement Process, a data driven decision making institutional change model. The process helps school based teams of administrators, teachers, counselors and staff to identify and implement research-based strategies proven to increase the participation and completion of women and girls in STEM programs of study.

## The Five Step Program Improvement Process

**Step 1: Document Performance Results.** The first step in the process is to describe state and school/college performance on the core indicators by comparing performance levels between schools/colleges, student populations, and programs over time. This step uses summary statistics and basic graphs and charts to document performance and identify performance gaps and improvement priorities.



**Step 2: Identify Root Causes.** The second step is to use additional information and methods to determine the most important and most direct causes of performance gaps that can be addressed by improvement strategies and specific solutions. This step encourages teams to use multiple methods to identify and evaluate potential causes and select a few critical root causes as the focus of improvement efforts.

**Step 3: Select Best Solutions.** The third step is to identify and evaluate potential solutions to performance problems, including both improvement strategies and program models, by reviewing and evaluating the underlying logic of these solutions and the empirical evidence of their effectiveness in achieving performance results.

**Step 4: Pilot Test and Evaluate Solutions.** The fourth step is to conduct pilot testing and evaluation of solutions. This step presents practical yet rigorous methods and tools for evaluating solutions before full implementation at the institutional levels.

**Step 5: Implement Solutions.** The fifth step is to implement fully tested solutions based on implementation plans that measure the implementation of the solution and evaluate the success of the solution in reaching the expected performance results. This step also addresses how to use evaluation results to plan the next steps in local improvement efforts.

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

## STEM Related Career Clusters and Pathways

### Science, Technology, Engineering, and Mathematics (STEM) Cluster

Engineering and Technology  
Science and Mathematics

### Architecture & Construction

Design/Pre-Construction  
Construction  
Maintenance/Operations

### Agriculture, Food, and Natural Resources Cluster

Food Products and Processing Systems  
Plant Systems  
Animal Systems  
Power, Structural & Technical Systems  
Natural Resources Systems  
Environmental Service Systems  
Agribusiness Systems

### Health Science Cluster

Therapeutic Services  
Diagnostic Services  
Health Informatics  
Support Services  
Biotechnology Research and Development

### Information Technology Cluster

Network Systems  
Information Support and Services  
Interactive Media  
Programming and Software Development

### Manufacturing Cluster

Production  
Manufacturing Production  
Process Development  
Maintenance, Installation and Repair  
Quality Assurance  
Logistics and Inventory Control  
Health, Safety and Environmental Assurance

### Transportation, Distribution, and Logistics Cluster

Transportation Operations  
Logistics Planning and Management Services  
Warehousing and Distribution  
Center Operations  
Facility and Mobile Equipment  
Maintenance  
Transportation Systems/  
Infrastructure Planning,  
Management and Regulations  
Health, Safety and Environmental  
Management  
Sales and Service

## STEM Equity Pipeline in Missouri

The Missouri Department of Elementary and Secondary Education, who administers career and technical education at the secondary and postsecondary level in Missouri, supports the Missouri Center for Career Education (MCCE). The MCCE has eight Career Education Coordinators (CECs) located throughout the state whose responsibility includes providing professional development and technical assistance to secondary and community college career and technical educators. One of their responsibilities is to assist local education agencies improve their performance on the Perkins Act accountability measure requiring the increase in participation and completion of underrepresented gender students in nontraditional career and technical education programs (i.e. women and girls in STEM related CTE programs). The CECs have been trained in the Five Step Program Improvement Process and have selected pilot sites where they are facilitating the process with local planning teams. The CECs have also integrated what they have learned from the training, participation in webinars and resources available from the virtual learning community into the professional development they conduct with teachers and programs they offer to students in their regions. The CECs have developed their own Five Step Program Improvement Process Toolkit to help them implement the process with additional sites in the future.

Missouri Department of  
Elementary and Secondary  
Education  
Career Education  
Dennis Harden, Coordinator



Missouri Center for Career  
Education  
[www.missouricareereducation.org](http://www.missouricareereducation.org)

Career Education Coordinator.	Pilot Site
Diana Reynolds	Brookfield Career Center
Janet Reppert	Crowder College Technical Education Center
Tanya Degonia	Arcadia Valley Career Technology Center
Camille MacDonald	Current River Career Center
Lori Mann	Excelsior Springs Area Career Center Clinton Technical School
Michelle Charlebois Didreckson	Ozarks Technical College Career Center