

A Pathway to Holistic Development and Professional Growth for Women of Color in STEM



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WHO WE ARE

The Society of Women Engineers (SWE) programs are designed to ignite inspiration in women and girls, guiding them toward prospective careers in science, technology, engineering, and mathematics (STEM) fields.

SWE recognizes the boundless potential of STEM disciplines to catalyze innovation, effect positive social change, and generate global impact across diverse domains.

These include:

A capacity to reshape societal norms and modes of living and working.

A potential to address some of the world's most pressing challenges.

An opportunity to shape a more sustainable and equitable future.

An ability to equip brilliant minds with the essential tools and skills needed to enact transformative change.

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SWE's outreach programs encompass more than just fostering a diverse and vibrant engineering community across sectors and organizations. They encompass a multitude of initiatives aimed at catalyzing a significant shift toward greater representation and inclusivity of women.

Through programs aligned with its four overarching goals, SWE has made remarkable strides in kindling interest in STEM fields among girls and women, ultimately nurturing lifelong success in STEM careers.

- 1** Expand access for, and strengthen the inclusion and retention of, girls and women in engineering and technology.
- 2** Champion intersectional diversity within engineering and technology and model an inclusive and equitable environment.
- 3** Develop a global, inclusive community, empowering women in engineering and technology from all locations and life stages.
- 4** Serve as a global authority on and a resource for women in and aspiring to careers in engineering and technology to develop their talents, personally define success, and achieve excellence throughout their life journeys.

Disclaimer: Everything described in this report represents SWE's authentic work and data. SWE used generative AI to assist with the first drafts of various portions of this report. The usage of generative AI was limited to 30% of the overall content creation. Segments that relied on generative AI were carefully reviewed and edited. This report's critical and confidential aspects, including data analysis, findings, and methodological decisions, were made independently of AI assistance.

ABOUT THE COLLEGIATE LEADERSHIP INSTITUTE

The Collegiate Leadership Institute (CLI) program, with its multifaceted benefits, is evidently more than just another course for aspiring engineers. It fosters holistic development, professional growth, and networking in the engineering field. CLI's mission is to equip collegiate members with skills, knowledge, and leadership abilities, positioning them as future leaders in the Society of Women Engineers.

Running from September to May, CLI provides an immersive experience with valuable skills and leadership development. Monthly virtual sessions enrich participants' learning and networking opportunities. Post-session surveys allow for reflection and feedback, showcasing personal growth.



CLI thrives on the stories and voices of its participants, gathered through insightful focus group interviews. These stories highlight CLI's impact, motivating participants to stay engaged in STEM, emphasizing the importance of networking, mentorship, and the support provided by CLI staff and peers in their STEM journeys.

CLI empowers SWE collegiate members by equipping them with essential leadership capabilities, enabling women to emerge as influential global leaders in their respective fields. Key facets of CLI include:

- Provision of indispensable skills and training sessions, encompassing technical, communication, and teamwork skills.
- Opportunities for training in leadership, networking, and public speaking.
- Creation of support platforms, connecting SWE collegiate members with mentors, coaches, and professionals.
- Enhancement of leadership capacities, skills, and values through project leadership, workshops, and presentations.

The objectives of CLI are multifaceted

- Inspiring and motivating participants to continue their engineering journeys.
- Facilitating the transition of students into the engineering workforce.
- Cultivating capable and confident professionals who will contribute to the growth and diversity of the engineering community.

The monthly virtual CLI sessions were conducted with the following goals in mind:

9.20.2022

Orientation

Introduce CLI participants to program expectations, outcomes, and resources.

10.21.2022

Exclusive CLI Event at SWE's Annual Conference

Private networking session for CLI members to connect with industry professionals.

11.8.2022

Practicing Self Advocacy in College

Equip participants with self-advocacy tools.

12.6.2022

Career Pathways & Special Interest Tracks Event

Networking and engagement on various topics, including career planning.

1.10.2022

Present Your Science: Tell a Clear Technical Story

Improve communication of technical information.

2.21.2022

Slaying the Demanding Dragons

Strategies for managing challenging professional dynamics.

2.21.2022

Focus Group

Evaluate the CLI Program's impact on education and career plans, assess self-confidence, leadership, communication skills, and exposure to experts.

3.7.2022

Applying CLI at SWE and Beyond

Reflect on CLI experience and plan for leadership development.

