



RISE Stars: An Experience Report on a Cohort of Black Freshmen Women in Computing

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Abstract

Despite significant efforts in recent years towards broadening participation in computing, the representation of Black women remains disproportionately low. Many Black women who start a computer science (CS) program often face barriers prompting them to reconsider and ultimately change majors. Recent work centered on the intersectional experiences of Black Women identify the nuances of what is needed to aid in the persistence of Black women. For example, career awareness and faculty mentorship are found to be especially important to Black women's computing persistence. Other studies have highlighted the importance of peer mentoring and a sense of belonging. In this study, we report on a research-based, targeted intervention for Black women in computing that aims to increase their persistence in the field. This intervention is aimed at first-year, traditional freshmen who are Black Women majoring in CS at a research university. The RISE Stars program consists of four main components designed to build and sustain a supportive community among the students: peer-based mentoring, a group-based social impact project, monthly cohort meetings, and social media platforms. This experience report describes the first year of organizing this program, shares initial promising outcomes, and describes lessons learned that can serve as a model to others to replicate.

CCS Concepts

• Social and professional topics → Computing education.

Keywords

Black women in computing; Broadening Participation in Computing; Computing education; Sense of belonging

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1 Introduction

Despite significant efforts in recent years towards broadening participation in computing, the representation of Black women remains disproportionately low [10, 14]. According to the 2023 CRA Taulbee Report, Black women accounted for only 1.59% of the Bachelor's enrollment of computer science (CS) programs during the 2022–2023 academic year [21]. Numerous studies have shown that this underrepresentation is not due to a lack of interest or ability, but instead to a variety of challenges that Black women uniquely face in the educational space and the tech industry [17, 20]. Even more troubling is that Black women accounted for only 0.849% of the bachelor's degrees awarded during the same academic year [21]. This indicates that beyond the barriers to entry into the program, there are also barriers to retaining the students. While the Taulbee survey does not capture data for all 4-year CS programs, it is representative of the trends at academic units that grant Ph.D. degrees in CS. In consideration of this, we developed the RISE (Reaching for Inclusion – Striving for Excellence) in Computing Stars program. The RISE Stars program is a cohort-based counterspace [7, 12] to support first-year CS majors that are Black women. The program is based upon best practices presented in previous research to build community and provide academic and professional development, with the goal of improving the first-year retention rates and future graduation rates for Black women CS majors at our institution.

2 Institutional Context

Georgia State University (GSU) is an urban public university with R1 Carnegie classification. GSU ranks in the top ten nationally for ethnic diversity. Over 40% of students identify as Black/African-American, and GSU grants Bachelor's degrees to more African American students than any university in the United States [1]. The Department of Computer Science offers degrees at the bachelor's, master's, and doctoral levels. At the undergraduate level, there is a keen interest in CS. In Fall 2023, over 2,800 students declared Computer Science or Pre-Computer Science as their major, making it the most popular degree major in the university. There are an impressive number of Black students enrolled in the undergraduate CS major; In Fall 2023, there were 297 Black women and 667 Black men. Unfortunately, when compared to the overall population of GSU, Black students are underrepresented in the undergraduate computer science program. Only 31.9% of computer science undergraduate students identify as Black as compared to 43% of the GSU population. For Black Women, the numbers are even more startling. Black Women represent only 9.8% of the CS major compared to 16% of the GSU population. Enrollment only tells part of the story. The data suggests that Black Women in the CS program start but do not persist in the major. An analysis of first-time, full-time freshmen

(FTFT) in the fall semesters of 2011 through 2015 showed that 78% of the Black women across these cohorts did not graduate with a CS degree within 6 years. More recently, we reviewed the 71 FTFT Black Women who began as CS majors in Fall 2022 and found that only 45 were enrolled as CS majors by the following fall (representing a one-year retention rate in the program of 53.5%). Worse, only 30 of these Black women were enrolled as CS majors two years later. In other words, we lost 57.7% of the Black Women who started as CS majors by the end of their second year in the program. Given this context, it is important for GSU to focus squarely on activities that can address and improve these graduation and retention rates. With the large number of Black women that already exist within the university, there is a huge potential to make a national impact on the number of Black women computer scientists.

