COMMUNITY COLLEGE S-STEM NETWORK

MAY 2026

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.

Building Connections in a Community: The role of an Open, Faculty-Staffed Study Hall in S-STEM Scholar Persistence

Jan Edwards, College of Lake County

Introduction

This strategy brief explores student perceptions of belonging and identity relative to the supports provided through the S-STEM program at the College of Lake County (CLC). Located just north of Chicago, CLC secured a Track 2 NSF S-STEM grant in the fall of 2019. The award focus was on building community in order to increase persistence and transfer rates. The scholars were selected from academically talented, low-income students pursuing engineering (AES) and computer science (AS) associate degrees with the intent to transfer and complete a bachelor's degree. CLC is a large two-year comprehensive community college serving over 35,000 community members and 22,299 students with a full-time equivalent (FTE) of 8,686 in FY24. The ethnic diversity of the college's credit-seeking student population (40% Latinx, 38% White, 8% Black, 8% Asian, and 7% other) is echoed within the engineering and computer science transfer programs.

Major Strategies in the S-STEM Grant

- Deliver academic support in the form of intentional advising and an open study hall with faculty tutoring

- Assign a faculty member from the grant leadership team to each scholar who will advise and mentor with the goal of successful transfer
- Begin each semester with a social event to welcome students into the rolling cohort model
- Partner with the area universities to provide transfer seminars
- Encourage enrollment in an Introduction to Engineering course to explore a range of engineering disciplines and careers
- Employ a program navigator to assist in finding support systems beyond academic needs
- Provide financial aid, up to $4,000 per semester

With community building at the core of the S-STEM program, it was important for scholars to have a gathering place at the commuter campus (Dorsey et al. 2017). Fortunately, the engineering department was finalizing their new makerspace as the 2019 grant proposal was being written. It was designed not only to support coursework but also to be an informal gathering space for individual students and study groups between classes. This enabled the S-STEM program to expand the study hall model to include two physical spaces, both a more traditional classroom as well as a technology-infused makerspace. This additional space allowed the team to invite both the scholars and any other students pursuing an engineering or computer science degree to attend study hall.

The Strategy: Holding an Open Study Hall in the Engineering Makerspace

One of the primary goals of the grant was to increase persistence, graduation, and transfer rates among our population of scholars. When activities for community building were conceived for this grant, they centered on the engineering makerspace. Emerging literature at that time suggested that makerspaces could enhance the undergraduate experience by exposing the students to design and prototyping experiences (Wilczynski & Cooke, 2017; Han et al., 2017). It was thought that experiences tinkering in the lab would increase student motivation and persistence (Mamaril et al., 2016). The planning team hoped that using the engineering makerspace for weekly study halls would encourage students to return to it on their own time to tinker. In addition, a small technology workshop would be included each semester to support cohort connection as well as to expand scholars' skillsets.

The design and format of the weekly study hall was devised to provide flexibility to our scholars while providing academic support and a weekly touchpoint. Bringing faculty together from a variety of technical disciplines: chemistry, math, physics, computer science, and engineering, enabled students to get support for most of their courses in one place. The study hall was designed with several key features in mind. First, a more flexible approach to support: The intentional framing of the support as a study hall rather than tutoring would allow students to work independently or with friends and only reach out to the faculty within the room as needed. Second, widespread availability: The study hall was open for three hours each afternoon, and scholars were encouraged to attend for two hours a week. These hours took advantage of less-technical courses being offered on Tuesday and Thursday afternoons, increasing the possibility that scholars could build this time slot into their academic schedule. Third, ease of access: The study hall was a drop-in format, unlike other campus tutoring and advising services that required appointments.

The makerspace location had several advantages over a traditional classroom. Students had access to the space outside of the study hall hours. This often resulted in students using this location as their home base throughout the week. In addition, the makerspace was student-run, which seemed to enhance the comfort level and sense of camaraderie scholars felt in the room. Scholars' engagement with student interns in the study hall also promoted awareness of the engineering student internship role in the lab, an opportunity that several scholars successfully leveraged. Each semester, the makerspace hosted one social activity in the form of a technology workshop. There was limited participation, however, even when scholars were already in the space. They commented that they preferred to use that focused time for their academic efforts.

Evaluation/Data on the Selected Strategy and Grant

On average, 17 S-STEM scholars were active in any given semester after the first year of the program. Of these, roughly 85 percent actively engaged with the study hall programming. Those who did not engage in the study hall typically fell into one of two categories: students who were academically successful and chose to use that time to pursue additional income—some even working as student tutors—or students who were struggling academically and often personally.

The program navigator would work with these students to identify and overcome obstacles; however, they were still the most likely to change majors or leave college.

