



CRA-E/CRA-WP CSGrad4US Mentoring Program: Cohort One Year One Immediate Impact Evaluation Report

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COMPUTING RESEARCH ASSOCIATION



CERP

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Evaluation



CRA-E

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Education



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To learn more about CRA's Center for Evaluating the Research Pipeline, please visit our website: <http://cra.org/cerp>. Questions regarding this report and/or requests for other related documents please contact: cerp@cra.org.

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About CERP & Acknowledgements

The Computing Research Association's (CRA) Center for Evaluating the Research Pipeline (CERP) is a research and evaluation center whose mission is to promote diversity in computing. CERP serves as a resource for the computing community by supporting efforts to recruit and retain individuals considered underrepresented in computing or historically marginalized (i.e., women; people who are Black/African American, Hispanic/Latinx, Indigenous and First Nations, Native Americans, Alaska Natives, Native Hawaiians, and Pacific Islanders; persons with disabilities; persons from low-income backgrounds; first generation college students; LGBTQIA+ individuals; and veterans). More generally, CERP strives to inform the computing community about patterns of entry, subjective experiences, persistence, and success among individuals involved in academic programs and careers related to computing.

CERP was created by the Committee on the Status of Women in Computing Research (CRA-W)/Coalition to Diversify Computing (CDC) Alliance through a National Science Foundation grant to the Computing Research Association (CNS-1246649). The current research was supported by NSF grant CNS-2123180. Any opinions, findings, conclusions, and recommendations are the authors' and do not necessarily reflect the views of the National Science Foundation.

For more information about CERP, visit <http://cra.org/cerp/>.

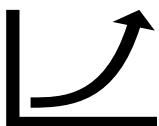
Executive Summary

The Computing Research Association's (CRA) Center for Evaluating the Research Pipeline (CERP) provided evaluation for the CSGrad4US Mentoring Program by assessing the impact of the program on the fellows' experiences applying to graduate school and their first-year graduate school experiences. CERP employed a pretest-posttest framework in each of the two years of the program. In this report, evaluation findings will focus on cohort one mentees' experiences in the program in the first year, where CERP examined the cohort's experiences and impacts in applying to graduate school at program entry (Time 1) and after applying to graduate programs (Time 2). Evaluation results suggest that the program had a positive immediate impact on some fellows' graduate school preparation and professional outcomes. In addition, Cohort 1 participants provided feedback to improve the program for future cohorts.

YEAR ONE KEY FINDINGS #1: IMMEDIATE IMPACTS

After year one in CSGrad4US Mentoring Program, cohort one mentees who completed both Time 1 and Time 2 program surveys showed the following:

- Significant increases in the following outcomes:



Perceived mentorship support
Perceived professional network
Knowledge in graduate school application

- No Observed Significant Changes in The Following Outcomes:



Identification in computing
Sense of belonging
Self-efficacy in graduate school application
Future career and employment preferences

YEAR ONE KEY FINDINGS #2: PROGRAM-SPECIFIC FEEDBACK

Quality of CSGrad4US Mentoring Program



On average, participated highly rated and appreciated the quality of the **CSGrad4US individual coaching** supporting their graduate school application.

Overall Feedback on Program's Mentoring and Coaching Activities

Positive Feedback

- Mentees highlighted the program's impact on building confidence, facilitating career transitions from industry to graduate school, and providing valuable mentorship.
- Mentees appreciated the effective coaching and their coach's involvement in their graduate school applications.

Suggestions and Recommendations

- Mentees express the need for more information on identifying research interests, selecting classes after acceptance, and understanding the research process to make decisions about choosing the right school.
- Mentees expressed a desire for increased social time and coordination among attendees to discuss application progress and doubts about graduate school life.
- Mentees recommended using communication platform, such as Slack, for fellows to connect and support each other throughout the process.
- Some mentees noted redundancy between meetings and coaching sessions and recommend minimizing repeated information.
Some mentees suggested that the timing of certain sessions, such as those related to succeeding in graduate school and the PhD application process, could be more aligned with the application cycle timeline.

Overall Feedback on Mentees' Concerns Related to their Participation.

Funding Concerns

- Mentees expressed concerns about how funds will be disbursed once they begin their first semester in their graduate program.
- Some mentees were unclear about the structure of funding and express a desire to see more details understand its utilization better.
- Mentees mentioned confusion about how fellowships work, particularly about potential interactions with other internal school scholarships.

Transitions & Lifestyle Adjustments

- Mentees expressed general concerns about going back to school after several years, including the challenges of adjusting to a new lifestyle.
- Some mentees raised the question of whether the program has any issues with participants working while enrolled in their program and seeks clarification on this aspect.

Future Admissions & Professional Goals

- Some mentees expressed concerns about whether they will be able to get admitted next year, possibly tied to personal factors.
- Few mentees expressed their concern not to be dropped from CSGrad4US for not being admitted to a program.
- Mentees discussed the challenge of keeping their goals secret from their employer, indicated a potential need for support in managing professional and academic aspirations.
- Some mentees expressed a desire for periodic meetings to discuss their progress, indicated the need for ongoing guidance.

Overall Feedback on Valuable Aspects of Program

Mentoring & Coaching Appreciation

- Mentees found the individual weekly or bi-weekly mentor meetings very helpful in the process of writing and completing their graduate applications.
- One-on-one coaching sessions were highlighted as invaluable, providing personalized experiences, and helping mentees gain confidence in navigating their options.
- Networking with mentees were mentioned as a valuable aspect, providing insights into academia and helping mentees understand what life inside academia is like.

