



DATA BRIEF:

Cybersecurity Texas Virtual Externship August 2020

Prepared for



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Preface

This data brief presents a summary of data collected for the Education Service Center, Region 20 (ESC-20) Cybersecurity Texas Virtual Externship program, facilitated by Experience America and funded by the Texas Education Agency (TEA), during the summer of 2020.

The overall goal of this data collection was to provide an external, independent evaluation of participants' attitudes, perceptions, and overall satisfaction with the virtual externship experience.

Any opinions, findings, or recommendations expressed in this brief are those of the evaluation team and do not necessarily represent the official views, opinions, or policy of the Texas Education Agency or Education Service Center, Region 20.

The evaluation tasks were conducted and the report prepared under an Independent Contractor Agreement with Education Service Center, Region 20.

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1. Introduction

The Cybersecurity Texas Virtual Externship was a series of 5-day virtual events held in July and August, 2020. Hosted by Education Service Center, Region 20 (ESC-20) in partnership with Experience America, the externships consisted of a series of workshops and virtual experiences for students to gain firsthand experience and insight into the world of Cybersecurity.

On the final day of the 5-day virtual events, Steuck & Associates LLC (S&A LLC) conducted an online survey of participants to evaluate their attitudes, perceptions, and overall satisfaction with the virtual externship experience. S&A LLC received 31 survey responses for Cohort 1 (July 20-24, 2020) and 48 survey responses for Cohort 2 (August 3-7, 2020). Cohort 1 survey data were summarized in the data brief issued July 2020. This data brief is intended to summarize findings from the Cohort 2 survey and compare findings between the two cohorts.

2. Methods

S&A LLC introduced participants to the survey instrument via videoconference on the final day of the two 5-day events. Participants were advised the surveys were anonymous, and thus, no data collected would be attributable to individual respondents. The survey consisted of a combination of Likert scale and open-ended questions. S&A LLC analyzed responses to the open-ended questions and collapsed them into categories using thematic coding.

Two scales were created to assess student satisfaction with the virtual externship experience: perceived level of benefit and overall satisfaction. To achieve this, survey questions were broken out into the two respective categories, then an average was calculated by dividing the number of points assigned by each respondent divided by the total number of possible points. A third scale was created to assess respondents' interest in cybersecurity based on their future career choice. The cybersecurity career interest scale, when visualized in context with respondents' perceived level of benefit and overall satisfaction with the externship experience, allows the reader to assess the potential relationship between the respondents' future career choice on their preferences and attitudes related to the externship.

The data presented in Section 3: Cohort Comparisons are intended to be illustrative in nature and are not necessarily generalizable, as the differences between participants in the two cohorts are not fully understood. Many factors in addition to program design and instructional delivery could have impacted participants' responses. The dumbbell charts presented on page 7 were created by converting Likert scale responses to a numeric value (1-5 and 1-4), then calculating the mean scores for each question by cohort.

3. Cohort 2 Results

Chart 1

Approximately one fifth of respondents did not identify any areas for improvement. The "Other" responses were varied and included comments on diversity of participants, more social interaction, and providing instruction on different operating systems.

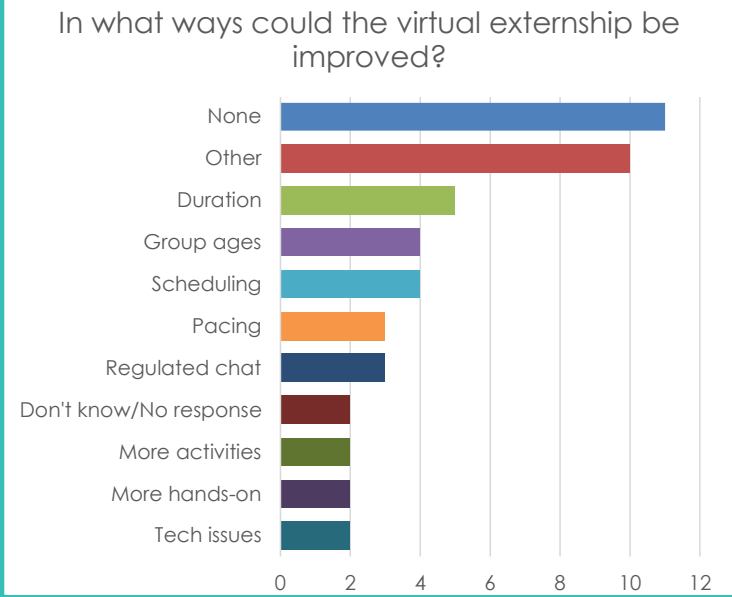
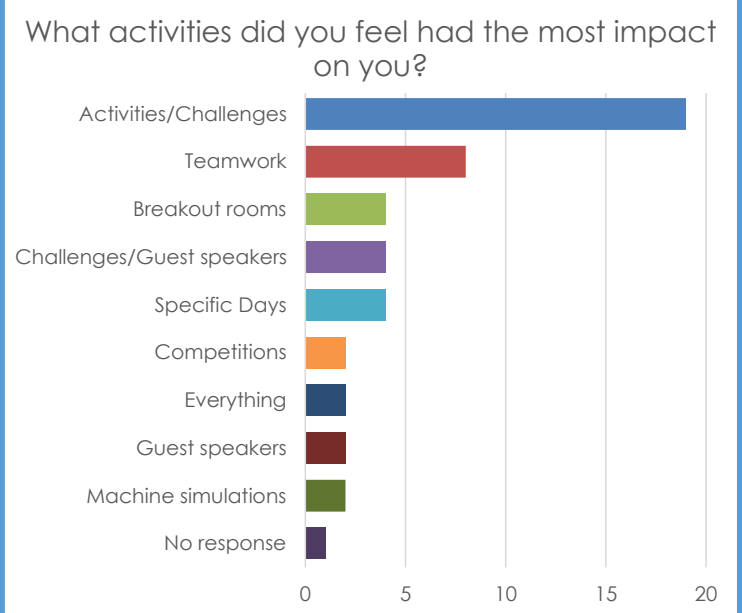
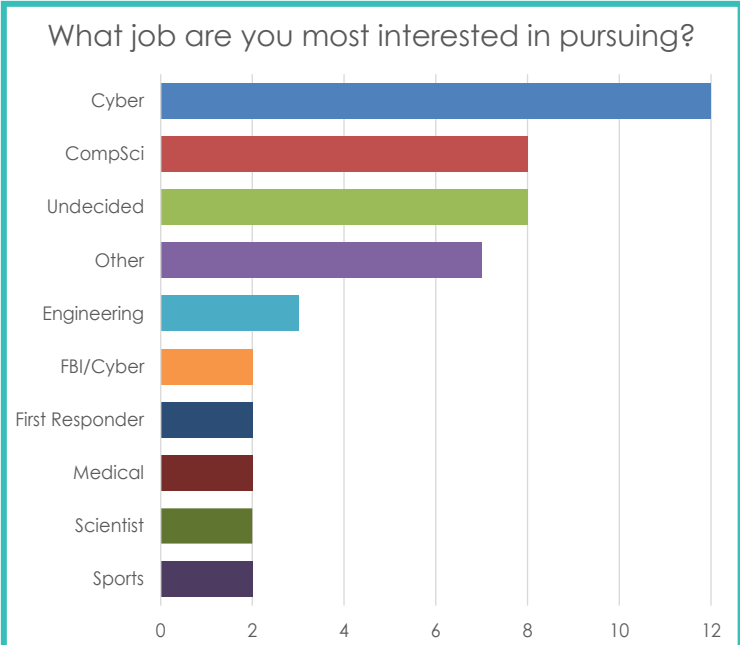


