



**The National Alliance for Partnerships in Equity Education Foundation’s (NAPEEF) STEM Equity Pipeline™** works with teams of high school and college partners to implement a data driven decision making program improvement process (the Program Improvement Process for Equity in STEM - PIPESTEM<sup>®</sup>) focused on increasing the participation of women and girls in STEM related programs of study at the high school and community college level. Since 2008 the STEM Equity Pipeline has been providing high quality professional development, technical assistance and consulting at the state and local level. Here are some highlights of this initiatives success.

### STEM Equity Pipeline Participation Data as of March 31, 2012

Table 1 State (entry year)	Professional Development Outcomes (unduplicated counts)				Reported State Team Outcomes*	
	# trained in 5-Step Process	# attended Leadership Institute	# participated in webinars	# attended any professional development	# trainings conducted	# educators reached
California (2007)	69	46	129	547	36	810
Illinois (2007)	14	22	79	102	128	790
Missouri (2007)	22	27	26	75	27	369
Oklahoma (2007)	44	5	56	315	8	346
Wisconsin (2007)	79	28	87	160	136	5993
Iowa (2008)	84	31	31	178	13	390
Minnesota (2008)	50	18	75	146	44	4213
New Hampshire (2009)	22	17	16	54	4	126
Ohio (2009)	34	15	24	101	21	603
Georgia (2010)	22	11	37	115	24	334
Texas (2010)	79	4	53	306	18	531
Idaho (2011)	28	2	4	33	1	60
Other states		12	320	819	108	5849
<b>Total</b>	<b>547</b>	<b>289</b>	<b>937</b>	<b>2,952</b>	<b>568</b>	<b>20,414</b>

\* From extension agent reports

### STEM Equity Pipeline Leverages State and Local Systems to Invest in Supporting Programs Using A Data Driven Decision Making Model Targeted to Increasing the Participation and Completion of Women in STEM Programs of Study.

State and local teams have discovered the power of the process as an institutional change model worthy of investment. The following states and local education agencies have sought external funding or changed internal funding policies to institutionalize the work into existing funding mechanisms and programs. For example:

- **Wisconsin Department of Public Instruction** funded three secondary school district pilot sites to implement PIPESTEM<sup>®</sup> focused on increasing the participation of women and girls in nontraditional CTE STEM related programs of study. Each site received a grant of \$2500 to \$10,000/year for up to four years of funding ó a \$60,000 investment.

- **Iowa Department of Education** aligned its discretionary Perkins funds with the STEM Equity Pipeline's *PIPESTEM*<sup>TM</sup>. The \$150,000 was awarded to regional consortia led by Iowa's fifteen community colleges, which brought teams comprised of their dean, STEM faculty, equity staff, and secondary STEM faculty from their feeder schools to PIPESTEM<sup>TM</sup> Training.
- **Ohio Department of Education** has invested \$78,000 over two years, through a grant to **Columbus State Community College**, to expand the number of STEM Equity Pipeline<sup>TM</sup> pilot sites from the original four to twelve pilot sites.
- **Texas Higher Education Coordinating Board** has invested \$135,000 over the past three years in a statewide technical assistance project, through a grant to **Amarillo College**, to disseminate the professional development and resources of the STEM Equity Pipeline<sup>TM</sup> to local education agencies and community colleges across the state of Texas.
- **Illinois U-46 School District**, through a \$50,000 grant awarded to the NAPEEF from Motorola Solutions Foundation, has had five high school teams working on implementing PIPESTEM<sup>TM</sup>. All five high schools report their female enrollment in STEM programs have increased. For example **Streamwood High School** reporting their female enrollment in Project Lead the Way (PLTW) has increased from 8 to 24 girls enrolled for the fall.
- **Pennsylvania College of Technology** has partnered with NAPEEF, through an NSF Advanced Technological Education grant, to assist five high schools and career technical centers implement PIPESTEM<sup>TM</sup>. Due to targeted outreach and recruitment, the Introduction to Auto Technology program at **Jersey Shore Area High School** has 7 girls enrolled, a program that has never had more than 1 girl enrolled in the past.
- **Chester County Intermediate Unit** has contracted with NAPEEF to provide PIPESTEM<sup>TM</sup> training and technical assistance with its three Career and Technical Education Centers to develop research-based action plans for increasing the participation of underrepresented gender students in nontraditional programs of study.

### **STEM Equity Pipeline Increases the Capacity of Professional Development Providers to Assist High School and Community College Staff Implement Activities to Increase the Participation of Women and Girls in STEM Programs of Study.**

The following STEM Equity Pipeline<sup>TM</sup> professional development partners provide professional development and technical assistance to local education agencies in their states who receive federal Perkins Act funds for career and technical education. The staff, at each of these organizations, has been leading the STEM Equity Pipeline<sup>TM</sup> effort. They have received technical assistance and participated in onsite PIPESTEM<sup>TM</sup> training, gender equity in STEM research based strategies webinars and the annual Professional Development Institute.

