COMMUNITY COLLEGE S-STEM NETWORK

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S-STEM STRATEGY BRIEF

CCSN Mission:

The Community College S-STEM Network (CCSN) connects and supports researchers and practitioners in conducting and translating research on how students navigate STEM pathways into evidence-based practices, programs, and policies.

Evaluating S-STEM Through Student Eyes: What Students Think, Value and Engage With

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"This STEM group…it's really opened up opportunities to me that could stick with me for a lifetime" - Process

Introduction

Community colleges have always played a critical role in expanding access to higher education, so it should come as no surprise that their role has included extending access to STEM education for their very diverse student populations. Through a combination of initiatives such as the Community College Presidents' Initiative in STEM Education (CCPI-STEM) and the Community College Innovation Challenge (CCIC), community colleges have found support through partnerships and grants funded by the National Science Foundation. One particular program, the National Science Foundation's Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM), combines need-based scholarships with evidence-based academic and co-curricular programming to address outcomes to include student persistence, transfer, degree completion, and career readiness.[1]

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[1] National Science Foundation. (2024). *NSF scholarships in science, technology, engineering, and mathematics (S-STEM) program solicitation (NSF 24-511).* https://www.nsf.gov/funding/opportunities/s-stem-nsf-scholarships-science-technology-engineering-mathematics/nsf24-511/solicitation

Research increasingly suggests that the effectiveness of S-STEM programs extends beyond the financial assistance they provide, often speaking of their support components. These supports may include mentoring, professional development, and other opportunities that encourage the development of a STEM identity and sense of belonging.[2] In recent studies, researchers have found that the high-impact programming embedded into S-STEM programs has reinforced the importance of pairing financial support with intentional student development strategies, as these factors contribute to increased persistence, stronger sense of community, and greater engagement at the community college level.[3,4,5]

While a growing body of research has well documented the outcomes of S-STEM programs, there has been less attention paid to how students have experienced these programs and the components they perceive as most influential to their success. This practitioner brief aims to share insights from interviews with eight students participating in S-STEM programs at community colleges across the United States. It centers the student perspective to explore why students joined S-STEM, how they describe the program, and which experiences they believe contributed most to their academic, professional, and personal development. Drawing from these experiences, we present practical recommendations and reflection prompts that institutions can use to strengthen their current and future S-STEM initiatives.

About the Participants

The insights presented in this brief are drawn from interviews with students participating in S-STEM programs at community colleges across the United States. Participants' ages ranged from 18 to 24 years old; all were enrolled full-time and were enrolled in various STEM fields, including biological science, environmental science, statistics, computer science, engineering technology, and biology. Three of the eight participants reported working part-time to assist with familial responsibilities and outstanding educational expenses. Participants were recruited via email distribution in collaboration with community college faculty who held NSF grants related to S-

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[2] American Association for the Advancement of Science. (2023). *STEM students and their sense of belonging: S-STEM programs' practices and empirically based recommendations*. National Science Foundation. https://sstemrec.aaas.org/wp-content/uploads/2023/12/S-STEM-REC_Report_Final.pdf

[3] Meza, E., Espino, M., & Bragg, D. (2025). Retention of academically talented STEM scholarship recipients in community college. *Journal of Higher Education Theory and Practice, 25*(2), 160–176. https://doi.org/10.33423/jhetp.v25i2.7674

[4] American Association for the Advancement of Science. (2023). *STEM students and their sense of belonging.*

[5] Davis, E., Taylor, J., Clinton, T., Olivar, S. M., Peters, K., Rodgers, M., and Neering K. (2025). *Bridging potential and opportunity: The experiences of NSF S-STEM scholars*. NSF S-STEM Research and Evaluation Center. https://sstemrec.aaas.org/wp-content/uploads/2025/05/NSF_S-STEM_REC_Y3_Outcomes_Impact_Report_Final.pdf

STEM programs. Given the small qualitative sample, these findings intend to highlight students' experiences rather than represent the experiences of all community college S-STEM scholar

More Than Just a Scholarship

A common assumption one might make is that students apply to S-STEM programs primarily because of the scholarship component. While financial support was an important factor for many participants, student interviews revealed a more complex set of motivations. Students frequently described interest in the S-STEM program due to financial stability, academic support, mentorship, professional development opportunities, and exposure to future STEM careers and educational pathways.

For many participants, the scholarship funding was the initial attracting factor. They frequently discussed the challenges of balancing paying for their education while also pursuing demanding STEM coursework. Some students expressed that the scholarship helped to alleviate financial stressors their families were experiencing, which allowed them to pursue their studies with less guilt or worry. They also described the scholarship as opening doors toward networking opportunities and resources they might not otherwise access.

