# PREPARING COMMUNITY COLLEGE STUDENTS IN STEM

## FOR SUCCESSFUL TRANSFER TO 4-YEAR INSTITUTIONS

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**ABSTRACT:**
The Academic and Career Experience (ACE) Scholarship Program at the Community College of Denver (CCD), funded by the National Science Foundation (NSFS-STEM), was designed to support academically talented, low-income students pursuing degrees in STEM. The program provides scholarships, mentorship, connections to internships, plus 4-year institution and career exploration to enhance student success and transfer readiness to four-year institutions.

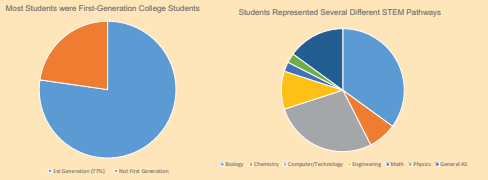
Since Fall 2021, the ACE program has sponsored 44 STEM students at CCD. Eight first generation ACE scholars were interviewed twice, once at the start of their participation in the program and once after they transferred. Overall, the results indicate that the ACE program increased student readiness for transfer, however, remaining challenges were identified, such as continued financial strain and a lack of support after transfer.

This poster presents the program components, outcomes, and lessons learned from implementing the ACE program's student-centered approach to STEM education, with a focus on first-generation students. The results underscore the critical role of mentorship, community, and financial support in preparing community college students for successful transfer in STEM disciplines.

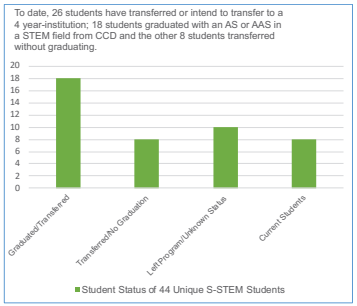
**BACKGROUND:**

- **Program:** Academic and Career Experience (ACE) Scholarship Program at Community College of Denver
- **Funding:** National Science Foundation (2021–2026) S-STEM Award 2029789 NSF Award Project Title: Scholarships with Academic and Career Support to Increase Associate STEM Degree Completion
- **Goal:** Increase STEM degree completion among low-income, academically talented students
- **Supports Provided:** Scholarships (up to $2500/semester), faculty mentoring, academic and transfer guidance throu monthly meetings, connections to 4-Year Institutions, access to research and internship opportunities
- **Focus:** First-generation and non-traditional students preparing for transfer to 4-year STEM programs

**PROJECT OVERVIEW:**
Forty-four Students Accepted into the ACE Scholarship Program

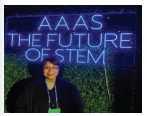


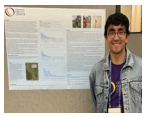

**PROJECT OUTCOMES:**

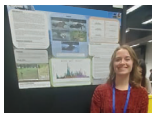



**EVALUATION RESULTS (FROM YEAR 4 EVALUATION REPORT):**
% of students responding that components of the ACE Program were at least "somewhat useful"

- **Financial Assistance (Scholarship):** 100% (*Very useful)
- **Connections to Research & Internship Opportunities:** 100% (*Very useful)
  - 10 students participated in research or internship
  - 8 students presented their research at conferences
  - 75% learned of these opportunities through the ACE program
- **Regular Meetings with Faculty Mentor:** 91% (*Very useful)
  - Students noted that mentors provided encouragement, general support, information about professional opportunities, and advice with course choices, many students commented the mentor was more helpful than the academic advisor
- **Monthly Scholars Meeting**: 91% (*Very useful)
  - Highly-regarded topics included: how to study and time management, financial health, mental health, federal vs private industry resumes/job applications, job interview skills,
  - Attendance at a national AAAS S-STEM Conference: 10 students
- **Visits to 4-year Institutions:** 71-100%, useful, depending on the institution






**EDUCATION RESEARCH OVERVIEW:**

- **Participants:** 8 ACE Scholars interviewed twice over ~2 years (2022–2024).
- **Method:** Longitudinal qualitative interviews pre- and post-transfer
- **Key Question:** What supports and challenges did students experience during the transfer process?

**Findings from the Post-Transfer Follow-up with Eight First Generation ACE Scholars:**

- ACE significantly strengthened students' STEM transfer readiness, confidence, & career development competencies
- All participants successfully transferred to four-year institutions, with smoother transitions among those earning AS degrees in specific STEM majors (Biology, Chemistry) compared to general or applied associate degrees
- Students described ACE as transformational, citing mentorship, financial support, and peer networks as the most influential components
- Faculty mentors provided individualized transfer and career guidance, helping students clarify educational goals, develop professional materials, and access internships and research opportunities
- Scholars also valued ACE workshops, field trips, and campus visits for demystifying the transfer process and exposing them to real-world STEM pathways
- The program fostered a strong sense of belonging and academic identity, validating students' abilities and solidifying commitment to STEM careers

**Challenges that Left Transfer Students Feeling Under-prepared:**

- After transfer, students felt they were "behind their peers" in making connections for research opportunities
- Many students also felt behind peers in their major in the coursework after transferring. (The first two years at CCD focuses on major pre-requisite courses and General Education requirements)
- ACE required students to use support structures, but since these supports were not always mandatory at the four-year school, students didn't seek them out or use them—even though they recognized they needed them

**Challenges Students Identified Post-Transfer:**

1. Uneven Mentoring Access
   - Hard to find equal discipline-specific mentorship at 4-year institution.
2. Financial Strain Post-Transfer
   - Students underestimated costs at 4-year institutions.… "If I had ACE-level support now, school would be so much easier."
3. Transfer Credit Confusion
   - Some non-transfer or general AS degrees limited credit acceptance.…"Always confirm transfer requirements early, I learned that the hard way."
4. Finding Undergraduate Research
   - Post-transfer students needed time to build networks for research opportunities
5. Limited Post-Transfer Resource Use
   - Some students did not utilize first-generation or transfer student support programs due to unfamiliarity or hesitance.

**Education Research Conclusions & Lessons Learned:**
An integrated approach of scholarships, mentoring, experiential learning (internships and research opportunities), and structured transfer preparation proved highly effective in promoting academic success & STEM transfer readiness among first-generation community college students.

- Early, structured mentoring significantly improves transfer readiness and self-efficacy
- STEM-specific AS degrees ease transfer and alignment with 4-year programs
- Ongoing post-transfer mentorship and undergraduate research could improve persistence
- Financial planning support before transfer remains a key need

**RECOMMENDATIONS FOR EDUCATORS AND 4-YEAR INSTITUTIONS:**

- Provide transfer-specific workshops on degree alignment and credit transfer
- Provide more opportunities and room in curriculum maps of DWD's and transfer agreements to allow community college students to take more degree specific courses at 2-year institutions
- Provide structured supports for transfer and first-generation students and/or find ways to ensure students utilize supports that are in place
- Encourage and provide structured opportunities for peer cohorts to build belonging and motivation
- Institute faculty mentoring programs especially for transfer and first-generation students
- 4- and 2-year institutions collaborate to provide more research opportunities for community college students

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