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FOSTERING BELONGING IN COMMUNITY COLLEGE STEM TRANSFER STUDENTS THROUGH A COMPENSATED COMMUNITY MODEL: A CASE STUDY

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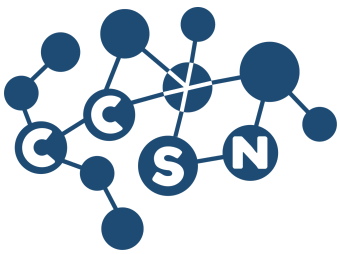

Fostering Belonging in Community College STEM Transfer Students Through a Compensated Community Model: A Case Study

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Abstract

Although sense of belonging is acknowledged as a cornerstone of student retention, little is known about programs and strategies specifically designed to facilitate belonging for students who transfer from community colleges into four-year programs, particularly in STEM disciplines. Drawing on interviews and focus groups with 39 community college transfer students at the University of South Florida College of Engineering, we analyze how the NSF Scholarships in STEM (S-STEM) program serves as a generator of student belonging. This S-STEM's social supports fall into three categories: faculty and mentor advising, biweekly group meetings, and tutoring sessions. Proactive programming and monetary compensation strongly encourage student participation in all three touchpoints as well as in community activities. We conceptualize S-STEM as a model of *compensated community engagement*: an equity-centered design in which students are financially supported to participate in structured academic and professional communities central to learning, identity development, and persistence. Across the board, respondents credited S-STEM with connecting them with other students, helping them find community, and buoying their academic success. By documenting the power of S-STEM's social programming to foster belonging, we reveal how university practices shape student communities and how compensated communities and proactive programming can unlock student success.

Keywords: Compensated Community Model, Compensated Community Engagement, Community College STEM Transfer, Community College Sense of Belonging in STEM, College Sense of Belonging in STEM, S-STEM

Acknowledgements

The authors acknowledge and thank all participating students. Additional thanks are extended to Angel Butts of The Word Angel LLC for editorial assistance, and Dr. Monica Reid Kerrigan for their external review. At EERC, we would like to thank Melissa Quaal for professional design and formatting. This material is based upon work supported by the National Science Foundation under Grant Nos. 2224623, and 2224671. Any opinions, findings, and conclusions or recommendations expressed in this material do not necessarily reflect the views of the National Science Foundation.

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Eighty percent of community college (CC) students enter their two-year degree intending to transfer and earn a four-year degree. On average, only 16% will meet their goal within six years. These rates are even lower for groups such as low-income (11%), older (6%), Black (9%), and Hispanic (13%) students (Velasco et al., 2024; Weissman, 2024). Two- and four-year institutions have sought to address low transfer student retention rates by investing in programs designed to bolster student belonging.

Within higher education, belonging refers to the degree to which students feel accepted, valued, and included by their institutions and networks (Goodenow, 1993; Parkes, 2014). Involvement in student organizations, close relationships with faculty, and peer mentorship are shown to facilitate such feelings (Strayhorn, 2023; Watson et al., 2010; White & Cones, 1999). Belonging has long been considered a harbinger of student success in higher education, with studies showing that students who feel higher levels of belonging are more likely to finish their degrees (Astin, 1984; Tinto, 1993; Morrow & Ackermann, 2012; O'Keefe, 2013; Bentrim & Henning, 2022; Strayhorn, 2019).

Early scholarship emphasizes the importance of student involvement for integrating into campus communities (Tinto 1975,1993). However, critics point out that this places an unfair burden on students for successful integration while downplaying the role of institutions in facilitating those connections (Hurtado & Carter, 1997; Rendón et al., 2000; Tierney, 1992). While previous studies have identified types of activities and interventions that can foster belonging, a gap remains in understanding how institutions implement these techniques and how successful their efforts are. Accordingly, this paper describes how four-year colleges reduce the

burden of integration for STEM transfer students and examines institutional interventions that successfully foster belonging in STEM transfer students.

This study investigates these themes through an analysis of 22 individual interviews and 4 focus groups with CC transfer students enrolled in 4-year engineering degrees at the University of South Florida, a large, public, predominantly white research university. All participants are members of the National Science Foundation's Scholarships in STEM (S-STEM) program. S-STEM delivers financial, academic, and social support to underrepresented community college transfer students studying STEM at selected institutions.