Chart 2



The largest group of respondents (40%) indicated the challenges and/or interactive activities were the most impactful. The next most common responses centered around teamwork and bonding with teammates in breakout rooms.

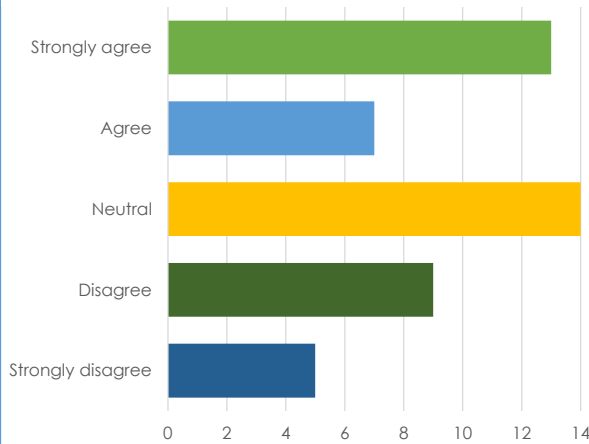
Chart 3



A majority of respondents (52%) indicated they plan to pursue a career in Cybersecurity or a related field. "Other" includes open-ended responses categorized as: computer science/forensics, creative writing, cybersecurity/computer science, cybersecurity/medical, entrepreneur, forensic science, & lawyer.

Chart 4

Even if there was not a global pandemic requiring social distancing, I would still prefer to attend this externship virtually rather than in-person.



More Cohort 2 respondents agreed rather than disagreed that they would have preferred attending the externship virtually rather than in-person; however the largest group of responses (29%) were neutral.

The open-ended text responses explaining "why or why not" indicate those who preferred attending virtually cited not having to travel as a major benefit, with several stating they would not have been able to participate had the externship been convened in-person.

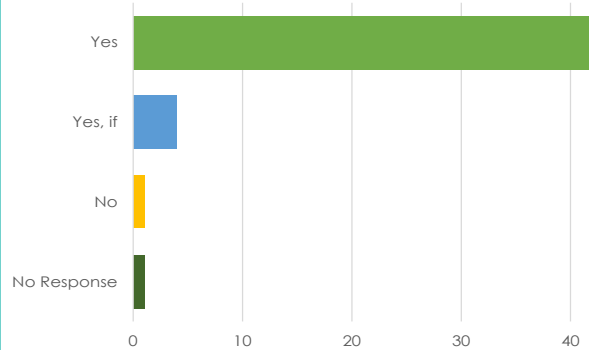
Why or Why Not?

Table 1

Responses	Count
Strongly agree	27%
Better on a computer	1
Convenience	4
Loved it	1
More engaging / bonding	1
No travel required	1
No travel required / meet new people	1
No Answer	4
Agree	15%
Good activities	1
Less social interaction	1
No travel required	3
No Answer	2
Neutral	29%
Don't know	1
hands on learning / no travel required	1
Less engaging	1
More comfortable / meet people from around the world	1
No preference	2
No travel required	1
Wouldn't change anything	1
Greater opportunities in person	1
No travel required / more connection in person	1
No Answer	4
Disagree	19%
Do not like virtual	1
Less focus	1
Less learning	1
Less social interaction	2
Tech issues	1
Students less respectful online	1
No Answer	1
Less fun / locked inside	1
Strongly disagree	10%
Distractions / tech issues	1
Do not like virtual	3
Less connection / hold interest	1

Chart 5


Would you recommend this virtual externship to others?





The "Yes, if" category includes respondents who specified in their open-ended responses that they would only recommend the virtual externship to those who are interested in Cybersecurity.

4. Cohort 2 Qualitative Highlights


What activities did you feel had the most impact on you?


 "The breakout room sessions, we communicated a lot and it was a perfect pick of a group."


 "I think the start-up group challenge impacted me the most...it helped me to break out of my shell a little."

 "...the teamwork activities, because we all did our best to help one another. It helped me feel like a part of a team, which helped me make friends."

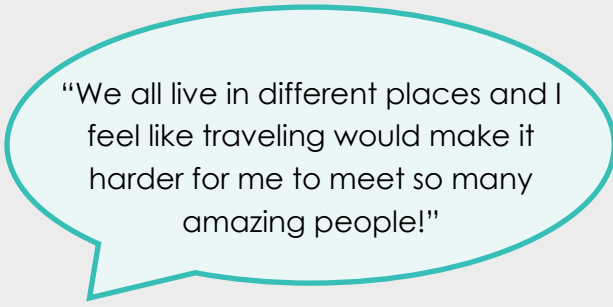
Would you recommend this virtual externship to others?