Increase Knowledge in Graduate School Process

- Some mentees emphasized the significant value of learning the complexities of the application process, providing clarity on what is needed to make their applications stand out.
- Mentees appreciated the value in learning about the process of applying to graduate school, indicating a better understanding of the steps involved.

Perspective Shift & Confidence Building

- The program and mentorship were appreciated by the mentees to have the confidence to believe that attending graduate school was within their aspirations.

- The program's impact on the mentees to envision themselves as a Ph.D. student was valuable, contributing to mentees' understanding of the graduate school life.

Additional Program-Specific Feedback

Overall Appreciation

- Mentees acknowledged the impact of working with their mentors describing it as one of the defining moments of their life. This emphasizes the positive influence of mentorship in the program.
- Few mentees shared their personal journey from industry to academia, highlighting the importance of programs like CSGrad4US for individuals prioritizing financial stability before transitioning to a research career.
- One feedback voiced their belief that academia and research must offer higher pay and continue creating programs like CSGrad4US to attract and retain passionate researchers, particularly from underrepresented communities.

Overall Recommendations

- Mentees recommend having meeting videos available immediately after sessions in format with notes. This feedback indicates a preference for easily accessible resources to reinforce learning.

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1. Introduction

The Computing Research Association's Committees on Education (CRA-E) and Widening Participation (CRA-WP) collaboratively implemented the CSGrad4US Mentoring program for recipients of the National Science Foundation's (NSF) CSGrad4US Graduate Fellowships. The program targets individuals currently in the workforce who are planning to return to computing-related graduate programs. The goals of the CSGrad4US Mentoring Program are (1) to guide returning students through the application process towards a successful graduate admission and school selection, (2) mentor them through the transition to graduate study in the first year towards high retention, and (3) increase the domestic pipeline of students earning graduate degrees in computing.

The CSGrad4US Mentoring Program offered for the CSGrad4US Fellows to address the unique needs and situations of those in the workforce who want to return to school. Through this program, fellows will receive both group mentoring and individual coaching over the course of two years. In the first year, mentees were advised on the graduate school application and selection process. In the second year, mentees were advised on having a successful first year of their doctoral program.

Report Overview

Employing a quasi-experimental research approach with a comparative pre-test-posttest framework, the CRA Center for Evaluating the Research Pipeline (CERP) conducted an evaluation of the year one of CSGrad4US Mentoring Program. CERP used an online survey to distribute to mentees at program entry (Time 1) and program exit (Time 2). In the first year, CERP examined cohort one participants' goals, aspirations, and experiences with their graduate school applications. The surveys also aimed to assess the immediate impact of the mentoring provided in the first year on the fellows. The Time 2 survey included open-ended feedback questions, allowing participants to provide insights into the impacts of the mentoring received during the first year. This report focuses on the analysis of 34 cohort one participants, discussing the results and assessing any immediate impacts on the mentees' outcomes, such as social support and graduate school preparation, in relation to the program's goals.

2. Evaluation Methodology

Data Collection Activities

CERP employed a pretest/posttest framework to assess the impact of the CSGrad4US Mentoring Program. The evaluation involved administering surveys at two distinct time points: program entry (Time 1) and immediately upon program completion (Time 2). At program entry, CERP distributed a pre-program survey to gather information on participants' demographics, past educational history, and initial perceptions of career interests, social support, and motivations for pursuing graduate school. The post-program survey was administered after program completion, which measured changes in participants' perceptions across various measures outlined in the Program Measures section. Additionally, this survey included questions seeking participants' feedback and evaluation of the program's impact on their graduate school experiences.

Program Measures

For the evaluation of the CSGrad4US Mentoring Program, CERP examined the impacts during the first year of the program using the following self-reported quantitative outcomes: identification with computing, sense of belonging, graduate school knowledge/preparedness, perceived mentorship support, perceived professional network, and career interests.

Analyses

Pre/post comparisons of CSGrad4US cohort one mentees were analyzed using a paired samples t - test on each Likert-scale outcome measure (e.g., measures rated on a scale from 1 to 5 to create a mean score). Two-proportions z -tests were used to test differences between proportions of groups (e.g., measures with only one response option thus creating the percentage of participants who selected a particular option). For each statistical test, we indicate whether differences in means or proportions from Time 1 to Time 2 are statistically significant using the conventional, $p \leq .05$ thresholds for inferential statistics.

It is important to note that positive changes between Time 1 and Time 2 responses suggest, but do not prove, the positive impact of the fellowship. Due to limitations inherent in pretest/posttest self-reported data, changes between Time 1 and Time 2 could be due to response bias, demand characteristics, or may be fleeting and not sustained over time.

Qualitative data (i.e., open-ended comments) were analyzed using a thematic coding scheme, wherein patterns among open-ended comments were grouped together and summarized as an over-arching theme or ideas.