Literature Review

Origins of Retention Through Belonging

A growing body of scholarship builds on foundational retention theory by turning attention to the role institutions themselves play in student success. Museus (2014) extends academic and social integration concepts by highlighting how colleges can intentionally engage students' cultural backgrounds and identities, creating environments where diverse students are more likely to thrive. Yorke and Longden (2004) add to this understanding by pointing to the institutional, financial, and cultural conditions that shape whether students persist—conditions that are, in large part, within an institution's power to shape. Together, this scholarship complements earlier work by Tinto (1987/1993) and Astin (1984), whose academic and social integration models remain foundational to the field, by widening the lens to consider what institutions themselves can do to support the students they serve.

More recent scholarship places the onus on institutions to promote student retention and a sense of belonging. O'Keefe (2013) underscores the role of the institution in creating a caring,

welcoming environment for students through strong faculty-student relationships, counseling resources, and the encouragement of diversity and difference. Colleges may devote effort to practices such as peer mentoring, proactive advising, living-learning communities, and intergroup dialogue. When students perceive these services as present and helpful, they feel a sense of belonging (Shortlidge et al., 2024). In this way, belonging is shaped not only by institutional actions or student involvement, but by the extent to which students recognize the supportiveness and success of these efforts.

The effects of belonging on student success are widespread. Research demonstrates that students with stronger feelings of belonging not only have higher rates of degree completion but also report improvements in self-confidence, academic motivation, peer and mentor relationships, and overall enjoyment of the academic experience (Hausmann et al., 2007; Pedler et al., 2022; Strayhorn, 2019; Bentrim & Henning, 2022). Qualitative interview evidence shows that many transfer students experience the transition from community college to a four-year institution as socially dislocating—"like a freshman who didn't get a freshman orientation"—because they must quickly decode unfamiliar norms, policies, and expectations while simultaneously trying to form relationships on a campus where networks are already established (Cepeda et al., 2021, p. 1). Research focused on STEM transfer students similarly emphasizes identity and belonging as intertwined. Transfers often encounter misaligned expectations of what "success" looks like across institutional contexts and must negotiate their legitimacy in university STEM spaces, particularly when institutional cultures privilege competitive, individualistic norms that feel unwelcoming (Zuckerman & Lo, 2021).

The strongest practice-oriented evidence points to structured, relationship-rich interventions, particularly those that connect transfer students to peers, mentors, and high-impact

learning communities early in the post-transfer period. Program evaluations and qualitative studies highlight that peer mentoring, cohort-based community building, and guided connections to faculty and research experiences increase students' feelings of membership and integration, with belonging often developing through repeated, low-barrier interactions that normalize help-seeking and provide affirmation (Chamely-Wiik et al., 2021; Teshera-Levye & Vance-Chalcraft, 2024). In STEM, focus-group research suggests that transfer students' trajectories often diverge into "thriving" versus "surviving" pathways depending on the availability of supportive relationships, clarity of expectations, and opportunities to build community—conditions that shape whether students feel recognized and supported after transfer (Gray et al., 2022).

Conceptual Framework

This working paper continues the conversation about belonging among transfer students participating in an S-STEM program. S-STEM is a National Science Foundation grant program that provides scholarships and local program supports to academically talented, low-income STEM students. We undertake a case study of programming designed to form student communities and increase persistence.

Drawing on the frameworks and critiques of Tinto's integration theory, we examine how institutions can lessen the burden of integration for students by shifting responsibility from individuals to structures. Rather than requiring students to "fit" existing campus cultures, we consider how institutions can actively construct conditions that foster belonging. We term this approach a compensated community: an equity-centered design in which students are financially supported to participate in structured academic and professional communities central to learning, identity development, and persistence. This framing extends institutional-responsibility models

of belonging by treating community participation itself as a form of labor—one that institutions can materially support rather than simply encourage. In particular, we explore how S-STEM compensates students through their scholarships for the time they spend engaging in academic and social integration activities, and how this affects integration.

With a focus on the academic and social supports that S-STEM facilitates, we identify the potential of accountable programming and compensated community as mechanisms for building belonging among STEM transfer students. This framework positions belonging not as an individual trait or disposition, but as an institutional outcome—produced through intentional design, material support, and structured relationships.

