

# **The Community College Presidents' Initiative in Science, Technology, Engineering, and Mathematics**

*George R. Boggs*

## **Introduction**

The United States is facing a significant need to develop adequate talent in science, technology, engineering, and mathematics (STEM) fields to ensure economic strength, security, global competitiveness, and environmental health (National Academies of Sciences, Engineering, and Medicine, 2016, p. 7). The number of jobs requiring substantial STEM expertise grew by nearly 34% in the second decade of the millennium (National Science Board, 2019). In addition to projected STEM labor shortages, there are significant racial and gender disparities in the technical workforce. Americans of color are significantly underrepresented in STEM fields, and women remain underrepresented in many areas of the STEM technological workforce.

The National Science Foundation (NSF) is supporting a strategy to address these issues through the Community College Presidents' Initiative in Science, Technology, Engineering, and Mathematics Education (CCPI-STEM). Community colleges are logical institutions to address the challenges of preparing the STEM technological workforce and closing equity gaps, but the institutions face significant barriers that the CCPI-STEM project is working to address.

Components of the CCPI-STEM project include: a robust website that provides a wealth of information related to STEM technological education, grant funding opportunities, and best practices; Regional Networks designed to share information and ideas and to help colleges to secure funding and implement STEM technological education programs; a Fellows program to support the research and work interests of STEM professions and future community college leaders enrolled in graduate programs; the development of instructional modules on aspects of grant funding that are intended to be used in community college leadership programs and institutes as well as in individual colleges; webcasts and podcasts that are designed to provide information about STEM strategies and to feature exemplary practices and model programs; Virtual Thought Leaders' Dialogues to identify barriers, to share ideas and best practices, and to provide feedback to NSF; dissemination of information about the various mentoring programs that are available for community college faculty, staff, and administrators to assist them with grant proposals; and, a series of conference presentations, publications, and newsletters to share information and help college leaders strengthen and expand STEM technological education programs. In addition, plans have been developed to extend and expand the reach of CCPI through a follow-up, four-year initiative.

While the CCPI-STEM project is only entering its third year, it has already brought greater attention to community college STEM education and to the NSF ATE program. The success of the initiative will be determined by the number of community colleges that successfully compete for the funding necessary to develop and expand STEM technician programs.

## **Projected Workforce Challenges**

In an increasingly global society and economy, education beyond high school is essential to a nation's competitiveness and the standard of living of its people. By 2031, 72% of the jobs in the U.S. will require postsecondary education or training. The fastest-growing industries require employees with disproportionately higher education levels than industries with slower growth (Carnevale et al., 2023). Keeping up with the need for skilled employees will be a significant challenge. Technical occupational employment is expected to grow at twice the rate of overall employment over the next ten years, and the replacement rate for technical occupations during the 2024-2034 period is expected to average 6% annually or 350,000 workers per year, totaling several million through 2034 (CompTIA, 2024).

Over time, if the country's workforce does not have the skills that employers need, firms may close, relocate to other countries, or operate with lower productivity levels. According to a 2018 report from Deloitte and the Manufacturing Institute, the skills gap could jeopardize \$454 billion of U.S. economic output per year by 2028 (Selko, 2018). If these challenges remain unaddressed, the standard of living for Americans could decline, and the country could fall into a downward spiral of decreased tax revenue to pay for needed services.

## **Inequity in the Workforce**

Accompanying the need for higher levels of education and skills is a serious employment equity issue. Research done by the National Center for Inquiry & Improvement (NCI&I) revealed significant racial inequity in the workforce. Black and Latina/o/x workers are overwhelmingly employed in the lowest-paying jobs and significantly underrepresented in the highest-paying professions. The findings are consistent across all regions studied by NCI&I – across red states and blue states, geographic regions, and urban/suburban/rural areas (Johnstone, 2023). Many of the higher-paying jobs are in STEM fields, including the STEM technological workforce.