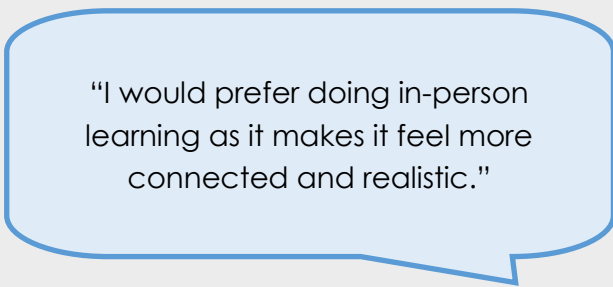
"Yes. But only to people with previous experience or knowledge about cyber security." 

"Yes, I learned a lot. This is very good for anyone looking to pursue a career in Cyber security." 


"I wouldn't recommend my own classmates (dual credit) as they know most of the info but would recommend freshman or those beginning to express interest in cybersecurity." 


Attending virtually rather than in-person...


 "We all live in different places and I feel like traveling would make it harder for me to meet so many amazing people!"

 "I would prefer doing in-person learning as it makes it feel more connected and realistic."


In what ways could the virtual externship be improved?


 "Meeting a certain age requirement or perhaps enforcing a rule where students only use chat for relevant purposes."


 "Maybe randomize the group ages, because the younger groups will not have as much knowledge as the high schoolers."

 "I wish the externship was longer. If it was longer then I'd be able to get even more information."

Is there anything else you'd like us to know?

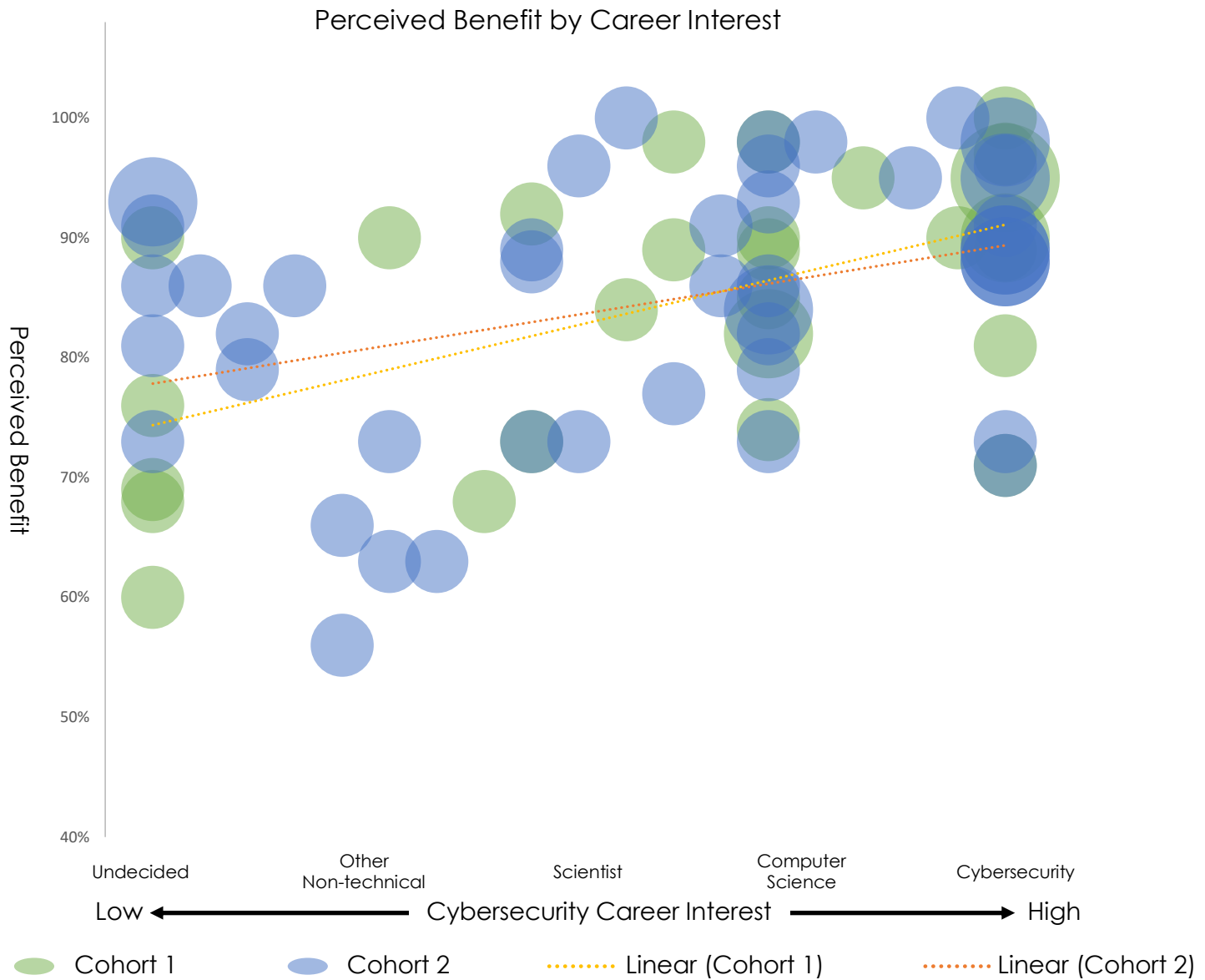
"I think we should have future reunions all as a group to talk about how we have been doing." 

"I feel like we all became a family" 

"I expected to feel awkward in the small breakout rooms, however I didn't. I felt engaged and like I knew the others more than I actually did, largely because of the teachers." 