Data and Methods

Program Description

This paper examines the National Science Foundation (NSF) Scholarships in STEM (S-STEM) program with regard to fostering student belonging for community college transfer students enrolled in a four-year STEM degree. S-STEM is supported through the Transfer Undergraduate Rural/Nontraditional Student Pathways through Identity, Knowledge & Engagement (TURNPIKE) program, which is a partnership between Polk State College (PSC) and the University of South Florida (USF) Engineering. The goal of the TURNPIKE program is to foster equity, address the equity gap in engineering education, and contribute to developing a well-educated STEM workforce by assisting underrepresented minority community college students and those from nontraditional backgrounds in successfully transferring from Florida community colleges to the urban USF Tampa campus. The program supports students' educational and career success by providing financial support in the form of grants of up to

$10,000 per semester, as well as structure and access to other key resources such as academic advising, tutoring, and peer networks.

Data collection for this study was conducted at the University of South Florida (USF), a large, public research institution in Tampa, Florida. With a total enrollment of just under 40,000 undergraduates, USF is one of the largest higher education institutions in the state. Situated in the suburbs of Tampa, the third-largest city in Florida, USF is primarily a commuter school, where it is less common to live on campus. The university hosts a relatively diverse student body, with approximately 12% identifying as first-generation students and 46% as nonwhite (identifying not as white, not reported, or as temporary, non-citizen residents). In the 2022–2023 school year, USF enrolled 3,233 new transfer students, 44% of whom are nonwhite. The data collection specifically focused on a subset of students receiving S-STEM scholarships within USF's College of Engineering, which serves approximately 7,500 students.

Participants

The research team completed 23 interviews and conducted four focus groups with a total of 16 students (n = 39). Members of the research team attended an S-STEM biweekly meeting (described below) to share information about the study with S-STEM scholars. Students signed up for one of 24 30-min interview slots or one of four 60-minute focus-group slots held on a day students come to campus to meet with project staff. Program staff and administrators also followed up with students by reminding them of the opportunity and facilitating signups. Participants received a $25 gift card. The average age of participants was 25, with the lowest age being 21 and the highest 34. 30% of the sample were female, and 70% were male. 47.5% of

students identified as Hispanic, 22.5% as white, 15% as Asian/Pacific Islander, 7.5% as unknown, 5% as Black, and 2.5% as Native American.

Table 1. *Demographics of Quoted Participants*

Pseudonym	Age	Sex	Race
Bailey	34	Female	White
Daniel	33	Male	Hispanic or Latino
Luke	26	Male	White
Lena	21	Female	Hispanic or Latino
Cheryl	22	Female	Asian/Pacific Islander
Reina	22	Female	Unknown
Oscar	21	Male	Hispanic or Latino
Lana	22	Female	Asian/Pacific Islander
Alexander	23	Male	White

Data Collection and Analysis

In-depth, semi-structured interviews and focus groups were conducted in October 2023 with students currently enrolled in an S-STEM cohort. All interviews and focus groups used a standardized facilitation guide that included topics such as student decision-making, experience in the S-STEM program, and educational and career pathways. There were also specific questions about students' feelings of belonging in USF's engineering community and their identities as engineers and transfer students.

Research Questions

Data for this analysis primarily stemmed from two questions:

1) “Can you highlight specific S-STEM activities or support systems that impacted your personal and academic growth as a STEM student?” and
2) “Do you feel a sense of belonging or connection to the engineering community at USF? If so, how has S-STEM influenced this?”

We also asked students about S-STEM programming and their feelings of belonging through open-ended follow-up questions that allowed them to outline their experiences more specifically. Data were coded using grounded theory methods (Charmaz, 2006), first reading the transcripts for discussions of the social impacts of S-STEM and then, as themes emerged, grouping responses more distinctly around themes of belonging and S-STEM programming. Special attention was paid to the impacts of each type of S-STEM support named by students, and the overall effects of each programming piece were compared.