3 Program Motivation and Overview

In March 2023, a focus group was held to understand the unique experiences of Black women CS majors at GSU. Twenty-two participants, ranging from first-year to graduate students, attended this session. Remarkably, it was the first time these women had gathered despite sharing the same major. Facilitators encouraged open dialogue about the challenges faced at GSU, uncovering common themes such as imposter syndrome, discomfort in male-dominated classes, reluctance to speak to teaching assistants and professors, and a sense of isolation. The focus group highlighted a pressing need for a stronger sense of community. Students expressed disconnection, fueled by GSU's urban setting and limited on-campus housing. With over 30,000 students but fewer than 5,000 living on campus, many commute, limiting social interaction opportunities. Consequently, students often felt disconnected from their peers and the department. In response to these concerns, students proposed targeted technical and professional workshops, noting that discovering these opportunities too late in their academic journey was a common issue. This feedback led to the creation of the RISE Stars program, a counterspace [7, 12] to support Black women in computer science upon entry to GSU. The program aims to enhance participants' experiences by concentrating on four key goals:

- Goal 1 Persistence: continuing in CS, ideally at GSU;
- Goal 2 Community: fostering community through academic, professional, and social networks;
- Goal 3 Internships: raising awareness and starting preparation for securing internships;
- Goal 4 Confidence: instilling confidence and a sense of belonging within their major.

There are four main components included in the program design that we expect will contribute towards achieving the goals of the program. These include 1) mentoring, 2) a social impact project, 3) cohort meetings, and 4) social media platforms. Research has shown that mentoring, and in particular, near-peer mentoring, provides essential guidance, support, and networking opportunities, which are particularly crucial for Black women in CS [5, 8, 13, 15, 17]. The inclusion of a social impact project is based on evidence that hands-on, community-oriented projects increase engagement and motivation by allowing students to see the real-world impact of their skills [2, 3, 19, 20]. Cohort meetings foster a sense of community and belonging, which is vital for retention and success, as

they provide a space for sharing experiences, challenges, and strategies [12, 14, 15, 17]. Including meetings that focus on professional development equips participants with the awareness, skills, and confidence to apply for internships [4, 16, 20]. Finally, leveraging social media platforms aligns with current best practices for maintaining flexible and ongoing communication and resource sharing, thereby engaging and supporting the participants [11, 18]. Holistically, these components create a comprehensive support system tailored to the unique needs of Black women in CS. The next section provides implementation details. Also instrumental to the program is having a near-peer Undergraduate Program Coordinator (PC) that is also a Black woman majoring in CS. The PC selected for our first year had attended the focus group session and was enthusiastic to help develop such a program for the new incoming freshmen.

4 Program Approach

In this section, we provide details for the program implementation over the first year. This includes a timeline of program activities (Figure 1), information regarding the recruitment process, and descriptions for the four main program components. All program activities are grounded in evidence-based best practices. As this was our first year, we altered aspects from the fall to the spring semester to determine what would be most impactful for the Star participants in the context of GSU.

4.1 Recruitment & Welcome Brunch

In late July 2023, we sent invitations via email and postal mail to all 65 incoming Black women who were first-time full-time (FTFT) Black women intending to major in CS. The invitation included a welcome letter from the PC, who provided motivation and encouragement in her own words for the students to join the RISE Stars program. Along with the welcome letter and invitation, she also included her picture to make it more personal, helpful lists of essentials to pack for dorm life, the best study and food spots on campus, and information about CS tutoring on campus. Prospective participants were asked to sign up indicating their interest, of which 26 did; of these 26 students, 21 RSVP'd to attend our welcome brunch, the Saturday prior to classes starting. We had 13 students attend our welcome brunch, all of which continued to participate in the RISE Stars program. The welcome brunch was a full-day event held on the Saturday before classes began. This was an opportunity for the students to get to know each other, meet the PC and mentors, as well as some alumni and the university liaison from Google. It was a day of socializing, learning about what to expect in their academic journey, and setting up their laptops, along with walking through a practice lab session.