3. Participant Characteristics

SECTION OVERVIEW

This and the following sections report the participant characteristics for cohort one CSGrad4US program participants, based on the cohorts' responses on the Time 1 (pre-program) survey. The sections tables highlight the cohort on the following characteristics:

- Demographics
- Post Undergraduate Activities and Research Experiences

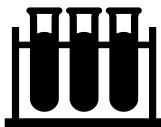
SECTION KEY FINDINGS

DEMOGRAPHICS



Most mentees identified as **White/Caucasian (61%)**, **having no disability (62%)**, and **male (62%)** (Tables 3.1, 3.4, and 3.5).

POST-UNDERGRADUATE ACTIVITIES AND RESEARCH EXPERIENCES



At program entry, majority of Cohort 1 mentees were involved in **course-based research projects and independent research projects** in their undergraduate programs (Table 3.6).



Cohort 1 mentees had a lot of experience in **collaborating with colleagues** on research projects before starting CSGrad4US Mentoring Program (Table 3.8).

Table 3.1. What is your race/ethnicity?

	CSGrad4US Participants
	Percentage
Black or African American	11%
Native Alaskan or American Indian	4%
Native Hawaiian or Pacific Islander	4%
White or Caucasian	61%
Asian/Southeast Asian	32%
Other	4%
Latinx	14%
n	28

(*) p ≤ .05; (N/A) n<5 or test criteria were not met. Select all that apply.

Table 3.2 Participant veteran status.

	CSGrad4US Participants
	Percentage
No	97%
Yes	3%
n	30

(*) p ≤ .05; (N/A) n<5 or test criteria were not met.

Table 3.3. Participant gender.

	CSGrad4US Participants
	Percentage
Woman	34%
Man	62%

CSGrad4US Participants	
Non-binary	3%
Gender-queer/non-confirming	0%
n	29
(*) p ≤ .05; (N/A) n<5 or test criteria were not met.	

Table 3.4 What type of disability do you have?

CSGrad4US Participants	
	Percentage
None	62%
Attention deficit or ADD/ADHD	9%
Deaf or hard of hearing	3%
Autism spectrum disorder or ASD	6%
Health related	3%
Learning or other invisible	3%
Mental health	6%
Mobility	0%
n	34
(*) p ≤ .05; (N/A) n<5 or test criteria were not met. Please check all that apply.	

Table 3.5 In what year did you complete your most recent undergraduate degree?

CSGrad4US Participants	
	Percentage
2016	9%
2017	12%
2018	32%

CSGrad4US Participants	
2019	47%
2020	0%
2021	0%
n	34

(*) p ≤ .05; (N/A) n<5 or test criteria were not met.

Table 3.6. Up to this point in your undergraduate program, which of the following experiences were you involved in that were NOT part of a formal REU?

CSGrad4US Participants	
	Percentage
Independent research projects	48%
Course-based research projects	52%
Internships or co-ops	48%
Research Assistant	27%
Teaching Assistant	33%
K-12 outreach	21%
None of the above	6%
n	33

(*) p ≤ .05; (N/A) n<5 or test criteria were not met. Select all that apply.

Table 3.7. What experiences were you involved in during your undergraduate program that were NOT part of a formal REU?

CSGrad4US Participants	
	Percentage
Entrepreneurial or consulting projects	9%

CSGrad4US Participants	
Computing-related student groups	45%
n	33
(*) p ≤ .05; (N/A) n<5 or test criteria were not met. Select all that apply.	

Table 3.8. How much experience have you had with

CSGrad4US Participants	
	Mean (SD)
Generating hypotheses	2.55 (1.12)
Using scientific methods to test a hypothesis	2.94 (1.20)
Collaborating with colleagues	3.58 (1.25)
Collecting data or conducting experiments	3.21 (1.22)
Analyzing data with statistics or other tools	3.18 (1.26)
Summarizing published research results	2.55 (1.06)
Explaining research results	2.85 (1.23)
Writing or co-authoring a research paper or report	2.24 (1.03)
Presenting a research paper or report	2.30 (1.10)
Publishing a research paper or report	1.67 (0.82)
n	33
(*) p ≤ .05; (N/A) n<5 or test criteria were not met. (1) None - (5) A lot	

4. Cohort 1 Pre-Post Program Findings

Self-Perceptions and Self-Efficacy in Graduate School Preparation

SECTION OVERVIEW

This section summarizes cohort one mentees' attitudes, sense of belonging, and confidence in applying to graduate school programs at program entry and after applying for graduate school (Time 2) that relate to their future and current educational paths including:

- Identification and belonging in computing.
- Perceived scientific identity.
- Self-efficacy in the graduate school application.

SECTION KEY FINDINGS

IDENTIFICATION WITH COMPUTING



There were no significant differences over time in Cohort 1's mentees' computing identity. However, there was little movement in the scores over time in the following statements: "I see myself as a computing person" and "I feel welcomed in computing" (Table 4.1).

PERCEIVED SCIENTIFIC IDENTITY



There were no significant differences over time in Cohort 1's participants' computing identity. However, there was little movement in the scores over time in having a strong sense of belonging to the community of scientists (Table 4.2)

SELF-EFFICACY IN GRADUATE SCHOOL APPLICATIONS



There were no significant differences over time in Cohort 1's mentees' confidence in applying to graduate school and achieve in the careers. However, there was little movement in the scores over time in **completing a graduate degree program and finding employment in area of computing interests**. (Table 4.3).

Table 4.1. Please indicate the extent to which you disagree or agree with the following statements.