It has never been more important than today to prepare an adequate and diverse STEM-capable U.S. workforce that leverages the talents of all segments of our population. According to the study "Diversity in the STEM workforce varies widely across jobs" conducted by the Pew Research Center, African Americans make up 11% of the workforce, but only 7% of all STEM workers. Hispanics are 17% of the workforce but only 7% of all STEM workers. Sixty-nine percent of all STEM workers are White (Funk & Parker, 2018).

Women are underrepresented in several STEM occupations, particularly in computer jobs and engineering. The racial and gender inequalities have significant income implications. Even among workers with similar education, STEM workers earn significantly more (Funk & Parker, 2018). Moreover, at a time when we need to address STEM labor shortages, we cannot afford to leave segments of our population behind.

A solution to the problems of a projected technical skills shortage and inequities in the technological workforce can be found in the nation's community colleges. These institutions host programs designed to meet workforce needs, and populations that have been historically underrepresented in the STEM workforce are well-represented among community college

students. Unfortunately, STEM technology programs are expensive to establish and maintain, and community colleges are generally underfunded.

### **The NSF ATE Program and Community Colleges**

Fortunately, there is a program that stands ready to help community colleges meet the increased need for technological employees and to close gender and racial gaps in the workforce. It began more than 30 years ago as the nation first awakened to both equity and workforce concerns. By the early 1980s, policymakers began to question the adequacy of the nation's technological workforce. However, it wasn't until 1989 that North Carolina Congressman David Price introduced a bill that would provide support to enable the nation's community colleges to establish programs to address the need. His 1989 legislation did not survive committee hearings; however, in 1991, Congressman Price and Maryland Senator Barbara Mikulski introduced companion bills that jointly provided funding for technological education with economic development for diverse populations. Their combined efforts gained bipartisan support; and, in October of 1992, President George H.W. Bush signed the Scientific and Advanced Technology Act (SATA) into law. In response to the Act, program officers in the NSF created the Advanced Technological Education Program (ATE). Following approval by the National Science Board, the ATE program was launched in 1993 (National Science Foundation, 2019).

With its focus on community colleges, the ATE program supports the education of technicians for the high-technology fields that drive the nation's economy. The program involves partnerships between community colleges, four-year colleges and universities, secondary schools, economic development agencies, and business and industry. It provides financial support for curriculum development and professional development for faculty and teachers. The program also invites applied research proposals that advance the knowledge base related to technician education (National Science Foundation, 2023). ATE-funded programs prepare technicians in strategic areas including agriculture, environmental technology, energy, transportation, geospatial technology, biotechnology, engineering technology, chemical technology, manufacturing, information technology, telecommunications, cybersecurity, space technology, nanotechnology, and process technology (National Science Foundation, 2019).

With the support of the National Science Foundation's ATE Program, America's community colleges can play a larger role in addressing the projected skills gap, leveling the playing field, and bringing greater diversity to STEM fields. Community colleges, serving the most diverse student body in higher education, are a fertile ground for preparation and effective diversification of the STEM workforce. More than 50 percent of community college students taking college credit classes are students of color (American Association of Community Colleges, 2023).

To assist the nation's community colleges in meeting these workforce challenges, the NSF has provided more than \$1.4 billion through the ATE program since 1994 (Van Noy & Biswas, 2023). However, only about half of the nation's community colleges have received an ATE grant during that time. To meet the projected need for a diverse technological workforce, more community colleges must be engaged in technological education programs such as those supported by ATE. In October 2021, NSF funded CCPI-STEM to help expand and strengthen

community college STEM technician programs and to increase the number of community colleges submitting competitive proposals for ATE funding.

### **The CCPI-STEM Project**

CCPI-STEM, initially funded for four years by the NSF ATE Program, is working to increase awareness of the need to prepare an adequate diverse STEM technological workforce. Its goal is to galvanize, enlighten, and inspire community college presidents, board members, vice presidents, and chief academic officers to promulgate, encourage, and support regional STEM education and technological workforce development at their colleges. CCPI-STEM works collaboratively with national community college organizations, including the American Association of Community Colleges (AACCC), the Association of Community College Trustees (ACCT), and the League for Innovation in the Community College.