5. Cohort Comparisons

Chart 6

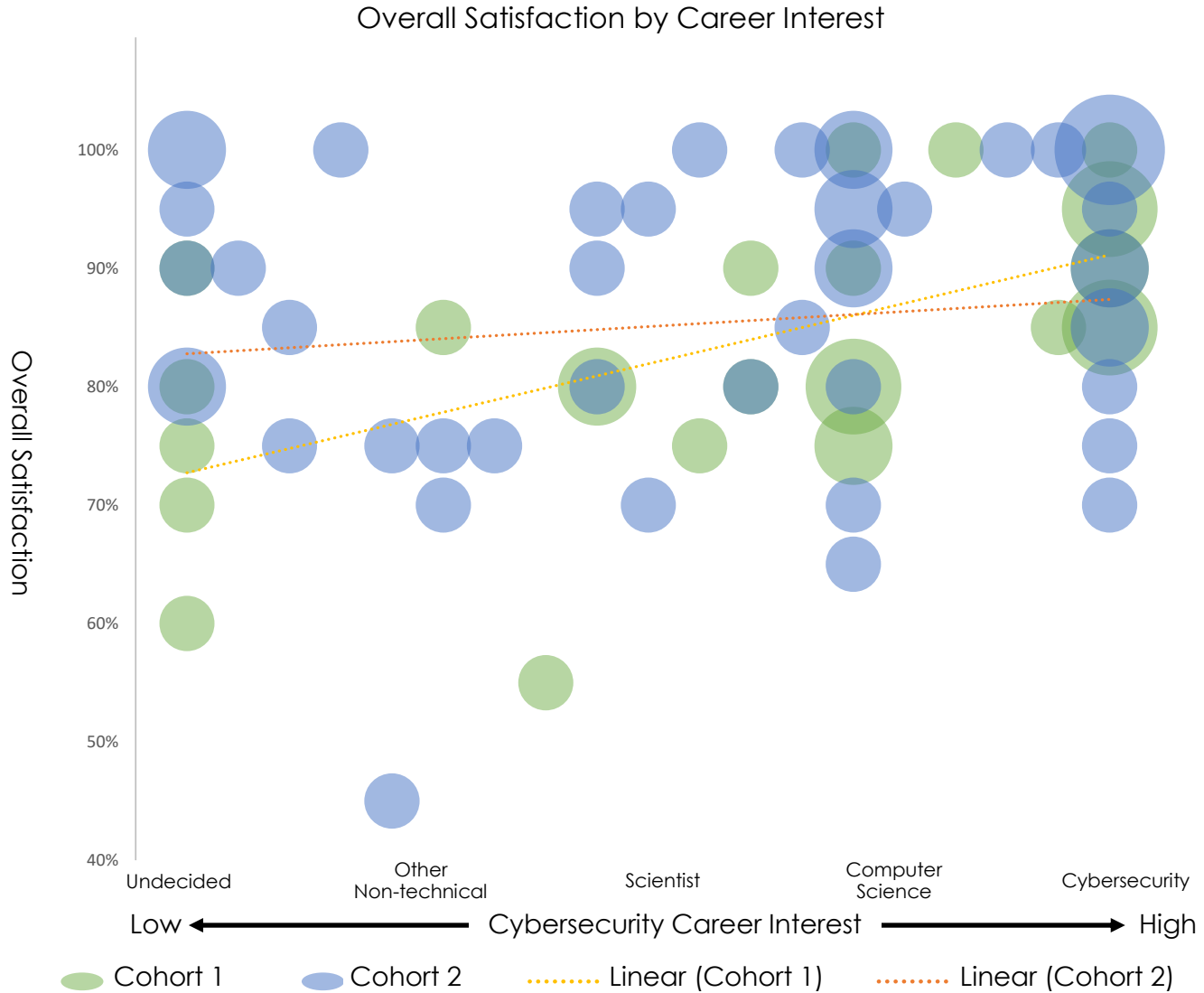


In the bubble chart above, the size of the bubbles correspond to the number of respondents. Areas of the chart with large, overlapping bubbles correspond to a higher concentration of respondents. The “Other Non-technical category along the cybersecurity career interest scale includes respondents who indicated they plan to pursue careers such as creative writing, first responder, and lawyer.

For both cohorts, the perceived level of benefit from the virtual externship experience was highest among respondents who plan to pursue a career in cybersecurity or a related field. The trend line for Cohort 2 is slightly flatter than Cohort 1, suggesting career interest in cybersecurity may have had less of an impact on Cohort 2's perceived level of benefit than Cohort 1.

The average perceived level of benefit was the same for both cohorts (85%).

Chart 7



For both cohorts, overall satisfaction with the virtual externship experience was highest among respondents who plan to pursue a career in cybersecurity or a related field. The trend line for Cohort 2 is slightly flatter than Cohort 1, suggesting career interest in cybersecurity may have had less of an impact on Cohort 2's overall satisfaction than Cohort 1. This is also evident by the cluster of Cohort 2 students in the upper left of the graph who scored high on overall satisfaction despite having reported a lower interest in cybersecurity careers.

The average overall satisfaction with the externship experience was slightly higher in Cohort 2 than Cohort 1 (87% and 84%, respectively).

Chart 8

Cohort 2 responded slightly more positively than Cohort 1 to three out of four questions related to general satisfaction with the externship. The chart below presents the means for each cohort (5-point Likert scale).