Findings

Proactive Advising Tailored to Scholars’ Needs

A main aspect of TURNPIKE is its proactive advising system. S-STEM scholars meet with the program’s advisors multiple times per semester, a ritual shown to build stronger advising relationships and strengthen students’ sense of belonging (DeRosa, 2023; Karp & Stacey, 2013). Proactive advising and mentoring take the onus off students to facilitate their involvement with faculty, automatically giving them access to the type of close student-faculty relationship that has been shown to increase feelings of belonging within an academic community (Varney, 2012).

During interviews, students underscored the differences between their general advisor and their S-STEM faculty mentor. They noted that S-STEM advisors were more familiar with

program requirements, gave more tailored advice, and overall had more time for the students they worked with. As Daniel (33, Hispanic, male) described,

> "[My S-STEM advisor] was very helpful in navigating a lot of trouble that I had in my first semester, whereas I feel an advisor who's less familiar with the situation and the demands of students like me probably wouldn't be able to navigate as well."

Daniel noted the different demands and experiences of navigating the university world as a nontraditional student when he specified "students like me" and identified that having an advisor who was familiar with these challenges made a considerable impact when navigating difficulties that emerged from his situation. S-STEM scholars reported feeling "closer" to their S-STEM advisors and "less rushed" compared to their general engineering advisors. Another scholar described receiving conflicting instructions from previous advisors but noted that S-STEM's advising system gave him the information he needed to take the right path and streamline his academic journey. S-STEM's individualized approach to advising allows students and faculty to build relationships that benefit students rather than treat them as a formality, giving them a trusted ally for navigating the university system as transfer students.

Many students reported that STEM advisors helped them mitigate feelings of loneliness in the transfer journey, which were common among community college transfer students (Cepeda, et al., 2021; Karp, 2013). The S-STEM advising system gave scholars an ally who looked out for their success. Students spoke positively of this connection, noting that their advisors served as constant reminders of their pathways and helped them stay on track toward their long-term goals. Leo (22, Hispanic, male) placed this relationship on an almost familial level, stating,

> "It feels kind of like a small parent, just waiting in the background. Just kind of wanting to let [them] know what's going on with your classes, your grades, if everything's good … So it's pretty comforting, or it's easy to fall back on if you are struggling."

For Leo, his advisor took shape as a lesser version of a parent, shepherding him through the demands of classes and grades. He described this feeling as a safety net *"waiting in the background,"* there to turn to in challenging times. This safety net allowed students to feel like they could make mistakes and still find success in the program—that they had people at their side to support them if they faltered. Transfer students often experience much higher levels of precarity compared to their peers (Goldrick-Rab et al., 2019). S-STEM helps them gain confidence as they find their footing at the university level. Whether by checking in regularly or by acting as a trusted resource when times are tough, S-STEM advisors become an integral part of the community for students to draw on in times of need.

Creating Opportunities for Connection Through Advising

The one-to-one advising relationship through S-STEM gives students access to individualized connections that encourage scholars to move toward their goals. Reina (22, race unknown, female) describes the way she became connected with her research position through S-STEM:

> I want to do research for renewable energy. [My advisor] talked to the professor. I sent an email, but the professor had so many emails that he doesn't respond. So [my advisor] sent another email, and that way, because they have connections with the professor, they help you get into the program that you wanna be.

For Reina, her advisors served as an intermediary for professional networking by leveraging their connections within the department. Without access to the support of her S-STEM advisor, Reina would have lost out on a valuable opportunity to expand her professional experience in renewable energy work. By asking for help, she took a significant step in advancing her career. In this way, the trust between S-STEM advisor and advisee translates into the formation of connections with other faculty, a domino effect that pushes students toward higher levels of community integration. Advisors act affirmatively on behalf of students, showing students that seeking help pays off with results.

Another student recounted their experience with an S-STEM advisor who, despite leadership responsibilities as an assistant dean, took time out of her schedule to personally tutor them when they reached upper-level courses. This connection helped the student persevere through academic difficulties, demonstrating the high level of investment the S-STEM program and its advisors have in maintaining student engagement. In addition to professional and academic support, S-STEM advisors serve as emotional pillars for their students. Bailey (34, white, female) recounted sharing her challenges navigating a death in her family with regular engineering advisors. According to her, the advisors told her to "suck it up and get through it or [do] another year of school." Despondent, Bailey struggled until a chance meeting in the hallway with an S-STEM advisor who had a more compassionate response: "He told me this amazing story that he had been through and shared this really special moment with me, and it was really genuine and encouraging." S-STEM advisors make it a priority to connect with students in moments of emotional need, stepping out of a strict academic advising role to support students in their personal lives as well. In this way, S-STEM utilizes a holistic view that acknowledges student success requires more than just academic achievement.

