

# W&M Cybersecurity Awareness Initiative for PIT-UN

## APPENDIX I

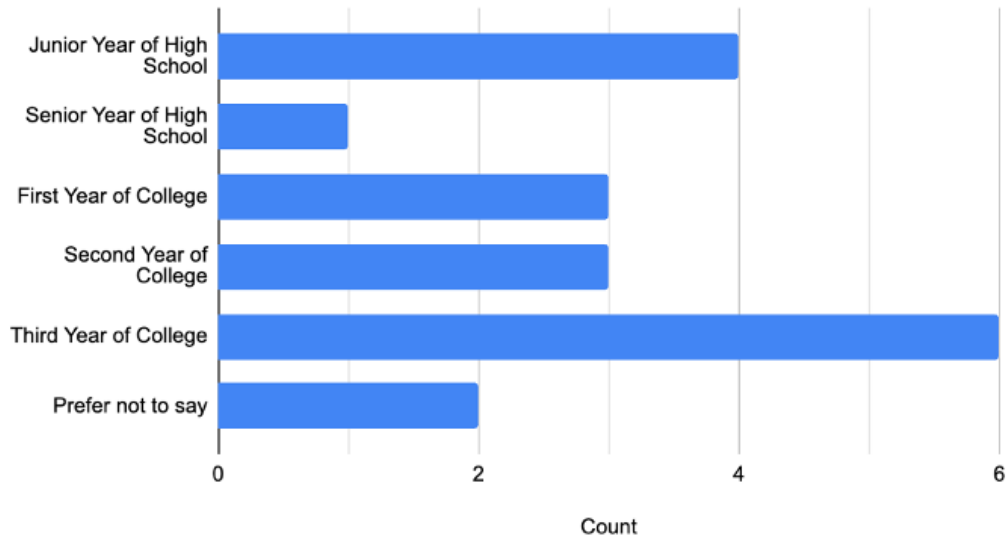
### Diversity, Equity, and Inclusion Data Analysis

Via experiential learning, the project aimed to expose students, especially minority and women who are underrepresented in the field of cybersecurity, to practical cybersecurity challenges and equip them with valuable skillsets. To assess how the participating students judged the experience, we conducted an anonymous survey. The full text of the survey can be found at the end of this appendix.

This project set out to reach students in areas and schools that did not have significant exposure to cybersecurity topics and lacked resources for such programs. For instance, the program was advertised with William & Mary Scholars Undergraduate Research Experience (WMSURE), a program that attracts undergraduate students who have overcome unusual adversity and/or are members of underrepresented groups who would contribute to campus diversity. The program was also shared with the Chief of the Nansemond Tribe who disseminated it through his contacts.

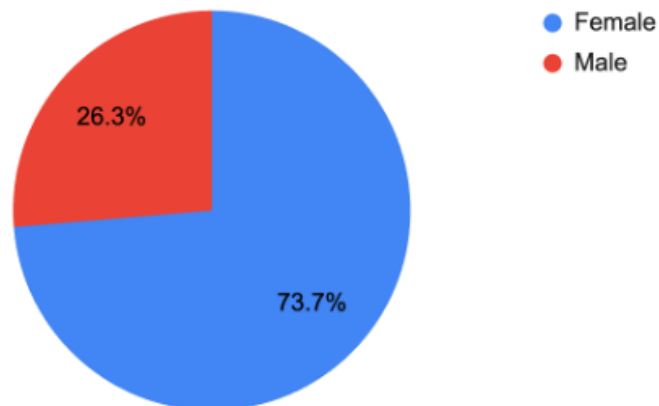
The program enrolled 30 students, and 29 out of 30 students who enrolled completed an internship. Of the 29 participants, 19 responded to the survey: a response rate of 66%, which is a sample size representative of the program population.

The survey results confirmed that one of the DEI objectives was met since participants ranged from junior year in high school to third year in college (see Figure 1). High school students constitute 33% of the participants and 26% of the respondents to the survey.