4.4.2022

It's Not You, It's The Process: Negotiating Away the Systemic Bias in Pay

Gain insights into overcoming systemic bias in pay, particularly for women in engineering (speaker series).

EXECUTIVE SUMMARY

SWE's outreach programs strive to empower women through collaborative professional networks and transformative experiences that foster collective learning and engagement. The goals of these programs include inspiring girls to consider future careers in STEM fields, ensuring the retention of girls within STEM disciplines, and promoting the inclusion of underrepresented groups in engineering and technology sectors.

At the heart of SWE's efforts to empower women in engineering and technology careers lies the Collegiate Leadership Institute (CLI). Through comprehensive year-round virtual programming that engages participants monthly, CLI supports students in their transition to the engineering workforce. CLI equips college students with essential leadership capabilities, enabling participants to emerge as influential global leaders in their respective fields.

Past annual post-program surveys revealed high satisfaction levels among CLI participants, though notably among women from predominantly white institutions (PWIs). Building on prior research conducted on women of color in engineering and technology, SWE expanded its year-long the CLI program to incentivize undergraduate women of color to pursue advanced STEM degrees.

Through surveys and focus groups, this project examined the impact of the CLI program on women's long-term education and career plans. Specifically, the purpose of the study was to determine whether CLI was adequately supporting and encouraging women to pursue a graduate STEM education. With a particular focus on women of color and women from Historically Black Colleges and Universities (HBCUs) and Hispanic-Serving Institutions (HSIs), SWE made a concerted effort to recruit women of color in the CLI program. As a result, more than 50% of 2022-23 CLI participants were women of color, with almost 20% Black or African American, Hispanic or Latino/a/x, Pacific Islander, or Multiracial, and 18 women were from HSIs. Though several women from HBCUs applied and were accepted into the CLI program, no one from these institutions enrolled in the 2022-23 CLI cohort.

KEY RESEARCH QUESTIONS AND HIGH-LEVEL FINDINGS

Does the CLI program amplify participants' ambitions to advance in STEM graduate studies?

Yes

Are the participants' intentions influenced by their racial/ethnic background or the nature of their undergraduate institution?

**No - Racial Influence
Yes - Undergraduate Institution Influence**

Which facets of the CLI program resonate most in motivating women to sustain their trajectory in STEM, be it academically or professionally?

Networking opportunities, mentorship, and exposure to STEM role models

KEY PROGRAM HIGHLIGHTS

- 1 Nuanced Impact on Aspirations in STEM Graduate Studies**

The CLI program’s impact on participants’ ambitions in STEM graduate studies is nuanced and encouraging, especially for women of color. Nine percent of overall participants reported that the program influenced their decision to pursue a graduate degree in STEM.
- 2 Distinctive Curriculum Driven by Feedback**

A key to CLI’s success is its unique content, informed by participant feedback. This curriculum addresses often-overlooked topics, ensuring a tailored educational experience that maintains appeal and relevance.
- 3 Factors Shaping Participants’ Decisions**

Participants’ decisions to pursue STEM graduate education are influenced by various factors, including their career objectives, confidence levels, and external resources. For example, 23% were already planning to pursue a graduate degree in STEM before participating in CLI, and 30% mentioned that the program did not influence their decision or wasn’t related to their decision-making.
- 4 Ethnicity and Race Influence on Inclinations**

Ethnicity and race appear to align with CLI’s emphasis on growth and empowerment, as pre-existing plans for STEM graduate studies often resonate with the program’s goals. South Asian respondents were most influenced by the CLI program, with 30% indicating such, followed closely by Multiracial and Hispanic or Latino/Latina/Latinx groups at 22% and 20%, respectively. Black or African and several other ethnicities had notably lower or zero affirmative responses.
- 5 Empowerment Beyond STEM Graduate Studies**

The CLI program goes beyond direct inclinations toward STEM graduate studies, with 70% of participants indicating that they value the program for the deep insights it offers into the professional engineering landscape.
- 6 Diversity, Equity, and Inclusion (DEI) Commitment**

CLI demonstrates a strong commitment to diversity, equity, and inclusion. 84% of participants seek to develop comprehensive leadership skills that pertain to DEI, recognizing their importance not only in their current engineering education but also in shaping their future engineering careers.
- 7 Inclusive Network and Community Building**

The CLI program fosters an inclusive network and community building, exemplified by its alumni network that transcends cultural boundaries and strengthens the sense of community among participants.
- 8 Ongoing Impact and DEI Commitment**