Multiple students named advising as the best or most beneficial part of the S-STEM program, even beyond the scholarship. One scholar described their feelings toward S-STEM's faculty advisors, stating, "… it's just the relationships that you have with the faculty in the S-STEM that I think are really amazing. It's so much more than just the money." We found that, while the financial support provided by S-STEM scholarships is often the primary motivator for joining the program, the relationships between students and faculty become more significant in the long term. Robust student-faculty relationships have been shown to increase students' sense of belonging and, in turn, their academic success, a trend echoed by Daniel:

> Knowing that there are faculty and advisors who are invested in your success personally makes a very big difference just in terms of your mentality, because, especially as an engineering transfer student, you spend so much time doing prerequisites and not doing anything engineering-related. So you feel like you don't even belong … And then if you transfer and things aren't going well or whatever, maybe that could have a very negative effect. But when I transferred, knowing that there are people who are actually personally invested in me succeeding made a very big difference.

Daniel saw himself and his experience as a transfer student as distinct from his peers seeking four-year degrees, especially in terms of the classes and sequence he was taking on his pathway toward degree completion. Transfer students often spend more time on prerequisites unrelated to their major, a pathway that can make them feel out of place in their new academic community (Zuckerman & Lo, 2021). S-STEM helps mitigate this feeling by providing students with helpful, personally connected advisors who scholars feel are devoted to their success. This type of personalized relationship, formalized by the program through proactive advising and

active mentoring, forges close relationships that support students through the unique challenges of transferring without placing additional burdens on the student, such as scheduling or reaching out to faculty and staff. Indeed, these may be the first close faculty mentors a student has had, teaching them the skills they need to continue seeking out this type of support beyond S-STEM. Whether the program's advisors provide tailored academic recommendations, frequent check-ins and accountability, or emotional support, S-STEM scholars benefit from mentoring relationships that are truly invested in helping them feel part of a community that succeeds.

Tutoring and Study Groups

The TURNPIKE S-STEM program connects scholars to a range of academic resources, including tutors and peer study groups, to relieve the pressure students face to seek out academic support on their own. Although scholars are not required to participate in formal tutoring sessions, TURNPIKE heavily recommends tutoring, and scholars reported feeling like participation was required. One student described how this expectation enriched their learning, stating that previously they would attend tutoring only if they needed specific help, but because they felt they were required to attend, they discovered the value in learning from others' questions. Another student praised the tutoring program for helping them stay ahead of their homework schedule through outside scheduling, noting that with an S-STEM tutoring session, they would show up and complete their assignments days in advance without having to worry about scheduling or internal motivation. Other students echoed the benefits of these sessions, as they helped students structure their time and removed the pressure to find their own academic support and community. Alexander (23, white, male) described how tutoring and peer groups helped him face the social anxiety commonly felt among students:

> The tutors were very helpful. It pushes you. Obviously engineering, you think you don't need social skills for engineering. You can be like, "Oh, I want to work alone. I want to be an engineer," blah. You have to work with people … Most people that have social issues, like social anxiety, they don't pursue the way I want to study with somebody. It helps a lot if you have somebody to study with. It helps so much, but people like that, they need a pushing hand. So if you have a tutor … basically you're put in a group, nobody ever even asked you, they tell you: "You told me that you're free now, so we're going to meet at that time." And you're put in this position. It helps so much, basically.

By removing the logistical pressures of searching for, scheduling, and assigning academic support, S-STEM lessens the burden on students to form their own community.

S-STEM tutoring activities also combat the social isolation students reported in their field. Multiple students noted that before S-STEM, they would study alone or unsuccessfully try to contact their professor or TA for help. With the support of S-STEM, students are encouraged to create academic peer communities and seek one another out as resources. Sarah (26, white, female) stated:

> Definitely the learning teams have also been very helpful. It's difficult because the further you get in, they don't really have tutors for higher-level courses. But even just having a peer group, just people that you know you can meet up with regularly for the classes that you're in, that's been really big as well.