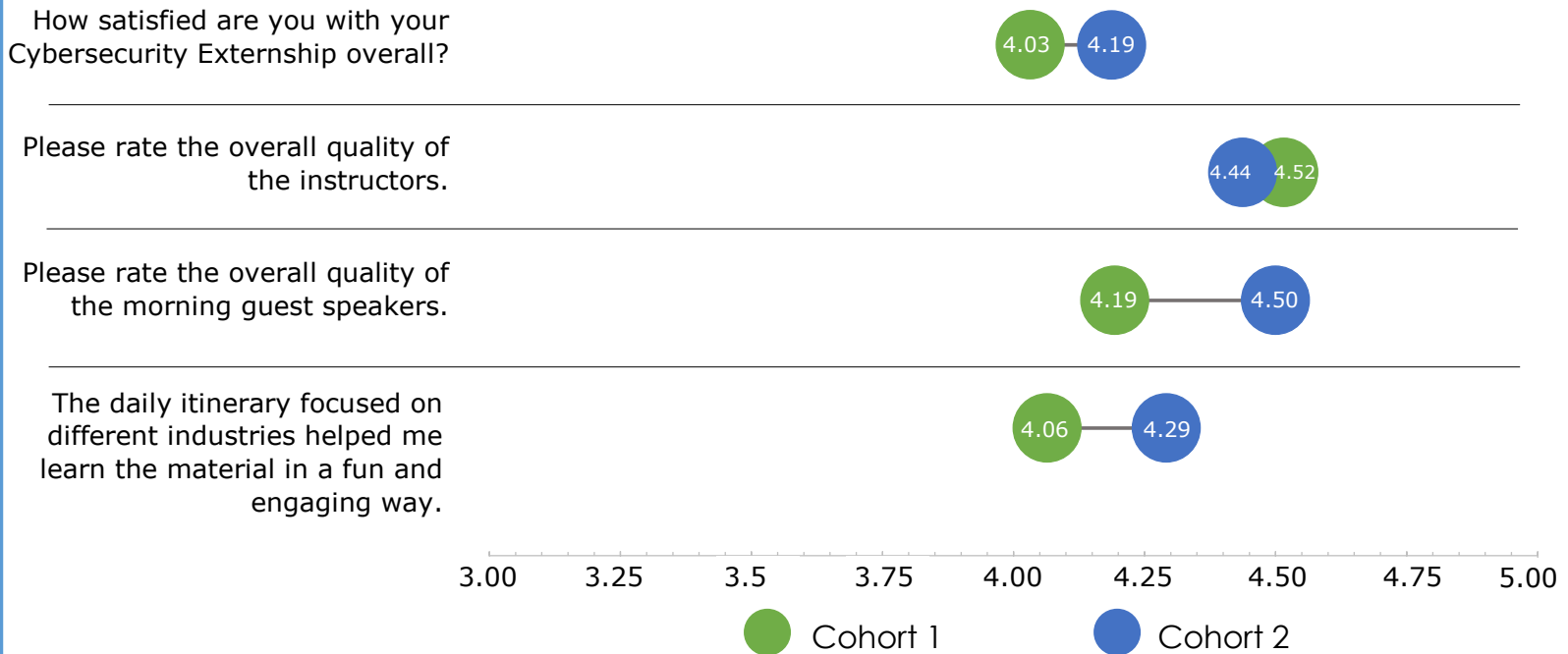
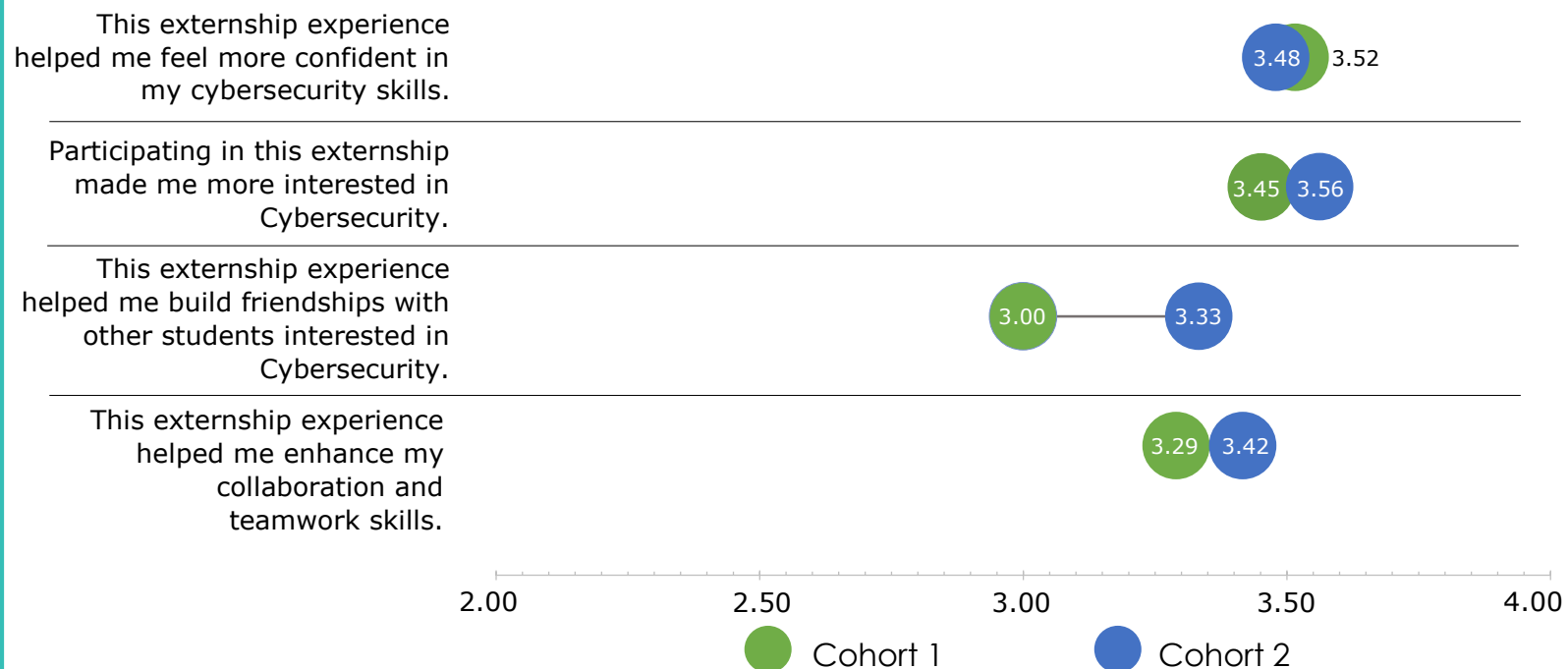


Chart 9

Cohort 2 responded slightly more positively than Cohort 1 to three out of four questions related confidence, interest, and skills. The chart below presents the means for each cohort (4-point Likert scale).