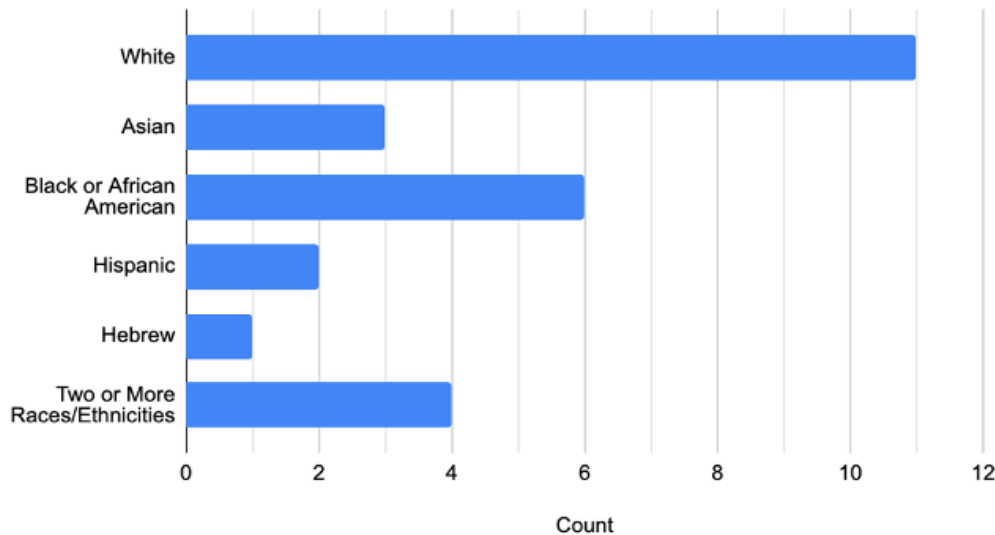
**Figure 1.** Highest level of education completed upon program's commencement

Given that the program intended to increase comfort among participants identifying as women or minorities in the cybersecurity field, the survey asked for other demographic information. The results show that the majority of participants identified as female (Figure 2), confirming success in recruiting this gender, which is underrepresented in the cybersecurity field.



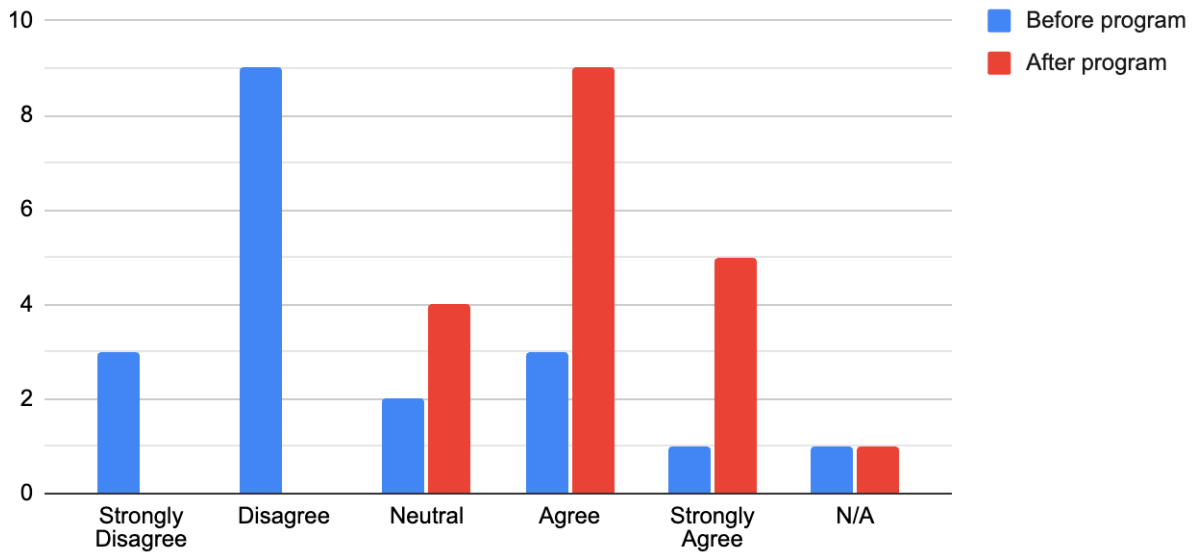
**Figure 2.** Participants' self-identified gender

In terms of race, minority races/ethnicities are those who do not self-identify as white. Of the respondents, 10 (53%) self-identified with minority races/ethnicities, with four (21%) indicating two or more races/ethnicities (see Figure 3). This further indicates success in recruiting participants belonging to minority groups underrepresented in the cybersecurity field.