The CCPI-STEM project is managed by a strong leadership team and an influential National Advisory Board. Elizabeth Teles, the Co-Lead of NSF's ATE program from its inception until 2009, is a senior advisor. The National Advisory Board members include three community college presidents who each have several years of experience administering successful ATE programs and the presidents of ACCT and the League for Innovation in the Community College.

Components of the project include the establishment of regional networks chaired by current or former community college presidents, a Fellows program for emerging community college leaders, instructional modules to be used in community college leadership doctoral programs and leadership institutes, instructional webcasts and podcasts, virtual Thought Leaders' Dialogues, links to mentoring resources, conference presentations, newsletters, and published articles. The CCPI-STEM website displays a map showing the current regional networks and provides links to a variety of resources intended to assist community college leaders and faculty (CCPI-STEM, n.d.).

### **Regional Networks**

An integral component of CCPI-STEM is the Regional Network (RN) structure. The RNs were designed to engage college leaders locally and to encourage participation in ATE by those colleges that have not had an NSF ATE grant. As of July 2024, seven RNs, chaired by experienced community college presidents or recently retired presidents and supported by RN coordinators, are serving twenty-five states and two U.S. territories, sharing opportunities, discussing challenges, and stimulating collaborations to increase success in grant applications. The CCPI-STEM leadership team is seeking chairs and coordinators for the remaining regions.

The following chart represents the current RN Chairs, the seven regions, and the 25 states and U.S. territories (Table 1).

**Table 1***Regional Network Chairs*

<b>REGION</b>	<b>Regional Network Chair</b>	<b>STATES</b>
Northeast Region	Dr. Anne Kress, President, Northern Virginia Community College, VA	DE, MD, NJ, NY, VA
Midwest Region	Dr. Daniel Phelan, President and CEO, Jackson College, MI	IL, IN, MI, WI
Southeast Region	Dr. Edwin Massey, President Emeritus, Indian River State College, FL	AL, FL, GA, MI, NC, SC, Puerto Rico
Pacific Region	Dr. Frank Chong, President Emeritus, Santa Rosa Community College, CA	Northern CA, AK, American Samoa
Pacific Southwest Region	Dr. Pamela Luster, President Emerita, San Diego Mesa College, CA	Southern CA, AZ, NM
Southwest Region	Dr. Jennifer Wimbish, President Emerita, Cedar Valley Community College, TX	TX, OK, LA
Three Rivers	Dr. Charlene Newkirk, President Emerita, Community College of Allegheny County, PA	OH, WV, PA

The activities in the regions continued to grow as the project progressed through its second year. RN Chairs and Coordinators have scheduled in-person and online meetings with state associations and with administrators, faculty, and support staff at the colleges in their regions, and with the participating colleges designated as CCPI-STEM Affiliates. Communications from the RN Chairs to the colleges in their region have focused on NSF grant opportunities, partnerships with business and industry, and mentoring programs to assist faculty and staff in preparing successful grant proposals. The RN Chairs participate in bimonthly online meetings with the CCPI-STEM leadership team to report on activities and to share ideas.

The vibrancy of the RNs is evidenced by regular online meetings and presentations about strategies to overcome challenges to the development of programs and proposals. The topics of the two most well-attended RN presentations were “Building Effective and Impactful Business Partnerships for NSF ATE Grants” and “Building Institutional Capacity through Economic Development Partnerships.” Participants’ inquiries, insights, and recommendations informed CCPI-STEM offerings and influenced the proposal to extend CCPI-STEM for another four years (CCPI-STEM 2.0).

