

Building a Statewide Experiential Learning Portfolio in Cybersecurity

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Commonwealth
Cyber Initiative

CyBER Con
Norfolk, VA, 20 September 2023

The Commonwealth Cyber Initiative

Our vision

Positioning the commonwealth as a globally recognized leader in cyber

Our mission

Research, innovation, and workforce development

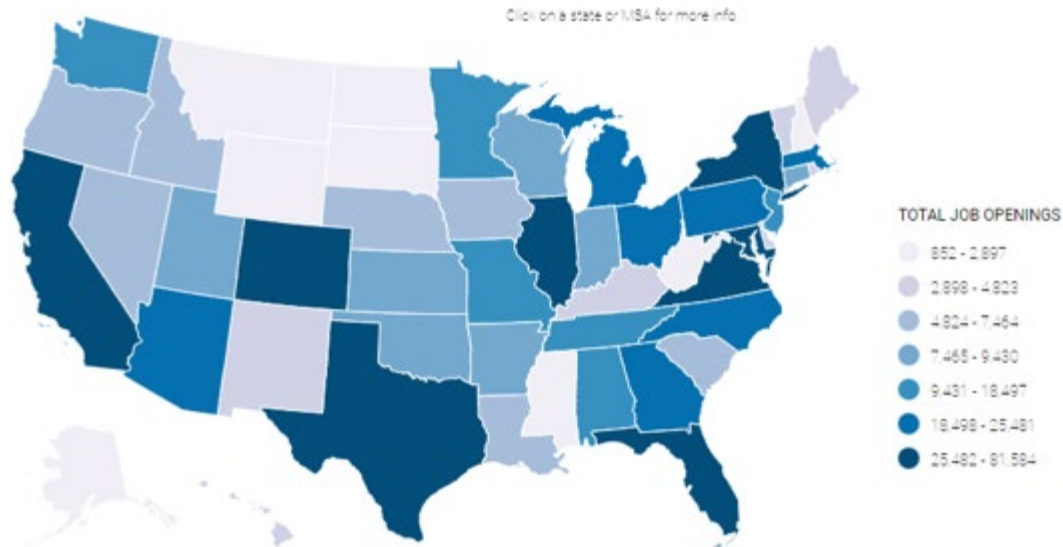
300+
researchers



42 higher ed institutions



The US cybersecurity workforce challenge



Large workforce gap

1.13 M workers employed
663 K job openings

Source: cyberseek.org (Sep. 2023)

Underrepresentation by key demographic groups

Women: 25% of the workforce (51% of the population)

Black/African American: 9% of the workforce (13% of the population)

Latino/Hispanic: 4% of the workforce (19% of the population)

Source: Frost & Sullivan white paper, 2019



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Employment and Wages: Information Security Analyst

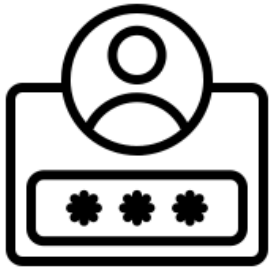
METROPOLITAN STATISTICAL AREA	RANK (2022)	TOTAL EMPLOYMENT (2022)	MEDIAN ANNUAL PAY (2022)	LOCATION QUOTIENT	PROJECTED JOB GROWTH (2022-2032)
Virginia					
Washington, DC-MD-VA*	1 st	17,170	\$132,640	5.1	+6,002
Virginia Beach, VA	26 th	1,440	\$106,740	2.8	+504
Richmond, VA	27 th	1,380	\$112,840	2.0	+483
Charlottesville, VA	92 nd	190	\$111,200	1.5	+67
National Leaders and Peers					
New York, NY-NJ	2 nd	10,270	\$136,010	1.0	+3,594
Dallas-Fort Worth, TX	3 rd	6,430	\$126,620	1.5	+2,250
Baltimore, MD	4 th	4,720	\$128,880	3.3	+1,652

Source: BLS Occupational Employment and Wage Statistics, May 2022



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Experiential learning correlates with...



higher rates of
credentialing



higher interview
rates



success in
employment
after graduation



success in
entering grad
school



monetary
compensation



job satisfaction

Source: References in DaSilva et al.,
ASEE 2023



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Our approach: an experiential learning portfolio