	Time 1	Time 2	Sig.
	Mean (SD)	Mean (SD)	
I see myself as a computing person.	3.97 (1.07)	4.13 (0.99)	
I feel like I belong in computing.	3.75 (0.95)	3.97 (0.98)	
I feel like an outsider in computing.	2.73 (1.31)	2.61 (1.20)	
Computing is a big part of who I am.	3.64 (1.29)	3.77 (1.12)	
I feel welcomed in computing.	3.91 (0.80)	4.13 (0.88)	
n	33	31	

(*) p ≤ .05; (N/A) n<5 or test criteria were not met. (1) Strongly disagree - (5) Strongly agree

Table 4.2 Please indicate the extent to which you agree with each statement.

	Time 1	Time 2	Sig.
	Mean (SD)	Mean (SD)	
In general, being a scientist is an important part of my self-image.	3.45 (1.28)	3.42 (1.29)	
I have a strong sense of belonging to the community of scientists.	3.06 (1.09)	3.26 (1.34)	
Being a scientist is an important reflection of who I am.	3.39 (1.27)	3.06 (1.29)	

	Time 1	Time 2
I have come to think of myself as a scientist.	3.03 (1.40)	3.03 (1.28)
n	33	31
(*) p ≤ .05; (N/A) n<5 or test criteria were not met. (1) Strongly disagree - (5) Strongly agree		

Table 4.3. I am confident that I can:

	Time 1	Time 2	Sig.
	Mean (SD)	Mean (SD)	
Choose graduate programs that are well-suited to my goals.	3.91 (0.98)	4.00 (1.04)	
Prepare a strong graduate application package.	3.67 (1.19)	3.75 (1.06)	
Get admitted to a graduate computing program.	3.88 (1.08)	3.83 (1.19)	
Be successful in a graduate computing program.	4.21 (0.82)	4.42 (0.72)	
Complete a graduate degree program	4.42 (0.79)	4.45 (0.81)	
Be a capable researcher in computing.	4.45 (0.75)	4.42 (0.72)	
Find employment in an area of computing interest.	4.52 (0.71)	4.71 (0.53)	
n	33	31	
(*) p ≤ .05; (N/A) n<5 or test criteria were not met. (1) Strongly disagree - (5) Strongly agree			

Mentor and Professional Support Structures

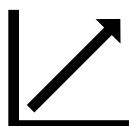
SECTION OVERVIEW

This section shows the changes in their social support structures among Cohort 1 program participants, based on their responses on the program surveys. The sections tables highlight the following measures:

- Mentor Support
- Professional Network

SECTION KEY FINDINGS

MENTOR SUPPORT



Cohort 1 participants reported stronger mentorship, wherein they were more likely than at program entry to have access to **mentors who can talk about research topics, challenges of going back to graduate school after working, and provide information on the graduate school process** (Table 4.4).

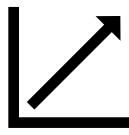


The most responses for Cohort 1 participants to consider someone as a mentor were **coworker, supervisor, or someone else with whom they have a professional relationship** and **family member, partner, friend, religious leader, or someone else with whom they have a personal relationship** (Table 4.6).



Cohort 1 participants reported that they have a mentor who helped them **explore career options** and **prepare a career in academia** (Table 4.7).

PROFESSIONAL NETWORK



Cohort 1 participants reported having available professional support wherein they were more likely than at program entry to have access to **people whom they can ask about professional development questions and a strong network of peers and mentors to interact with at conferences** (Table 4.5).

Table 4.4. To what extent do you have access to

	Time 1	Time 2	Sig.
	Mean (SD)	Mean (SD)	
People you can talk to about research topics you find interesting?	3.09 (0.98)	3.61 (0.99)	*
People you can talk to about the challenges of going back to graduate school after working?	2.39 (1.20)	3.19 (1.05)	*
People who can give you advice about applying to graduate school?	2.85 (1.12)	3.33 (0.89)	
People who can give you information about what graduate school is like?	3.36 (1.14)	3.90 (0.91)	*
People you can talk to about balancing professional and personal responsibilities?	2.91 (1.28)	3.35 (1.05)	
n	33	31	
(*) p ≤ .05; (N/A) n<5 or test criteria were not met. (1) None - (5) Very much			

Table 4.5. To what extent is each of the following available to you at this point?

	Time 1	Time 2	Sig.
	Mean (SD)	Mean (SD)	
People whom you can ask professional development questions?	3.00 (1.15)	3.61 (0.92)	*
A strong network of peers to interact with at conferences?	1.55 (0.75)	2.26 (1.15)	*

	Time 1	Time 2	
A strong network of mentors to interact with at conferences?	1.61 (0.70)	2.29 (1.07)	*
People who would be excited to learn about your professional successes?	3.36 (1.14)	3.32 (1.05)	
People with whom you can discuss issues you are having?	3.03 (1.07)	3.26 (1.09)	
n	33	31	
(*) p ≤ .05; (N/A) n<5 or test criteria were not met. (1) None - (5) Very much			

Table 4.6. Who do you consider to be a mentor?