4.2 Mentoring

The mentorship component varied between the two semesters. During the welcome brunch, we randomly formed four small groups of 3-4 students and paired each group with an upperclass Black woman mentor in computer science. Mentors met with their small group in person weekly for at least an hour to work on team projects and provide advice as the Stars progressed through their first semester of college. Beyond the group project, mentors provided guidance on developing LinkedIn and GitHub profiles and resumes. The second

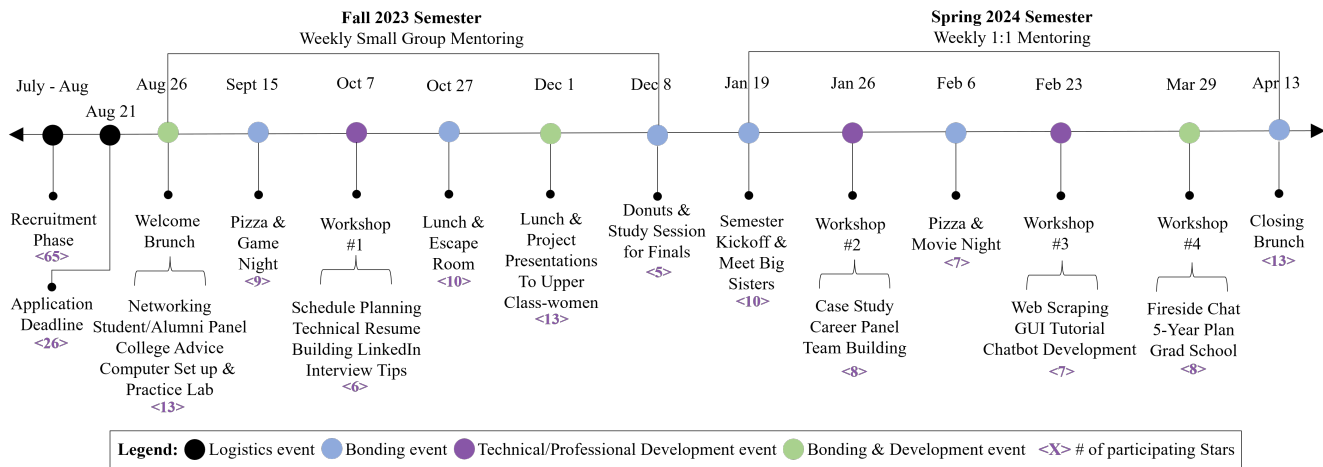


Figure 1: Timeline of the RISE Stars Program.

semester shifted to a one-on-one “big sister, little sister” model, allowing for more personalized support. Like the first semester, the big sisters met with their little sisters for an hour weekly. However, instead of focusing efforts on the group project and targeted outcomes, the Stars and big sisters decided their own agendas. These meetings often involved guidance for personal projects, tutoring for coursework, and personal bonding over informal meetups for coffee, meals, or time to study together.

4.3 Social Impact Project

The group project assigned in the first semester was a pivotal aspect of the RISE Stars cohort. During the welcome brunch, the groups were tasked to come up with an idea for a social impact project. We encouraged them to envision how technology could be used to provide solutions for a problem or challenge they were passionate about. Initially, the project deliverables centered around designing an application using collaborative tools such as Figma to build professional portfolios. However, the Stars were eager to learn and exceeded expectations by creating functional solutions and utilizing advanced development frameworks. With guidance from mentors, teams assigned individual roles and held weekly stand-ups during small group meetings. This structure provided early exposure to team-based development and helped students overcome challenges as they learned new technologies. Many students collaborated outside group meetings to tackle difficult problems. Throughout the semester, the small-group teams participated in local hackathons and formed relationships with other teams. At the end of the fall semester, they formally presented their diverse set of projects to a group of mostly Black upperclass-women majoring in CS and computer information systems. The four projects were 1) an interactive website about campus safety; 2) an interactive student calendar; 3) a website to find eco-friendly trash receptacles; and 4) an anonymous big sister advice portal. Although we did not formally continue with the group projects during the spring semester, there was one group that did continue to extend their project. We instead placed a greater emphasis on professional and technical

development workshops and encouraged the participants to begin their own personal projects.

