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.

Developing a Transfer-Centered Framework for S-STEM Scholar Success

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Introduction

This strategy brief examines the challenges community college STEM students face during the transfer process in Washington State and the lessons we learned while developing an S-STEM program designed to support successful STEM transfer pathways. Although Washington State's transfer system is widely regarded as one of the strongest in the nation in terms of policy and design,[1] outcomes for community college transfer students reveal a more complicated picture. Washington has a lower percentage of community college students who successfully transfer to four-year institutions compared to the national average; however, once students do transfer, they complete bachelor's degrees at rates above the national average.[2]

[1] Washington Student Achievement Council (WSAC). (2025). *Beyond transfer degrees: Opportunities for future learning*. https://wsac.wa.gov/sites/default/files/2025-Beyond.Transfer.Degrees.pdf

[2] Velasco, T., Fink, J., Bedoya, M., Jenkins, D., & LaViolet, T. (2024). *Tracking transfer: Community college effectiveness in broadening bachelor's degree attainment.* Community College Research Center. https://ccrc.tc.columbia.edu/publications/tracking-transfer-community-college-and-four-year-institutional-effectiveness-in-broadening-bachelors-degree-attainment.html

As we developed support programs for our S-STEM scholars, we gained a deeper understanding of the complex challenges students face throughout the transfer process. The need for stronger transfer support emerged repeatedly in student feedback, and we became increasingly aware of barriers embedded both within our own institution and among four-year university partners. Over time, our S-STEM program recognized the importance of a comprehensive framework to support community college scholars in achieving their goal of completing bachelor's degrees in STEM fields. As a result, our program evolved to intentionally center transfer through transfer-focused programming, advising, mentoring, and faculty engagement.

Community College STEM Transfer in Washington State

Transferring from a community college to a four-year institution is often more complicated than it initially appears. In Washington State, community college transfer is guided by a statewide policy called the Direct Transfer Agreement (DTA). At first glance, the process seems straightforward for both students and institutions. The articulation agreement allows students who complete the Associate in Arts Direct Transfer Agreement degree (AA-DTA) at any of Washington's 34 public community or technical colleges to transfer approximately 90 quarter credits, or the equivalent of junior standing, to any public baccalaureate institution in the state.[3] The degree is designed so that transfer students complete all or most lower-division general education requirements before entering a four-year institution.[4]

For STEM students, there is a more specialized transfer pathway called the Associate of Science Transfer degree (AS-T), which includes additional pre-major math and science coursework. In addition, Major Related Program (MRP) transfer degrees *also* allow students to focus more specifically on particular majors. STEM examples include the Biology DTA/MRP, Computer Science DTA/MRP, and Engineering AS-T/MRP pathways.[5]

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[3] Washington Student Achievement Council (WSAC). (2026a). *Direct transfer agreement (DTA) associate degree guidelines 2026*. https://wsac.wa.gov/sites/default/files/DTA-AssociateDegreeGuidelines.pdf

[4] Ibid.

[5] Ibid.

What We Discovered About STEM Transfer in Washington State

On paper, through institutional messaging, or during a quick online search, these pathways appear streamlined and easy to navigate. In practice, however, transfer pathways are far more complex and nuanced. Students frequently encounter barriers both within their own institutions and at receiving colleges and universities, including limited transparency, misaligned requirements, and hidden expectations that make the process difficult to navigate. As new principal investigators of an S-STEM program, we did not initially understand the full extent of these challenges, in part because we assumed the transfer system functioned as designed.

Community college students face numerous decisions regarding transfer pathways, each of which can significantly affect their future academic opportunities. Decisions about STEM majors and transfer institutions often need to be made early in a student's academic journey, yet many students are unaware of available transfer resources. Community colleges frequently lack the advising capacity needed to provide comprehensive transfer guidance and STEM career exploration support.[6,7]

Most scholars in our S-STEM program entered college with goals centered on a specific STEM major or career path, such as biology, engineering, or scientific research, but many struggled to identify the most effective pathway to achieve those goals. Students often had difficulty understanding how pre-major coursework at the community college connected to STEM bachelor's programs and long-term career aspirations.

Hidden barriers within institutions and the transfer process

For many students, transfer can feel like a "DIY" process.[8,9] The feeling of being "on your own" and the lack of access to clear information can contribute to confusion and frustration about

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[6] Fay, M. P. (2022). *Community college STEM pathways* [Policy sheet]. Columbia University, Teachers College, Community College Research Center. https://ccrc.tc.columbia.edu/publications/community-college-stem-pathways.html

[7] Center for Community College Student Engagement. (2023). *Helping students climb the transfer ladder.* https://www.cccse.org/transfer

[8] Wang, X. (2021). *On my own: The challenge and promise of building equitable STEM transfer pathways*. Harvard Education Press.

