DATA BRIEF:

Cybersecurity Texas Virtual Externship
July 2020

Prepared for

ESC★20
Serving the Educational Community

Education Service Center, Region 20

1314 Hines Avenue

San Antonio, TX 78208

Ph: (210) 370-5200

Written by

S&A LLC

Steuck & Associates LLC

Table of Contents

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.

To cite: Steuck & Associates LLC (July 2020). Data Brief of the Education Service Center, Region 20 Cybersecurity Texas Virtual Externship Program: Summer 2020. Unpublished Data Summary.

1. Introduction

The Cybersecurity Texas Virtual Externship was a 5-day virtual event held July 20-24, 2020. Hosted by Education Service Center, Region 20 (ESC-20) in partnership with Experience America and funded by the Texas Education Agency (TEA), approximately 40 middle school students participated in a series of workshops and virtual experiences to gain firsthand experience and insight into the world of Cybersecurity.

On the final day of the 5-day virtual event, 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. This data brief is intended to summarize findings from the survey.

2. Methods

S&A LLC introduced participants to the survey instrument via videoconference on the final day of the 5-day event. 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 series of heat maps, graphical representations of data where values are depicted by color, were created in order to help the reader easily visualize the quantitative data and understand it at a glance. The heat maps presented on pages 2-7 of this brief include survey questions along the top of the table in columns, and survey respondents in each row. Respondents were sorted vertically (along the Y axis) according to their level of interest in pursuing a future career in Cybersecurity, with respondents most interested in Cybersecurity or a related field at the top. Scanning from left to right along rows allows the reader to analyze consistency by respondent to better understand individual learning preferences and level of engagement. Scanning from top to bottom within columns allows the reader to assess consistency by topic to better understand level and quality of instruction as well as the potential impact of the respondents' future career choice on their preferences and attitudes.

3. Quantitative Data

Because of this externship, how much did your...

Key

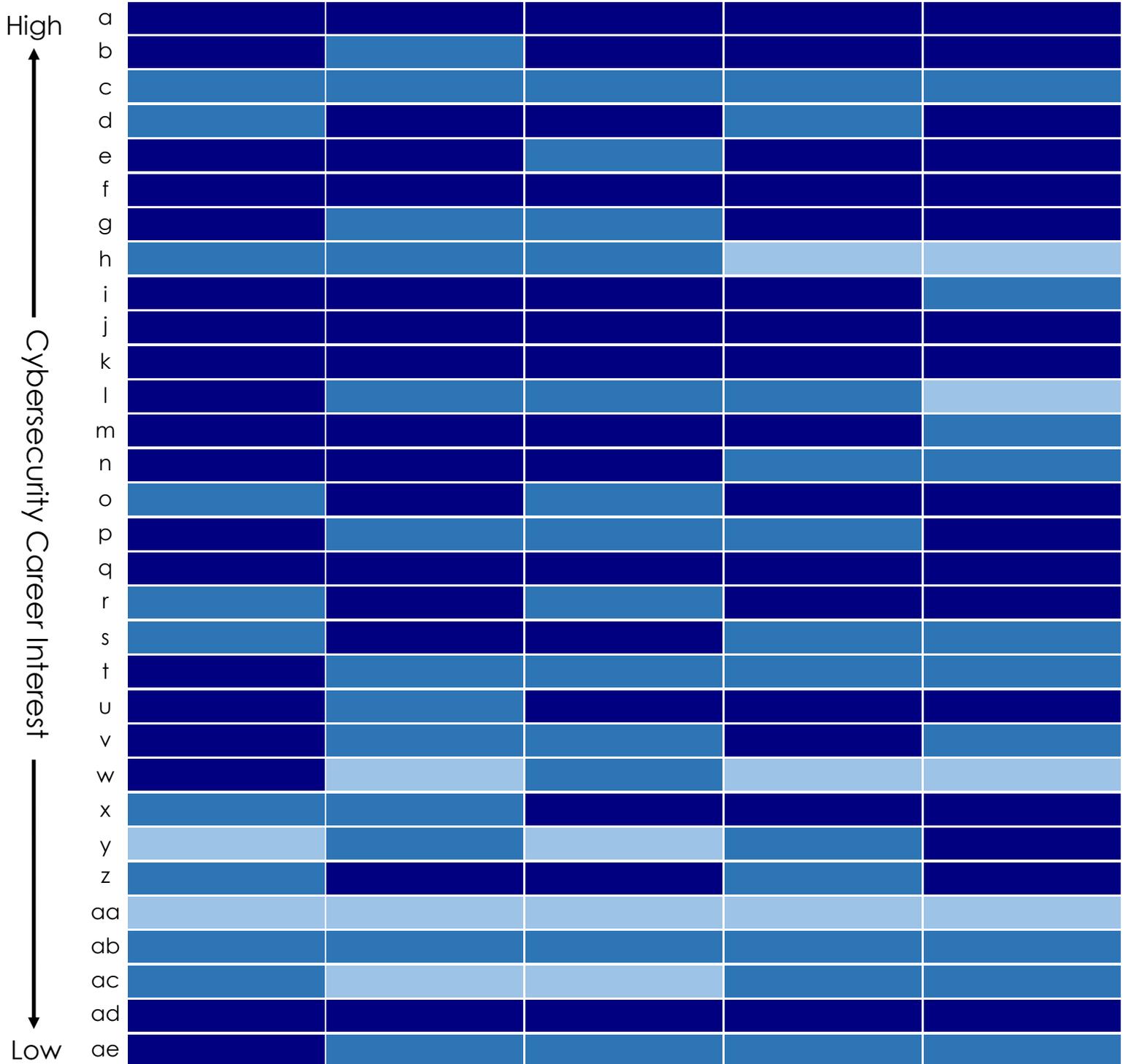| To a large extent |
| To a moderate extent |
| To a small extent |
| Not at all |