	Time 1	Time 2	
	Percentage	Percentage	Sig.
My academic advisor from my undergraduate institution	21%	20%	
A professor from my undergraduate institution (not my advisor)	58%	43%	
A faculty member from an academic institution other than my undergraduate institution	36%	43%	
A Director or administrative faculty	9%	17%	N/A
A graduate student (includes graduate teaching/research assistants and student mentors)	36%	43%	
An undergraduate student (includes undergraduate teaching/research assistants and student mentors)	3%	10%	N/A
Someone I met at a conference or mentoring program sponsored by an outside organization (or other professional activity)	15%	13%	N/A

	Time 1	Time 2
A family member, partner, friend, religious leader, or someone else with whom I have a personal relationship	61%	60%
A coworker, supervisor, or someone else with whom I have a professional relationship	76%	80%
Someone else	6%	7%
I do not have a mentor	0%	7%
n	33	30
(*) p ≤ .05; (N/A) n<5 or test criteria were not met. Select all that apply.		

Table 4.7. To what extent do you have a mentor who:

	Time 1	Time 2	
	Mean (SD)	Mean (SD)	Sig.
Helps you improve your computing skills?	2.45 (1.23)	2.67 (1.15)	
Helps you improve your research skills?	2.55 (1.33)	3.07 (1.14)	
Helps you identify or develop your research interests?	2.39 (1.27)	3.00 (1.17)	
Gives you insight into what graduate school is like?	2.88 (1.24)	3.50 (1.28)	
Provides information or advice about applying for graduate school?	2.79 (1.17)	3.18 (1.08)	
Explores career options with you?	2.27 (1.13)	2.90 (1.27)	*
Shows compassion for any issues you discussed with them?	3.52 (1.18)	3.73 (1.01)	
Shares personal experiences as an alternative perspective to your problems?	3.18 (1.18)	3.30 (1.12)	
Prepares you for a career in academia?	2.45 (1.18)	3.17 (1.23)	*
Provides constructive feedback?	3.12 (1.22)	3.63 (1.07)	

	Time 1	Time 2
n	33	30
(*) p ≤ .05; (N/A) n<5 or test criteria were not met. (1) None - (5) Very much		

Table 4.8. Overall, how satisfied are you with the amount of mentoring support you have for issues related to your professional life?

	Time 1	Time 2	
	Mean (SD)	Mean (SD)	Sig.
Overall, how satisfied are you with the amount of mentoring support you have for issues related to your professional life?	2.91 (1.21)	3.73 (1.01)	*
n	33	30	
(*) p ≤ .05; (N/A) n<5 or test criteria were not met. (1) Extremely dissatisfied - (5) Extremely satisfied			

Table 4.9. Overall, how satisfied are you with the amount of peer support you have for issues related to your personal life?

	Time 1	Time 2	
	Mean (SD)	Mean (SD)	Sig.
Overall, how satisfied are you with the amount of peer support you have for issues related to your personal life?	3.58 (1.09)	3.53 (1.07)	
n	33	30	
(*) p ≤ .05; (N/A) n<5 or test criteria were not met. (1) Extremely dissatisfied - (5) Extremely satisfied			

Graduate School Motivations, Knowledge, & Application Preparation

SECTION OVERVIEW

This section's findings and tables summarizes Cohort 1 participants' motivation, knowledge, and preparedness in applying to graduate school throughout their participation in the program, including:

- **Graduate School Motivations**
- **Graduate School Preparation & Application**
- **Knowledge about Graduate School**

SECTION KEY FINDINGS

GRADUATE SCHOOL MOTIVATIONS



The most responses for Cohort 1 fellows' motivations to apply to graduate school were **they wanted to make an impact on society with their advanced degree and future career** and **work on advanced research projects** (Table 4.10).



On average, participants reported that they are more likely **to have work colleagues who are supportive of their decision to apply to graduate school** (Table 4.11).

GRADUATE SCHOOL PREPARATION & APPLICATIONS



On average, participants reported that they are more likely to **successfully complete a doctoral program, if they are accepted** (Table 4.12).

KNOWLEDGE ABOUT GRADUATE SCHOOLS



After Year 1, Cohort 1 mentees showed **significant improvement** in their knowledge and learning about the graduate school process (e.g., application materials, resume/CV, etc.) (Table 4.14).

Table 4.10. Which of the following are your biggest motivations for deciding to apply to graduate school?

	CSGrad4US Participants
	Percentage
Wanting to continue my learning	73%
Making an impact on society with an advanced degree	76%
Feeling limited in my current career options	9%
Disliking the work I am currently doing	12%
Wanting to work with a specific professor	6%
The job market for advanced degrees is promising	0%
My dream job requires an advanced degree	18%
Wanting to work on advanced research projects	73%
Wanting to make a lot of money	9%
My family or friends encouraged me to apply	0%
Other; please specify:	9%
n	33

(*) p ≤ .05; (N/A) n<5 or test criteria were not met. Choose up to 3 items below.

Table 4.11. To what extent are each of the following statements true for you?