[9] Blake, J. (2023). College transfer process is 'DIY' for many students. *Inside Higher Ed*. https://www.insidehighered.com/news/students/transfers/2023/college-transfer-process-diy-many-students

every step.[10] Despite the importance of well-informed, early decision-making, students often lack access to transfer information or the guidance needed to successfully navigate requirements.[11]

When we launched the S-STEM program at our college, we discovered that many of our STEM students were unaware of university transfer requirements, and that our college lacked a central location, physical or virtual, where students could go to find transfer information. Beyond the absence of sufficient resources, we found that many of our existing resources were outdated, confusing to use, or contradictory.

As we began advising and mentoring our S-STEM scholars, we saw that transfer degree pathways were often poorly aligned with STEM bachelor's programs at four-year institutions. As faculty, we were surprised to learn that STEM bachelor's programs frequently required specialized pre-major coursework that was neither available at our college nor explicitly called out in transfer degree requirements. We were also surprised to discover that successful transfer did not guarantee entry into high-demand STEM majors.

When transfer degree pathways are misaligned with bachelor's programs, community college students may need to complete additional pre-major coursework after transfer or experience delayed entry into their intended major programs. This misalignment carries real financial costs. Students may not be admitted to their chosen program and must take extra courses to satisfy similar requirements at different institutions. Because financial aid structures do not cover these additional preparation courses, students often bear that burden out of pocket—a significant obstacle to timely degree completion.

Building a Transfer-Centered Community College S-STEM Program

Our S-STEM program gradually evolved to place far greater emphasis on transfer-focused advising and programming than we had originally anticipated. We found a substantial gap between general advising—supporting students in choosing degree pathways, registering for courses, and accessing college support programs—and advising specific to the transfer process.

[10] Wang,X. (2021).
[11] Center for Community College Student Engagement. (2023).

Understanding the challenges and barriers within our own institution was a critical step toward developing a comprehensive support program with transfer success as a central goal.

Our program's support strategies align well with the community college literature on effective practices for transfer students. In particular, our activities fit within a transfer student capital framework.[12] A recent study by Cepeda et al.[13] highlights the importance of transfer students gaining accurate knowledge about the transfer process, building networks of social support and self-efficacy, and developing confidence in their ability to succeed.

Early and frequent transfer advising

Pre-transfer advising is a cornerstone of our S-STEM program. A recent study by Harper and Thiry[14] highlights the importance of high-quality transfer advising for students navigating STEM degree pathways, particularly for underrepresented students in community college STEM transfer programs. Access to accurate, high-quality transfer information and positive advising experiences most likely strengthen transfer student capital.[15,16]

Every scholar meets with their assigned program advisor during their first quarter to develop a personalized educational plan—a "roadmap" for tracking progress toward completing a STEM-focused associate degree.[17] Recently, our college has begun emphasizing longer-range plans for transfer-aspiring students that extend beyond the associate's degree through transfer and bachelor's attainment. These plans are flexible; quarterly check-ins by program advisors provide ongoing guidance, helping students stay on track and adjust course loads as needed. Faculty mentors are a key part of our advising and program support team. We have also invested in

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[12] Laanan, F. S., Starobin, S. S., & Eggleston, L. E. (2010). Adjustment of community college students at a four-year university: Role and relevance of transfer student capital for student retention. *Journal of College Student Retention: Research, Theory & Practice, 12*(2), pp.175–209.

[13] Cepeda, R., Buelow, M. T., Jaggars, S. S., & Rivera, M. D. (2021). "Like a freshman who didn't get a freshman orientation": How transfer student capital, social support, and self-efficacy intertwine in the transfer student experience. *Frontiers in Psychology, 12*, 767395. https://doi.org/10.3389/fpsyg.2021.76739, p. 3.

[14] Harper, R., & Thiry, H. (2023). Advising from community college to university: What it takes for underrepresented transfer students in STEM to succeed. *Community College Journal of Research and Practice, 47*(9), pp. 582–601.

[15] Cepeda et al., (2021).

[16] Harper & Thiry, (2023).

[17] Bailey, T. R., Jaggars, S., & Jenkins, P. D. (2015). *What we know about guided pathways.* Teachers College, Columbia University, Research Overview. http://ccrc.tc.columbia.edu/media/k2/attachments/What-We-Know-Guided-Pathways.pdf

updating our website and other transfer tools so that students can more easily navigate to relevant transfer information.

