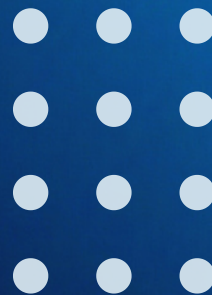


Bridging Gaps, Building Futures:

Corporate Scholars Program



NACME

NATIONAL ACTION COUNCIL FOR
MINORITIES IN ENGINEERING

Acknowledgement

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The National Action Council for Minorities in Engineering (NACME)

The U.S. higher education system has made impressive progress in equipping our engineering workforce for the future. Still, underrepresented students face challenges seamlessly transitioning into engineering, with only half likely to be employed in engineering as White or Asian students.¹ As a result of this disparity, underrepresented students are less likely to have been exposed to or understand the engineering work culture, creating a double bind experience as they enter unfamiliar work environments during internships or early career choices. The National Action Council for Minorities in Engineering (NACME) recognizes this and established the Corporate Scholars Program (CSP) to offset this double bind.

By joining hands with educational institutions and industry leaders, NACME seeks to both prepare minority students for the corporate world and provide companies with actionable insights to enhance internship experiences. This loop of knowledge exchange lays a strong foundation for subsequent initiatives to foster greater inclusivity in engineering and computer science.

The CSP, a signature initiative launched in the Summer of 2021, includes a corporate internship, professional development programming, and a \$5K scholarship for the students. The initial insights were instrumental in refining the program, leading to significant enhancements in 2022 and 2023, with the most significant being the addition of faculty collaborators, which elevated the research and assessment capabilities of NACME.

Introducing the CSP

The brilliance of CSP lies in its multi-pronged approach - a combination of academic excellence, professional development, and technical training ensures that NACME Scholars are “career ready” for the competitive workforce of today and tomorrow.

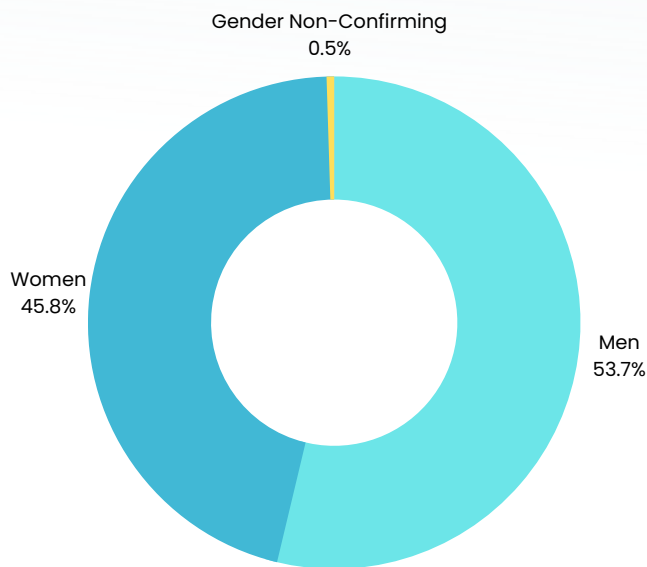
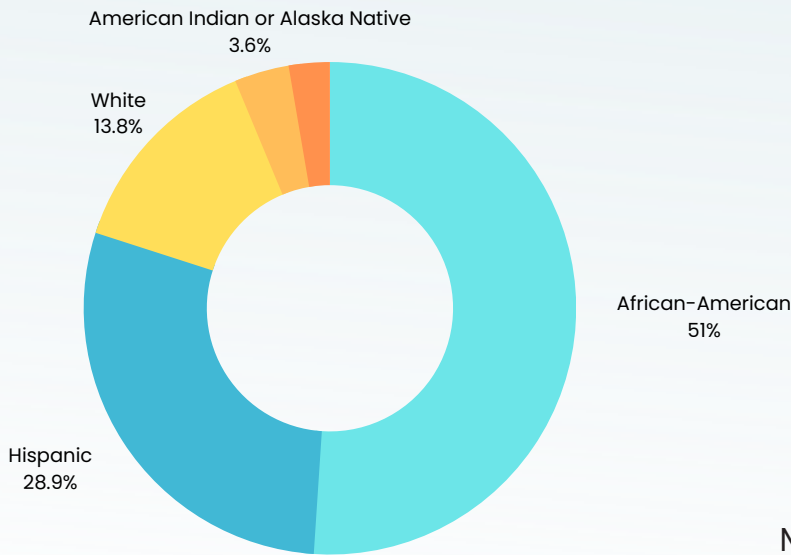
In partnership with stellar teams from Virginia Tech and UNC Greensboro, NACME orchestrated an interdisciplinary ensemble of experts—from STEM educators to event planners—to craft activities and analytical tools that ease students' transition into technical corporate internships. Students were immersed in an 8-week series focusing on essential professional development areas.