4.4 Cohort Meetings

We held at least one cohort meeting each month, with all but one being held as in-person events. The meetings ranged in their focus, from technical development, professional development, academic planning, to bonding activities (Fig 1).

Technical development: The goal for these workshops was to alleviate imposter syndrome, a common issue in the competitive nature of computer science classes. As freshmen students, many were being exposed to programming for the first time and felt out of place. By giving the Stars a head start on essential skills, we aimed to reduce their fear and boost their confidence as they progressed through their courses. During the fall semester, most of the technical development was achieved through the group project activities. In the Spring semester, the focus shifted to gaining additional project experience and workshops included a case competition and chatbot development. The case competition challenged students to build a timed technical solution to real-world problems, working in randomly assigned teams to design a web application and solve a coding challenge. Another workshop focused on utilizing a graphical user interface design and web scraping to construct a functional chatbot.

Professional development: Other workshops focused on resume building, online portfolios (e.g. LinkedIn and GitHub), and various presentation opportunities. The Stars learned the importance of properly highlighting their accomplishments, often for the first time. Stars were given multiple opportunities to present their projects in formal settings and more casual, peer-to-peer environments, and at the end of each technical session, they were asked to stand and share a pitch of their work. Over time, these experiences improved their communication skills and helped them become more confident in articulating their ideas and achievements.

Academic Well-Being: Stars worked with their mentors, PC, and the faculty leader to create their 4-year plans of study and select courses for the following semester. Cohort meetings for this

guidance were diverse in format, ranging from interactive panels and lessons to fireside chats. These sessions offered personalized advice and strategies for academic success, mental well-being, and navigating the resources available at GSU, all tailored to the unique challenges faced by Black women in computer science.

Bonding: The RISE Stars program placed significant emphasis on building a strong and supportive community among its members. Recognizing the importance of fostering connections, we organized various bonding events. These events allowed students to relax and form meaningful relationships with their peers outside of academic settings. From thrilling escape room challenges that tested critical thinking skills to game nights filled with friendly competition, each activity was designed to cater to diverse interests. These bonding events played a vital role in cultivating a community of students who felt comfortable to be authentically themselves.

4.5 Social Media Platforms

Social media messaging platforms were crucial in providing resources and facilitating communication within the cohort. Platforms like Discord (actively managed by the PC) and LinkedIn enabled students to interact, seek advice, and share valuable information. These channels served as hubs for information on scholarships, internships, seminars, and other opportunities, supporting students' academic and professional development. By leveraging these platforms, we equipped students with essential resources and insights for their academic and professional journeys.

5 Outcomes

After the inaugural year, we wanted to evaluate how well the program met its goals related to persisting in CS, building community, promoting internships, and instilling confidence and sense of belonging. To that end, we invited Stars students to participate in an hour-long focus group session in April 2024. For those that were not able to attend, we offered individual interview slots. Sessions were conducted online and were recorded and transcribed to aid in data analysis. To encourage openness about the program, the interviewer was a neutral party who had not been involved in the program throughout that year. The focus groups and interviews covered the following topics: participant introduction, overall experience in the program, favorite and least favorite activities, preferred mentoring model, CS culture at GSU, and other reflections on the program. Overall, there were 6 participants in the focus group and 2 who completed one-on-one interviews.

5.1 Goal 1 Persistence (Fully met)

Our first goal was for participants to persist in the CS major, ideally at GSU. This goal was fully met as 100% of the 13 participants remained CS majors in their sophomore year. Three of 13 students have transferred to other schools. Therefore, 77% of participants were retained at GSU in the CS program. This is slightly higher than the Fall 2022 one-year retention rate of 54% for Black Women in CS at GSU.