S-STEM gives scholars the connections they need to find support from their peers, particularly when tutors are unavailable. S-STEM introduces students to each other and facilitates cohort-building, which removes the onus from students to find and nurture a peer support network. Luis transitioned from studying alone at home to studying in groups on

campus. He explained that S-STEM helped him step outside his comfort zone, which improved his collaboration and teamwork abilities—employability skills he knows he will need for a career in engineering. Another student echoed this sentiment, noting that some students assume engineers work alone, but through S-STEM, he learned how to approach his studies and future work more collaboratively. Ethan (21, white, male) summed up the impact of S-STEM on building peer academic support and bridging social difficulties, stating:

> There's a lot of social anxiety going on with college students, and not a lot of people take the effort to [say], "Hey guys, let's go do a study session today." So I feel like the program pushing that, making it a little bit more required, is getting students together to actually study and get better grades.

Overall, S-STEM tutoring facilitates student belonging by creating opportunities for academic engagement and involvement that do not require outside effort from the student. As Ethan stated, program and social accountability made participation in S-STEM's academic support feel "a little bit more required." Many students spoke positively about this S-STEM institutional pressure to participate in tutoring activities, citing increased academic achievement, lower stress, and improved collaboration skills as some of the benefits they received from participation. These responses make it clear that by removing the logistical burdens of accessing tutoring and creating an environment of academic accountability, S-STEM helps scholars feel an increased sense of belonging without placing an undue burden on the student to facilitate their involvement.

Biweekly Scholar Group Meetings

As part of the S-STEM program, students are required to meet every other Friday with other scholars and program advisers in a large group. These biweekly meetings are times to build community, check in with peers, coordinate study groups, and listen to speakers who give talks on developing academic, personal, and professional skills. Participants described presentations focused on topics such as learning good study habits, academic writing, and de-stressing through mindfulness. Occasionally, potential employers, including alumni, address the gatherings to help students form networks in their fields. Many students spoke positively of the biweekly meetings, indicating that they were a cornerstone of S-STEM's community.

Anthony (21, white, male) said the meetings *"*gave me that kind of feeling that, 'Hey, maybe it's not just me in this. There are other people that are feeling the same way as me.' It kind of makes you feel good sometimes. You're not alone." For Anthony, the meetings served as a touchpoint for interacting with students who were in similar positions, giving him a bridge to form connections with other students and combat feelings of isolation. The S-STEM meetings automatically facilitate introductions among students, a process that students reported made it easier for them to recognize each other on campus and in classes later. As Arjun, (23, race unknown, male) describes,

> "I think one of the best things about S-STEM is it brings a bunch of transfer students in STEM together. I think we have around 50 people, which are all potential new connections, which both helps while I'm in school and out of school."

In this way, the program's biweekly meetings encourage student belonging by creating the opportunity for bonds between students both during the required gatherings and outside of them.

Other students noted the impact of spending time with students from similar backgrounds. Specifically, many scholars appreciated the opportunity to connect with other transfer students, with the awareness that their path through the four-year engineering degree was very different from that of a non-transfer student. Some noted this experience increased their confidence, even inspiring one student to go after internship opportunities she thought were unattainable for transfer students until she saw fellow transfers earn internships. The biweekly meetings gave students the platform to share their challenges and receive help from one another. Students reported benefiting from the noncompetitive environment in the S-STEM meetings, in a culture they described as extremely collaborative. Tania (21, Asian/Pacific Islander, female) states:

> We do have meetings every other week, and I feel like there is a connection between everyone because there's not a person that I would think, "Oh, I shouldn't share everything," or "That person is going to get ahead of me." Nobody has that mentality. Everyone is helping each other out with any type of problem.

Tania highlighted the benefits of a community built around teamwork and recounted her experience of S-STEM as a program that discouraged competition between students. These students describe the ways in which S-STEM meetings become a go-to safe space for students to find support from peers and mentors.