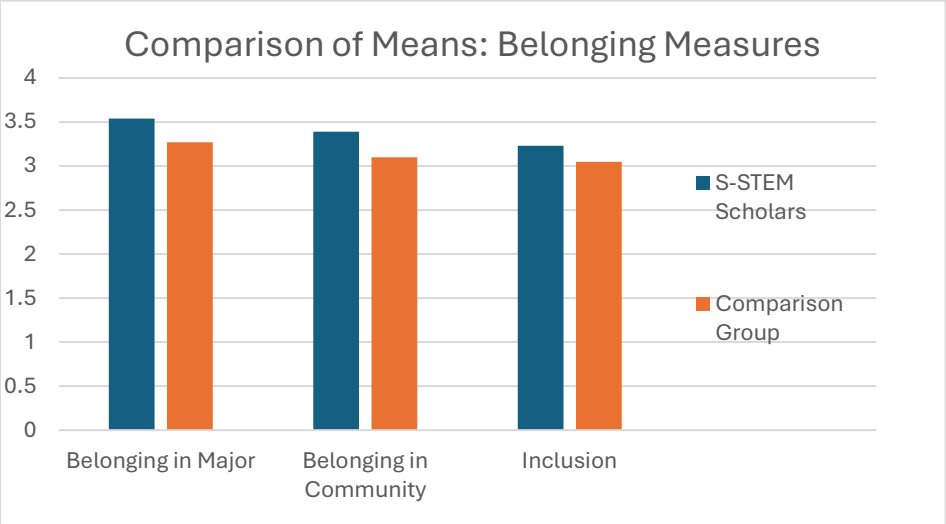
Table 1 summarizes the differences in academic outcomes, where the comparison group also consisted of full-time students pursuing engineering and computer science degrees who are in college algebra or a higher-level math course. As a result of the combined grant strategies, S-STEM scholars consistently outpaced their peers in academic achievement. While scholars are required to maintain a GPA of 2.5, the majority of our scholars excel beyond that benchmark to ensure a competitive transfer application.

Table 1. Comparison of Academic Outcomes from 2020 to 2025

	S-STEM Scholars (n = 74)	Comparison Group (n = 782)
Graduated with AS or AES	47%	30%
Transferred with intent to complete BS or BA	70%	32%
Mean GPA	3.20	2.77
Mean cumulative credits	65	48

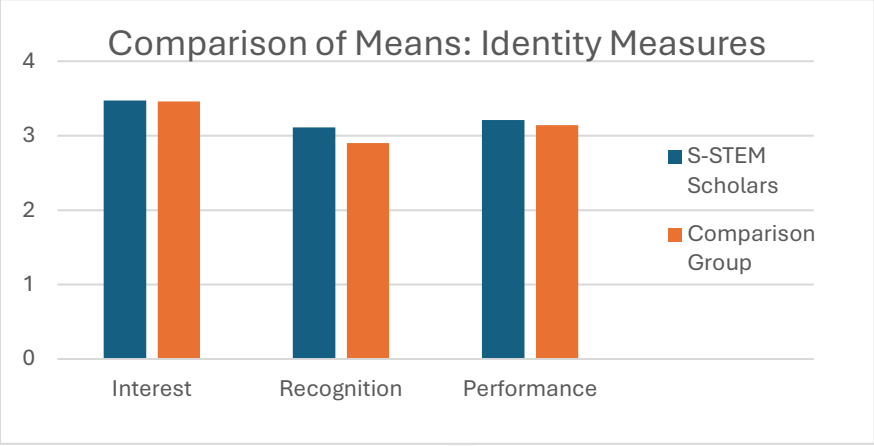
In addition to the academic data, surveys were sent twice a year to all of the students enrolled in the engineering and computer science programs to measure belonging and engineering identity. The S-STEM scholars self-reported statistically significantly higher values ($p < 0.001$) for all three belonging measures: belonging in major, belonging in community, and inclusion (Edwards & Mazilu, 2025). The graph in Figure 1 displays four years of data collection on these three measures, where the numbers represent the calculated means of responses based on a Likert scale from 1 = strongly disagree to 4 = strongly agree

Figure 1. An increase in belonging measures observed for the S-STEM Scholars.



From 2022 to 2024, the data collection also included self-reported engineering identity measures—interest, recognition, and performance—using the same Likert scale (Godwin, 2016). As shown in Figure 2, the calculated means were observed to be higher on all three measures for the S-STEM scholars, with a statistically significantly higher mean only for recognition (Edwards & Mazilu, 2025). The two statements within the recognition construct that were individually statistically significant, included "My instructors see me as an engineer" and "Others ask me for help with engineering." The higher means among S-STEM scholars on both the recognition and belonging measures could be attributed at least in part to time spent actively working with faculty and other S-STEM students in the study hall.

Figure 2. An increase in engineering identity measures observed for the S-STEM scholars.