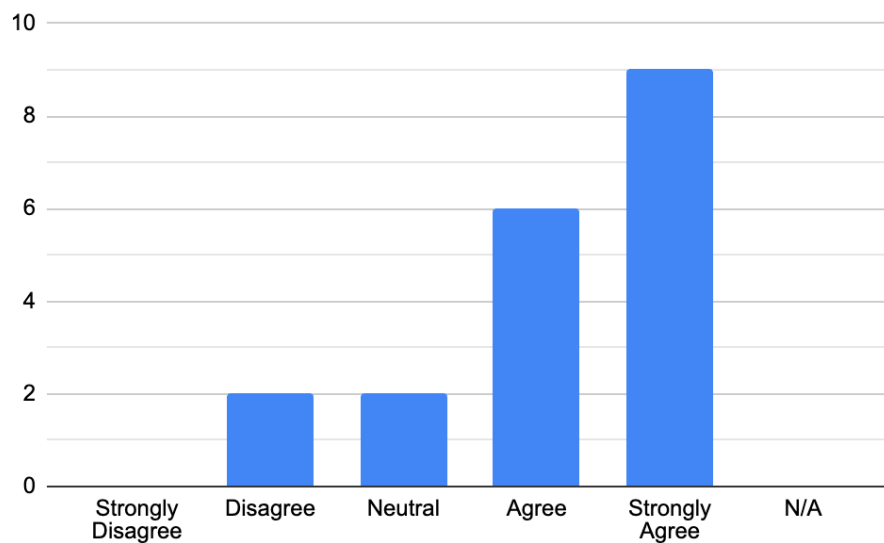
**Figure 3.** Participants' self-identified races/ethnicities

The responses indicate that the program succeeded at increasing participants' confidence regarding working within the cybersecurity field: 14 respondents (74%) felt non-confident at the program's commencement, and none felt unsure at the conclusion. To assess the participants' degree of confidence gained by taking part in the program, the survey asked participants to select the extent to which they agree with 10 statements drafted to foster self-reflection. The responses show that the program was successful in its goal of increasing participants' confidence in working within the cybersecurity space. The survey revealed that there was a significant shift towards agreeing with the statement "*I was confident that I could work within the cybersecurity space*" after the program's end as compared to prior to program (Figure 3).

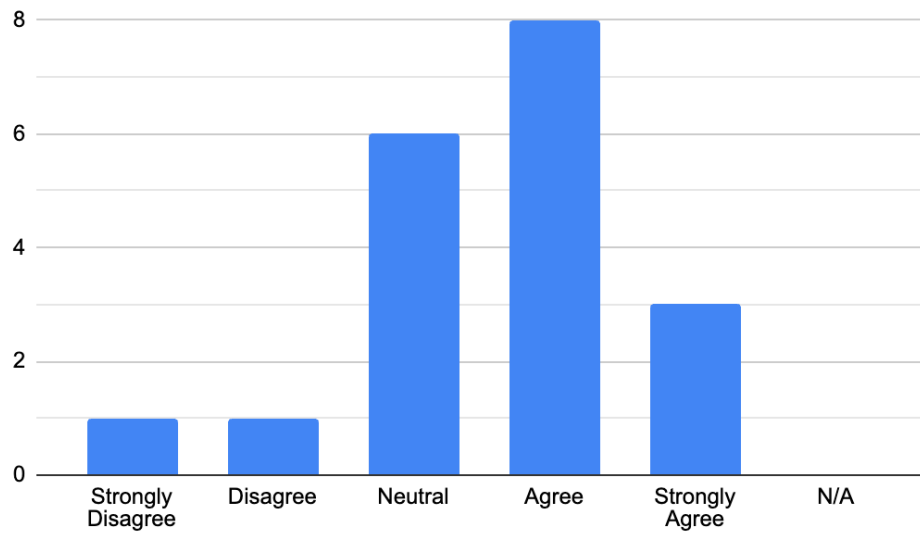


**Figure 3.** Participants’ response to “*I was confident that I could work within the cybersecurity space*” before and after the program