Data Takeaway: While the means for each cohort were fairly consistent for questions related to career awareness, Cohort 2 responded slightly less positively than Cohort 1.

Chart 10

To what extent has this externship experience helped you learn about new career fields related to your interests?

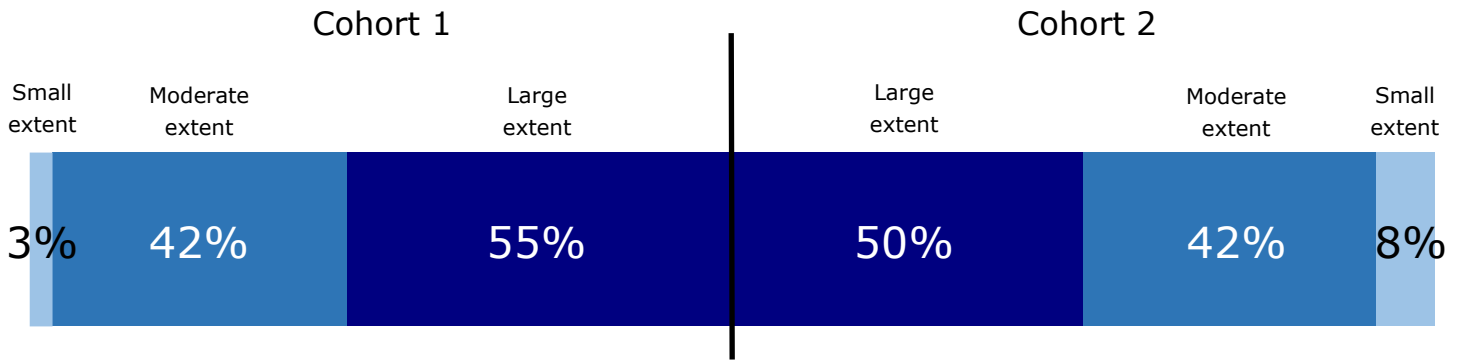


Chart 11

To what extent has this externship experience helped you network with potential future employers?

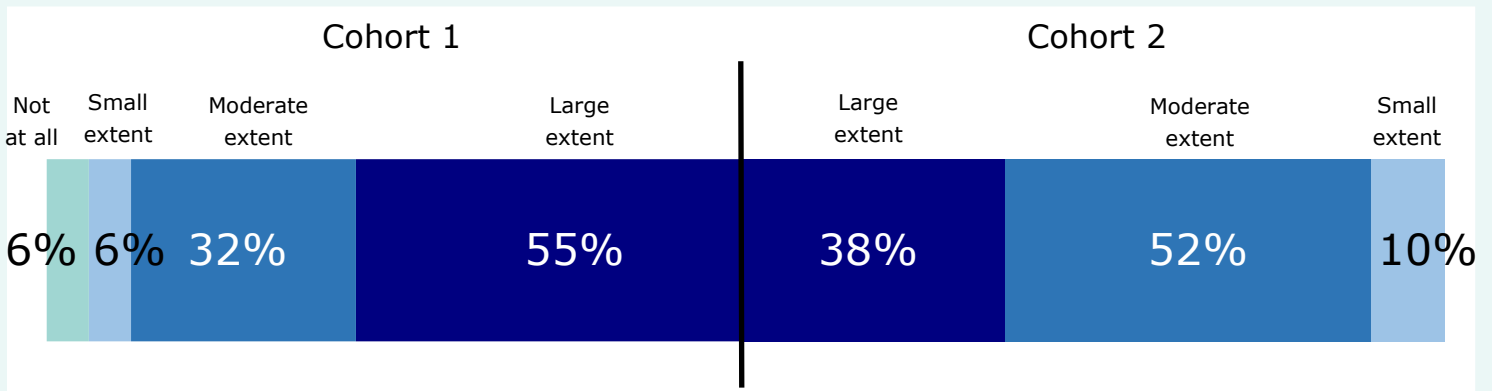
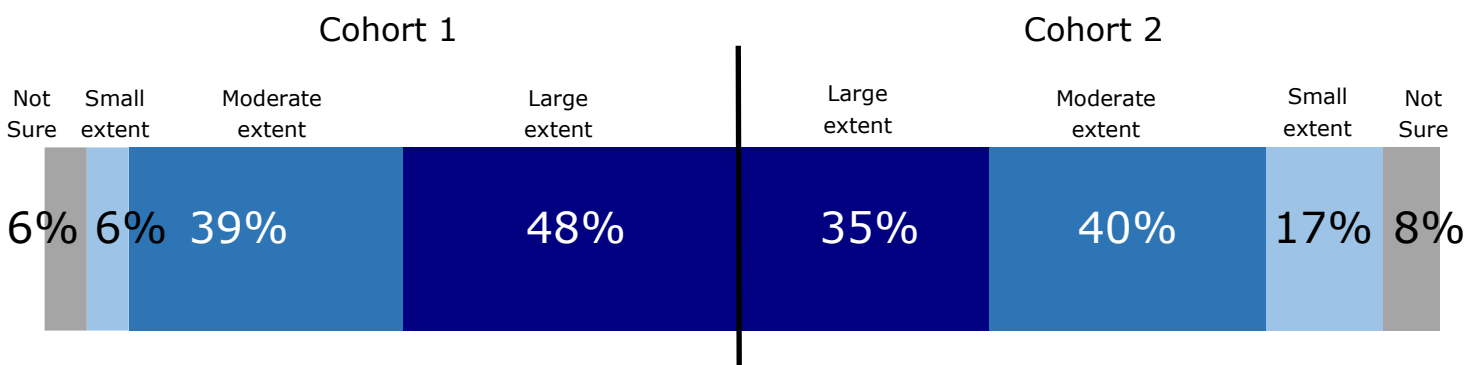


Chart 12

To what extent will the technical skills that you learned during this virtual externship will help you in your future career?