5.2 Goal 2 Community (Fully met)

Our second goal was to foster a strong sense of community. This was fully met by building tight bonds among the freshmen in the cohort

as well as with upperclassmen serving as near-peer mentors. The frequent activities organized by the RISE Stars program provided opportunities for students to build friendships: "All of the people in this call, like, I'm really close with them now... I wasn't really able to go to many clubs, but RISE was one that I consistently was there. I did make a lot of friends, and it was really helpful, for, like that connection, that community aspect." [S3] In some cases, participants voluntarily planned additional activities outside of RISE. For instance, one of the social impact teams from the first semester participated in a hackathon together. A participant described the positive impact of this experience this way: "I've never been in that type of group setting before, and I just had a lot of fun. It was really stressful. But like it was really rewarding in the end, even if we didn't win. That type of teamwork and just learning how to work with people and making like pretty presentations – it was really nice." [S8] These connections also spilled over into the academic space. During their second semester, participants enrolled in several of the same CS classes and were able to study together: "Because we're all in this cohort together, it's like we all work together in those classes." [S3] The assigned mentors were described by participants using phrases such as "support system" [S1] and "friend" [S6]. Over and over, the RISE Stars praised the interpersonal relationship being built with their mentor – especially during the second semester's one-on-one Big Sister model. "We did a lot of things. It wasn't just like all about computer science and stuff. We met up regarding social events... I feel like it was less of a professional setting kind of vibe compared to the first semesters." [S7] In this way, the students could see that they were part of a larger community within GSU. The peer mentors selected clearly represented aspirational role models for participants: "The way she does her schoolwork and does internships: It makes me want to be better, and it makes me want to be more like her. So, I want to follow on her footsteps because I see where she is, and it makes me want to be a better student, better software engineer, and better in general." [S6] The presentations participants made to the junior and senior Black women were also impactful: "I was so nervous I was sick to my stomach. But when we got started it was so fun. Afterwards, all of their feedback was really encouraging." [S3]

5.3 Goal 3 Internships (Partially met)

Our third goal was to raise awareness of the importance of technical internships and prepare students to secure one as early as the summer after their freshmen year. Participants were keenly aware of the critical role of technical internships. In fact, 12 out of 13 participants applied to at least one summer internship. Seven of those who applied received interviews, with 2 participants (17% of all participants) successfully securing summer internships. Since awareness was high but the ability to secure an internship was lower than we would like, this goal is only partially met. Participants acknowledged that the program helped them prepare for gaining their internships. They appreciated the focus on resume building, networking, and technical interview preparation. When asked about which workshop was their favorite, many praised the session lead by a technical recruiter. The recruiter described what employers wanted to see on resumes and provided feedback on participant's elevator pitch: "Doing my elevator pitch ... inspired

me to keep practicing. I really liked getting to know her. I really liked getting to know what recruiters see and like want to see in their candidates.” [S3] The Discord server further facilitated internship preparation and professional development: “We had a tab called resources, and they would send in like an internship a day, like a scholarship a day which I really appreciated. We had a like a plethora of things that we could apply to.” [S5] Another RISE Stars student attributed her preparation for internship interviews to the small group sessions led by her mentor: “The reason why I was so prepared was because in our first semester small group, our mentor she really like did a lot of sessions with us, specifically, with technical interviews and practicing that. So that’s what really helped me...” [S8]

5.4 Goal 4 Confidence and Belonging (Met)

The fourth goal was to increase student confidence in their computing ability as well as a sense of belonging in computing. Our focus group discussion indicates that there were strides made in this area; however, because these numbers for our cohort were still lower than we would like, this goal is marked only as met. The Discord server was actively managed by the PC with an effort to provide overall encouragement: “The empowering messages were definitely nice. It definitely helps with like confidence and stuff because imposter syndrome is a thing.” [S7] Another participant mentioned how being with other Black women in the RISE Stars program assisted with imposter syndrome: “I was having a lot of imposter syndrome when I was in high school, because it was just me. I was like, this is really hard, and I don’t know if I can do this, and seeing that there are other Black women that can do it as well, has made me feel much more comfortable and much more confident.” [S6]

6 Lessons Learned

In this section, we reflect on the different program components and share lessons learned to inform future programming.