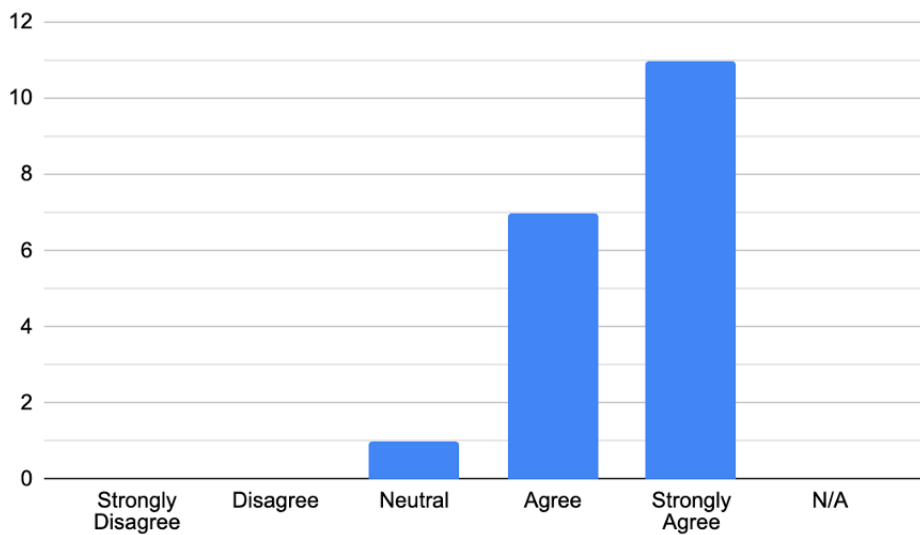
The data also showed that there was an overwhelming desire (74%) for additional training regarding cybersecurity (Figure 4). The responses revealed participants’ perspectives on technical knowledge required for working in the cybersecurity field (Figure 5) as well as the efficacy of the program’s deliverables (Figure 6) and mentor advising (Figure 7).



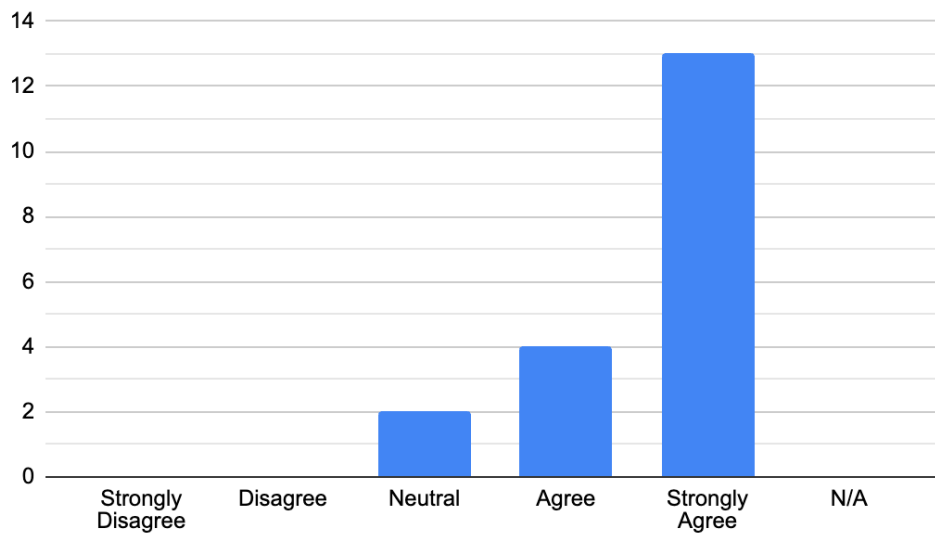
**Figure 4.** Participants’ response to “*When I finished the program, I was interested in pursuing more training.*”