**Fellows**

The CCPI-STEM Fellows program is designed to support leaders and aspiring leaders who are studying STEM education or STEM-related workforce issues. Qualified applicants are community college faculty, administrators, and staff as well as individuals from industry and nonprofit organizations who work with community college STEM workforce programs. The program supports selected individuals who are pursuing graduate degrees in community college leadership or STEM education. Fellows are provided an annual two-year honorarium of \$5,000.00 and are assigned a mentor to assist them with their studies and career development. Fellows are also given opportunities to attend and present at conferences. The Fellows program is led by Ashok Agrawal, a former administrator with service at the American Society for

Engineering Education, St. Louis Community College at Florissant Valley, and the Division of Undergraduate Education at NSF.

The first cohort of fellows, shown in Table 2 below, was selected in 2022.

**Table 2**  
*2022-2023 Fellows*

<b>Name</b>	<b>Institution</b>	<b>Position</b>	<b>State</b>
Bethany Sansing-Helton	Madison Area Technical College, Madison	Faculty - Math	WI
Buffy Quinn	Industry, Syracuse	Industry	NY
DeDe Griffith	Temple College, Temple	VP Workforce	TX
Emily Halvorson-Otts	Pima Community College, Tucson	Dean - Science	AZ
Eugene Mahmoud	Mt. San Antonio College, Walnut	Faculty - Engr.	CA
Michael Silva	Solano Community College, Fairfield	Faculty - Biology	CA

Bethany Sansing-Helton is pursuing a Doctor of Philosophy degree in Educational Leadership and Policy at the University of Wisconsin-Madison. The focus of her research is the improvement and success of diverse students in STEM. Buffy Quinn is pursuing a Doctor of Education degree at the University of Southern Mississippi. She was the PI for an ATE grant at Onondaga Community College in New York and collaborates on several ATE projects in the field of global information systems. DeDe Griffith is pursuing a Doctor of Education degree in the Community College Leadership Program at Kansas State University. Her research is focused on partnerships between rural high schools and community colleges to promote dual enrollment and matriculation to a STEM-related college program. Emily Halvorson-Otts is pursuing a Doctor of Education degree in the Community College Leadership Program at Ferris State University. She has been engaged in several NSF-funded programs. Eugene Mahmoud is enrolled in the Engineering Education doctoral program at Purdue University. His research focuses on how engineering and technology students experience different segments of education systems as they prepare to enter the workforce. Michael Silva is pursuing a Doctor of Education degree in Organizational Change and Leadership at the University of Southern California. His research focuses on student success in biotechnology and manufacturing. More information about the 2022-23 Fellows can be found on the CCPI-STEM website (CCPI-STEM, n.d.).

In addition to their studies, the Fellows participated in a variety of professional development programs and served as active ambassadors for the NSF ATE program. They also presented at conferences and college convocations and shared their experiences with their graduate faculty and college colleagues. The 2022-23 Fellows reported that the program provided a degree of credibility and legitimacy for them in their interactions with colleagues, and their participation increased their confidence that they could achieve their academic goals. It expanded their professional networks through their interactions with the PIs and colleague Fellows.

The second cohort of Fellows, shown in Table 3 below, was selected in December of 2023.

**Table 3***2023-24 Fellows*

<b>Name</b>	<b>Institution</b>	<b>Position</b>	<b>State</b>
Allison Foster	Columbus State CC, Columbus	FT faculty	OH
Diane Rhodes	Red Rocks CC, Lakewood	FT faculty	CO
Jason Boehm	St. Louis CC, St. Louis	FT fac. / adm.	MO
Karen Bridges	Howard CC, Columbia	Faculty	MD
LaToya Chandler	Santa Fe College, Gainesville	Dir. of Center	FL
Laurel Carpenter	Holyoke CC, Holyoke	Faculty	MA
Mitchell Sweet	Scottsdale CC, Scottsdale	Faculty	AZ