- Transdisciplinary experiential learning
 - Internships
 - Traineeships
 - Cybersecurity competitions
 - Intensive training + professional development
-
- ✓ Experiential learning provides improvement to professional skills like time management and teamwork
 - ✓ The number of internships an undergraduate has is a good predictor of initial career outcomes

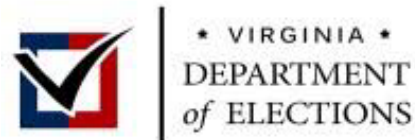


Transdisciplinary experiential learning

USDA NIFA Women and Minorities in Ag



Rural
Cybersecurity
Workforce Pipeline



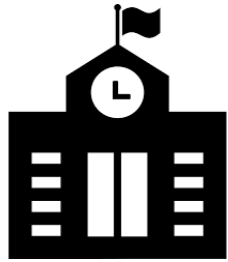
Computer
evidence recovery
system

- ✓ Cybersecurity as intrinsically transdisciplinary
- ✓ Cross-disciplinary activities improve the ability to think systemically, work in teams, combine technical and social skills



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Internships, from high school to grad school



NoVA Program (2021)

- ✓ 20 internships for HS juniors or seniors
- ✓ 110 applicants
- ✓ In 2022, 30 internships



- ✓ 54 placements
- ✓ 21 companies (13 new)
- ✓ 42% female, 50% POC
- ✓ 17% military veterans
- ✓ 91% remained in cyber



Cyberstartups internship program (2021):

145 applicants, 15 positions (80% from underrepresented groups), 11 received post-internship job offers



CCI Experiential Learning



Kylie Amison



Traineeships



Developed by CCI NoVA Node

- ✓ 25 apprentices
- ✓ 7-week full time training
- ✓ 12-week apprenticeships
- ✓ Hosted by Arlington Co., MITRE, Dekra, InterSec, Sedulous, Peraton

Increasing diversity in the cyber workforce:

