By Ben Williams

INCREASING ACCESS, EQUITY AND DIVERSITY:
NAPE’s Program Improvement Process for Equity

The demand for a skilled and educated STEM (science, technology, engineering and math) workforce continues to increase. Over the next five years companies will need to replace 945,000 U.S. workers who have basic STEM literacy and 655,000 U.S. workers who have advanced STEM knowledge (Business Roundtable & Change the Equation, 2014). Yet, the participation of women, people of color and individuals from “special populations” (i.e., individuals with disabilities; individuals considered to be economically disadvantaged; individuals with limited English proficiency, including English language learners; single parents; displaced homemakers; and individuals pursuing programs that lead to nontraditional occupations) has stagnated in some cases and dropped in others. For example, from 2001 to 2014, the participation of women in engineering, computing and advanced manufacturing remained flat, and the participation of African-Americans and Latinos in those fields relative to the U.S. working-age population declined (Change the Equation, 2015).

The U.S. Department of Education’s Office for Civil Rights (OCR) and the Office of Career, Technical, and Adult Education (oCTAE) released a “Dear Colleague” letter on June 15, 2016, to provide “significant guidance” in addressing the critical need for state and local education agencies (SEAs and LEAs) to increase gender equity in career and technical education (CTE). The letter states the following:

Ensuring equitable access to CTE by eliminating discriminatory practices and taking proactive steps to expand participation of students in fields where one sex is underrepresented can increase overall participation and success in high-growth fields, such as nursing, advanced manufacturing, information technology, computer science and cybersecurity, for both men and women. … (U.S. Dept. of Education, 2016)

The Carl D. Perkins Career and Technical Education Act of 2006 (Perkins) requires every state to set negotiated performance measures and annually report its progress to OCR. If a state does not meet at least 90 percent of its negotiated target, it is required to develop and implement an improvement plan outlining the action it will take to improve its performance. Included in the Perkins accountability system are two measures directed toward gender equity in CTE. Those measures are focused on increasing the participation and completion rates of underrepresented gender students in programs that lead to nontraditional occupations, i.e., those with less than 25 percent of one gender represented in the workforce, such as women in engineering technology and men in nursing. These accountability provisions also apply to every LEA receiving Perkins funds.

NAPE’s Solution: The Program Improvement Process for Equity™ (PIPE™)
The National Alliance for Partnerships in Equity (NAPE) Education Foundation has designed a highly effective process to translate current research on gender equity in CTE into practice and transfer this knowledge to and through state offices of education, especially those responsible for the implementation of Perkins.

PIPE is a research-based institutional change model and professional development program designed to increase the participation and success of underrepresented students in nontraditional CTE programs, including girls and women in STEM (Williams, 2014). PIPE training includes five modules: Organize, Explore, Discover, Select, and Act.

Module 1: Organize PIPE is most effective when a cross-functional team representing the CTE and STEM education and workforce pipeline in the local community is assembled. Team members typically include administrator(s), teachers and staff members (including counselors and advisors) from local high schools and/or career centers, community colleges and middle schools, as well as community partners and employers. Also part of each Pipeline team is a site team leader from NAPE who orient and prepares the team for training.

Module 2: Explore The data typically provided to Perkins coordinators relative to their institution’s performance on the Perkins accountability measures are aggregated at the institutional level. For example, an institution’s

(FIGURE 1: PIPE training includes five modules: Organize, Explore, Discover, Select, and Act.)
nontraditional participation might be 18 percent, but what does that mean? In some cases, these data may be disaggre-
ged by gender, race/ethnicity, and
special populations; however, one cannot identify specific programs in which there are greater equity gaps than others, espe-
cially in high-skill, high-wage and high-de-
dmand career pathways. Although the over-
percent in this example, the participation
of those categories.

Module 4: Select
Pipeline teams review and evaluate evi-
dence- and research-based solutions and
the empirical evidence of their effective-
ness in mitigating the root causes identi-
fied in the steps outlined above and
at consensus around two to three specific
strategies to implement.

Module 5: Act
Pipeline teams develop comprehensive (pro-
cess) and summative (outcome) mea-
sures to evaluate the effectiveness of the
strategies they have agreed to employ.
Creating thorough and complete short-
and long-term evaluation measures and
methods is a critical step in the process
to ensure success.

PIPE Plan
Throughout training and implementation, the Pipeline team captures its insights and interpretation of the data, which easily translates into an improvement plan for SEAS/LEAs that have fallen below the 90 percent threshold for nontradi-
tional participation/completion.