The biweekly S-STEM gatherings also give students access to valuable academic and professional skills without the additional labor of seeking out connections or information. Participants noted that the professional development component was beneficial. One student shared that making connections in his field through the S-STEM meetings gave him hope for the

future. S-STEM meetings expose students to peers and professionals in other disciplines, giving them knowledge of a wide array of career paths and industries that they may otherwise not have had access to. Multiple participants noted the importance of these interdisciplinary connections to their development as students, sharing that the S-STEM meetings gave them the chance to enrich their networks with other scholars and professionals outside their immediate academic focus. S-STEM meetings also focus on diversifying students' soft skills, giving them the techniques they need to succeed academically and personally. Lana (22, Asian/Pacific Islander, female) described:

> "I remember one of the meetings we focus on being mindful and being aware of what is … Because there's so much noise in our life, trying to focus on what is happening right now and be present. That one was very helpful for me."

Whether through lessons on evidence-backed study techniques or a group meditation session, S-STEM gatherings expose students to a wide array of approaches meant to enrich their holistic student experience. By creating the space for students to find community with other transfer students, teaching valuable soft skills, and giving scholars the opportunities to form connections broadly across fields, S-STEM meetings turn a required gathering time into a valuable opportunity for fostering student belonging.

Promoting Social Supports

Through the social and academic activities that S-STEM facilitates for scholarship recipients, students report navigating the transfer transition with more ease and less social pressure. Cheryl (22, Asian/Pacific Islander, female) explains her experience:

> "USF is so broad … sometimes it's hard to reach out or talk to other people. But S-STEM kind of condenses all that and makes it more, I don't know, more comfortable for me, and it just helps me ease into the transition."

One way that the meetings, tutoring, and academic advising support student success in this way is by connecting a network of students with similar experiences. Multiple students reported the power of these relationships in their academic and professional lives, explaining how they gave them hope and confidence and boosted their self-esteem. Oscar (21, Hispanic, male) described these feelings:

> I mean, having a program, an institution, or a group of people that support you, you feel like you belong to some group of people, and that actually empowers you, I believe. If you feel like you're by yourself, a lot of times you cannot actually go out and feel confident. It's like a family. If you have family backing you up, then you feel like you can take on the world, right?

For Oscar, having the institutional support of S-STEM allowed him to feel more confident than he would have on his own. He likened his experience in the program to having the backing of a family behind him, a feeling that gave him the sense he could overcome any obstacles in his path. Other students felt similarly, noting that S-STEM had helped them assemble a peer network that gave them the confidence to take on new challenges. Several students noted that their peers gave them valuable advice about classes and professors, guiding their decision-making process as they progressed through the major. Others described the academic support they received from their peer network, relationships that helped them feel more secure academically by showing them they have many people they can turn to for help.

Additionally, several scholars described the hope they felt when seeing students from similar transfer backgrounds succeed. Other students noted that seeing other students go through similar struggles made them feel less alone and gave them someone to talk to. Lena, (21, Hispanic, female) spoke about her experience finding friends through this aspect of S-STEM, stating, "I made a lot of friends because we have a lot of things in common. We're transfer students and all that, but also they've gone through the same struggles as me." Our evidence shows that by bringing together students facing similar sets of challenges, S-STEM strengthens bonds between students driven by mutual recognition and respect.

Outside of practical considerations like choosing classes and receiving help with academic work, the community that S-STEM facilitates provides its scholars with key social supports. Like Oscar, multiple students described S-STEM as a family, noting that both in and out of S-STEM activities, the relationships produced through S-STEM became friendly faces and trusted support systems for students throughout their degree. Alexander (23, white, male) described this feeling as a cornerstone of S-STEM: "That's one of the main aspects of S-STEM. It's a community, right? It's our thing. We're a family." For Alexander, the hallmark of S-STEM programming was the community it created among its students. In S-STEM, the transfer standing that usually gives students outsider status instead marks them as insiders, fostering strong bonds among students based on a shared experience that is both emotional and academic.

Several students identified the driving force behind S-STEM's success as a community builder: required or expected participation. As Luke (26, white, male) explains,

> I feel like, if money wasn't even an issue, being a part of the program is super cool just because engineers are pretty introverted people. So going out of my way

> to meet people is not my cup of tea, but being kind of forced to, in a sense, I love it, and I'm super happy that it happened.