CLI’s impact extends beyond individual participants, shaping their achievements, reshaping STEM, and contributing to a more inclusive future for the field.
- 9 Participant Feedback and Insights**

Feedback from participants at HSIs indicates that the CLI program helped them envision themselves as STEM professionals, provided exposure to diverse career paths, and bolstered their confidence. PWI respondents, while less influenced in their decision-making, still reported benefits such as increased knowledge about STEM fields and enhanced confidence.
- 10 Influence by Institution Type**

The CLI program appears to have a more pronounced influence on students from HSIs (23%) compared to PWIs (8%) in deciding to pursue graduate STEM studies. However, a significant portion from both institutions had either already decided on STEM graduate studies irrespective of the program or claimed the program didn’t influence their decision.

NOTE: HBCU stands for Historically Black Colleges and Universities. HSI stands for Hispanic-Serving Institutions. PWI stands for Predominantly White Institution.



INTRODUCTION

In the landscape of technological progress and innovation, engineering stands as a paramount force propelling our nation's future. Yet, a pressing concern persists—the underrepresentation of women of color in this vital domain. Despite their significant potential and contributions, women of color encounter persistent barriers. Recognizing the potency of diversity in generating effective solutions, it becomes crucial to collectively address the systemic impediments hampering the advancement of women of color in engineering.

Although women now make up about half of all employed college graduates, they still only represent 14% of the engineering workforce and 26% of those working in computer and mathematical occupations. While the number of women entering college and the workforce is growing, only 24% of engineering bachelor's degree recipients are women, and less than 7% are women of color.

However, this statistic assumes a more complex facet when the intersectionality of gender and race is explored. The challenge becomes even more pronounced for women of color, particularly Black and Hispanic women, who confront severe underrepresentation in engineering. In fact, the same data indicate that Black and Hispanic women comprise only two percent of engineering professionals. This alarming reality underscores the need for cohesive actions to bridge the gender gap and promote broader representation of women, especially women of color, within the engineering sector.

BARRIERS TO REPRESENTATION

The underrepresentation of women of color in engineering is a multifaceted concern rooted in a web of contributing factors. These factors can be categorized into three distinct spheres: social and cultural barriers, educational barriers, and discriminatory practices.

Social and Cultural Barriers

1. Stereotypes about Women's Abilities in Math and Science

Women of color often encounter stereotypes impinging on their proficiency in math and science. These stereotypes engender self-doubt and create hurdles, making the journey more arduous for women of color.

2. Lack of Role Models

The scarcity of role models in engineering hinders women of color from envisioning themselves as engineers. This dearth also limits access to mentors and networks, compounding the challenges faced by women of color.

Educational Barriers

1. Limited Access to Quality STEM Education and Mentors

Women of color often attend institutions with limited STEM resources, impacting their access to crucial support systems for success in engineering. Furthermore, they are less likely to secure mentors, hampering their navigation within the engineering realm.

2. Financial Constraints

A higher prevalence of women of color from low-income families exacerbates financial obstacles in pursuing education, particularly within high-cost regions.

Discriminatory Practices

1. Microaggressions, Unconscious Bias, and Racism

Women of color in engineering frequently confront microaggressions, unconscious bias, and explicit racism. These experiences generate discomfort in the field, undermining their prospects for success.

The cumulative impact of these challenges manifests as imposter syndrome, isolation, and burnout among women of color pursuing engineering careers. Research by the Anita Borg Institute (2020) highlights women of color in STEM being more prone to imposter syndrome than their counterparts. Furthermore, Michelle

Ryan and Alex Haslam's work "The Glass Cliff" (2010) reveals that women of color in STEM often experience isolation and burnout. The National Academies of Sciences, Engineering, and Medicine (2018) affirms that women of color face microaggressions and discrimination in STEM fields.

METHODOLOGY

This study evaluated the CLI program's effectiveness in supporting women in engineering, particularly underrepresented women from HBCUs and HSIs and women of color.

Research Questions

1. Does the CLI program amplify participants' ambitions for STEM graduate studies?
2. Are participants' intentions influenced by their racial or ethnic background or undergraduate institution?
3. Which CLI program aspects motivate women to pursue STEM academically or professionally?