- **The Illinois Center for Specialized Professional Support (ICSPPS)** - Through the ICSPPS New Look Project community colleges receive mini grants to implement programs focused on increasing the participation of students in nontraditional<sup>1</sup> career preparation programs. As a result

<sup>1</sup> A nontraditional career, as defined in the Perkins Career and Technical Education Act of 2006, is an occupation or field 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.

of their involvement ICPS has been able to enrich their capacity to build PIPESTEM into the 23 New Look projects.

- The **California Joint Special Populations Advisory Committee (JSPAC)** ó The JSPAC had integrated the STEM Equity Pipeline into its annual program of work and have incorporated training into their annual Special Populations Conference and regional professional development workshops.
- The **Missouri Center for Career Education (MCCE)** ó The eight MCCE regional Career Education Coordinators have received training in the program improvement process and have been working with pilot sites in their region to implement research-based strategies to increase gender equity in nontraditional careers.
- The **Online Professional Education Network New Hampshire (OPEN NH)** ó OPEN NH uses e-learning to provide effective professional development that leads to gains in teachers content knowledge, improvements in their teaching practices, and increases in the achievement of their students. OPEN NH sponsors a STEM Equity Pipeline online course that is available to educators nationally.
- The **Idaho Center for New Direction's Career Pioneer Network (ICPN)** ó The six ICPN regional coordinators have been participating in customized professional development that is then being disseminated to local educators through regional and statewide training.

**STEM Equity Pipeline PIPE-STEM™ training for teams of high school and community college educators leads to increases in female enrollment in STEM programs of study and interest in STEM Careers.**

- **Bement High School, IL** New Look Project held a STEM Night for eighth through twelfth grade students and their parents who participated together in a series of high interest, hands-on activities with real-world applications including robotics, web design, and nanotechnology. 22% (17/76) of the eligible female student population participated. As a result of this event and the team's focus on increasing access to STEM programs for girls, additional activities continued to occur spontaneously on campus throughout the year, such as a math teacher incorporating videos of women in math/engineering careers into her courses. A Parkland College representative gave the COMPASS placement test to all juniors to assess their preparedness for college math and talked to all students about the importance of attaining math competence in high school to avoid remediation. 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, up from 15% two years before.
- The **Sauk Valley Community College, IL (SVCC)** New Look Project, in partnership with the Whiteside Area Career Center and area high schools, conducted their 4<sup>th</sup> annual Women in Engineering Day. Thirty five young women participated, a threefold increase from 2008 and the largest group since the events inception. 97% of the participants indicated an increase in their interest in engineering as a career field and felt they were equipped with valuable information to assist them in making an informed decision about becoming an engineer.
- **Plymouth High School, WI** reported that *“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 Pipeline project have definitely paid off.”*

- **St. Paul College, MN** invited middle school girls enrolled in the PLTW Gateway program to the campus where they were introduced to various engineering career fields through speakers and projects. In a survey after the event, 40% said they would like to pursue a STEM career, with 11% specifically stating Engineering, and 83% of the girls said that they would like to take an engineering class in high school. 20 of the 61 girls who attended the event said that they were going to attend **Johnson High School**, home to the districts PLTW and other pre-engineering programs. The next fall, 7 ninth grade girls enrolled in the PLTW introduction to engineering course (previously there was only one ninth grade girl enrolled) and 18 ninth grade girls enrolled in beginning drafting.
- A California STEM Equity Pipeline<sup>1</sup> participating teacher was looking to fill an instructional aide position in his auto technology program. After completing the training he chose to hire a highly qualified female applicant for the position. 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, a decision he made because of what he had learned from participating in the STEM Equity Pipeline professional development. (Anonymous response to evaluation interview)
- One of the PLTW teachers at **Anne Arundel High School, MD** participated in a webinar about "Focus Your Future", a program developed by NAPE and PLTW, to engage high school girls and their parents with women engineers as role models. The PLTW teachers implemented the program and reported the female PLTW enrollment went from 8-30 in one semester.
- **A.R. Johnson Allied Health and Engineering Magnet School, GA** conducted gender equity in STEM staff development for elementary school teachers; took students on STEM related field trips; utilized women in STEM role models as classroom guest speakers, and improved their STEM curriculum. The female enrollment in PLTW increased from 0 to 11 out of 46 senior students (23.9%), and 0 to 10 out of 30 (33.3%) junior students.
- **Augusta Technical College, GA** graduated its first class of students in their Nuclear Engineering program in 2012 which included six women (25%) and has enrolled seven women (30%) for the Fall of 2013.

For more information about the STEM Equity Pipeline<sup>1</sup> contact:  
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