For Chris, participation in a peer network felt outside his comfort zone as an engineer who was used to working alone. However, he praised S-STEM for breaking him out of this habit and "forcing" him to meet people. Chris reported feeling a sense of belonging and connection within the USF engineering community, mainly because, in his words, "We all suffer together." In this way, S-STEM led to the creation of a peer network for a scholarship participant who would not have ordinarily had the tools or desire to form one for himself, with the result being a better-connected, supported student. Others described S-STEM as the "push" they needed to engage with their community, or as "making" them participate and communicate with others in their department. For the scholars we spoke to, this pressure was seen as a largely positive push in the right direction, encouraging them to get outside of their normal routines and receive the support they need to succeed.

Discussion and Conclusion

Participants attributed much of their academic success to the faculty, peer, and professional networks they built through S-STEM. We conceptualize this program as a model of *compensated community engagement*: an equity-centered design in which students are financially supported to participate in structured academic and professional communities central to learning, identity development, and persistence. By recognizing community participation as labor, this model reduces opportunity costs for low-income and working students and embeds belonging, mentoring, and professional socialization into educational work.

Rather than placing the burden of integration on students, The TURNPIKE S-STEM program assumes institutional responsibility for connection. Students overwhelmingly reported strong feelings of belonging within the program and identified three core components as central to their growth: proactive advising, structured tutoring and study groups, and biweekly cohort meetings. These supports reduced the need to independently locate resources or initiate relationships, creating predictable, low-barrier opportunities for connection. While academically beneficial, students emphasized the relational power of these experiences.

Consistent with O'Keefe's (2013) and Strayhorn's (2023) models of belonging, students described feeling genuinely cared for by advisors, peers, and tutors, easing isolation and strengthening confidence. For many, S-STEM was their primary connection to the engineering community, effectively "condensing" a large campus into a navigable social space. Through repeated socio-academic interactions (Deil-Amen, 2011), help-seeking and collaboration became normalized, fostering shared identity among transfer students.

Crucially, the scholarship made this participation feasible by helping students afford transportation to campus, live on or near campus, and/or reduce their work hours, thus lowering the barriers associated with regular engagement on campus (Tyson et al., 2024). S-STEM compensated students to make it easier for them to participate in the recommended activities needed to be part of a campus community. Although most group activities were not required, students enthusiastically participated in optional offerings, in part because it was less of a burden to do so, and also because those activities were shown to be manageable and beneficial uses of their time. Proactive programming and required biweekly cohort meetings further lowered barriers by removing logistical hurdles and providing accountability, which many students—

especially introverts—found supportive. Together, expected participation and reduced opportunity costs created conditions for belonging without adding burden.

Although this single case lacks long-term outcome data, it offers a clear implication for institutions serving STEM transfer students: Belonging is most attainable when relationship-rich programming is paired with material support. Compensating students for time in community and designing structures that assume responsibility for connection can meaningfully reduce the burden of integration during the critical post-transfer period.

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Appendix

Table 2. Participant Demographic Information

Age	Sex	Race
30	Female	Hispanic or Latino
25	Female	Black
34	Female	White
22	Male	Hispanic or Latino
22	Female	Hispanic or Latino
33	Male	Hispanic or Latino
22	Male	Asian/Pacific Islander
26	Male	White
21	Female	Hispanic or Latino
22	Female	Hispanic or Latino
22	Female	Asian/Pacific Islander
22	Female	Unknown
23	Male	Hispanic or Latino
21	Male	Hispanic or Latino
22	Female	Asian/Pacific Islander
23	Male	White
25	Male	Hispanic or Latino
22	Male	Hispanic or Latino
25	Male	Black
22	Male	Asian/Pacific Islander
22	Male	White
21	Female	Asian/Pacific Islander
25	Male	White
26	Female	White
22	Male	White
24	Female	Hispanic or Latino
21	Male	White
24	Male	White
41	Male	Hispanic or Latino

29	Male	Hispanic or Latino
25	Male	Hispanic or Latino
21	Male	Hispanic or Latino
23	Male	Unknown
23	Male	American Indian/Alaskan Native
22	Male	Asian/Pacific Islander
33	Male	Unknown
22	Male	Hispanic or Latino
30	Male	Hispanic or Latino
25	Male	Hispanic or Latino
22	Male	Hispanic or Latino