Allison Foster is pursuing an Education Specialist degree from Kent State University. Her research focuses on STEM education and workforce development in community colleges. Diane Rhodes is pursuing a Doctor of Education degree from Ferris State University. She is particularly interested in the education of future technology innovators. Jason Boehm is pursuing a Doctor of Education degree in higher education leadership at Missouri Baptist University. He is interested in ways to foster innovation and advancement in STEM and leadership. Karen Bridges is pursuing a Doctor of Education degree from Morgan State University. Her research is focused on inequities that are based on gender identity, age, and race or ethnicity. LaToya Chandler is pursuing a Doctor of Philosophy degree in Curriculum and Instruction from the University of Florida. She is interested in developing project-based STEM learning interventions. Laurel Carpenter is pursuing a Doctor of Philosophy degree at the University of Massachusetts. Her research is focused on the profiles of STEM students, their experiences in STEM courses, and the supports they use. Mitchell Sweet is pursuing a Doctor of Education degree from the Community College Leadership Program at Kansas State University. His research focuses on how teaching pedagogy influences course outcomes for students in introductory chemistry classes. More information about the 2023-24 Fellows can be found on the CCPI-STEM website (CCPI-STEM, n.d.).

### **Instructional Modules**

Five curriculum modules have been developed as part of the CCPI-STEM project to introduce grant concepts and strategies to aspiring community college leaders and to provide useful information to others interested in obtaining grant funding to support STEM programs. The modules were developed by Shane Kirby, Director of the Grants Office at Columbus State Community College in Ohio, with the collaboration of Angel Rodriguez, Professor of Oceanography and Marine Biology at Broward College in Florida. The modules have been made available to community college leadership graduate programs and the directors of community college leadership institutes with a request to provide feedback and suggestions for modifications.

Module 0 provides an overview of community college grants. It is an introductory summary of the core concepts detailed in the remaining modules. Module 1 presents information on grant strategies. Module 2 focuses on the NSF ATE program and its requirements. Module 3 explores different types of internal and external partners, best practices for relationship management, and

how to distinguish between a sub-award and a contract partnership. Module 4 discusses the grant lifecycle and best practices for tactical deployment. The modules include video clips of experienced community college presidents, templates and examples from benchmark materials, short quizzes for self-testing, and supplemental resources and links.

These modules are hosted on Canvas, an online Learning Management System (LMS) and can be downloaded to another LMS. They can be used in any order to fit the needs of a leadership program or institute or any college professional development office. The CCPI-STEM leadership team is also exploring the potential for individual use and certificates of completion.

### **Webcasts and Podcasts**

CCPI-STEM has hosted seven webcasts, beginning in January 2023, with an introduction to the project. Other topics include opportunities for ATE grants, success through mentoring, the Fellows program, building capacity at small and rural community colleges, and strengthening STEM education at minority-serving institutions. Recordings of the webcasts are available from the CCPI-STEM website (CCPI-STEM, n.d.). An audio-only recording is available for those interested in listening to the presentation as a podcast. The slides used during the webcasts are also available from the website.

Webcasts planned for 2024-25 include the impact of the Mentor Up, FORCE, and Mentor Connect programs on ATE grant proposal success, grant impact on the economy and labor market, collaborations and models that work, and an update on the Fellows program.

### **Thought Leaders' Dialogues**

CCPI-STEM partnered with the League for Innovation in the Community College to convene the first Thought Leaders' Dialogue on May 11, 2023. The virtual meeting sought insights from community college leaders to catalyze engagement in STEM programs, particularly NSF's ATE program. The Dialogue was led by Rufus Glasper, President and CEO of the League for Innovation in the Community College, and Charlene M. Dukes, Co-PI of the CCPI-STEM project. V. Celeste Carter, the NSF Program Director who leads the ATE program, welcomed participants and informed them of the tremendous national interest in the role that community colleges play in preparing the STEM workforce. She told the attendees what NSF's ATE program can do to help support college programs.