...level of knowledge of **data protection** improve?

...level of knowledge of **incident response** improve?

...level of knowledge of **digital analysis** improve?

...ability to **understand & analyze a problem** improve?

...ability to **solve problems in real-life scenarios** improve?

High

Cybersecurity Career Interest

Low

a b c d e f g h i j k l m n o p q r s t u v w x y z aa ab ac ad ae

Heat Map 1

S&A LLC

This externship experience helped me...

Key
- Strongly Agree
- Somewhat Agree
- Somewhat Disagree
- Strongly Disagree

...become more **interested in Cybersecurity**.

...better understand how to **reach my career goals**.

...feel more **confident in my Cybersecurity skills**.

...**build friendships** with other students interested in Cybersecurity.

...enhance my **collaboration and teamwork skills**.

High

Cybersecurity Career Interest

Low

a
b
c
d
e
f
g
h
i
j
k
l
m
n
o
p
q
r
s
t
u
v
w
x
y
z
aa
ab
ac
ad
ae
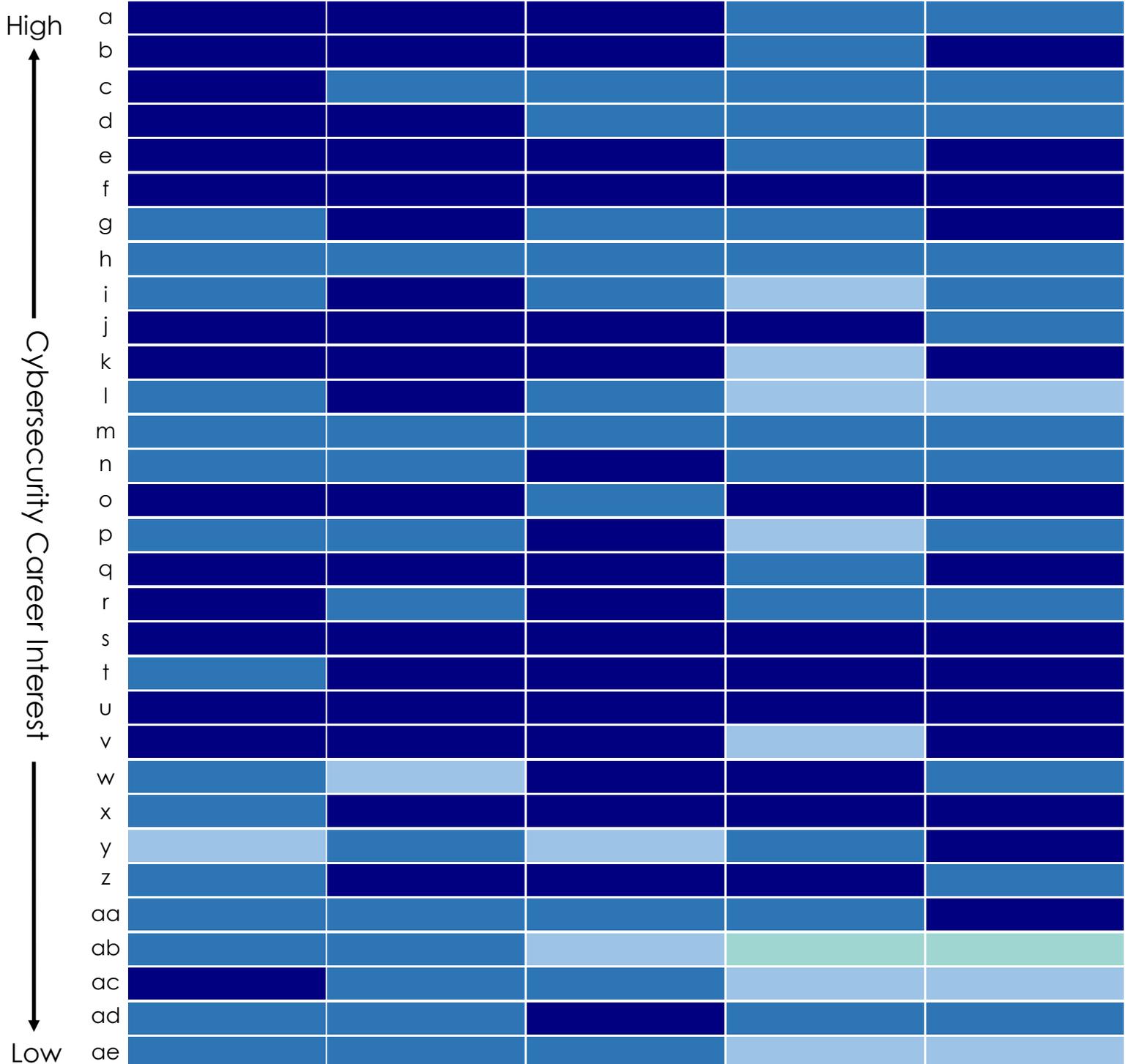
Heat Map 2