In line with NACME's commitment to evidence-based programming, surveys were administered for each session, incorporating free response qualitative feedback to guide CSP implementation and assess student and program progress and challenges.

¹ Mission Not Accomplished: UNEQUAL OPPORTUNITIES AND OUTCOMES FOR BLACK AND LATINX ENGINEERS. The Georgetown University Center on Education and the Workforce - 2021.

Inclusive Excellence: CSP's Impact

Over the past three years, CSP has touched the lives of 217 students, including 58 students from the initial pilot, 86 in 2022, and 73 in the most recent 2023 offering - cultivating a diverse and vibrant community of future engineers. A snapshot of the community demographics is shown below. Students who complete CSP are eligible for a NACME scholarship for the next academic year.



² Data extracted from Building Capacity to Support Career Acceleration and STEM Workforce Development: Evaluation Report. National Action Council for Minorities in Engineering - February 2023.

The weekly webinar series covered various topics like:

Week	Session Topic
1	Understanding Company Culture
2	Understanding Workplace Performance
3	Professionalism in the Workplace
4	Webinar: Research Team Topic
5	Seeking Your Next Career Opportunity
6	Career Experiences/Opportunities in the Workplace
7	Executive Speaker
8	Develop a Competitive LinkedIn Page

Much of the content for the weekly webinars was provided by professionals from corporations who make up our governing Board of Directors. These executive leaders give first-hand knowledge about workforce needs and shape our program offerings accordingly.

The CSP students ranked the webinar sessions in seven key areas - workshop usefulness, workshop experience, career objectives, workshop big takeaways, lessons learned applicable to the STEM workplace, suggested improvements, and offered topics for future sessions. Overall, the weekly webinars were a big hit and consistently ranked above 4.0 on a 5.0 scale by scholars as informative, well organized, and positively impacting their identity as engineers.²

Measuring Impact

NACME's unique relationship with both corporate leaders and university partners provides the potential to do impactful work that yields new models for advancing the participation of historically underrepresented groups at every phase of their professional development. A primary part of NACME's research strategy is to document the various factors that contribute to the success of minority students in engineering programs. The research strategy for assessing the CSP has evolved to include collecting and analyzing attributes related to the internship experience to supplement the initial assessment activity, which provides feedback on the professional development series and the manager feedback survey.

Through a National Science Foundation (NSF) grant, NACME established a partnership in 2022 with research teams at Virginia Tech and UNC Greensboro, providing valuable resources for program assessment and a comprehensive program review with quantitative and qualitative insights on the internship component. With the end of the NSF grant, the 2023 program review includes only a quantitative evaluation.

The Internship Impact

To gauge the transformative nature of their experiences, NACME collected pre- and post-survey responses employing a paired-sample t-test to discern any significant variations in students' vocational identity and their perceptions of engineering before and after their internships. We took a comprehensive multiple-regression analysis of the survey data. This approach provided an illuminating perspective on the interplay between the interns' experiences, their perceptions of the host company, and the pivotal role of workplace culture in shaping their future aspirations in the field.

Delving into the 2022 results, we discovered significant shifts in individual responses or the aggregate scores when comparing pre- and post-data, demonstrating the tangible impact of the internship experience on students' perceptions and aspirations. However, the findings from our 2023 scholars, while not reaching statistical significance, certainly present intriguing patterns. These patterns merit deeper exploration and provide valuable insights, which we have put into the summary below for a holistic understanding.