The 91 participants in the Dialogue met with moderators in small groups for 60 minutes to discuss STEM-related issues and to make suggestions for improvement. Moderators asked a series of planned questions to elicit information on whether participants have applied for and received ATE grants, whether they were aware of mentoring opportunities, what the role of faculty was in applying for and implementing grants, and what kinds of support they would need from college administration to establish a culture that is receptive to an ATE grant.

Participants raised the following issues:

- Many dialogue participants were not aware of the mentoring available to help community college faculty members prepare competitive proposals.

- The ATE grant application process can be intimidating for faculty at colleges that do not have grants offices and for those who are already teaching overloads.
- Small and rural colleges that could benefit most from ATE grants have the least capacity to submit proposals and carry them out.
- Community college presidents and vice presidents need professional development that explains NSF, ATE, and the value of programs that improve the STEM technical workforce.
- Community college educators are interested in consortia for interdisciplinary approaches and multi-college networks to support STEM workforce development efforts.
- Community colleges need stronger infrastructures to support faculty preparing ATE applications, developing new programs funded with ATE grant awards, and managing ATE grants.
- Faculty need strategies for responding when new community college presidents do not see the value of ATE grants or other STEM workforce initiatives.

These issues are more fully described in the Dialogue Report that has been shared with NSF and is available on the CCPI-STEM website (CCPI-STEM, n.d.). In addition to these issues raised, the Dialogue participants also made suggestions to:

- Simplify the ATE proposal process.
- Allow stipends from grant funds rather than teaching load reductions for principal investigators.
- Clarify whether bringing new colleges into the ATE program is penalizing previously funded community colleges when they submit new proposals.
- Modify the merit review process to give points to the institutions and leaders of previous well-executed grants as the U.S. Department of Education does with TRIO programs.
- Select reviewers who understand the culture of community colleges.
- Address the misperception that community colleges and faculty without NSF grant experience will not be able to make competitive proposals.
- Improve the connections between NSF program officers and community college leaders and faculty.

The second Thought Leaders' Dialogue, on February 9, 2024, focused on strengthening capacity at small and rural colleges. Eighty-eight participants attended the 90-minute virtual session.

Participants raised the following issues:

- Funding and issues related to finances, such as faculty salaries, were listed as the primary challenges facing small and/or rural colleges by a majority of the participants.
- Capacity, lack of personnel with grant-writing experience, and declining populations were among the other most frequently identified challenges.
- Institutional nimbleness and educators' knowledge of local employers and residents were cited as strengths that small and rural colleges can leverage for grant initiatives.
- Partnerships—either with employers or other schools—were listed most often as ways for small and/or rural colleges to create pathways to economic mobility.
- Perhaps the most effective way for small and rural colleges to prepare competitive grant proposals is through the formation of consortia arrangements with other colleges.

These issues are more fully described in the Dialogue Report that has been shared with NSF and is available on the CCPI-STEM website (CCPI-STEM, n.d.).

## **Mentoring Resources**

The CCPI-STEM website provides a list of resources for community college faculty, staff, and administrators who wish to apply for NSF ATE funding—or who have applied unsuccessfully in the past and want to improve their chances of success (CCPI-STEM, n.d.). The following mentoring initiatives are among the most helpful resources:

- FORCE-ATE (Fortifying Cybersecurity and Computing Education Through ATE Grants) offers team-based professional development and mentoring designed to help participants crystalize their innovative ideas and develop competitive proposals for external support.
- Mentor-Connect provides mentoring for nine months to college teams as they prepare ATE grant proposals. Mentor-Connect has an extensive free library of materials related to ATE proposal preparation and grants management.
- MentorLinks helps two-year colleges to develop new technician education programs or strengthen existing programs in STEM fields through mentoring over a two-year period. It offers professional development, technical assistance, and networking opportunities to help mentee teams gain insights for building and sustaining programs.
- Mentor Up (Advanced Technological Education Grant Mentoring for Two-Year Colleges) offers faculty one-on-one mentoring with experienced principal investigators and past NSF program officers during a 2.5-day virtual proposal writing workshop. Mentor Up also provides post-workshop webinars and proposal reviews.
- Pathways to Innovation fosters a culture of innovation using the Business and Industry Leadership Team (BILT) model through two complementary initiatives: the BILT Academy and the Grant-Seeker Academy. The BILT Academy offers one-on-one coaching for teams from community college STEM programs to engage employer partners. The Grant-Seeker Academy mentors grant-seeking college teams to use BILT elements to develop ATE proposals.
- Project Vision provides two-year colleges with guidance from a team of ATE experts, former senior college administrators, and former NSF program officers, to generate ideas and support capacity building that helps administrators and faculty at mentee colleges discover and match innovative ideas with NSF funding opportunities.

## **Conference Presentations and Published Articles**

The CCPI-STEM leadership team and RN Chairs have made several presentations at state, regional, and national conferences in the first two years of the project. Presentations at AACC's Workforce Development Institute (WDI) and the conventions of the American Association of Community Colleges, the Association of Community College Trustees, and the League for Innovation in the Community College provided general information about the project and allowed attendees to ask questions and make suggestions that would be helpful to the colleges.

Publications written by the CCPI-STEM leadership team are available from the CCPI-STEM website (CCPI-STEM, n.d.) and include: Addressing STEM Underrepresentation: The Community College Presidents' Initiative (Boggs et al., 2022b), Responding to an Educational

Imperative: The Community College Presidents' Initiative (Boggs et al., 2022c), Have You Heard About the Community College Presidents' Initiative in STEM? (Zdravkovich, 2022), The STEM Education Priority (Boggs et al., 2022d), and Addressing the STEM Workforce Shortage (Boggs et al., 2022a). These publications emphasize the importance of preparing students for the STEM technological workforce and the need to close racial and gender equity gaps, and they describe the CCPI-STEM project and its goals. The *Presidents Press* is a CCPI-STEM newsletter that began in January 2023. The six 2023 issues were broadly distributed across the regions and made available during conferences and other events. Past issues are available on the CCPI-STEM website (CCPI-STEM, n.d.). The newsletter serves as a primary project communication outlet. The issues highlight regional activities and provide information about upcoming deadlines, workshops, webcasts, and presentations.

## Next Steps

The CCPI-STEM leadership team is planning a second phase of the initiative, labeled CCPI-STEM 2.0. The extension of the initiative will build upon its original components. As a result of feedback received from regional meetings, evaluations, focus groups, and Thought Leaders' Dialogues, five new programs will be added to ensure extensive and effective national and regional impact. Effective programs initiated in CCPI-STEM will continue in CCPI-STEM 2.0. The five new programs that are planned include the growth of the Regional Networks from seven to ten to support all 50 states and provide ongoing support through regional meetings, sharing NSF ATE opportunities, and encouraging collaborations with community colleges wishing to join with other colleges that have been successful with grant applications and program implementations; supporting faculty members and grant preparation teams during the proposal preparation and project implementation stages; focusing publications and presentations on models that work; and, strengthening and expanding relationships that support and highlight business and industry collaborations designed to build strong technical programs that meet workforce needs locally, regionally, and nationally.

## References

- American Association of Community Colleges. (2023). FastFacts 2023. <https://www.aacc.nche.edu/research-trends/fast-facts/>
- Boggs, G. R., Dukes, C. M., & Hawthorne, E. (2022a). Addressing the STEM workforce shortage. U.S. Chamber of Commerce Foundation. <https://www.uschamberfoundation.org/education/addressing-stem-workforce-shortage>
- Boggs, G. R., Dukes, C. M., Hawthorne, E., Railey, C. A., & Zdravkovic, V. (2022b). Addressing STEM Underrepresentation: The Community College Presidents' Initiative. *Diverse Issues in Higher Education*, 39(3), 49-50. <https://link.gale.com/apps/doc/A704246289/AONE?u=anon~69d80b6e&sid=googleScholar&xid=453943ac>
- Boggs, G. R., Dukes, C. M., Hawthorne, E., Railey, C. A., & Zdravkovich, V. (2022c). Responding to an educational imperative: The community college presidents' initiative. *Leadership*, 35(5). <https://www.league.org/leadership-abstracts/responding-educational-imperative-community-college-presidents%E2%80%99-initiative>