To what extent…

Key

To a large extent
To a moderate extent
To a small extent
Not at all
Not sure

...has this externship experience helped you **learn about new career fields** related to your interests?
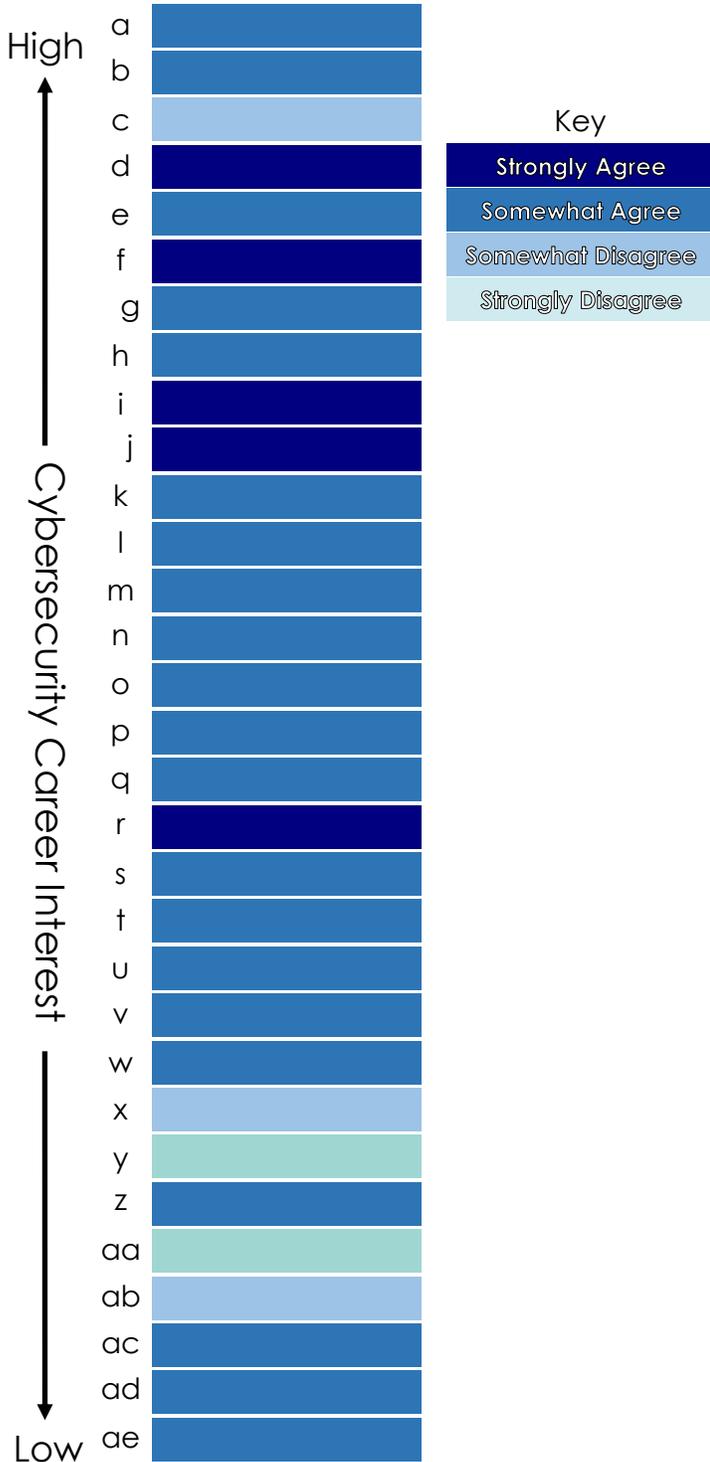
...has this externship experience helped you **network with potential future employers**?

...will the **technical skills** that you learned during this virtual externship will **help you in your future career**?