6.1 Group vs. Individual Mentoring

As detailed earlier, we used group and individual mentoring models to pair upperclassmen with the Stars students. Each approach had its advantages and disadvantages, and there was no clear preference among participants interviewed. During the first semester, the peer mentors were paid and given the responsibility to provide both technical and professional development for a small group of the RISE Stars, along with guiding the social impact project. The Stars participants were motivated to see how computing can be used for good. In one case that went especially well, the Stars student praised the mentor’s ability to listen to what the group wanted to do and guide them on completing the technical task: “[The mentor] was very open to like our ideas and incorporating them in the project... We were able to incorporate Google Maps, which I didn’t think was possible.” [S7] Other groups experienced difficulties when the assigned mentor did not have the necessary technical skillset to support the group. In the future, we will consider assigning the mentor after the project has been better defined. During the second semester, we transitioned to an individual mentoring model where the peer mentors served as “Big Sisters”. The mentoring relationship

was allowed to develop in an organic, unstructured way with no technical skills required. Unfortunately, some mentors were a bit lost as to what to do with the time. As one participant mentioned: “Sometimes with my current mentor we were just kind of like: ‘oh, what do we do?’ I don’t know. Let’s just talk.” [S1] Overall, we found that both forms of mentoring can be successful. The actual mentoring experience varied greatly in part based upon the level of enthusiasm from fellow students as well as the engagement from the peer mentor. In the future, we will provide the peer mentors with more structure, training, and ongoing support [6, 9].

6.2 Cohort Meetings

The RISE Stars program provided a robust calendar of events focused on program goals. When we asked participants for suggestions on how to improve this area, the overwhelming theme was “We want more!” Specific topics mentioned included more information about graduate school, career options (e.g., cybersecurity and research), behavioral interview preparation and elevator pitch practice. We plan to develop more comprehensive online resources for students on these topics. They also wanted the opportunity to have more unstructured time with the larger group. One participant recommended that we “just have a room where people can come and work on something, and like just casually interact. I think that would also be nice. For, like more connection.” [S8] We will also consider adding more informal touchpoints with less of a predefined agenda.

6.3 Program Logistics

A key challenge to program logistics was finding a suitable time for Stars students and mentors to meet. Participants had lecture classes scheduled throughout the day from Mondays through Thursday with many CS 1 labs on Friday. Some students were reluctant to meet in person during the evenings due to safety concerns. We conducted polls before events to optimize attendance. This had some success but also added administrative overhead for each activity. Timing was also a factor that limited the success of the mentoring efforts. In some cases, the peer mentor appeared to be too busy to really dedicate time to the RISE Stars. In other cases, the schedules for the mentor and Stars students were in conflict. “I know for a lot of the big sisters and mentees it felt like they didn’t have a lot of time on their plate. And it often felt like it was just like another thing that they had to do.” [S5] In the future, we will use a variety of strategies to address these issues. First, we will select a regularly scheduled meeting time well before the semester begins (e.g., blocking two hours on Friday). By announcing this during the recruitment phase, students can adjust their schedules to allow participation in the program. Second, we will consider adding hybrid or online sessions to allow participation from a larger number of students. Finally, we can consider time availability when matching mentors and Stars participants. A key success factor related to program logistics was the adaptability and responsiveness of program management, especially the student serving as Project Coordinator (PC). The PC solicited student suggestions for activities that the Stars participants wanted and adapted quickly to implement these ideas. The PC attended every event, found and posted opportunities on the Discord server, prepared all communications with students,

mentored a small group, and eagerly assisted students as needed: “[The PC] heard that I was applying for an internship, and she set up ... a virtual technical interview with me, and I really appreciate that.” [S5] The PC clearly had a passion for the program and devoted countless hours to ensuring its success. The work she performed needs to be better understood, documented, and resourced to guarantee the program is sustainable at GSU and replicable at other institutions.