Impact of Internship Experience²

	2022	2023
Vocational Identity	<ul style="list-style-type: none">• Students' overall vocational identification was positively reinforced as a result of their internship experience• The internship experiences served to solidify their occupational interest• Students increased their understanding of the type of occupation available and could more readily envision the kind of work they wanted to do.	<ul style="list-style-type: none">• Students' overall vocational identification was positively reinforced as a result of their internship experience• The internship experiences served to heighten their sensitivity to ethical/moral issues as well as company culture related to meeting norms.• Students' exposure to the different types of occupations available did not result in narrowing down the kind of work they wanted to do.

Impact of Internship Experience; cont'd²

	2022	2023
Perceptions of Engineering	<ul style="list-style-type: none"> Students' perceptions of what was important to be an engineer or computer scientist remained consistent on the majority of items assessed before and after the internship. Students' perceptions of being able to work with others by sharing ideas as a necessary factor for being thought of as an engineer or computer scientist significantly decreased after students' internship 	<ul style="list-style-type: none"> Students perception of what was important to be an engineer or computer scientist remained consistent on the majority of items assessed before and after the internship Students have overall positive perceptions of the engineering professional despite indicating they have a difficult time choosing what type of work they would like to do in the future.
Positive Perceptions of Company	<ul style="list-style-type: none"> Working with a supervisor who motivated them to do their best work subsequently increased their positive company perception. Students held a positive perception of their company because they felt their internship helped develop their problem-solving abilities. 	<ul style="list-style-type: none"> Students intend to continue pursuing professional opportunities in their field of study. Students had a positive perception of their company and enjoyed discussing their corporate experience and saying positive things about the company.
Intention to Persist	<ul style="list-style-type: none"> Students' intention to persist in their field increased as a result of having a supervisor who tried to make their work experience more interesting 	<ul style="list-style-type: none"> Students' confidence increased in their ability to tackle unfamiliar work-based problems and work in the engineering profession.

Our most recent analysis reveals resoundingly positive feedback from our interns. Students shared a unanimous sentiment of enriching experiences and testified to a marked enhancement in their skills and confidence.

Additionally, we discovered that the predominant themes that affected students' perception of their engineering internship and skills were **work modality**, **intern community**, and **company culture**. Student views on these themes are shared and highlighted in the illustration on Page 6. Insights like these and program assessments give NACME invaluable data for CSP's future direction and refinement.

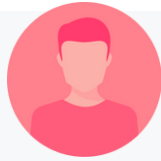
Themes Affecting Intern Perceptions of Engineering Work and Skills



=indicates a negative affect

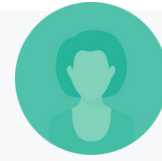


=indicates a positive affect



Work Modality

*It was my first remote full-time job, so it was definitely weird cause I've never worked eight hours straight in my room. And it was really exhausting because I'm really a sociable, more outdoorsy person. Don't get me wrong, the job was fun and I learned so much, but . . . **maybe in the future, I'm going to reconsider maybe doing a fully remote position.***



*Since we were working on projects in the city where I was from, a lot of the times I would see a map with a street that I used to live on or oh I grew up around there, I went to school around there. I knew exactly what they were talking about, what space they were talking about...**It was cool for me to see like, "Oh, I grew up here and this is what I remember about it and now I'm coming back and doing something for it.***

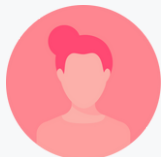


Intern Community

*I was the only intern on my team and a lot of the other interns were the only interns on their team. . . **if I had other interns on my team, then I would've felt not so isolated** because I was the only one really having to be in my position on the team.*

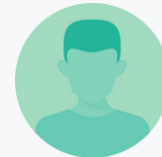


*We often talked to each other, we helped each other on projects, many projects that she helped me with, even though it wasn't her project for example. **That being by myself there, I think I would've had a very different experience.** And outside of work I'm a 20 hour drive away from home up there. So she was the only person that I was hanging out with outside of work.*