Responses to annual interview questions conducted via phone or Zoom by our external consultant provided further evidence regarding the impact of the study hall. When asked about ways that the program made S-STEM scholars feel more supported by faculty and peers, references to the study hall were common. The following exchange was observed in a focus group:

> *Participant 1: Definitely the tutoring (in study hall), just knowing that there we could get extra help for any classes was reassuring.*
>
> *Participant 5: Yeah, I agree with [Participant 1]. The tutoring was very nice, and working with professors. One-on-one really helped. I've started to do more relationships with other students. So that was pretty nice.*
>
> *Participant 1: It definitely encourages cooperation and homework, just working together.*
>
> *Participant 3: Personally, it's the sense of community I feel with all the other fellow scholars. We all have something in common that we're trying to strive for. And the scholarship is just like the cherry on top that allows us to be able to work together and pass our classes.*

In addition to the academic support being provided by professors, the students appreciated the informal mentoring that occurred during study hall, as demonstrated by the following comment:

> *Not only have these professors helped me academically, but I tend to go to them for a lot of like advice, on, well, I guess (it) is also academic, but it's not only chemistry, only physics, only math, but like on advice on if I'm taking the right courses, if I'm making the right decision on my career and what I can do differently, or how I can excel in my field.*

Overall, the study hall was mentioned second only to financial support as the aspect of the S-STEM program that had the most significant impact.

Lessons Learned

First, students responded more favorably to the idea of a study hall as opposed to tutoring. They didn't want the perception of academic need to be tied to financial need. Many of our students perceived the suggestion of tutoring as a judgment on their ability to succeed. This might be attributed to the stigma of choosing a community college over a university or historical deficit narratives that high schools in lower-income areas underprepare their students. In addition, some scholars wanted the option of working quietly without the expectation of social interaction. However, once the scholars started to attend the study hall, many of them referred to the advantages of having faculty tutors available.

Second, the relationships that developed with faculty had an impact on the scholars' sense of belonging and identity. Time spent in the study hall with faculty created a sense of familiarity, enabling conversations to flow organically from coursework to transfer plans to possible internships to plans for the weekend. Consequently, students felt more confident and empowered to seek letters of recommendation for transfer applications, internships, and additional scholarship opportunities.

Third, the other students in the cohort were as important to persistence as the faculty support. It was common to see scholars not only working on common coursework together in study hall but also offering advice to other scholars on courses they had previously completed. Talking with their peers normalized the challenges within the curriculum and strengthened the resolve to succeed together. This sense of community even extended beyond their time at the community college. Past scholars frequently served as guest speakers in the Introduction to Engineering course to discuss the transfer process and then, later, their transition from university to the workplace.

Reflections on this work resulted in another successful proposal awarded in the fall of 2025. Leveraging lessons learned during the previous grant, more intentional onboarding with a bridge program as well as additional transfer and career support will be added.

Acknowledgements

The author would like to thank Shyam Kurup, Miguel Mireles and Ana Pizano at the College of Lake County for their support of students and this work. I also thank Monica Reid Kerrigan and Elizabeth Meza for their review, Angel Butts for editing assistance, and Melissa Quaal and Sam Scovill for designing and formatting this strategy brief.

The S-STEM award that this brief is based on - 1929983 Building an Academic Community of Engineering Scholars to Increase Persistence and Transfer into Four-year Engineering and Computer Science Degree Programs

This material is based upon work that is supported by the National Science Foundation under Grant Nos. DUE 1929983, DUE 2224623, and DUE 2224671. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation (NSF).

References

Dorsey, J. B., & Apple Meza, E., & Harvey-Buschel, P. G. (2017, June). *Meeting the Need for Diversity in STEM Fields* [Paper presentation]. ASEE Annual Conference & Exposition, Columbus, Ohio. https://doi.org/10.18260/1-2—28662

Edwards, J., & Mazilu, A. (2025, June). *Examining an NSF S-STEM Community College program through an Identity Lens* [Paper presentation]. ASEE Annual Conference & Exposition, Montreal, Quebec, Canada. https://doi.org/10.18260/1-2—56464

Godwin, A. (2016, June). *The Development of a Measure of Engineering Identity* [Paper presentation]. ASEE Annual Conference & Exposition, New Orleans, Louisiana. https://doi.org/10.18260/p.26122

Han, S. Y., Yoo, J., Zo, H., & Ciganek, A. P. (2017). Understanding makerspace continuance: A self-determination perspective. *Telematics and Informatics*, *34*(4), 184–195. https://doi.org/10.1016/j.tele.2017.02.003

Mamaril, N. A., Usher, E. L., Li, C. R., Economy, D. R., & Kennedy, M. S. (2016). Measuring undergraduate students' engineering self-efficacy: A validation study. *Journal of Engineering Education*, *105*(2), 366–395. https://doi.org/10.1002/jee.20121

Wilczynski, V., & Cooke, M. N. (2017, June). *Identifying and Sharing Best Practices in International Higher Education Makerspaces* [Paper presentation]. ASEE Annual Conference & Exposition, Columbus, Ohio. https://doi.org/10.18260/1-2--29284

This material is based upon work that is supported by the National Science Foundation under Grant Nos. DUE 2224623 and DUE 2224671. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.