CSGrad4US Participants	
	Mean (SD)
I have friends who are or have been in graduate programs who tell me what it is like.	3.42 (1.37)
I am unsure about what research area I want to focus on in graduate school.	2.64 (1.39)
I have already identified one or more programs where I want to apply to graduate school.	3.45 (1.30)
My supervisor at work knows all about my current graduate school plans.	3.27 (1.64)
I have work colleagues who are supportive of my decision to apply to graduate school.	3.72 (1.10)
It will be difficult for me to leave my current job to attend graduate school.	2.07 (1.20)
I have strong connections to my former professors and advisors from my undergraduate program.	3.03 (1.24)
I am concerned that my academic background is not strong enough to get me into graduate school.	2.58 (1.39)
I wonder how well I will be able to handle the stress of graduate school.	3.03 (1.42)
n	33
(*) p ≤ .05; (N/A) n<5 or test criteria were not met. (1) Not at all true - (5) Extremely true	

Table 4.12. How likely is it that

CSGrad4US Participants	
	Mean (SD)

CSGrad4US Participants	
You will apply to one or more doctoral programs in computing this fall?	3.67 (1.55)
You will receive admission to one or more doctoral programs in Spring 2022?	2.94 (1.37)
If accepted, you will enroll in a doctoral program for Fall 2022?	3.72 (1.35)
If accepted, you will successfully complete your doctoral program?	4.28 (0.89)
n	32
(*) p ≤ .05; (N/A) n<5 or test criteria were not met. (1) Not at all likely - (5) Extremely likely	

Table 4.13. How committed are you to completing a doctoral degree program?

CSGrad4US Participants	
	Mean (SD)
How committed are you to completing a doctoral degree program?	4.00 (1.20)
n	33
(*) p ≤ .05; (N/A) n<5 or test criteria were not met. (1) Not at all likely - (5) Extremely likely	

Table 4.14. How much do you feel you know about

	Time 1	Time 2	Sig.
	Mean (SD)	Mean (SD)	
How to find graduate programs that are right for you?	2.58 (0.87)	3.78 (1.01)	*
What to look for in a graduate research advisor?	2.52 (1.00)	3.84 (0.88)	*
Whether your graduate school goals are realistic?	2.52 (1.06)	3.66 (1.00)	*

	Time 1	Time 2	
How to identify and approach good candidates for writing your letters of recommendation?	2.67 (0.89)	4.03 (0.97)	*
How to write a strong resume for your graduate applications?	2.55 (1.00)	4.00 (0.98)	*
How to write a strong personal statement for your graduate applications?	2.42 (0.97)	4.00 (0.92)	*
What parts of your background you should emphasize in graduate applications?	2.64 (1.06)	3.88 (1.04)	*
Which research areas you would like to pursue in graduate school?	3.15 (1.15)	3.72 (1.02)	*
What graduate admissions committees look for in an applicant?	2.39 (1.00)	3.62 (1.13)	*
How to choose between different graduate programs that may offer you admission?	2.30 (1.21)	3.12 (0.98)	*
What to do during site visits for potential graduate programs?	1.67 (1.08)	3.12 (1.07)	*
How to choose your graduate courses?	1.76 (1.09)	2.41 (1.01)	*
What doing research as a graduate student is like?	2.55 (1.03)	3.12 (1.04)	*
n	33	32	
(*) p ≤ .05; (N/A) n<5 or test criteria were not met. (1) Nothing - (5) A lot			

Future Career Interests & Preferences

SECTION OVERVIEW

This section summarizes Cohort 1 participants' future career/professional interests and preferences at program entry, including their general job interests and preferred career setting.

SECTION KEY FINDINGS



Cohort 1 participants were very interested **in becoming a computing researcher in the industry** (Table 4.15) and **more likely to work in academia** (Table 4.16).

Table 4.15. How interested are you in having the types of jobs listed below after you finish your highest degree?

CSGrad4US Participants	
	Mean (SD)
College or university professor in computing field (teaching focused)	4.06 (1.14)
College or university professor in computing field (research focused)	4.12 (0.99)
Computing researcher in industry	4.15 (0.71)
Computing researcher in a government lab or agency	3.58 (1.23)
Entrepreneur (computing related; e.g., individual contractor, build a start-up)	3.48 (1.50)

CSGrad4US Participants	
n	33
(*) p ≤ .05; (N/A) n<5 or test criteria were not met. (1) Very uninterested - (5) Very interested	

Table 4.16. For your future career, in which setting would you like to work the most?

CSGrad4US Participants	
	Percentage
Academia	47%
Industry	28%
Government	9%
Self-employment	16%
Something else	0%
n	32

(*) p ≤ .05; (N/A) n<5 or test criteria were not met.

Table 4.17. How interested are you in having a career:

CSGrad4US Participants	
	Mean (SD)
How likely will your future career have a computing-related focus?	4.67 (0.82)
How likely will your future career have a research focus?	4.19 (0.90)
n	32

(*) p ≤ .05; (N/A) n<5 or test criteria were not met. (1) Extremely unlikely - (5) Extremely likely

5. Program Year 1 Perceptions & Feedback

SECTION OVERVIEW

This section summarizes Cohort 1 participants' feedback on their experiences with the quality and mentoring impact on their motivation and success on their graduate school application after the first year of the program.

Followed by the results of survey questions, qualitative data were collected via open-ended comments and summarized into themes below.

Table 5.1 Rating on the Quality of Program.

CSGrad4US Participants	
Mean (SD)	
Overall, how would you rate the quality of the CSGrad4US individual coaching you received?	4.19 (1.06)
Overall, how would you rate the quality of CSGrad4US group mentoring sessions and panels?	3.56 (0.98)
Taking all your experiences into account, how would you rate the quality of the CSgrad4US program support you received during Year 1?	3.94 (0.98)
n	32
(*) p ≤ .05; (N/A) n<5 or test criteria were not met. (1) Poor - (5) Excellent	

Table 5.2. Rating on Overall Impact

CSGrad4US Participants
Mean (SD)

CSGrad4US Participants	
What impact do you think the CSGrad4US mentoring and coaching program has had on your ability to achieve your graduate school goals so far?	3.42 (0.92)
n	31
(*) p ≤ .05; (N/A) n<5 or test criteria were not met. (1) No impact - (4) A large impact	

Table 5.3. Overall learning on graduate school and the application process in Year 1.