Company Culture

***So yeah, the culture at [Company] is quite direct.** I think most tech companies don't hold back in terms of technical criticism and that's useful. But sometimes it was technical criticism without resources to understand the criticism nor resources of other particular solutions or good feedback, constructive feedback.*



*I learned that they're [the Company] really inclusive, they're really diverse, and they treat it less like a matrix of robots...**I feel like I was accepted well into the family.** There's this common misconception with interns that they're kind of the weaker link and...get you the coffee and they're kind of disrespected. It was completely the opposite for me. I felt accepted.*

Gratitude to Our Corporate Champions

NACME recognizes the corporate sponsors who provide internships to CSP students are essential to the program's success. Thirty-seven corporations have participated in CSP with 27 companies in 2021, 25 in 2022, and 28 in 2023 with 80% of the companies a part of CSP since its inception.

Corporate Sponsors

The success of CSP would be incomplete without acknowledging the corporate sponsors who offer internships.

Amazon	Dialog Semiconductor	Johnson Controls
Air Products	Ducommun	Merck & Co
AT&T	Dupont	Microsoft
Autodesk	Emergent/Ordaos Bio	MRI Real Estate Software
Bechtel Corporate	ExxonMobil	Phillips 66
Boston Scientific	First American/ Endpoint	Procter & Gamble
BP	Ford Motor Company	Raytheon Technologies
Chevron	GE Healthcare	Rolls-Royce
Coffman Engineers	Hewlett Packard Enterprise	RPS Group
Deloitte	IBM	UPS
	ITT Inc.	

Corporate sponsors provided feedback on their CSP interns and assessed five core attributes of the students during the internships. Since the ultimate goal of NACME is to promote inclusive excellence in the engineering workforce, intern managers were asked to indicate the likelihood they would recommend their intern to the hiring manager at their company. It is heartening to note their high recommendation rate of NACME interns - an impressive 7.5, 8.7, and 8.0 out of 10³ - respectively for 2021, 2022, and 2023. These recommendation rates can signal the beginning of a long-term work relationship since “70% of interns are hired by the company they interned with.”

***“70% of interns are hired by the company they interned with.”
(Zippia, 2022)***

³ Results are the mean value (M=) across for all participating companies using a 10-point scale with a response of 0 = Definitely Not, 5 = Maybe, and 10 = Extremely Likely.

Key Takeaways >>>

The journey of the Corporate Scholar Program underscores NACME's commitment to bridging the gap for underrepresented students in engineering. CSP represents the symbiotic relationship between its student participants and our esteemed corporate sponsors. For students, it's an invaluable gateway into myriad career possibilities. For NACME's corporate allies, it taps into a reservoir of extraordinary talent, potentially setting the stage for long-term associations.

With each passing year, we are confident in expanding our horizons, forging stronger partnerships, carrying out our vision for inclusive excellence in engineering, and having a workplace representing America's racial and ethnic diversity.

- ★ **Focused Collaboration for Inclusion:** The Corporate Scholars Program (CSP), an initiative by NACME, is aimed at preparing underrepresented students for the corporate world. This is achieved through collaboration with educational institutions and industry leaders, ultimately promoting inclusivity in engineering and computer science.
- ★ **Continuous Evolution and Enhancement:** CSP started in 2021 and has since embraced feedback and insights to refine its approach. Integrating research collaborators from Virginia Tech and UNC Greensboro was pivotal in bolstering the program's assessment capabilities and providing a framework and tools to strengthen NACME's research infrastructure.
- ★ **Interdisciplinary Model for Transitioning Students:** The CSP model is uniquely designed, bringing together an interdisciplinary team to craft tools and activities that aid students in smoothly transitioning from academic environments to corporate technical internships.
- ★ **Diverse Student Impact and Positive Feedback:** CSP has impacted 217 students from diverse backgrounds over its tenure. Student feedback underscores the program's relevance, particularly valuing sessions on professionalism.
- ★ **Corporate Partnership and Stellar Recommendations:** The role of corporate sponsors has been integral to CSP's success, with 37 companies providing internships. Most corporate sponsors indicated they would recommend hiring the intern, which is a testament to the high caliber of CSP students.