**Figure 5.** Participants’ response to “*You need a lot of technical knowledge to work in the cybersecurity space.*”

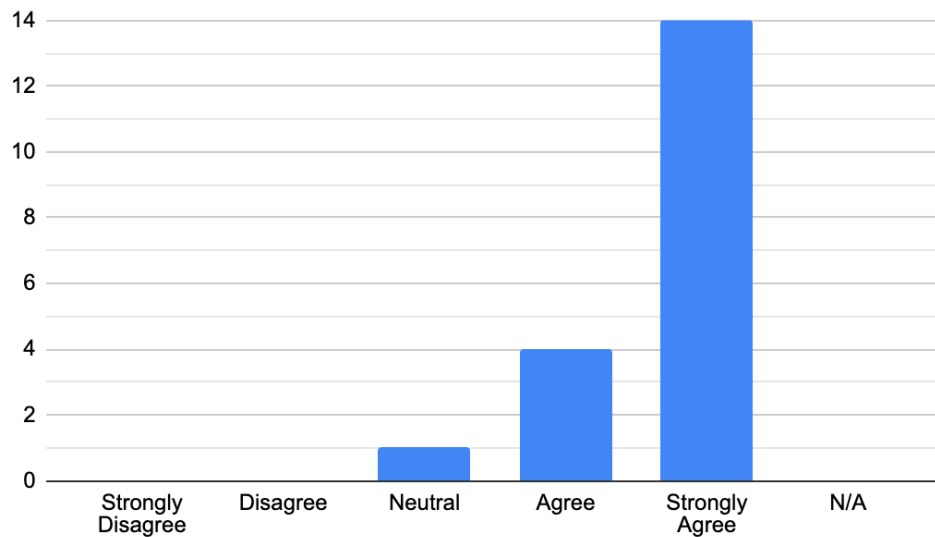


**Figure 6.** Participants’ response to “*The deliverables my group created during the program helped me understand the sort of work that occurs in the cybersecurity space.*”