Research Methodology

Mixed methods were used, including surveys and focus group discussions. Surveys were conducted at different times: baseline, pre-program, post-session, and end of year. Focus group discussions were conducted via Zoom with the 2022-23 CLI cohort of women. To comprehensively analyze the data, descriptive statistics were employed. These statistics helped to capture and summarize the main features of the data, presenting the information in a clear and logical manner, while also highlighting common trends and patterns.

Data Collection Process

Data collection covered program components and surveys. Closed-ended and open-ended survey questions provided structured and nuanced data.

Thematic and Qualitative Analysis

Qualitative analysis involved coding recurring themes from focus group transcripts, with reliability checks. A blended approach synthesized quantitative and qualitative data comprehensively.

Sample Selection

- Recruitment efforts for the 2022-23 CLI program focused on women from HBCUs and HSIs and women of color attending all institutions.
- There were 179 women into the program. More than 20 women from HSIs were accepted, and one from HBCUs. Approximately 60% of accepted applicants identified as a woman of color.
- Ultimately, 155 women enrolled, including 18 from HSIs. No one from HBCUs enrolled. More than 50% of the 2022-23 CLI cohort identified as a woman of color.

SURVEY SAMPLE DEMOGRAPHICS

Demographic data was collected from all accepted applicants to the 2022-23 CLI program. The pre-program survey was administered prior to the first virtual session in September 2023. There was some loss of participation seen over the course of the program, with 155 women participating at the start of the program and 135 still actively participating when the program concluded.

2022-2023 Cohort	179 Total Accepted Applicants 155 Total Enrolled Applicants
Demographics of Enrolled Participants at the Start of the CLI Program (September 2023)	65 White 35 South Asian 12 Black or African 9 Multiracial (two races or more) 8 Southeast Asian 8 East Asian 8 Hispanic or Latino/Latina/Latinx 6 Prefer not to answer 2 Middle Eastern 2 Pacific Islander
HSI, HBCU, & PWI Representation of Participants Enrolled	0 HBCU 18 HSI 137 PWI
Demographics of Enrolled Participants at the End of the CLI Program (May 2023)	61 White 28 South Asian 10 Black or African 9 Multiracial (two races or more) 8 Hispanic or Latino/Latina/Latinx 6 East Asian 5 Southeast Asian 6 Prefer not to answer 1 Middle Eastern 1 Pacific Islander
HSI, HBCU, PSI (2022-23) Representation of Post Program Participants	0 HBCU 14 HSI 121 PWI 135 Total post program enrollment



FOCUS GROUP DEMOGRAPHICS

OBJECTIVE: To explore the CLI program impacts on women’s education and careers, focusing on skill development and exposure to relevant experts.

Nine women participated in the virtual focus group discussion, sharing their experiences with the program.

MAJOR	ETHNICITY/RACE	HBCU OR HSI
Mechanical Engineering	Hispanic or Latino/Latina/Latinx	HSI
Biomedical Engineering	White	PWI
Mechanical Engineering	Did not provide	PWI
Engineering Physics	Hispanic or Latino/Latina/Latinx	PWI
Civil, Construction, and Environmental Engineering	Black or African	PWI
Electrical Engineering	White	PWI
Mechanical and Aerospace Engineering	Multiracial (two races or more)	PWI
Aerospace Engineering	Hispanic or Latino/Latina/Latinx	PWI
Chemical Engineering	Southeast Asian	PWI

NOTE: HBCU stands for Historically Black Colleges and Universities. HSI stands for Hispanic-Serving Institutions. PWI stands for Predominantly White Institution. The table includes students from a variety of ethnic backgrounds, including Hispanic or Latino/Latina/Latinx, Black or African, White, Multiracial (two races or more), and Southeast Asian. The table includes students from a variety of universities, both public and private. The table includes students who are expected to graduate in a variety of years, from 2023 to 2025.

PROGRAM FINDINGS

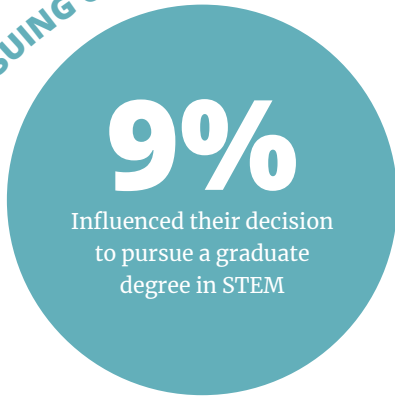
Does the CLI program amplify participants' ambitions to advance in STEM graduate studies?