One recruitment mechanism that emerged was the role of program faculty and advisors. Several participants spoke of their faculty or advisors introducing them to the S-STEM program and encouraging them to apply despite their doubts or concerns. Students said the encouragement reinforced confidence in their potential to perform well and to belong in STEM. For some participants, this validation was almost as influential in their decision to apply for S-STEM as the scholarship itself.

Students were also attracted to the opportunities that the S-STEM program offered them outside of the classroom. These opportunities included mentorship, research experience, attending conferences, professional networking, leadership training, and transfer preparation. Many of the participants believed these experiences would strengthen their academic and professional resumes while also expanding their understanding of the various STEM pathways and careers available to them. Students frequently discussed a strong desire to connect with STEM professionals, learn about career options, and develop skills that would allow them to be successful in industry.

What S-STEM Means to Students

After describing why they initially applied, participants consistently described S-STEM as a source of mentorship, community, guidance, and opportunity. Across interviews, participants viewed S-STEM as a mechanism to help them navigate college, build confidence, connect with peers and mentors, explore career pathways, and prepare for transfer and/or future careers.

A Structured Support System

Many students viewed the program as a structured support system designed to help them succeed in STEM. Participants regularly emphasized the guidance and support they received from faculty mentors, program staff, and advisors who helped them navigate academic challenges, identify professional and academic opportunities, and remain focused on long-term goals. One student described S-STEM as a program that helps students remain enrolled and succeed academically through encouragement and support, while another spoke of the developmental nature of the program, describing it as a place where students can build the skills necessary for future academic and professional success.

Students listed support, accountability, and guidance as key program factors they might highlight to peers and prospective participants. Interestingly, these were mentioned more often than scholarship funding. Several participants saw the program as a network of people and resources that helped them overcome obstacles and stay on track.

A Community of Belonging

Community emerged as a consistent topic across interviews. Participants frequently referenced relationships with faculty, mentors, advisors, and fellow scholars as a key component of their experience. One student said they were drawn to S-STEM “to create a community of peers,” while another shared how participation helped them develop a sense of belonging within the STEM community. Students repeatedly highlighted people rather than program structures.

Students also described S-STEM as creating a space where they could connect with other students who understood the challenges of STEM coursework and shared similar goals. For several students, the community that developed around S-STEM helped to reduce feelings of isolation; this was especially true for the female students. Most of the language students used to describe the purpose of S-STEM centered on support, encouragement, and guidance.

A Gateway of Opportunities

S-STEM was also frequently described as creating access to opportunities that students might have found difficult to discover or that would otherwise be unavailable to them. Students cited a variety of such opportunities, including chances to conduct undergraduate research and to participate in professional development activities such as networking, industry conferences, internships, and projects.

Several students viewed the program as a way to introduce students to graduate education, professional pathways, and research experiences they might not have previously considered. Students often connected opportunity access to future planning. Students emphasized the program as being extremely helpful in helping them identify future educational and career opportunities, providing access to professional experiences, networking, and preparing for a career in STEM. Their responses suggest that students saw S-STEM as a gateway to experiences that expand academic and professional possibilities.

Building Effective S-STEM Programs: Lessons from Students

S-STEM programs generally are associated with semester-based financial assistance for students at postsecondary institutions. Along with financial assistance, students are required to participate in a cohort-based experience where students engage in group check-ins, professional development, and community-based bonding activities. Across the eight students interviewed from S-STEM programs at associate-degree-granting institutions across the country, there were key programmatic features that students identified as beneficial. In this section, we present lessons from students along with prompts for reflection on your institution's practices.

Build Intentional Cohort Communities

Students highlighted the benefits of participating in an S-STEM cohort by emphasizing how much they valued engaging with a community of like-minded peers. Through frequent cohort-based activities (e.g., weekly/monthly discussion meetings, community-building socials, wellness check-ins, peer mentoring), they developed closer relationships and recognized that they were all working toward similar goals. This shared experience helped students build confidence in areas they hoped to improve. For example, one student explained that the

S-STEM community reassured him that he was not the only one working on presentation skills or navigating impostor syndrome.

Examples of practice:

- Beginning-of-semester retreats or welcome events
- Monthly STEM lunches or social gatherings
- Peer-led study groups
- Wellness check-ins
- Community service projects
- Peer mentoring activities

Reflection for practice.