CSGrad4US Participants	
Mean (SD)	
Overall, how much did you learn about graduate school and the application process during the first year of the CSGrad4US Mentoring Program?	3.88 (0.94)
n	31
(*) p ≤ .05; (N/A) n<5 or test criteria were not met. (1) None - (5) A lot	

Table 5.4 Feedback on program's mentoring and coaching

Please tell us below if there is anything else you feel the program's mentoring and coaching should have covered more or differently in the first year. This information will help us plan for the next cohort of CSGrad4US mentees.

Themes	Positive Comments	Areas of Improvements
 More Social Interaction & Support	<ul style="list-style-type: none"> “The encouragement and mentorship I received through the program has been critical to my success in getting into schools.” “I felt the program really helped even the starting line. I had been looking into PhD programs for a year, and there was still quite a lot I learned. I loved that everyone got the same general info and then got tailored help from a coach.” 	<ul style="list-style-type: none"> “I believe most of the attendees would've like to have increased social time together or a mechanism to coordinate it between each-other. I believe the social time would have included speaking about current application progress, fears and doubts about grad life, etc.”
 Coaching & Mentoring Sessions	<ul style="list-style-type: none"> “Sameer was an excellent coach! We were matched really well (HCI) and I appreciated his school and advisor suggestions. He was also so responsive via email.” “I want to especially recognize Dilma for her wonderful and encouraging mentorship. Thank you for your support in getting me on a path that I so much wanted to get to!” 	<ul style="list-style-type: none"> “It would have been helpful if the CSGrad4US sessions started earlier in the year and if the topics matched (or even was ahead of) the current application cycle timeline. For example, November 18's session on succeeding in graduate school was helpful but the timing wasn't ideal.” “More information about gaining research experience while working would be helpful. There are a lot of caveats in pursuing independent research and it is difficult to find a computer science lab that wants assistants from industry so covering this would be good.”schools I want to apply to.”

Table 5.4a. Feedback on program's mentoring and coaching

Please tell us below if there is anything else you feel the program's mentoring and coaching should have covered more or differently in the first year. This information will help us plan for the next cohort of CSGrad4US mentees.

Themes	Positive Comments	Areas of Improvements
 Additional Resources	<ul style="list-style-type: none">Going through the application process for CSGrad4US helped me sharpen why I wanted to go back, and then going through the actual PhD application process in the fall, I had guardrails/traintracks guiding me in the form of the weekly meetings and timelines.	<ul style="list-style-type: none">"It's hard because CS is such a vast field of study, but more information on identifying research interests, picking classes once accepted, and the process of actually doing the research would be helpful in picking the right school to apply to."

Table 5.5. Feedback on concerns related to participation.

If relevant, please describe any current or ongoing concerns you have related to your continuing participation in the CSGrad4US program.

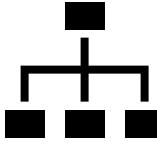
Themes	Cohort 1 Mentee Comments
 Funding and Financial Assistance	<ul style="list-style-type: none"> “I’m still sort of confused about how fellowships work. I was informed that people are generally only in one fellowship at a time, but I was awarded another fellowship from an internal school scholarship. I don’t believe they interact. It might be good to clarify to fellows at the start of the program what being a fellow actually means (in general, not just for CSGrad4US).” “The structure of funding we will receive is very unclear. I really need to be able to see the fine print of the award we will be getting to be able to understand how I can use it.” “Unclear on how to receive funds once I begin my first semester in the PhD program.”
 Graduate School Transition & Lifestyle Adjustment	<ul style="list-style-type: none"> “I guess the only question is ability to work while enrolled. The schools I am looking at have no problem with it but would like to know if the program has any problem with that.” “General concerns about going back to school after several years. Adjusting to new lifestyle. Nothing major.”
 Program Structure Clarification	<ul style="list-style-type: none"> “I think the program can do a better job of building social cohesion among the group. One thing missing has been the social community. One of the fellows *did* create a Slack group for us, which was nice, but more ways for us to build cohesion would be great. Not sure of good ideas on what to do.... perhaps having that kind of Slack group earlier would be better?” Maybe other kinds of social events? Something in person would be cool too. “I hope I am not dropped from CSGrad4US for not being admitted to any program.” “I wish we had more than 2 years to apply- but maybe that is just my low self esteem talking.”

Table 5.6. Overall feedback on valuable aspects of the program.

Please tell us below what has been the most valuable aspect of your experience in CSGrad4US so far.