The CLI program amplifies participants' ambitions to advance in STEM graduate studies, as evidenced by its influence on 9% of participants, while 7% were already planning to pursue STEM graduate degrees; additionally, 5% had their confidence boosted or their decision to pursue STEM graduate degrees solidified.



Additional findings

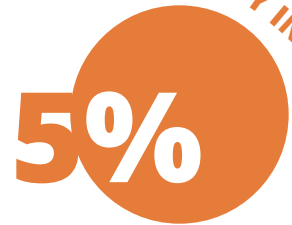
PURSuing GRADUATE STEM STUDIES



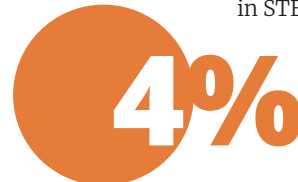
Boosted their confidence to pursue a graduate degree or solidified their decision to do so

“CLI helped me meet other fellow women pursuing master’s degree and that helped me understand its impact.”

ALREADY IN STEM



were already pursuing a PhD in STEM and were unaffected by the program



were already enrolled or had been pursuing a STEM graduate degree for some time

ALTERNATIVE CAREER PATHS AND BENEFITS



recognized opportunities for career growth without a STEM graduate degree due to the program



are considering an MBA or fields outside STEM for graduate studies



believed the program equipped them with skills, confidence, and resources for their future careers

“I have been considering a graduate degree for a while, but the CLI program helped me understand that it was the correct next step for me.”

Are participants' intentions influenced by their racial/ethnic background?

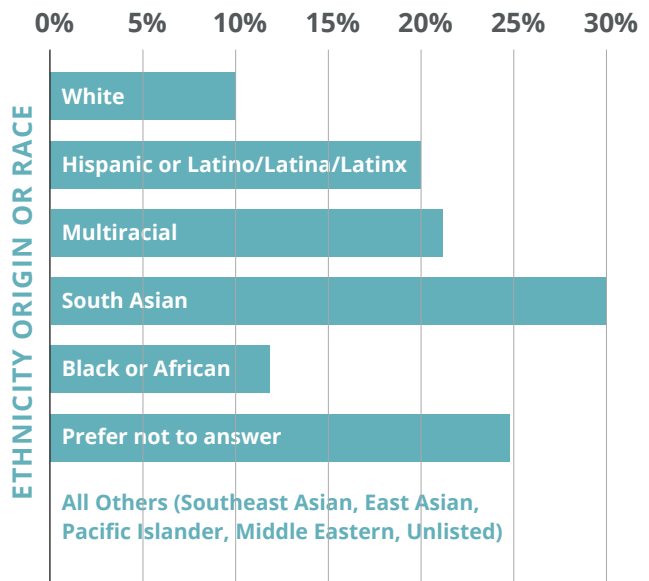
The data indicates that there isn't a definitive link between participants' racial or ethnic background and the influence of the CLI program on their decision to pursue STEM graduate studies. The responses exhibit a wide range of variations and trends. Therefore, without a broader context or comparative groups, it is not statistically sound to infer causation or significant influence.

RACE/ETHNICITY	TRENDS IN RESPONSES: INFLUENCED BY THE CLI PROGRAM?
White	Varied; some were influenced, while others were already planning to pursue a graduate degree or were not influenced by the program's topics.
Hispanic/Latino/ Latina/Latinx	Some were influenced by the program or professional women's stories, while others were already pursuing a PhD or were not influenced.
Multiracial (Two Races or More)	Responses varied, with some already planning to pursue a degree, while others found minimal influence or were already convinced.
South Asian	Many were already planning to pursue a STEM graduate degree, and some were influenced by the program to apply to graduate school earlier. A few mentioned the skillset gained from CLI.
East Asian	Most were already planning to pursue a STEM graduate degree, indicating CLI had minimal influence.
Black or African	Some were already pursuing a STEM graduate degree, while others were not influenced or felt CLI showcased pathways for women in STEM.

NOTE: Responses that were ambiguous or combined yes/no answers within a single question were excluded from the data analysis to ensure logical consistency in the table.

However, there are notable trends to consider. For instance, when examining the proportion of participants based on their ethnic or racial background who responded affirmatively "yes" about the CLI program's influence on their decision to pursue advanced degrees, South Asian participants appeared more influenced by the program compared to other racial/ethnic groups, though less so when compared to white participants. This observation might be attributed to the underrepresentation of South Asian women in STEM fields. The CLI program could potentially resonate with them, offering a vision of themselves as future STEM professionals.