400 applicants to the program

43% female, 19% veterans

90% in underrepresented groups in STEM

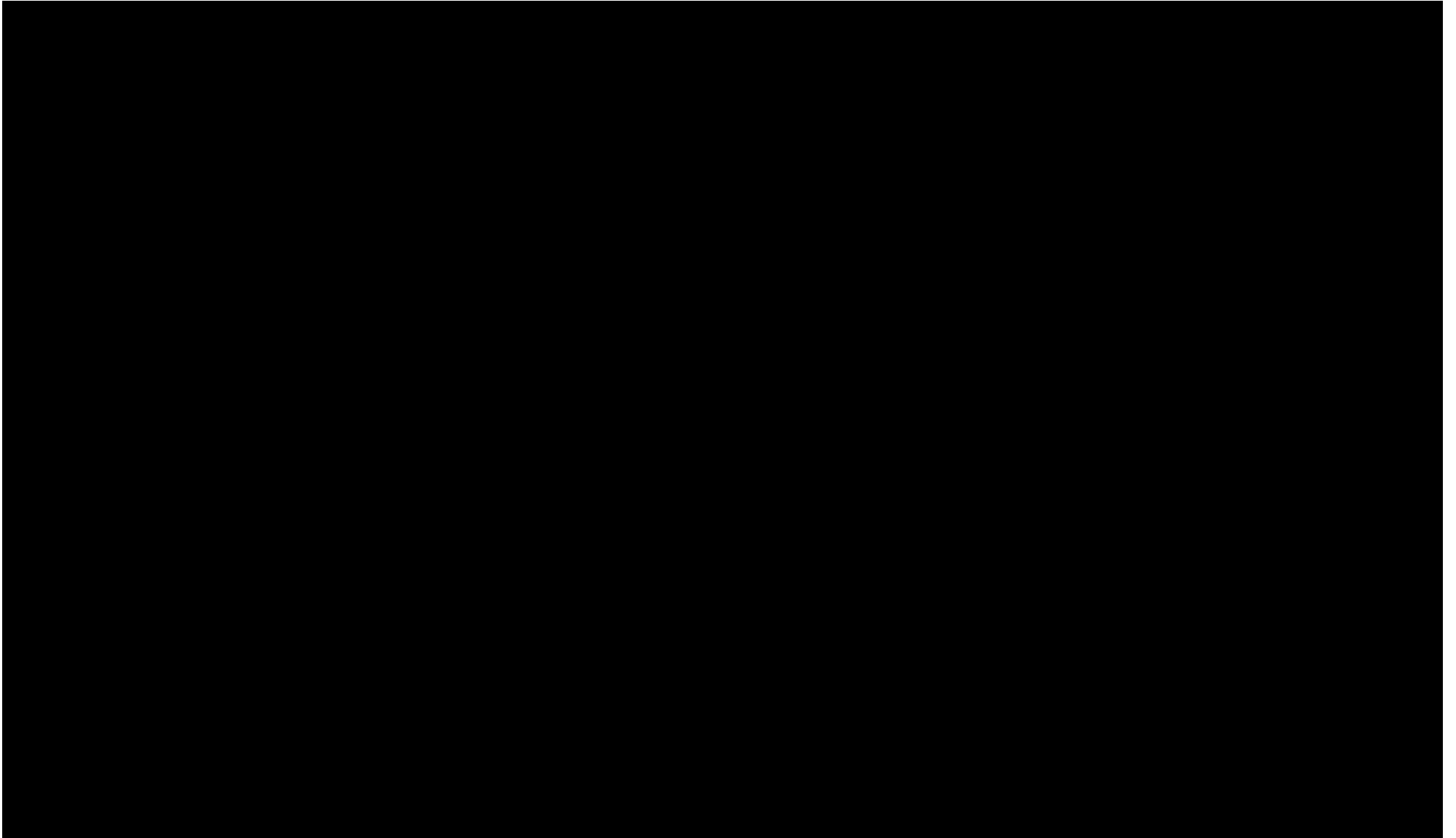


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CACI/CCI Partnership



Glenn Kurowski
Senior VP and CTO
CACI



Competitions + Intensive training + professional development



