# Strategic Initiative: ECS-CSCI: Enhancing Community and Support for Bucknell Computer Science Majors

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## Description of work completed and use of funds

For this grant, we completed the following work:
- We ran 3 focus groups with CS summer research students.
- We designed and sent a survey to current Bucknell CS students in the classes of 2025-2027 about their perceptions of community within the CSCI department.
- We designed a survey for the class of 2028, to be completed during advising during orientation (and thus not yet analyzed).
- Both surveys gauged interest in a Bucknell mentoring program where CSCI upperclassmen or alumni mentored underclassmen.
- We began planning to send students to Grace Hopper, the flagship conference for women and non-binary computer scientists.  This included purchasing 10 tickets, and working with advancement to identify opportunities for alumni engagement during that conference.

For this grant, we used roughly $300 worth of funding to cover meals during student focus groups.  We were also awarded $1,000 to run a focus group among CSCI faculty and $2,000 for stipends for the primary faculty members on this grant.  However, we were not able to find a time during the summer where a critical mass of other CSCI faculty were available and interested in meeting, and elected not to take the summer stipends.

## Description of stakeholder engagement

The main stakeholders we engaged with were current students.  We did this in two ways.

First, through focus groups targeting students doing CSCI research on campus (including CSCI students doing non-CSCI research and non-CSCI students doing research with CSCI faculty). Our pool thus primarily consisted of CSCI majors, but also included CSCI minors and students from other majors working with CSCI faculty. We accommodated all students who requested to join a focus group, ultimately facilitating 13 student-meals over 3 lunches (with 3 additional students signing up but not showing up).  These focus groups were 1-2 hours over meals downtown and facilitated by 1-2 faculty members.  Conversation at these focus groups was largely free-flowing, but organized around the following questions:

1. Do you feel part of a Bucknell CSCI community? :

a.   Followup: If so, when did you feel like you were part of the community?
2.   Do you feel connected to faculty within CSCI?
a.   Followup: What has facilitated or discouraged those connections?
3.   Do you feel that there is a community across CSCI majors in Engineering and in Arts and Sciences?
a.   Followup: Have you participated in E-Week?  If so, what encouraged you to do so?  If not, was there anything that discouraged you from participating?
4.   Have you participated in any ACM/ACM-W events/meetings?
a.   Followup: If so, which?  If not, were you aware of the events?  Was there anything that discouraged you from participating?
5.   What events/experiences have been the most impactful to you within the CSCI department?
6.   What ideas/advice do you have about building a stronger community within CSCI?

Second, we surveyed students about community through Google forms, writing separate surveys for first-years and for upperclassmen.  These surveys asked students to describe their current engagement in different CS events, their interest in programs like CSCSI-specific mentoring, and ended with optional open-ended questions for additional comments.

We also engaged with university advancement through Todd Merriett about planning a student-alumni event at the Grace Hopper conference this fall.

# Findings

Our first main finding was that students were generally positive about the CSCI community, but also saw areas for improvement.  Students in the focus groups reported particularly positive feelings, which may be due to the group of students in those focus groups (students on campus generally doing research in CS, who opted in to joining a focus group).  They shared that the CS department was known for having a strong community relative to other majors, that it has lots of events, and that students see lots of emails signaling these events.

This is largely consistent with survey data: of the 18 respondents so far, not a single student reported feeling "not at all connected" to CS students in their year and major, however (⅓) of students reported feeling "not at all connected" to students in other years.  Respondents also generally felt the most connected to CS faculty (even more so than students in their own year/major):