For example, South Asian (30%), Multiracial (22%), and Hispanic or Latino/Latina/Latinx (20%) are the leading racial or ethnic groups that seem to be most influenced by the CLI program to consider STEM graduate studies. On the other hand, groups like Southeast Asian, East Asian, Pacific Islander, Middle Eastern, and Unlisted showed no apparent influence from the CLI program, registering a 0% inclination.



Percentage of participants' intentions influenced by the CLI program to pursue a STEM graduate degree

Note: Post-surveys were utilized and assessed to determine the proportion of participants, based on their ethnic or racial background, who responded with a definitive "yes" regarding the influence of the CLI program on their decision to pursue an advanced degree. Descriptive statistics were then employed to determine percentages and identify trends.



SUPERSIZER

Are participants' intentions influenced by the nature of their undergraduate institution?

Institution type appears to play a role in the influence of the CLI program. Specifically, students from HSIs seem more receptive to the influence of the CLI program compared to those from PWIs.

Students at PWIs seemed to have already made up their minds about pursuing STEM to a greater extent than those at HSIs, possibly indicating a different set of influences or resources at these institutions that influence their decision.

INSTITUTION TYPE	INFLUENCED BY CLI	ALREADY DECIDED	NOT INFLUENCED BY CLI	UNDECIDED/ NEUTRAL	N/A OR NO RESPONSE
PWI	8%	41%	32%	7%	13%
HSI	23%	31%	39%	8%	0%