**Commonwealth
Cyber Fusion**

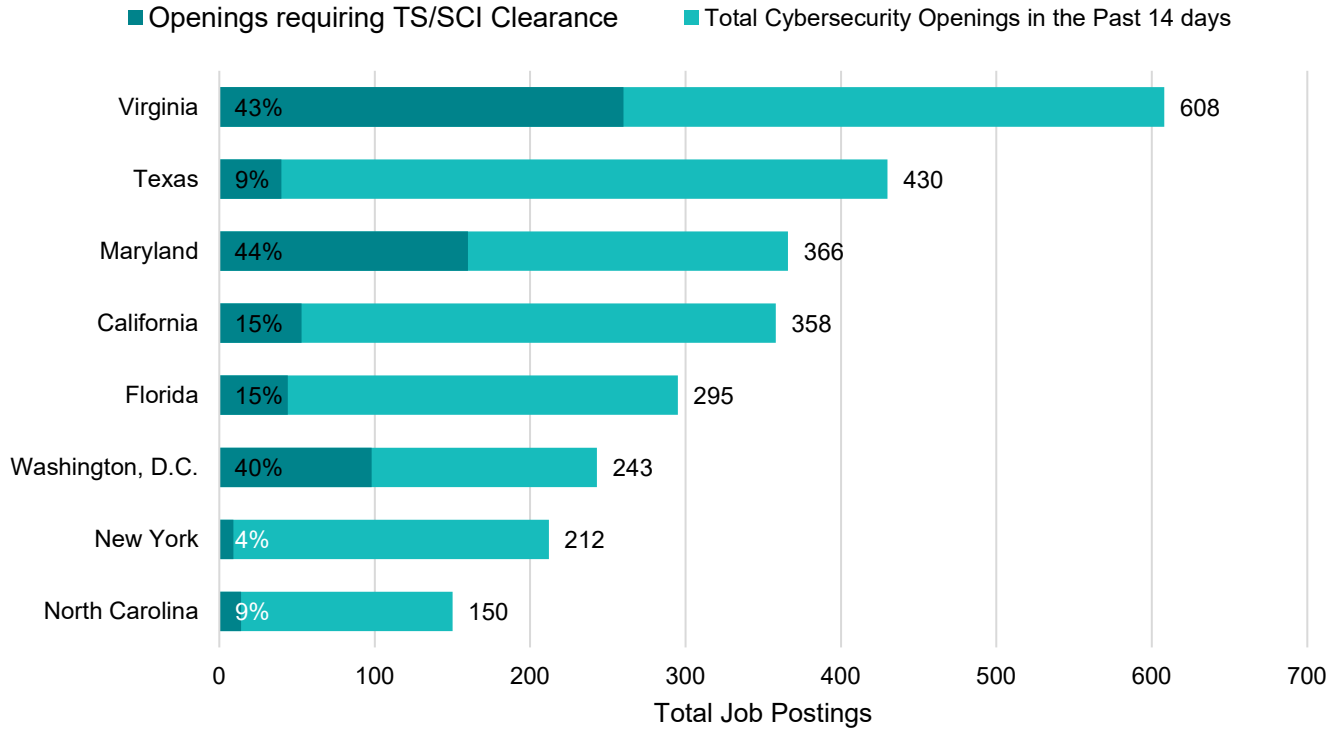
- ✓ Provide hands-on supplemental training in areas that employers identify as high priority
- ✓ Pair up with professional development: mock interviews, resumé writing, career panels
- ✓ Clearance preparedness programs