How connected do you feel to each part of the Bucknell CS community?
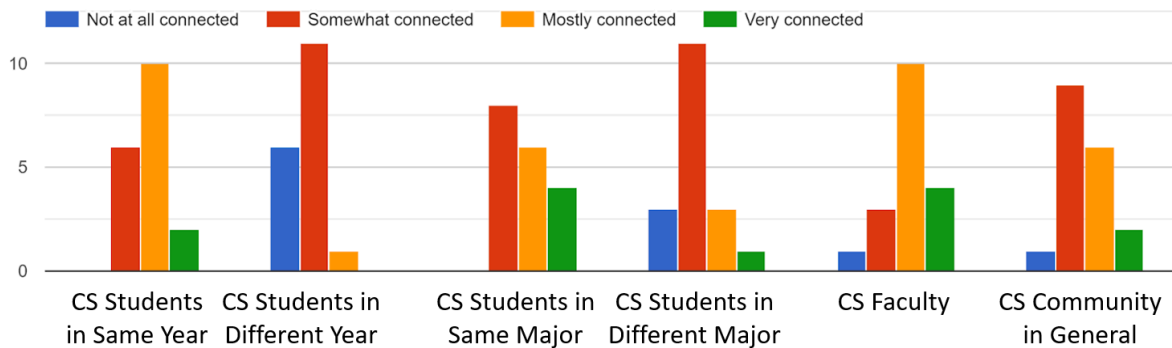


Our second major finding is that there is a particular need for programming building first-year community. This came up in focus groups, where students also noted two main reasons: there was no first-year moment where all students took the same course together, and students felt shy about attending events as first-years. Survey data corroborates this: all 8 of the students who reported feeling mostly or very connected to the CS community in general were in the class of 2025 or 2026, with the vast majority (6-of-8) in the class of 2025.

Our third major finding is a demand for certain types of programming. Students reported the most positive feedback about social events bringing together faculty and students. For instance, we received 10 responses to the question "What events/experiences have been most useful in joining the computer science community?" 60% focussed on events like Pancakes with the Profs and CS ice cream socials or on projects/interactions with faculty; another distinct 30% noted E-Week and the ACM club, which also mix faculty and students. Departmental social events and ACM/ACM-W events were the most attended.

In contrast, students expressed support for more mentoring opportunities: 17/18 reported being at least somewhat interested in a mentoring program that connected them with an alumni, and 14/18 reported being at least somewhat interested in mentoring new Bucknell students. At focus groups, students were not particularly aware of existing mentoring opportunities.

Finally, in discussing what events were most successful / compelling, students frequently highlight free food and swag as reasons to attend an event. Similarly, students valued having a shared space (e.g. with one survey respondent writing "our shared space in Dana is useful").

## Recommendations for implementation

Our recommendation is to initiate a peer and alumni mentoring program for the CSCI department. This two-pronged approach aims to foster a more connected and supportive community across all student levels.

The peer mentoring component will pair first-year students with upperclassmen, addressing the current disconnect felt by new students. Through one-on-one meetings, these mentorship relationships will help integrate newcomers into the CSCI community and provide valuable guidance from experienced peers.

Complementing this, the alumni mentoring program will connect sophomore and junior students with CSCI graduates. This initiative will offer insights into career paths, industry trends, and professional development through regular virtual meetings and when possible in-person events on campus (e.g. Homecoming, etc.).

To further build community and strengthen the bond between current students and alumni, we also recommend organizing a trip to the Grace Hopper Celebration. This annual conference is an unparalleled opportunity for students to network with women in computing from around the world, gain inspiration from keynote speakers, and participate in professional development workshops. By attending as a department, students and alumni can deepen their connections, share experiences, and reinforce the support system we've established through our mentoring programs.

Both programs will be strategically integrated with popular existing events like "Pancakes with the Profs" and CS ice cream socials, leveraging the strong faculty-student relationships already present in the department. We'll utilize shared spaces, such as the area in Dana 319, to reinforce the sense of community.

To boost participation and enthusiasm, we'll incorporate incentives that students have indicated they value, such as food at events and CSCI-branded merchandise. This approach not only attracts attendees but also helps build a shared identity within the department.