Think about how your current (or future) S-STEM program intentionally creates opportunities for students to build meaningful relationships with one another beyond required meetings. **How do students connect with peers around shared challenges, celebrate successes, and support one another throughout the academic year? If students were asked about their cohort, would they describe it as a scholarship group or as a community?** Engaging students in small, recurring opportunities for informal interaction can often be just as valuable as formal programming. At the same time, consider how cohort experiences may be experienced by students balancing employment, caregiving, commuting, or other responsibilities. **How might your program create multiple opportunities for students to participate in and benefit from the cohort community?**

Create Structured Opportunities for Ongoing Engagement

Each program varied in the frequency of its regular meetings, with some programs meeting once a week while others met once a month. These regular meetings provided the opportunity for the cohorts to check in on one another's well-being and progress toward their degree as well as to build a community that continues to learn from each other. Students underscored the importance of these regular meetings maintaining a focus on both academic and non-academic topics and highlighted the following topics as being particularly beneficial to their success as a scholar: transfer pathways, career opportunities, research opportunities, effective study habits, ensuring well-being, and impostor syndrome. Through these meetings, students gained a greater breadth of understanding of pathways for their future—especially in regard to potential career options.

Examples of practice:

- Monthly professional development seminars
- Transfer, career, and alumni panels
- Workshops on how to conduct undergraduate research
- Workshops on a successful work-life balance

Reflection for practice.

Review previous topics covered (or future topics you plan on covering) during cohort meetings over the course of a semester. **Does the list of topics balance academic development with personal and professional development?** Consider asking students what topics they would find most valuable and inviting them to help shape future sessions. Student-led discussions on topics such as transferring, internships, or managing work-life balance can increase engagement and relevance. Programs might also consider offering varied formats, times, or levels of participation so that students with additional responsibilities can remain engaged.

Invest in Multi-Level Mentoring

Students identified the guidance they received from faculty mentors involved in the S-STEM program as being instrumental in their success. Mentors supported students by connecting them with research opportunities, consulting with other instructors to identify points of improvement for students, and providing information on future career paths and transfer opportunities. S-STEM faculty mentors modeled effective guidance and support, which second-year students reflected in their peer mentoring program with first-year S-STEM students. The peer mentoring programs within S-STEM allowed both first- and second-year students the opportunity to learn from each other's experiences and build greater community across cohorts.

Examples of practice:

- Intentional peer-to-peer mentoring program
- Alumni mentorship opportunities
- Industry mentorship partnerships

Reflection for practice.

Reflect on the needs of students currently enrolled in the program. **How do the needs of first-year students vary from second-year students?** Consider how your program can intentionally connect students with faculty, staff, alumni, industry professionals, and experienced peers. **How can you create structured opportunities for second-year students or recent graduates to mentor newer scholars as a way to strengthen both leadership development and community?**

Challenge Students Through High Expectations

Students described their S-STEM programs as having high expectations, recognizing the following requirements as key to upholding those expectations: being actively involved in the S-STEM program as well as the broader campus community and participating in research either during the summer or the academic year. Due to these expectations, students felt like their S-STEM program pushed them to excel. Students were involved in numerous campus activities, were members of honors societies, held leadership positions, and engaged in undergraduate research opportunities—all things they did not necessarily consider prior to joining the program.

Examples of practice:

- Leadership development requirements
- Community engagement activities
- Campus engagement involvement

Reflection for practice.

Think about the expectations your program has for your students. **How do your program expectations encourage students to grow outside of the classroom? How are those expectations communicated to students?** Consider developing expectations collaboratively with students so that responsibilities, opportunities, and available resources are clear.

Provide Experiences Beyond the Classroom

Many S-STEM programs had connections with companies, other associate-degree-granting institutions, or bachelor's-degree-granting institutions to help expand students' networks. Students referenced opportunities through their S-STEM program that involved taking excursions to tour biotech companies, meeting with faculty members at bachelor's-degree-granting institutions, and participating in weeklong research experiences. Additionally, students engaged in multiple conferences across the country (including the S-STEM PI Meeting) to

propagate findings from their research experiences and network with other associate-degree-granting students from across the country.

Examples of practice:

- Dedicated undergraduate research experiences with partnering four-year institutions
- Additional opportunities for hands-on experience through internships, co-ops, or job shadowing
- Mentorship program with STEM students enrolled in four-year institutions

Reflection for practice.

Consider opportunities for expanding students' networks. **Who could you develop partnerships with in the local community to create experiences beyond the classroom?** Brainstorm partnerships with local educational institutions, research institutions, or companies that could support students' professional development and career growth.

Conclusion

Our findings suggest that students did not view S-STEM as merely a scholarship program. Rather, they understood participation as an opportunity to gain access to relationships, resources, and experiences that could support their development as STEM students and future professionals. While financial assistance often prompted initial interest, students frequently described mentorship, community, and professional opportunities as equally valuable aspects of the program. This finding is particularly noteworthy because institutions participating in the S-STEM program are not required to provide programming beyond financial support. Yet, students who received varying levels of scholarship funding reported similar benefits from the programmatic experiences that were offered. By identifying the program components students perceived as most beneficial, this brief provides insights that can inform the design and implementation of future S-STEM initiatives.

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