June 2023: \$700K
funding for seven
new experiential
learning programs



The Need for Clearable Professionals



Source:
indeed.com
July 2023



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Clearance Preparedness Program

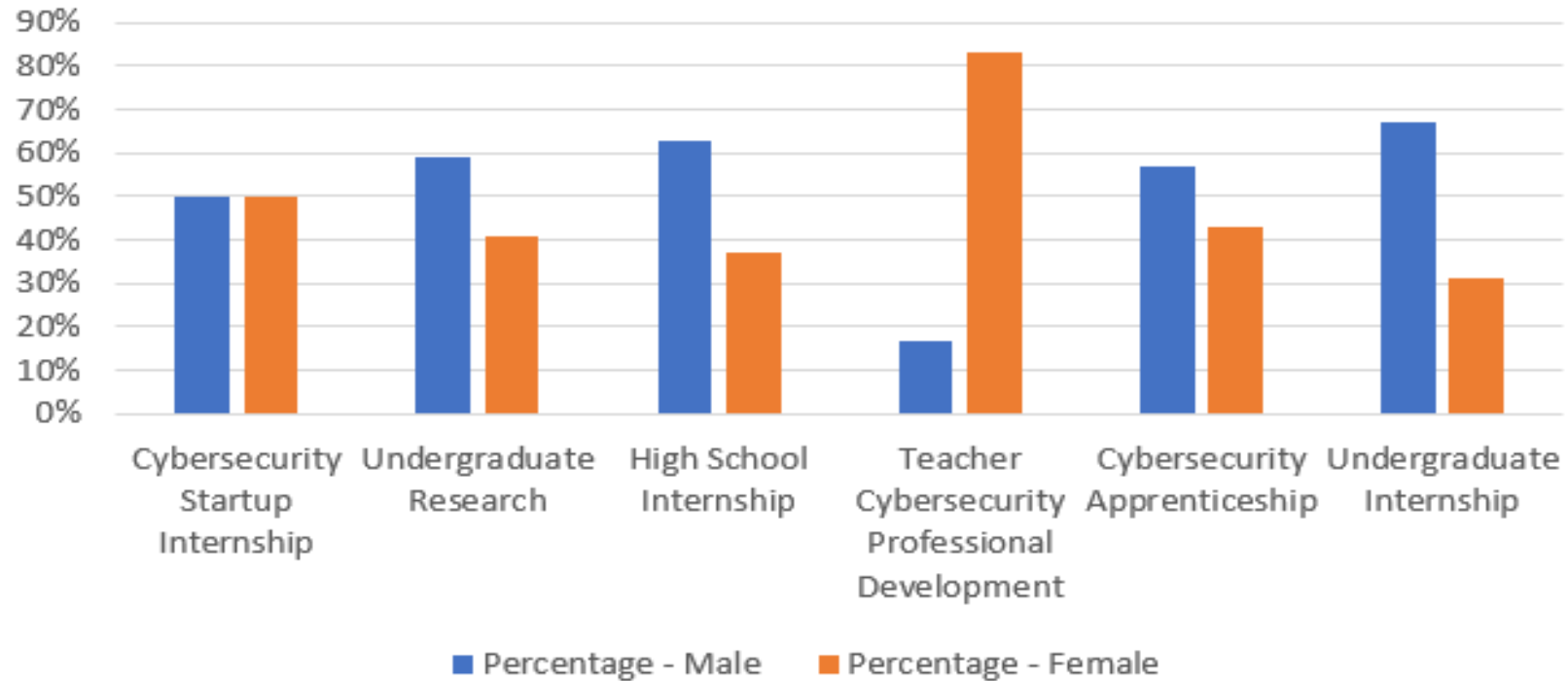
All Nodes Represented

- 18 institutions
- 219 students in the inaugural 2023 cohort
- Digital Certificate
- CCI and industry panelists