High

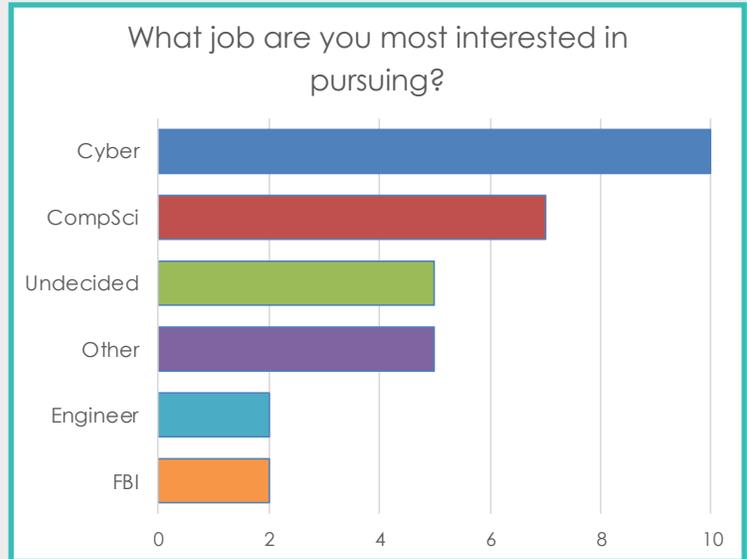Cybersecurity Career Interest

Low

Heat Map 3
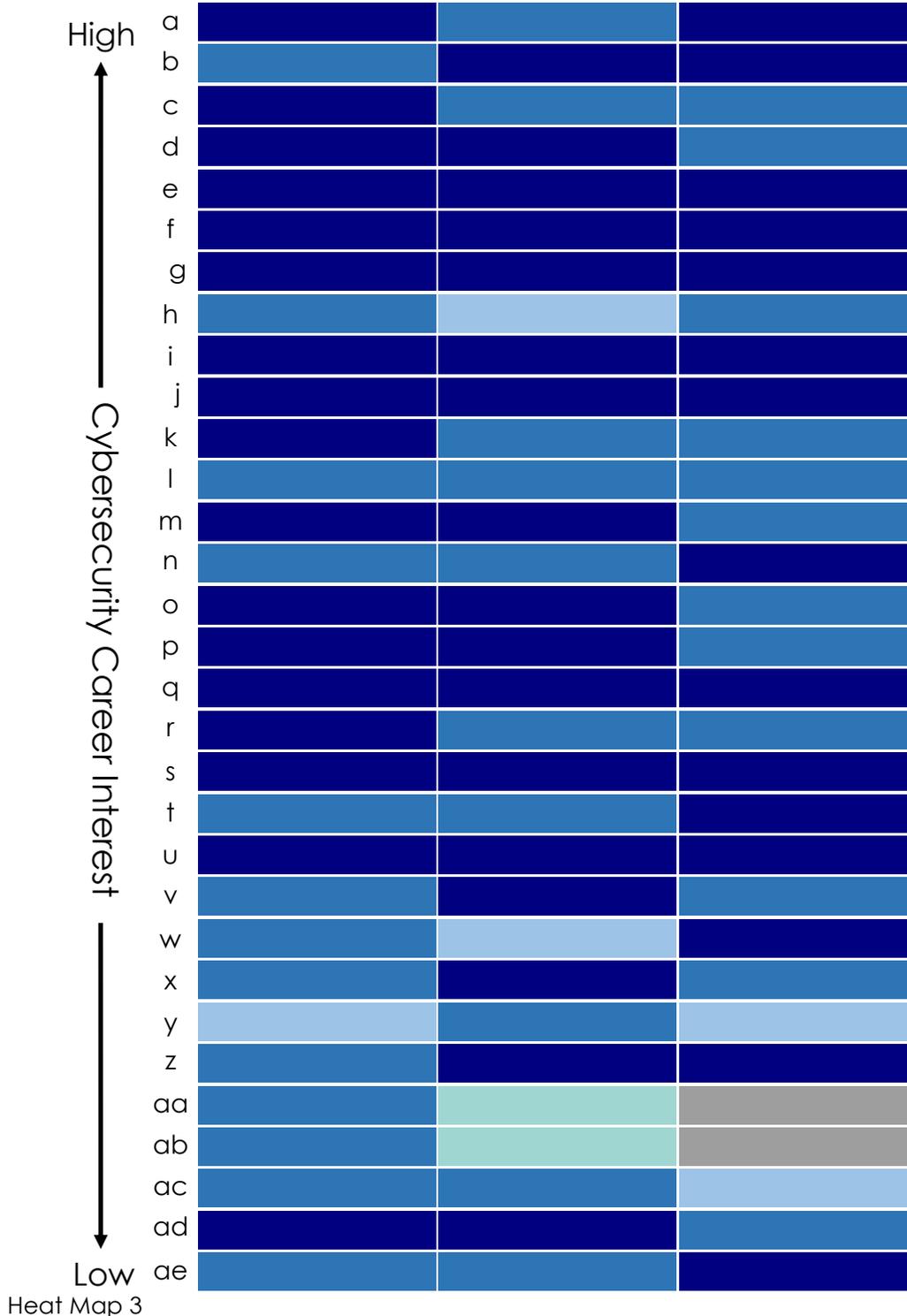
Responses to the question below may indicate respondents perceived Cybersecurity and Information Technology as two distinct occupational categories.