- Boggs, G. R., Dukes, C. M., Hawthorne, E., Railey, C. A., & Zdravkovich, V. (2022d). The STEM education priority. *ACCT Trustee Quarterly, Spring 2022*. <https://acct.org>
- Carnevale, A., Smith, N., Van Der Werf, M. & Quinn, M. (2023). After everything: Projections of jobs, education, and training requirements through 2031. *Georgetown University, Center on Education & the Workforce*. <https://cew.georgetown.edu/cew-reports/projections2031/>
- CCPI-STEM. (n.d.). CCPI-STEM. <https://www.ccpi-stem.org>
- CompTIA. (2024). State of the tech workforce 2024. <https://www.comptia.org/content/research/state-of-the-tech-workforce#:~:text>
- Funk, C., & Parker, K. (2018). Diversity in the STEM workforce varies widely across jobs. *Pew Research Center*. <https://www.pewresearch.org/social-trends/2018/01/09/diversity-in-the-stem-workforce-varies-widely-across-jobs/>
- Johnstone, R. (2023). Grounding our inquiry and change work in equitable post-graduation success. *Roueche Center Forum. Diverse Issues in Higher Education*. <https://www.diverseeducation.com/from-the-magazine/article/15635671/grounding-our-inquiry-and-change-work-in-equitable-postgraduation-success>
- National Academies of Sciences, Engineering, and Medicine. (2016). Barriers and opportunities for 2-Year and 4-Year STEM degrees. <https://nap.nationalacademies.org/catalog/21739/barriers-and-opportunities-for-2-year-and-4-year-stem-degrees>
- National Science Board. (2019). The skilled technical workforce: Crafting America's science and engineering enterprise. <https://www.nsf.gov/nsb/publications/2019/nsb201923.pdf>
- National Science Foundation (2019). Advanced technological education impacts, 2018-2019. [https://atecentral.net/r38357/ate\\_impacts\\_2018-2019](https://atecentral.net/r38357/ate_impacts_2018-2019)
- National Science Foundation (2023). Advanced technological education solicitation, NSF 21-598. <https://new.nsf.gov/funding/opportunities/ate-advanced-technological-education/nsf21-598/solicitation>
- Selko, A. (2018). Skills gap could cost US economy \$2.57 trillion over next decade. *Industry Week*. <https://www.industryweek.com/the-economy/article/22026709/skills-gap-could-cost-us-economy-25-trillion-over-next-decade>
- Van Noy, M. & Biswas, R. (2023). Illuminating economic development in community colleges: Lessons from NSF ATE grants. Education and Employment Research Center, Rutgers School of Management and Labor Relations. <https://sites.rutgers.edu/eerc-hii/wp-content/uploads/sites/609/2023/08/Illuminating-Economic-Development-NSF-HII-EERC-6.16.23-FINAL.pdf>
- Zdravkovich, V., Railey, C. A., Hawthorne, E. K., Dukes, C. M., & Boggs, G. R. (2022). Have you heard about the Community College Presidents' Initiative in STEM? *Higher Ed Jobs*. <https://www.higheredjobs.com/articles/articleDisplay.cfm?ID=3065>

*George R. Boggs, Ph.D., is President Emeritus of the American Association of Community Colleges and Palomar College. He teaches in the John E. Roueche Center for Community College Leadership at Kansas State University and the doctoral program at San Diego State University. He can be reached at [grboggs@ksu.edu](mailto:grboggs@ksu.edu).*