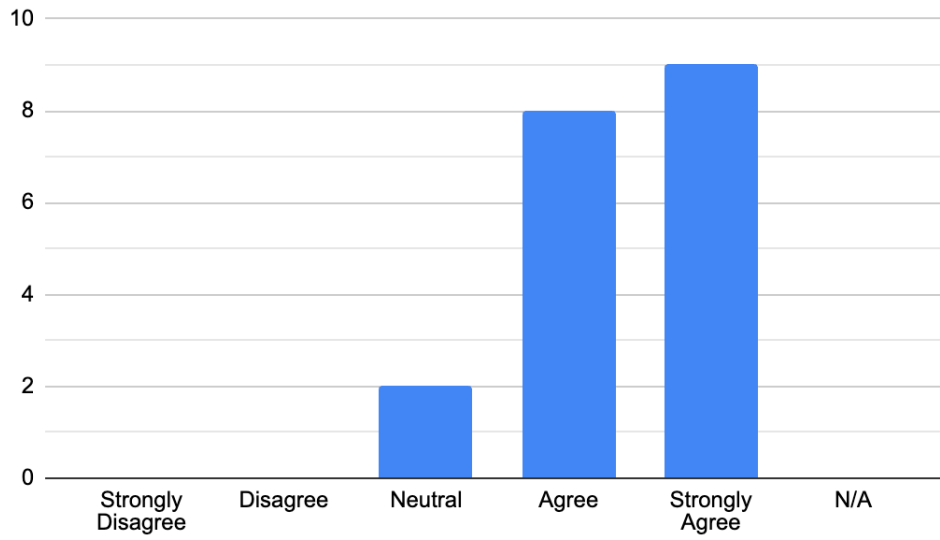


**Figure 7.** Participants’ response to “*The feedback my group received from our mentor was helpful.*”

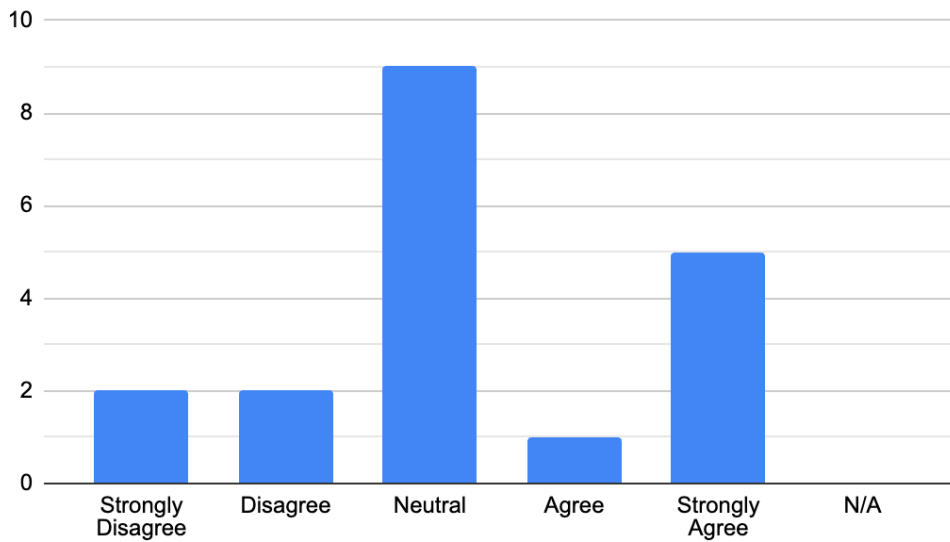
Additionally, the survey assessed the participants’ reasons for participating in the study by inquiring about their appeal based on practical experience (Figure 8) and pay (Figure 9). The question about payment was also important to determine whether the program increased access by enabling students from different socio-economic brackets to participate (Figure 10).



**Figure 8.** Participants’ response to “*This program appealed to me because it was an internship involving practical experience.*”

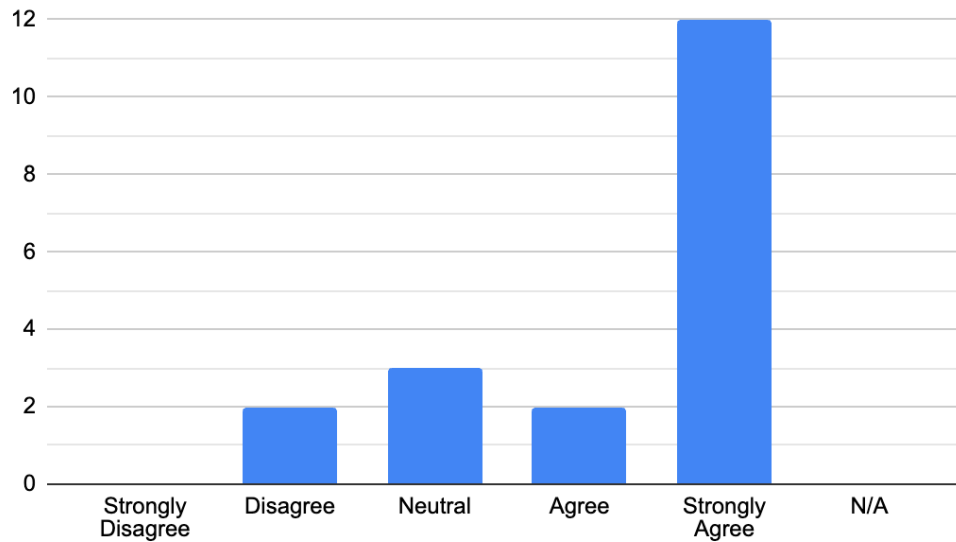


**Figure 9.** Participants’ response to “*This program appealed to me because it was paid.*”



**Figure 10.** Participants’ response to “*I would not have taken part in this program if it was not a paid experience.*”

Lastly, the survey concluded by asking about the participants' desire to pursue other opportunities in cybersecurity based on the program and found that there was an overwhelmingly positive response (Figure 11).