7 Limitations and Conclusion

Overall, the inaugural year of the RISE Stars program was a success. We met our goals of having 100% of our participants persisting in CS, built a community of Black women in computing, instilled confidence and a sense of belonging amongst the students. We also had 92% of the cohort apply for a summer internship during their freshmen year, with 58% receiving interviews. We believe this is a model that can be replicated at other institutions. A limitation of our report is that the students self-selected to participate in the RISE Stars program, and we are only studying the outcomes of those that participated. Future work includes investigating what reasons the other FTFT Black women did not apply or participate in the RISE Stars program. Additionally, we would like to conduct a longitudinal study of the Stars’ persistence in computing, both academically and professionally.

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References

- [1] 2024. Diverse Issues in Higher Education. <https://top100.diverseeducation.com/>.
- [2] Amber V. Benton. 2020. I am Doing More than coding: A Qualitative Study of Black Women HBCU Undergraduates’ Persistence in Computing. <https://d.lib.msu.edu/etd/49560>.
- [3] Edward Dillon and Krystal L. Williams. 2020. Connecting with Computing: Exploring Black/African-American Women’s People-Centered Interests in Computing Sciences. In *Proceedings of the 2020 Research on Equity and Sustained Participation in Engineering, Computing, and Technology (RESPECT)*. 1–2. <https://doi.org/10.1109/RESPECT49803.2020.9272447>
- [4] Susan R. Fisk, Brittany Watts, Courtney Dress, Charlotte Lee, Audrey Rorrer, Tom McKlin, Tiffany Barnes, and Jamie Payton. 2024. Retaining Black Women in Computing: A Comparative Analysis of Interventions for Computing Persistence. *ACM Transactions on Computing Education* 24, 2 (2024), Article 20. <https://doi.org/10.1145/3635313>
- [5] Cari Gillen-O’Neel. 2021. Sense of Belonging and Student Engagement: A Daily Study of First- and Continuing-Generation College Students. *Research in Higher Education* 62, 1 (2021), 45–71. <https://doi.org/10.1007/s11162-019-09570-y>
- [6] Nuria Gisbert-Trejo, Eneka Albizu, Jon Landeta, and Pilar Fernández-Ferrín. 2022. Mentoring programs implementation: differences between group and individual mentoring. *Development and Learning in Organizations: An International Journal* 36, 4 (2022), 1–4. <https://doi.org/10.1108/DLO-05-2021-0091>
- [7] Natalie S. King and Rose M. Pringle. 2019. Black girls speak STEM: Counterstories of informal and formal learning experiences. *Journal of Research in Science Teaching* 56, 5 (2019), 539–569. <https://doi.org/10.1002/tea.21513>
- [8] Kristina Kramarczuk, Kate Atchison, Jandelyn Plane, and Maya Narayanasamy. 2021. The Power of Mentoring Programs in Retaining Women and Black, Indigenous, and Students of Color in Undergraduate Computing Majors. In *Proceedings of the 2021 International Conference on Computational Science and Computational Intelligence (CSCI)*. 1125–1128. <https://doi.org/10.1109/CSCI54926.2021.00237>
- [9] Stacey Levine and Anu G. Bourgeois. 2023. Improving Student Success Through Early Industry Mentorship. In *Proceedings of the 54th ACM Technical Symposium on Computer Science Education V. 2* (Toronto ON, Canada). Association for Computing Machinery, 1357. <https://doi.org/10.1145/3545947.3576301>