This externship experience helped me decide that I want to **work in Information Technology** in the future.

High

Cybersecurity Career Interest

Low

a b c d e f g h i j k l m n o p q r s t u v w x y z aa ab ac ad ae

Heat Map 4

Key

| Strongly Agree |
| Somewhat Agree |
| Somewhat Disagree |
| Strongly Disagree |

Chart 1

What job are you most interested in pursuing?

A majority of participants (55%) indicated they plan to pursue a career in Cybersecurity of a related field.

"Other" includes open-ended responses categorized as: Architect, Cyber/CompSci, Forensic Science, Forensic Science/Cyber, & Nursing.

Table 1

Future Career	Perceived Level of Benefit	Overall Satisfaction
Forensic Science/ Cybersecurity (1)	95%	100%
Cybersecurity (10)	90%	92%
FBI (2)	94%	85%
Cybersecurity/CompSci (1)	90%	85%
Nursing (1)	90%	85%
CompSci (7)	86%	83%
Engineer (2)	82%	80%
Forensic Science (1)	84%	75%
Undecided (5)	73%	75%
Architect (1)	68%	55%

Perceived level of benefit and overall satisfaction with the Virtual Externship experience was highest among respondents who plan to pursue a career in Cybersecurity or a related field.

See the Methods section (page 1) for more on how the percentages above were calculated.

Chart 2

Approximately one third of respondents did not identify any areas for improvement in their open-ended responses. The "Other" responses were varied and included topics such as resume prep, social interaction, engaging presentations, and time of day.
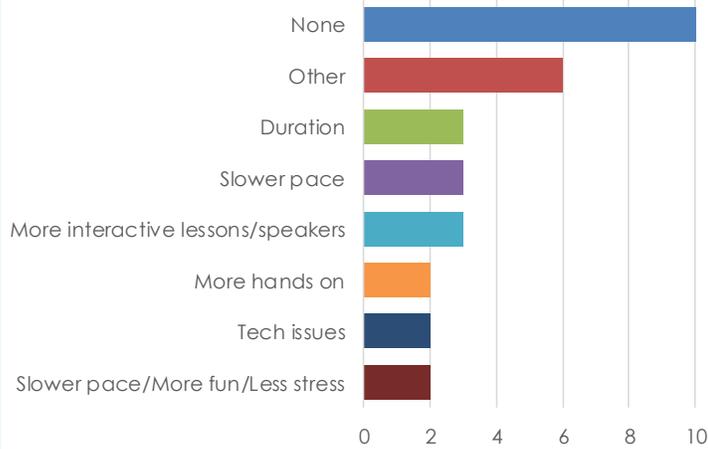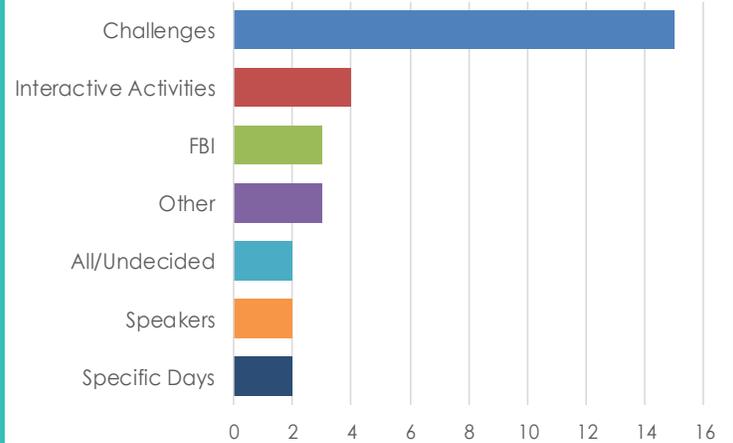
### In what ways could the virtual externship be improved?