Pipe’s Delivery
Pipeline worked in a combination of in-person and virtual professional develop-
ment and technical assistance, which is facilitated by a NAPN-certified equity
instructor over the course of an academic
year. Typical implementation entails two to
days of in-person professional develop-
ment and four to six one-hour technical assistance calls. This leads to an in-person showcase where the Pipeline team presents the results of their PIPE implementation and their plans
for the future with other teams when im-
plementation is endorsed by school district administrators and others who
have supported the project, but who have
not been directly involved with the training,
when training involves only one institution.

Promising Outcomes
PIPE has been the cornerstone of the Na-
tional Science Foundation-funded STEM
Equity Pipeline Project over the past 10
years, through which teams from 19
states received training and guidance in
implementation. In addition, other SEAS
and LEAs have utilized Perkins funds and
other resources to support PIPE training
and implementation.

One of the most exciting outcomes from
this past year illustrates the effec-
tiveness of PIPE in increasing the
enrollment of underrepresented gender
students, especially girls, in high-skill,
high-wage and high-demand nontradi-
tional STEM career pathways.

Recruiting Girls into Welding
Demand for skilled welders is increasing
nationwide, yet only 4.8 percent of welders in 2014 were women (NAPN, 2015). When Roseburg High School in Roseburg, Ore-
gon, began its PIPE training as part of the
Oregon Department of Education–funded
project in 2015, there were only four girls
in its Welding program. During the action
research phase of PIPE, the Pipeline team,
led by instructor Sheri Carson, discovered
through an equity environmental scan
and student surveys that girls were not
taking manufacturing courses (including
welding) in part because the protective
gear/clothing was, as students described it,
“large.” The team also discovered that the
smaller-statured students, many of whom
were girls, found it difficult to hold and
utilize the equipment. The message girls
were receiving was that this program was
not for them.

With the full support and participation of the welding instructor, the team decided
to implement four specific strategies to
address the low participation of girls in
the program. The first strategy was to
invest $350 to purchase welding helmets,
gloves and other supplies. The next two
strategies focused on addressing cultural stereotypes and the ways in
which implicit biases created barriers to
students’ success in nontraditional career
preparation programs.

The results from these efforts, which
were highlighted at the 2016 NAPN Nation-
al Summit for Educational Equity, were
truly remarkable. The enrollment of girls in
welding at Roseburg High School jumped
from four in the fall of 2015 to 38 in spring
2016, a greater than 800 percent increase in
one semester! PIPE outcomes have ranged from doubling enrollment of underrepresented gender students to increasing retention and completion in targeted programs.

The success of the Roseburg imple-
mentation serves as an excellent example
of the effectiveness of PIPE in identifying
and removing key barriers to girls’ partic-
ipation in nontraditional programs. Once
these barriers were identified and com-
prehensively addressed, a higher number
of girls at the school saw that welding was fully open to them and took advantage of the programs offerings. The school ulti-
mately purchased more than $2,100 in new
equipment to accommodate the growth in
the program.

Conclusion
In their Dear Colleague letter in June 2016,
Octae and OCR stated that “all students,
regardless of their sex or gender, must have
equal access to the full range of CTE pro-
grams offered” (U.S. Dept. of Education, 2016).
SEAs and LEAs have been required to set and
meet targets relative to the participation and completion of girls in nontraditional
programs since the reauthorization of Perkins
in 2006, and the nontraditional participation
and completion measures have been in
place since the reauthorization of Perkins

Ben Williams will be presenting at the STEM Symposium on Saturday, Dec. 3, at ACTE’s CareerTech VISION. Symposium participants will learn how NAPE’s PIPE provides secondary and postsecondary educators with the tools to identify equity gaps in CTE/STEM programs of study by gender, race and ethnicity, and special populations. To find out more about the symposium, including registration information, visit careertechvision.com/stem.cfm.


ENDNOTES

1. NAPE is a professional alliance of federal and state agencies, local school districts, colleges, universities, businesses, and corporate foundations whose focus is on building educators’ capacity to implement effective solutions to increase student access, educational equity and workforce diversity in STEM and CTE. See more at napequity.org.

2. Visit nsee.info and click on “2016 Sasta” and then “2016 Conference Sessions” to read more about this session and view the presentation. The session was titled “Expanding Educator Perceptions of Career Pathways Regional Implementation of NAPE’s Explore Nontraditional Careers’ Toolkits”.

REFERENCES