- [10] Stephanie Lunn, Leila Zahedi, Monique S. Ross, and Matthew Ohland. 2021. Exploration of intersectionality and computer science demographics: Understanding the historical context of shifts in participation. *ACM Transactions on Computing Education* 21, 2 (2021), 1–30.
- [11] Beronda L. Montgomery. 2018. Building and Sustaining Diverse Functioning Networks Using Social Media and Digital Platforms to Improve Diversity and Inclusivity. *Frontiers in Digital Humanities* 5 (2018). <https://doi.org/10.3389/fdigh.2018.00022>
- [12] Maria Ong, Janet M. Smith, and Lily T. Ko. 2018. Counterspaces for Women of Color in STEM Higher Education: Marginal and Central Spaces for Persistence and Success. *Journal of Research in Science Teaching* 55, 2 (2018), 206–245. <https://doi.org/10.1002/tea.21417>
- [13] Heather Pon-Barry, Audrey St. John, Becky Wai-Ling Packard, and Barbara Rotundo. 2019. A Flexible Curriculum for Promoting Inclusion through Peer Mentorship. In *Proceedings of the 50th ACM Technical Symposium on Computer Science Education* (Minneapolis, MN, USA). Association for Computing Machinery, 1116–1122. <https://doi.org/10.1145/3287324.3287434>
- [14] Yolanda A. Rankin and Jakita O. Thomas. 2020. The intersectional experiences of Black women in computing. In *Proceedings of the ACM Technical Symposium on Computer Science Education* (Portland, OR). Association for Computing Machinery, 199–205. <https://doi.org/10.1145/3328778.3366873>
- [15] Monique Ross, Zahra Hazari, Gerhard Sonnert, and Philip Sadler. 2020. The Intersection of Being Black and Being a Woman: Examining the Effect of Social Computing Relationships on Computer Science Career Choice. *ACM Transactions on Computing Education* 20, 2 (2020), Article 9. <https://doi.org/10.1145/3377426>
- [16] Cecilé Sadler, Shaundra Daily, and Alicia Washington. 2022. Work in Progress: A Novel Professional Development Program for Addressing Systemic Barriers to Computing Participation. In *Proceedings of the ASEE Annual Conference & Exposition* (Minneapolis, MN). ASEE Conferences. <https://doi.org/10.18260/1-2--41414>
- [17] Amber Solomon, DeKita Moon, Amisha L. Roberts, and Juan E. Gilbert. 2018. Not just Black and not just a woman: Black women belonging in computing. In *Proceedings of the Research on Equity and Sustained Participation in Engineering, Computing, and Technology (RESPECT)*. 1–5.
- [18] Renetta G. Tull, Autumn Marie Reed, Pamela Petrease Felder, Shawnisha Hester Lgsw, Denise Nicole Williams, Yarazeth Medina, Amanda Lo, Erika T. Aparaka, and Patricia Ordóñez. 2017. Hashtag #ThinkBigDiversity: Social Media Hacking Activities as Hybridized Mentoring Mechanisms for Underrepresented Minorities in STEM. In *Proceedings of the ASEE Annual Conference & Exposition* (Columbus, Ohio). <https://doi.org/10.18260/1-2--28430>
- [19] Judy Weng and Christian Murphy. 2018. Bridging the Diversity Gap in Computer Science with a Course on Open Source Software. In *Proceedings of the 2018 Research on Equity and Sustained Participation in Engineering, Computing, and Technology (RESPECT)* (Baltimore, MD, USA). 1–4. <https://doi.org/10.1109/RESPECT.2018.8491720>
- [20] Ryoko Yamaguchi and Jamika D. Burge. 2019. Intersectionality in the narratives of Black women in computing through the education and workforce pipeline. *Journal for Multicultural Education* 13, 3 (2019), 215–235. <https://doi.org/10.1108/JME-07-2018-0042>
- [21] Stuart Zweben and Betsy Bizot. 2023. 2023 Taulbee Survey All Degree Levels Exhibit Record Number of Graduates and Strong Enrollment. <https://cra.org/wp-content/uploads/2024/05/2023-CRA-Taulbee-Survey-Report.pdf>.