Themes	Cohort 1 Mentee Comments
 Coaching & Mentorship Appreciation	<ul style="list-style-type: none"> “The first is the mentor - I built a wonderful relationship with my mentor, Dilma. I looked forward to meeting with her each week and talking through where I was in my applications. The times that I felt discouraged, she encouraged me and I came out reinvigorated. I liked that she was in my field, and so could talk to me about potential advisors, schools.” “My mentor, Lenore Cowen, was incredibly helpful in guiding me throughout this process.” “The one-on-one coaching (with Prof. Ladner) has been really helpful. Even though I can't point to any one specific thing that he really helped with, it's just been invaluable to have someone in my corner that I can talk to, and to have someone to sanity-check my actions and decisions. In general, the coaching + group mentoring (especially the timeline of e.g. when to have letters, SOPs done, school lists done) have been really helpful to make me feel like I'm not lost.” “It was great to have a built-in forcing function for accountability through my weekly chats with my mentor. I felt I was able to make progress much more quickly and not get stuck because of this. I also was more encouraged to actually go and email professors more quickly than I may have done if I were exploring on my own.”
 Knowledge & Preparation for Graduate School	<ul style="list-style-type: none"> “Advice writing essays, tailoring for schools, and just generally feeling supported by NSF.” “Learning the application process was by far the most helpful. I had no idea what really needed to go into making your application standout.” “The perspectives of choosing schools, really professors, from professors and grad students. Having the lesson that professor is infinitely more important than school reputation hammered home over and over was really helpful.”
 Perspective Shift & Confidence Building	<ul style="list-style-type: none"> “The ability to network with great professors and get an idea of what life inside of academia is like’ “CSGrad4US’s program and mentorship gave me the confidence to believe that attending graduate school was in my reach.” “The most valuable aspect has been the program’s encouragement to envision myself as a PhD student.” “The experience was personalized and helped with confidence figuring out what my options were.” “Specifically, I enjoyed hearing from panels so I can connect at a personal level and feel more relatable.”

Table 5.7. Additional program-specific feedback.

Please use the space below to add any other program-specific feedback or comments.

Thank you for organizing this!

Please keep offering it! I think it's a really really great program and that the computing sciences would be better off if more people had more support / encouragement in pursuing doctoral study.

I'm really grateful that this fellowship exists. I first heard about it through my undergrad advisor in an email, and the timing was so perfect! I had been thinking about going for my PhD ever since senior year of college, and this fellowship was the perfect "push" to finally pursue it. Applying and being selected helped give me the boost of confidence to believe that I was a good fit for grad school and research. It also reassured me that there are systems of support in place for people like me to go into academia, something I was very worried about. My time in industry certainly wasn't perfect but the DEI initiatives to retain people like me contributed greatly to my wellbeing here. Personally, I always loved research, but as a first-gen in the US scholar, I had to prioritize establishing financial stability which is why I went into industry first. A career in research seemed to me like a luxury that I could never afford. It still isn't glamorous of course, and this program's stipend is the same (if not lower) than my funding offers but the recognition itself was meaningful and significant to me. The mentorship and coaching too is also a non-monetary but extremely valuable component. I truly believe that academia and research must pay higher and continue creating programs like these if we are to retain and attract passionate researchers, ESPECIALLY those of underrepresented/underserved communities. It is no secret that grad school is hard for everyone, but for many of us who already live with the emotional, financial, and mental burdens of being a minority in computing, it is a incredibly difficult to "give up" the stability of today's well-paying tech industry jobs no matter how much we love and want to contribute to computing research. Thank you for this opportunity! I look forward to seeing the program grow!

Thank you so much.

More eyes on my personal statement from the coaches. I reached out to University of Washington about why I wasn't admitted and they were nice enough to reply back and detail what I was lacking. I was told my personal statement was crap - quite bluntly. So I want more transparency from the coaching staff so I can craft a great personal statement next time. I applied thinking everything on my end was good...but to find out that the most crucial piece of my application - which could be easily edited and coached on - was awful.

It's been great! Thank you to everyone involved in this!

Having videos available right after meetings and in a format that one can consume with notes would be highly valuable.

Working with Dr. Halfond is, what I consider, one of the defining moments of my life. I truly do not know where I would be without his guidance, patience, and endless wisdom. This was an excellent program, and an experience that I will cherish for the rest of my life.

6. Discussion & Summary

The Year One evaluation report of the CSGrad4US Mentoring Program provides valuable insights into the immediate and mentoring impact on cohort one participants. It is essential to acknowledge the limitation in generalizability due to the sample size, recognizing that findings may not fully represent all participants' experiences.

The analysis indicates that most anticipated outcomes aligning with the program's goals were observed in participants who completed both Time 1 and Time 2 surveys. Positive changes were noted in perceived mentorship, professional support, and knowledge in graduate school applications. However, there were no significant observed changes in factors like identification with computing, sense of belonging, confidence for success in graduate school, and future career interests.

On the other hand, participants highly rated individual coaching for their goals and graduate school applications yet emphasized the need for clarity on the financial and funding process for the fellowship. Open-ended comments provided insights for improvement, including additional outreach to prospective PhD advisors, increased social time with peers, and more panels on research interests and gaining research experience, especially for fellows transitioning from industry to academia.

In summary, qualitative feedback from cohort one participants expressed overall appreciation for their coaches and programmatic support, contributing positively to their graduate school journey. Suggestions for improvement offer valuable guidance for future iterations of the mentoring activities. Overall, the first year of the program has made a significant impact on the participants' outcomes and experiences in applying and learning about the graduate school process. For next steps, CERP will conduct comparative analyses across these measures using first-year graduate students from our Data Buddies Survey for the year two evaluation report.

An abstract graphic element consisting of several overlapping circles in various shades of blue, ranging from light lavender to deep navy. The circles are positioned in the upper half of the page, creating a dynamic, fluid shape.

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