Data Takeaway: While the means for each cohort were fairly consistent for questions related to knowledge and skills, the charts below show a higher percentage of Cohort 2 respondents answered “to a moderate extent” on several questions.

Chart 13

Because of this externship, how much did your level of knowledge of data protection improve?

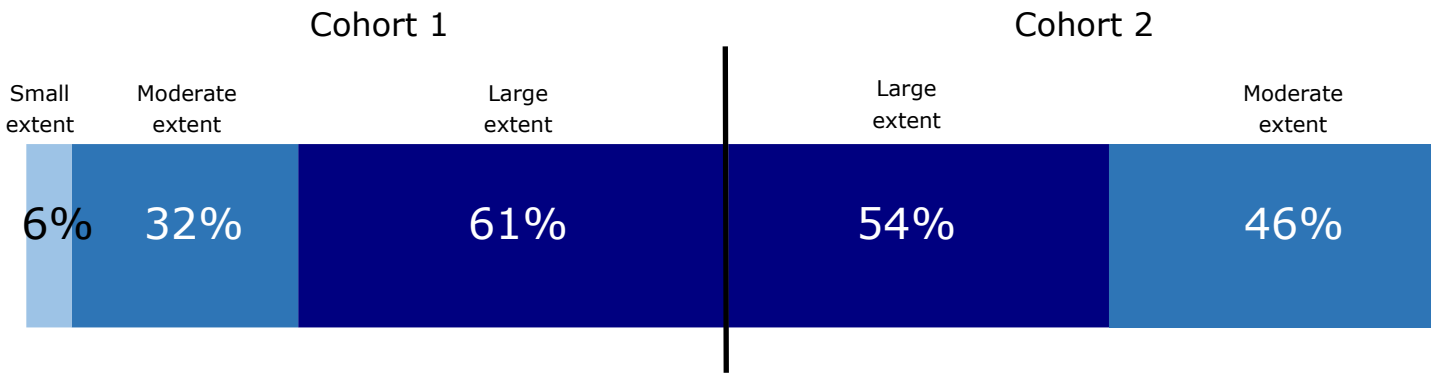


Chart 14

Because of this externship, how much did your level of knowledge of incident response improve?

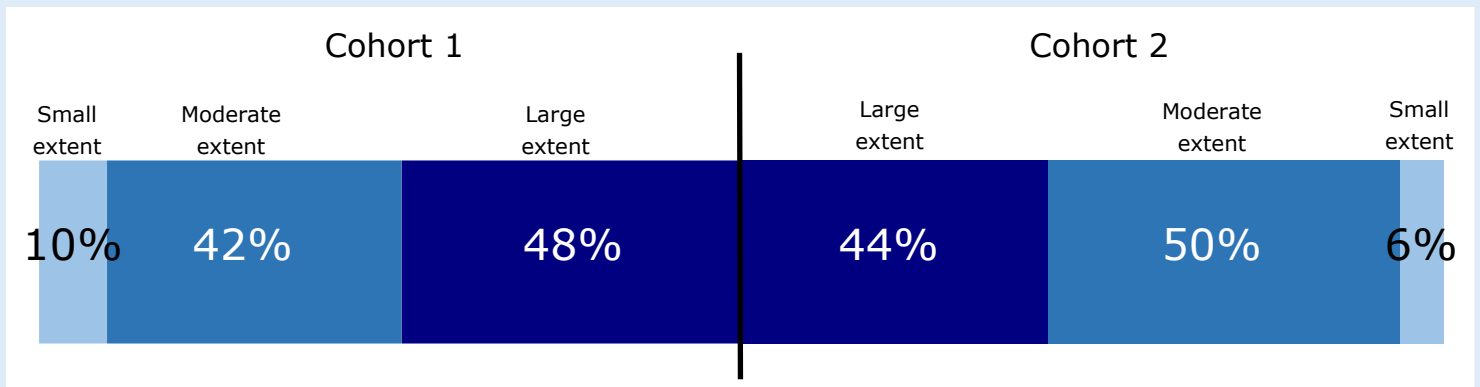
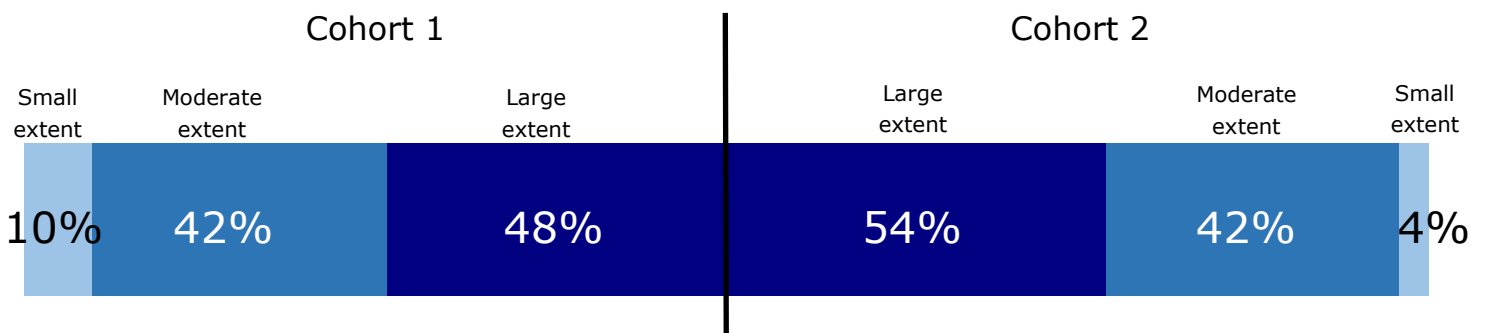


Chart 15

Because of this externship, how much did your level of knowledge of digital analysis improve?



Data Takeaway: While the means for each cohort were fairly consistent for questions related to problem solving abilities, Cohort 2 responded slightly more positively than Cohort 1.

Chart 16

Because of this externship, how much did your ability to understand and analyze a problem improve?