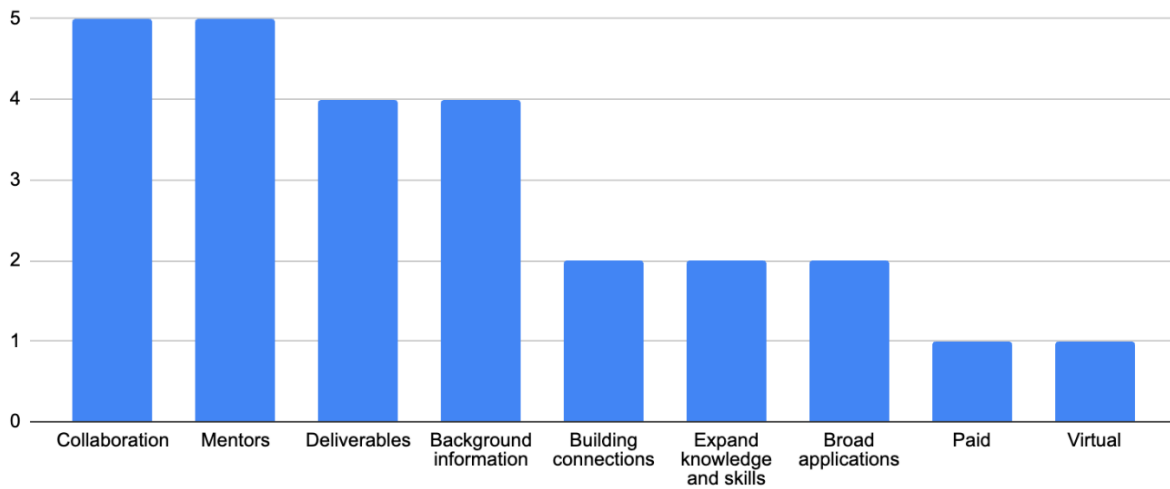


**Figure 11.** Participants' response to *“Because of this program, I am interested in pursuing other opportunities in cybersecurity.”*

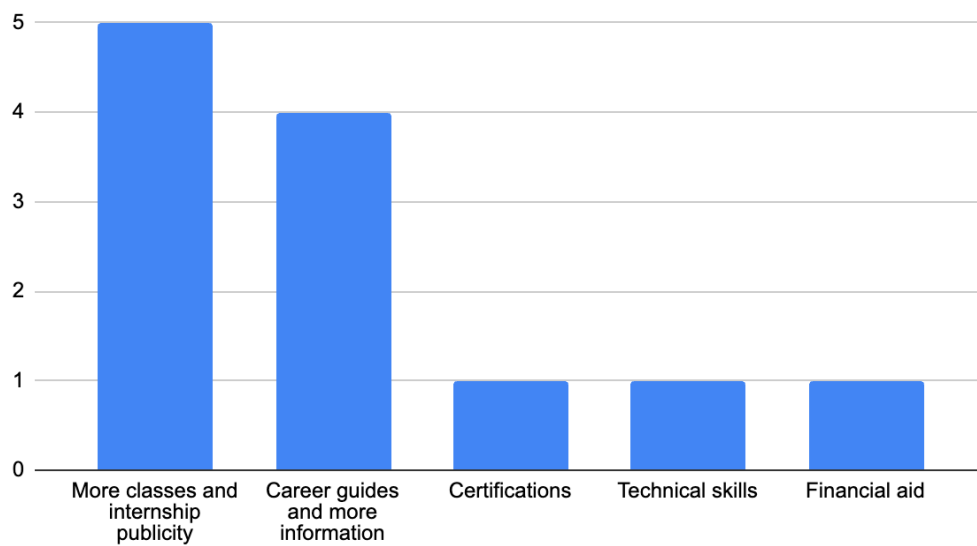
Taking all of these responses together, the program was highly successful in meeting its goals, and the methods used were very effective in increasing participants' confidence in working in the cybersecurity field.

The survey also included a place to allow participants to share their feedback on the program. The analysis shows that participants found several aspects of the program to be valuable. For instance, respondents reported feeling as though the opportunity to work in groups to collaborate with others and the mentors available for guidance and feedback were the two most valuable parts of the program (Figure 12). The responses also revealed that, among many additional support ideas, several participants felt as though more classes available in school and publicity about available internships would be beneficial to their continued growth and exploration in the cybersecurity field (Figure 13).