Bar chart categories (descending): None (~10), Other (~6), Duration (~3), Slower pace (~3), More interactive lessons/speakers (~3), More hands on (~2), Tech issues (~2), Slower pace/More fun/Less stress (~2). X-axis: 0 to 10.

Chart 3

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

Bar chart categories (descending): Challenges (~15), Interactive Activities (~4), FBI (~3), Other (~3), All/Undecided (~2), Speakers (~2), Specific Days (~2). X-axis: 0 to 16.

A majority of respondents (61%) indicated the challenges and/or interactive activities were the most impactful.

Chart 4

Would you recommend this virtual externship to others?

Bar chart categories: Yes (~26), Yes, if… (~3), Not unless… (~1), Other (~1). X-axis: 0 to 30.
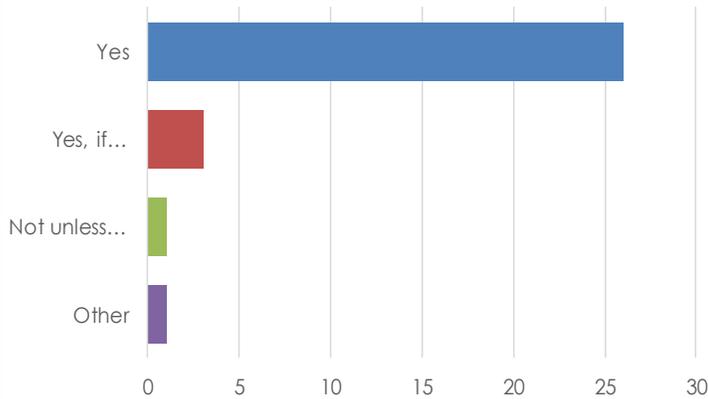
The "Yes, if" and "Not unless" categories include respondents who specified in their open-ended responses that they would only recommend the virtual externship to those who are interested in Cybersecurity.

Chart 5

A majority of respondents (61%) indicated they preferred the virtual externship over an in-person format. However, the impact of the Coronavirus pandemic on participant responses to this question is not known.

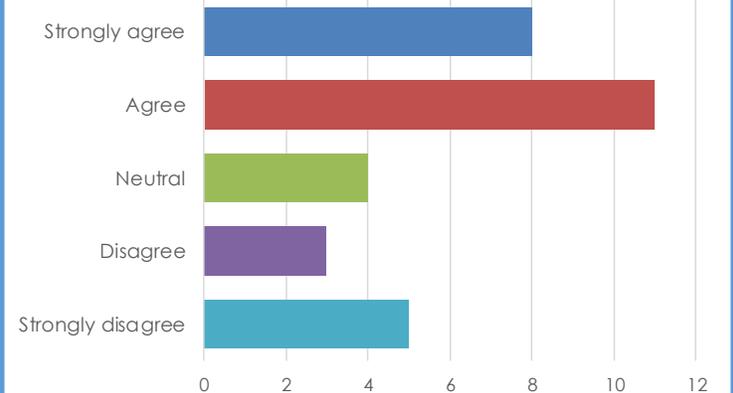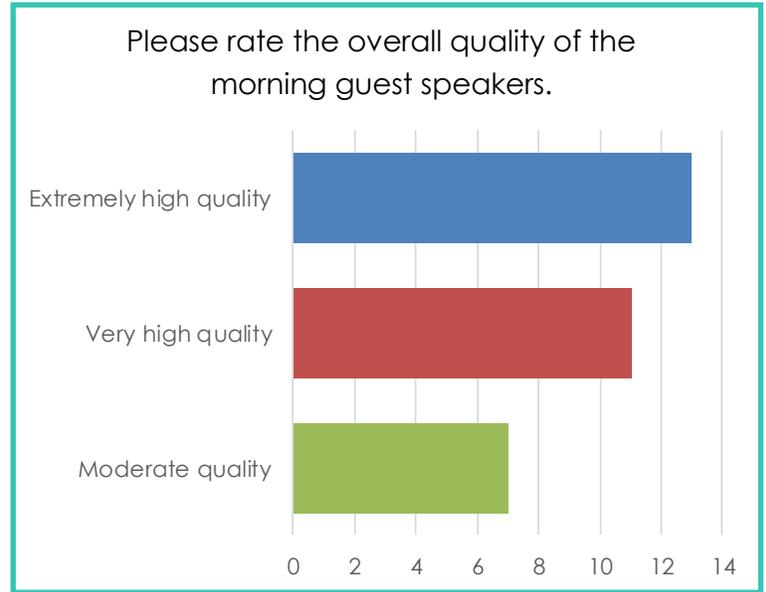### I preferred attending this externship virtually rather than in-person.