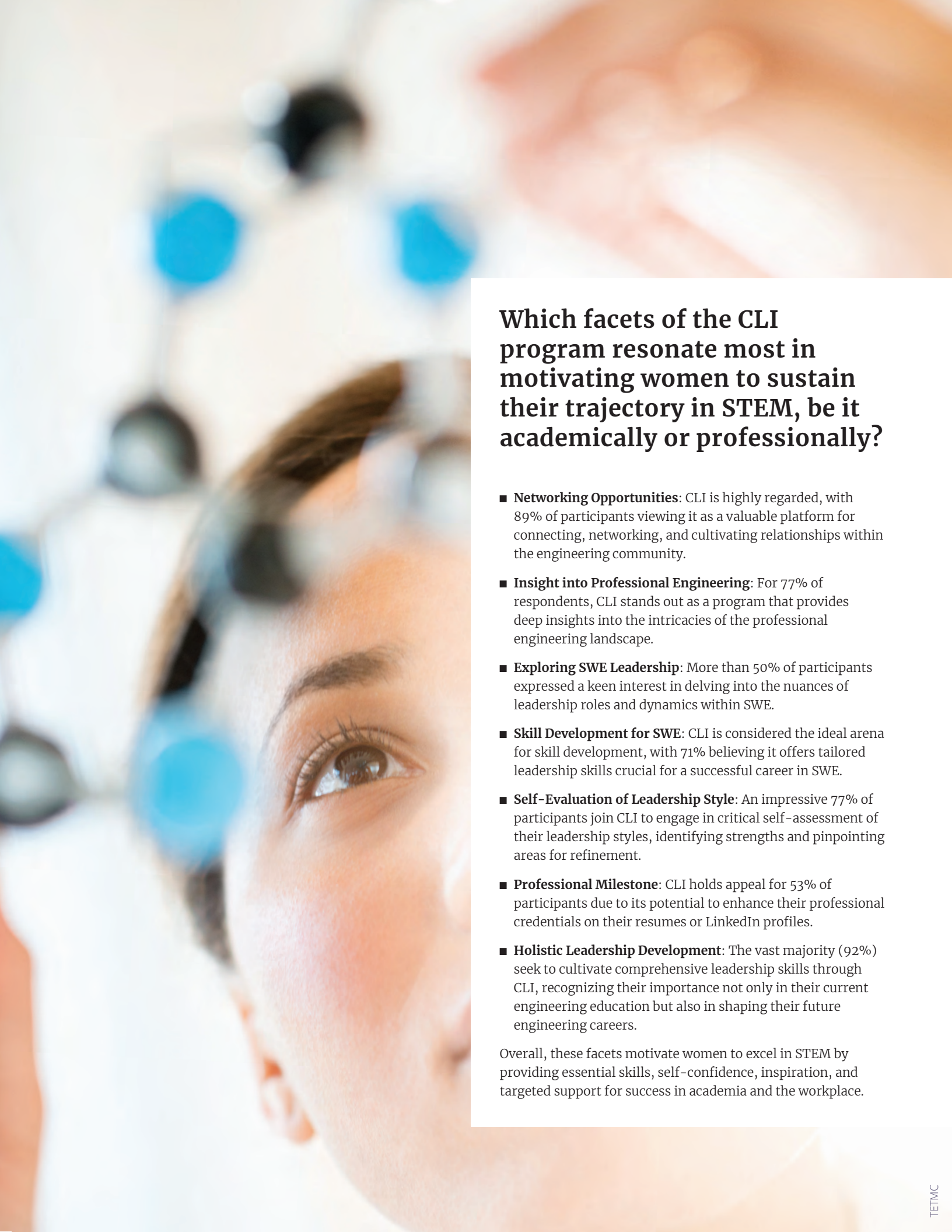
Additional Findings

Students from HSIs are more likely to be influenced by CLI (23%) compared to students from PWIs (8%).

A significant proportion of students from PWIs (41%) had already decided about pursuing STEM before enrolling in the CLI program.

A higher percentage of students from HSIs (39%) stated they were not influenced by CLI compared to PWIs (32%).





Which facets of the CLI program resonate most in motivating women to sustain their trajectory in STEM, be it academically or professionally?

- **Networking Opportunities:** CLI is highly regarded, with 89% of participants viewing it as a valuable platform for connecting, networking, and cultivating relationships within the engineering community.
- **Insight into Professional Engineering:** For 77% of respondents, CLI stands out as a program that provides deep insights into the intricacies of the professional engineering landscape.
- **Exploring SWE Leadership:** More than 50% of participants expressed a keen interest in delving into the nuances of leadership roles and dynamics within SWE.
- **Skill Development for SWE:** CLI is considered the ideal arena for skill development, with 71% believing it offers tailored leadership skills crucial for a successful career in SWE.
- **Self-Evaluation of Leadership Style:** An impressive 77% of participants join CLI to engage in critical self-assessment of their leadership styles, identifying strengths and pinpointing areas for refinement.
- **Professional Milestone:** CLI holds appeal for 53% of participants due to its potential to enhance their professional credentials on their resumes or LinkedIn profiles.
- **Holistic Leadership Development:** The vast majority (92%) seek to cultivate comprehensive leadership skills through CLI, recognizing their importance not only in their current engineering education but also in shaping their future engineering careers.

Overall, these facets motivate women to excel in STEM by providing essential skills, self-confidence, inspiration, and targeted support for success in academia and the workplace.

DISCUSSION

The CLI program's impact on participants' aspirations in STEM graduate studies, particularly for women of color, is nuanced and encouraging. Its multifaceted approach, including exposure to STEM pathways, engagement with professionals, soft skills development, and a focus on self-advocacy and leadership, effectively empowers women of color historically marginalized in STEM. One key to CLI's success is its unique content, informed by participant feedback. This distinctive curriculum addresses often-overlooked topics, enhancing its appeal and relevance. It ensures participants receive a tailored educational experience.

The CLI Program's Impact on Aspirations in STEM Graduate Studies

- Nuanced and encouraging impact, especially for women of color.
- Multifaceted approach:
 - Exposure to STEM pathways.
 - Engagement with professionals.
 - Soft skills development.
 - Focus on self-advocacy and leadership.
- Effective in empowering historically marginalized women of color in STEM.

Distinctive Content Driven by Participant Feedback

- Unique curriculum maintains appeal and relevance.
- Addresses often-overlooked topics.
- Ensures a tailored educational experience.

Influence on Participants' Decisions to Pursue STEM Graduate Education

- CLI influences a notable proportion of participants, particularly women from HSIs.
- Acknowledgment of pre-existing plans and diverse career goals.
- Offers diverse perspectives on STEM graduate education.

Factors Shaping Participants' Decisions

- Career objectives.
- Confidence levels.
- External resources.
- CLI's role varies but enriches the overall perspective.

Ethnicity and Race Influence on Inclinations Toward STEM Graduate Studies

- Pre-existing plans often align with CLI's emphasis on growth.
- CLI empowers readiness for diverse pathways.

Empowerment Beyond Direct Inclinations Toward STEM Graduate Studies

- Comprehensive skills development and career exploration.
- Prepares participants to embrace various opportunities.