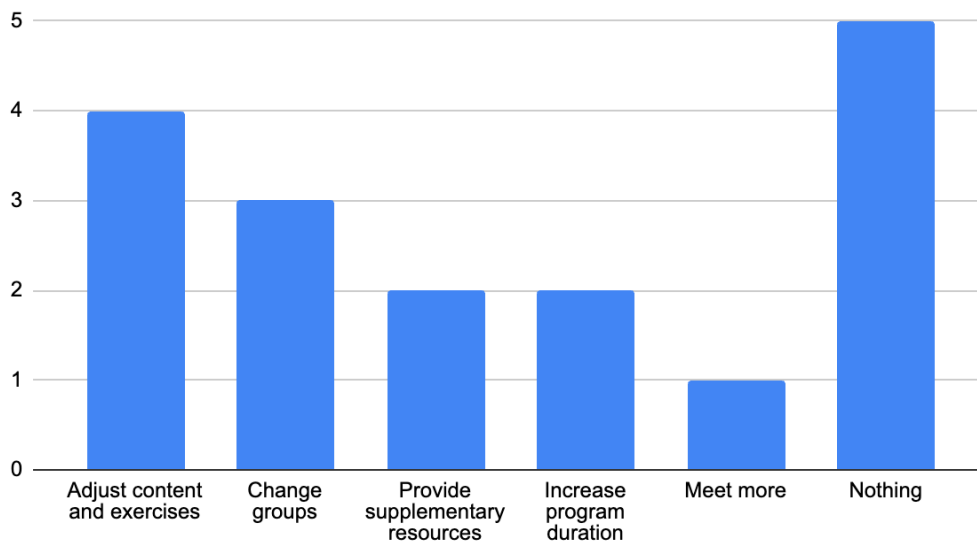


**Figure 12.** Most valuable aspects of the program as identified by participants



**Figure 13.** Additional cybersecurity field support ideas as identified by participants

Lastly, to capture the participants' view on any adjustments that could be implemented to increase the efficacy and enhance benefits of the program, participants were asked to suggest any changes if a similar the program were to be run again in the future. From the open-ended responses given, the most common suggestion was actually to keep the program the same and not change anything, followed by the suggestion to adjust content and exercises to go more in depth and to better align with what is currently happening in the real world (Figure 14).



**Figure 14.** Suggested program changes identified by participants

## Survey Questions

### *Demographic Questions*

- What is the highest level of education you had completed when you started the program in June 2022?
  - Junior Year of High School
  - Senior Year of High School
  - First Year of College
  - Second Year of College
  - Third Year of College
  
- What race/ethnicity do you identify as?
  - American Indian or Alaskan Native
  - Asian
  - Black or African American
  - Native Hawaiian or Other Pacific Islander
  - Middle Eastern or North African
  - White
  - Two or More Races
  - Other/write in
  
- What gender do you identify as?
  - Female
  - Male
  - Non-binary or third gender
  - Other/write in

### *Strongly disagree/disagree/neutral/agree/strongly agree questions*

- When I started the program, I was confident that I could work within the cybersecurity space.

- When I finished the program, I was confident that I could work within the cybersecurity space.
- When I finished the program, I was interested in pursuing more training (e.g., certificate, undergrad major, graduate studies) in cybersecurity?
- You need a lot of technical knowledge to work in the cybersecurity space.
- The deliverables my group created during the program helped me understand the sort of work that occurs in the cybersecurity space.
- The feedback my group received from our mentor was helpful.
- This program appealed to me because it was an internship involving practical experience.
- This program appealed to me because it was paid.
- I would not have taken part in this program if it was not a paid experience.
- Because of this program, I am interested in pursuing other opportunities in cybersecurity.

***Open ended question(s)***

- What do you believe was the most valuable part of your experience in the program?
- What do you believe the program should have done differently?
- What other support do you think will aid you in pursuing an education and/or career in cybersecurity?
- Have you received any other internships or other opportunities because of the program? If so, please describe them here.