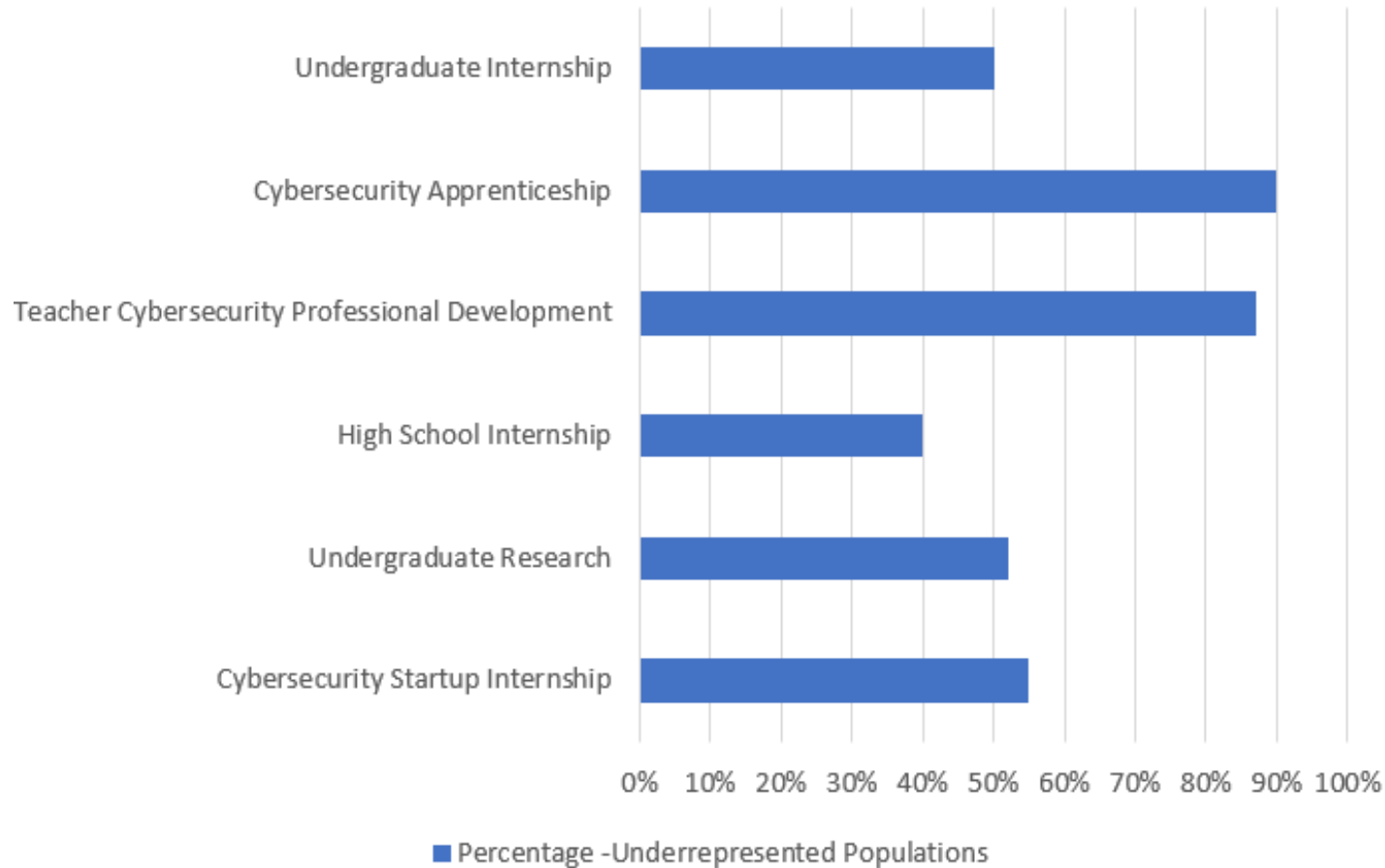
Gender representation in our programs

Gender Representation across Workforce Development Initiatives



Participation by under-represented groups

Representation of Underrepresented Populations Across Workforce Development Initiatives



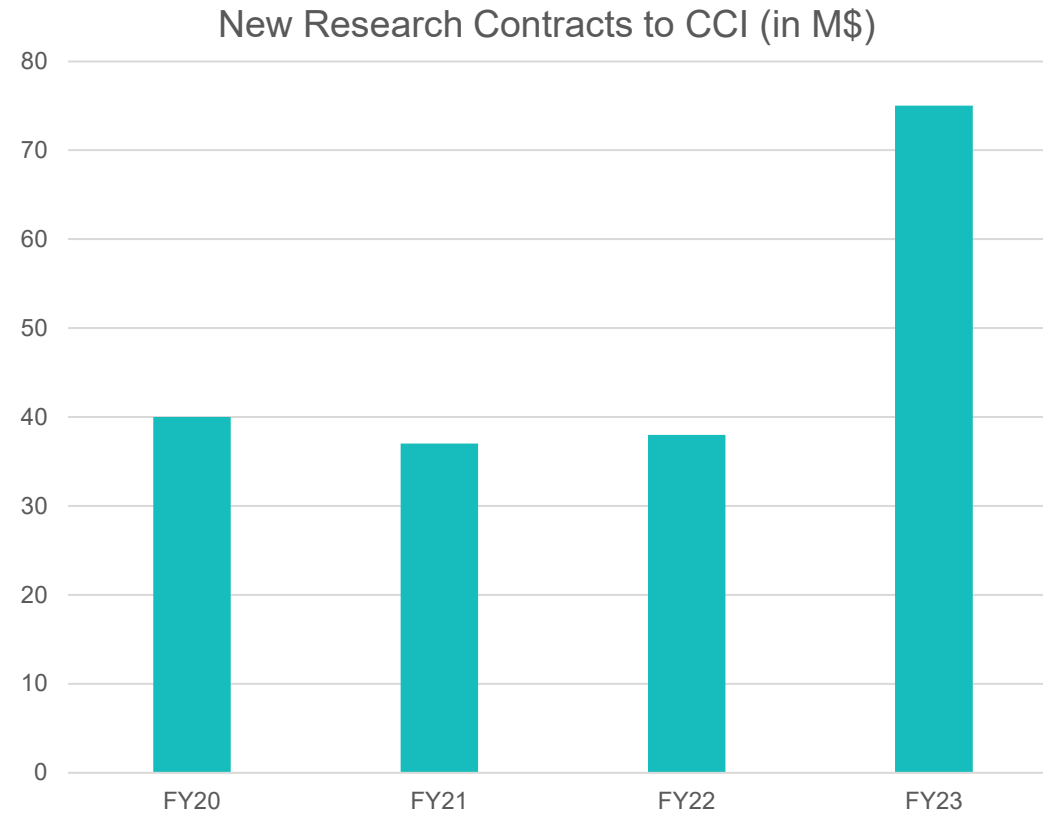
Participation in CCI workforce development programs

Workforce and Experiential Learning	FY20	FY21	FY22	FY23
Number of research scientists and graduate assistants	32	83	110	125
Number of interns and participants in experiential learning programs	-	92	151	262
Number of undergraduate students supported	-	235	243	256

Source: RTI, August 2023



New Research Grants to CCI Researchers



Funding from
federal and
industry sources



Impact: FY20 and
FY21 only





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