Bar chart categories: Strongly agree (~8), Agree (~11), Neutral (~4), Disagree (~3), Strongly disagree (~5). X-axis: 0 to 12.

Chart 6

Please rate the overall quality of the instructors.

Chart 7

Please rate the overall quality of the morning guest speakers.

4. Qualitative Highlights

In what ways could the virtual externship be improved?

"Giving the students more time to socialize and getting to know one another."

"The only thing I would say is to have an activity everyday."

"Maybe make the presentation in the morning a bit more interactive."

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

"...how great of instructors they were and that I really enjoyed this week and cannot wait to do it again."

"...this was an amazing experience and it really helped me become more confident."

"Thank you so much to everybody who helped make this possible. It was amazing."

5. Summary of Findings

Perceived Knowledge & Skills Gains

The data presented in Heat Map 1 (page 2) show there were no "Not at all" responses recorded for questions related to respondents' perceptions of the knowledge and skills they gained from the externship. This indicates there was consensus among respondents that they learned something from the externship experience. Responses to the first three questions in Heat Map 1 (columns 1-3) were slightly more positive than the last two questions (columns 4-5). This highlights a potential disparity between respondents' perceived level of knowledge and their perceived ability to apply that knowledge to understand and solve problems as a result of the externship.

In-person vs. Virtual Format

Chart 5 (page 6) presents respondents' preferences for attending this externship virtually rather than in-person. While a majority of respondents (61%) indicated they preferred the virtual externship over an in-person format, there are a number of factors which may have impacted this response pattern. For one, the impact of the global pandemic on student preferences for virtual versus in-person interactions is not known. Additionally, student preferences may vary depending on their primary motive for participating in the externship. For example, students who emphasize the social-emotional aspects of an externship experience may prefer an in-person format, while students who are primarily concerned with learning the content area may prefer a virtual format where distractions can be minimized. The fourth and fifth columns of Heat Map 2 (page 3) indicate lower satisfaction with the social-emotional components of the virtual externship (building friendships, collaboration/teamwork skills).

Career Pathways

Response patterns for questions related to future careers were fairly consistent. There were two respondents with less positive responses, indicating some respondents may have been less certain about their career direction and how the externship experience fits with their career pathway. This is also consistent with the data presented in Table 1 (page 5), which show that perceived level of benefit and overall satisfaction with the Virtual Externship experience was highest among respondents who plan to pursue a career in Cybersecurity or a related field.

Heat Map 4 (page 5) presents data from a single survey question related to respondents' desire to pursue a career in Information Technology (IT) as a result of the externship. While Chart 1 shows a majority of respondents indicated they intend to pursue a career in Cybersecurity, IT, or a related field, the responses presented in Heat Map 4 do not necessarily align with this. The response pattern could indicate respondents perceived Cybersecurity and Information Technology as two distinct occupational categories. Another possibility is that respondents may have already decided on a future career pathway prior to participating in the externship, leaving little room for improvement. Regardless, 97% of respondents agreed that participating in the externship made them more interested in Cybersecurity.