Transfer-centered programming

From the outset, our S-STEM program employed several approaches to support transfer, including monthly program meetings among the principal investigators, scholars, and the program coordinator; transfer workshops; university visits; and activities designed to explore STEM majors. Monthly programming is intended to provide the information students need to make transfer-related decisions and to build transfer student capital—broadly defined as the knowledge and skills students accumulate at the community college that drive successful transfer.[18] Scholars frequently commented on the value of program field trips and transfer workshops as they navigated the transfer process. Transfer-centered programming for S-STEM scholars included:

- A **Canvas community** (learning management system) designed for S-STEM scholars, providing transfer-related resources, STEM career information, links to universities, and information about undergraduate research programs and scholarships.
- **Quarterly workshops** covering transfer basics, best practices for writing transfer and scholarship essays, step-by-step guidance for transfer applications, and discussions about transfer requirements specific to particular institutions or STEM fields.
- **Program drop-in hours** offering space and guidance for transfer questions and application assistance.
- **Field trips to transfer universities** providing opportunities to learn about different STEM majors, connect with four-year transfer advisors, and explore program-specific transfer requirements.

Our program support network—composed of program advisors and faculty mentors—also ensured that scholars received timely assistance in the event of academic setbacks or challenges.

Mentoring and peer support

Scholars identified mentoring by faculty members as a catalyst for their success. Early on, we developed a community of practice among faculty and program support staff to share mentoring strategies, research, and best practices—as well as practical advising resources and

[18] Laanan et al., (2010)

updates on things like program requirements or admissions changes at local universities. Scholar feedback consistently highlighted faculty mentors as essential members of their support network, providing both guidance and emotional support throughout the college experience. Scholars specifically credited mentors with helping them navigate the transfer process and broadening their understanding of STEM majors and professions. Similarly, the peer social networks that developed within cohorts proved valuable; scholars in the program supported one another throughout the transfer application process.

Program Outcomes

Comprehensive transfer support and faculty mentoring emerged as key student success strategies within our S-STEM program. Program evaluation consistently emphasized the value of faculty mentoring and the STEM fellowship for navigating the transfer process and clarifying how pre-major coursework at the community college connected to STEM bachelor's programs and long-term career aspirations. More than 65 percent of scholars in our S-STEM program completed STEM-focused transfer degrees and/or successfully transferred to a four-year university. The strong program degree completion and transfer rates illustrate what is possible when transfer advising and programming are integrated into the framework of the S-STEM program.

Next Steps

As we reflect on the first six years of our S-STEM program, we recognize that there is more we can do to improve the transfer process at our college and within the program itself. Building stronger transfer pathways requires engagement across the college and shifting toward transfer-centered processes. As faculty leaders, we are well-positioned to drive the changes needed to improve both the transfer process and transfer outcomes for our students. Lessons learned from our S-STEM program have led to a deeper awareness of student experiences in STEM degree pathways and contributed to a growing momentum to improve transfer support. To advance sustainable change within STEM departments, we have developed a series of transfer-centered strategies to strengthen transfer advising and increase student access to comprehensive support, as well as long-term goals to establish a cohesive transfer infrastructure with four-year transfer partners

Transfer-centered strategies

- Use transfer data and lessons learned from our S-STEM program to communicate the need for change within our college.
- Emphasize advising models that include post-transfer education planning.
- Build partnerships with STEM faculty and programs at receiving transfer institutions.
- Improve alignment of transfer degree maps with bachelor's degree programs.
- Embed transfer support within STEM courses and extracurricular programs.
- Track post-transfer experiences and bachelor's degree attainment.

Final Thoughts

The promise of a community college transfer degree as a pathway to a bachelor's degree in STEM often falls short, with only 14 percent of transfer-intending community college students earning a bachelor's degree within six years.[19] A recent report from the Aspen Institute and Community College Research Center emphasizing the urgent need for change offers evidence-based recommendations and a "Transfer Playbook" for improving community college transfer outcomes.[20] Key recommendations of the Aspen report highlight the importance of comprehensive transfer advising and partnerships with four-year transfer institutions to strengthen community college transfer pathways to bachelor's degrees.[21] We found even within a state with strong articulation policy and transfer agreements, colleges need to listen, understand, and evaluate their own practices to smooth the pathway for students so they don't feel so on their own.

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[19] Fay, M. P. (2022).

[20] LaViolet, T., Masterson, K., Anacki, A., Wyner, J., Fink, J., Tulloch, A. G., Steiger, J., & Jenkins, D. (2025). *The transfer playbook 2.0: A practical guide for achieving excellence in transfer and bachelor's attainment for community college students.* Columbia University, Teachers College, Community College Research Center. https://highered.aspeninstitute.org/playbooks/transfer-playbook-20-practical-guide-achieving-excellence-transfer-and-bachelors

[21] Ibid.

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