CLI's Contribution to Diversity, Equity, and Inclusion (DEI)

- Secure and inclusive space for all participants.
- DEI initiatives integrated into curriculum.
- Addresses unconscious bias, microaggressions, and intersectionality.
- Encourages allyship and positive change.

Inclusive Network and Community Building

- Alumni network fosters ongoing support and collaboration.
- Transcends cultural boundaries.
- Strengthens the sense of community.

CLI's Ongoing Impact and DEI Commitment

- Shaping participants' achievements.
- Reshaping STEM.
- Contributing to a more inclusive future.

CLI attracts a diverse cohort, fostering inclusivity and providing underrepresented women with STEM education and graduate study opportunities. These insights guide SWE and similar organizations in designing effective support programs for aspiring professionals, addressing unique needs, and promoting lasting impact in STEM journeys

LIMITATIONS

SWE faced challenges in recruiting and retaining women from HBCUs in the CLI program, including external factors that influenced the recruitment process and data collection procedures, potentially impacting the breadth and depth of insights obtained in the study.

- **Recruitment Challenges:** SWE faced difficulties recruiting and retaining women from HBCUs in the CLI program, highlighting the need for a proactive, customized strategy.
- **External Factors:** External influences, such as socioeconomic status, cultural norms, and family commitments, may have affected participation decisions.
- **Participant Interest:** More than 10% of accepted participants did not enroll, and no one from HBCUs enrolled, raising questions about motivations and barriers.
- **Program-Specific Factors:** The study did not deeply analyze program-specific elements, like content and delivery methods, that may have impacted participation decisions.
- **Limited Generalizability:** Findings may not apply to other programs or populations.
- **Lack of Longitudinal Insight:** The study didn't track participants over time, hindering understanding of long-term program effects.
- **Social Desirability Bias:** Self-reported data may be influenced by participants responding in socially desirable ways rather than truthfully.
- **Data Collection Methods:** The study relied heavily on quantitative data, potentially missing the full range of motivations and barriers.

ROMEROCORPAS FOTO



FUTURE RESEARCH

This study offers valuable insights into the CLI program's impact on STEM graduate ambitions and lays the groundwork for future research and program improvement, contributing to diversity, equity, and inclusion (DEI) in STEM education and fostering a sense of belonging.

- 1. Longitudinal Exploration:** Conducting a longitudinal analysis to track program participants' trajectories over time for a deeper understanding of sustained program influence on careers and education.
- 2. Intersectional Analysis:** Exploring the intersectionality of identities, such as race, gender, and socioeconomic backgrounds, to understand challenges specific subgroups face and tailor support accordingly.
- 3. Alumni Insights:** Gathering feedback from the CLI program alumni about their post-graduation experiences and contributions to the STEM workforce, offering guidance for program enhancement.
- 4. Adaptable Program Design:** Establishing a feedback loop involving participants, mentors, and stakeholders to continuously assess and adapt the CLI program to evolving needs.
- 5. Expand Qualitative Data Collection:** Additional opportunities to gather qualitative data through one-on-one interviews or additional focus group discussions could help inform the program's curriculum and recruitment strategies by providing more descriptive explanations of survey responses.





GORODENKOFF

RECOMMENDATIONS FOR PRACTICE

The study's insights offer practical ways to enhance the CLI program and promote diversity, equity, and inclusion (DEI) for women of color in STEM education. Implementing these insights, including future research directions and adaptable program design, can create a more empowering learning environment for women of color in STEM. Recommendations stress the importance of ongoing assessment and improvement to align with participants' evolving needs.

These efforts aim to contribute to a diverse and equitable STEM landscape for the benefit of society. In practical terms, several approaches can optimize the CLI program's impact and strengthen DEI initiatives:

- 1. Customized Support Structures:** Tailor resources and support mechanisms to address the unique challenges and aspirations of women of color in STEM.
- 2. Sustained Alumni Engagement:** Foster ongoing engagement with the CLI program alumni through networking events, webinars, and mentorship opportunities to involve them in program enhancement.
- 3. Strategic Collaborative Endeavors:** Strengthen collaborations with diversity-focused organizations, educational institutions, and industry partners to expand the program's reach and support network.
- 4. Long-Term Outcome Assessment:** Establish mechanisms to assess the lasting impact of the CLI program on participants' careers, leadership roles, and contributions to STEM fields.
- 5. Intersectional Considerations:** Develop program components that acknowledge and address intersectional identities and their associated challenges, creating a more inclusive and tailored program experience.

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