# Measures of success if implemented

### 1. Peer Mentoring Program

- **Student Engagement:** Track attendance and participation in one-on-one meetings. Success could be indicated by high participation rates.
- **Retention Rates:** Compare the retention rates of first-year students involved in the program to those not involved. An increase in retention would suggest the program's effectiveness.
- **Surveys and Feedback:** Conduct pre- and post-program surveys to assess changes in students' sense of belonging, confidence, and satisfaction with their experience in the CSCI department.
- **Academic Performance:** Monitor any improvements in the academic performance of first-year students participating in the program, such as GPA increases or a reduction in the number of students on academic probation.

### 2. Alumni Mentoring Program

- **Mentor-Mentee Interaction Frequency:** Track the frequency and quality of interactions between alumni mentors and student mentees. Higher interaction rates could correlate with stronger relationships and better outcomes.
- **Alumni Engagement:** Assess the level of continued involvement from alumni mentors. A higher retention rate of alumni in the program over the years would indicate a successful and rewarding experience.

### 3. Grace Hopper Conference

- **Post-Conference Surveys:** Administer surveys to attendees to evaluate the impact of the conference on their professional development, networking, and motivation in their field.
- **Career and Academic Advancements:** Track any subsequent career opportunities, internships, or academic achievements that attendees attribute to their experience at the conference.
- **Community Impact:** Ask students who attended the conference to share their experiences and knowledge with peers, thereby spreading the benefits to the wider CSCI community and growing interest in future years.

## How this will connect to or enhance existing resource or programs on campus

Peer mentors can help connect students to existing campus resources such as the Teaching and Learning Center (TLC), study groups, the Office of Accessibility Resources (OAR), Center for Career Advancement (CCA), Global & Off-campus Education, Civic Engagement, etc. This comprehensive support system will bridge academic guidance and professional development.

## How this will positively impact students

Sending students to Grace Hopper has the potential to build CS community in several ways, including ways that were explicitly flagged by students in focus groups and survey data:

- First-years who attend will get to travel with students from all years, finding connections within CSCI.  Grace Hopper specifically supports women and non-binary computer science students, who are not as represented in CS.  Alvarado, Dodds, and Libeskind-Hadas, in I*ncreasing Women's Participation in Computing at Harvey Mudd College*, note that facilitating travel to Grace Hopper was one of three main strategies that increased the percentage of women students in their CS major from 12% to 40%.

- Students were very excited about the prospect of an alumni mentoring program.  Work with advancement will facilitate connections between alumni and students during the conference.

- Students who attend Grace Hopper will be invited to share their experience with other students as part of a departmental panel, building a culture supporting academic opportunities.

# How this connects to the strategic goals of the college and/or university

This proposal builds off of the initial themes identified in the proposal: supporting Student Success and High-Impact Educational Experiences. Conference travel supports students to foster new connections (both within the travel cohort and within the larger CS community), to meet alumni and leaders in the field, and to see different directions for CS majors.  As noted about, Alvarado, Dodds, and Libeskind-Hadas, in I*ncreasing Women's Participation in Computing at Harvey Mudd College*, flagged how highly-impactful the specific Grace Hopper conference is.  This high-impact education experience then supports student success, through increased belonging.

# Proposed implementation timeline and approximate budget with justification

**1. Peer Mentoring Program:**

- **Meeting Incentives** (coffee, 7th st. snacks, etc.): $20/meeting x 60 meetings = **$1,200**
- **CSCI-Branded Merchandise** (t-shirts, mugs, etc.): $30/item x 60 items = **$1,800**
- **Incentives for Mentors** (gift cards, recognition): $50/mentor x 20 mentors = **$1,000**

**Total for Peer Mentoring Program: $4,000**

**2. Alumni Mentoring Program:**

- **CSCI-Branded Merchandise** (additional for alumni): $30/item x 50 items = **$1500**

**3. Grace Hopper Conference:**

- **Conference Registration**: $749/student x 10 students = **$7,490**
- **Travel and Accommodation**: $1,200/student x 10 students = **$10,012**
- **Alumni Event**: **$3,000**

**Total for Grace Hopper Conference: $20,502**

**4. Miscellaneous/Contingency (~5%): $1,498**

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**Total Budget: $27,500**