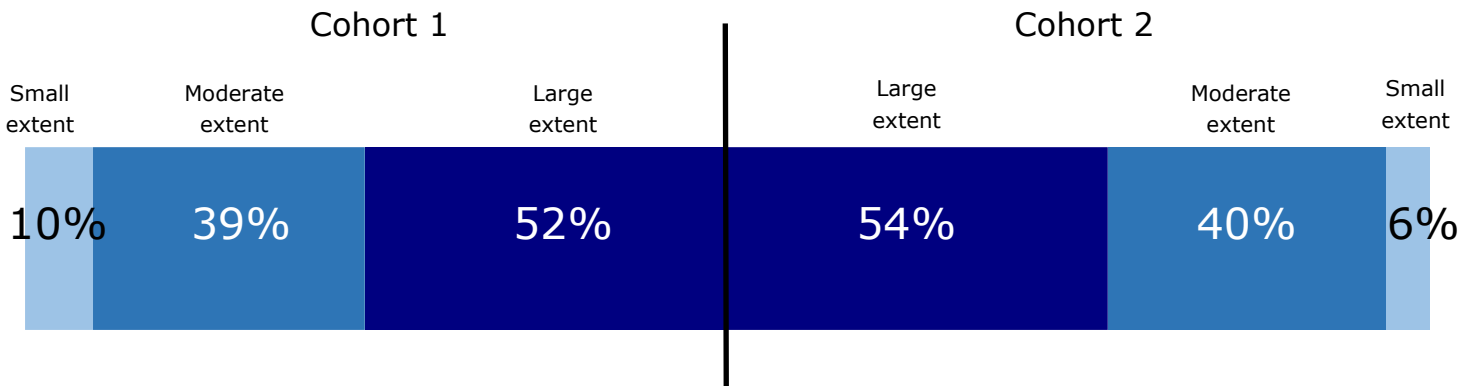
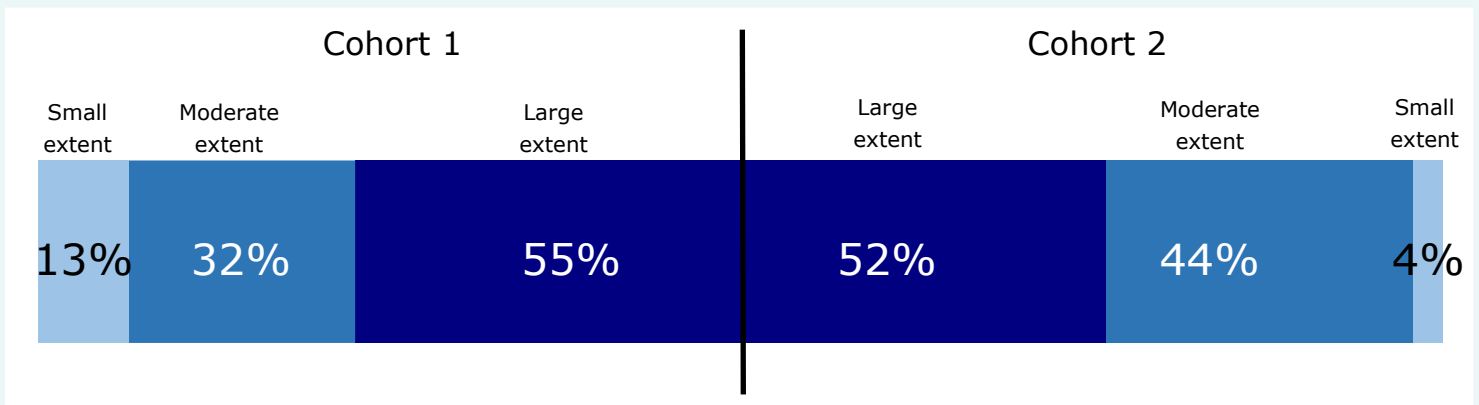


Chart 17

Because of this externship, how much did your ability to solve problems in real-life scenarios improve?



6. Summary of Findings

In-person vs. Virtual Format

For the survey of Cohort 2, the wording in the question related to preferring virtual over in-person externships was modified slightly to control for social distancing as a result of COVID-19. While most respondents responded neutrally, more respondents agreed rather than disagreed that they would have preferred attending the externship virtually rather than in-person. The open-ended text responses explaining “why or why not” helped fill in the gaps further. Text responses from those who indicated they felt “neutral” tended to be more positive about attending virtually rather than in-person, suggesting many of the neutral responses may not have been so neutral after all.

Teamwork & Social Connectedness

One theme that emerged from the Cohort 2 open-ended text responses was the impact of the teamwork and social connectedness components of the breakout rooms. When asked what aspect they found most impactful, after challenges and/or interactive activities (40%), the next most common responses centered around teamwork and bonding with teammates in breakout rooms. This was echoed in the text responses to the question, “Is there anything else you want to mention that we didn’t ask about?” Several respondents shared that they would miss the other participants and expressed a desire to keep in touch after the externship.

Group Ages & Live Chat Regulation

Another common theme among the Cohort 2 text responses centered around age differences between the middle and high school participants. Several students suggested improvements related to a more intentional approach when grouping students based on age or grade level. There were also several comments regarding what some respondents characterized as a misuse of the chat feature they found distracting or disrespectful to the instructors and/or presenters.

Cohort Comparisons

The mean responses for cohorts 1 and 2 were fairly consistent for most survey questions, with merely a hundredth decimal difference between the two in some cases. Cohort 2 appeared to be slightly more diverse in terms of respondents’ future career interests with more students indicating interest in career fields entirely unrelated to cybersecurity compared to Cohort 1 (e.g., creative writing, sports). As presented in Chart 7 (page 6), Cohort 2 had a higher percentage of students with low cybersecurity career interest who still had high levels of overall satisfaction with the externship experience compared to Cohort 1. While average overall satisfaction with the externship experience was slightly higher in Cohort 2 than Cohort 1 (87% and 84%, respectively), the average perceived level of benefit was the same for both cohorts (85%).