

NICE | Conference and Expo 2022

JUNE 6 - 8, 2022 | WESTIN PEACHTREE PLAZA | ATLANTA, GA

DEMYSTIFYING CYBERSECURITY

Integrated Approaches to
Developing Career Pathways

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 **NEW
AMERICA**

Accelerating To Victory! Leveling The Playfield in Information Security Through an Accelerated Training Program

Jasmine M. Jackson

Senior Application Security Engineer
Walt Disney Studios

Bryson Payne

Professor and Coordinator, Student Cyber Programs
University of North Georgia

Accelerating To Victory!

Leveling the Playfield in Information Security
Through an Accelerated Training Program

Presenters:

Jasmine Jackson, Senior Application Security
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The Walt Disney Studios

Dr. Bryson Payne, Professor and Director,
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About the Presenters

Jasmine Jackson is a Senior Application Security Engineer with The Walt Disney Studios and the Capture the Flag (CTF) Coach for the inaugural US Cyber Team.

Ms. Jackson has an M.S. in Computer Science (University of North Carolina, Charlotte) and a B.S. in Computer Science (California State University, East Bay). Jasmine is an adjunct professor at Drexel University (Philadelphia, PA) and City University of Seattle (Seattle, WA). Ms. Jackson volunteers with BlackGirlsHack, Open Web Application Security Project (OWASP), and the Women's Society of Cyberjutsu.

Dr. Bryson Payne is a Professor and Director of the Center for CyOps at the University of North Georgia and a Senior Tech Mentor for the inaugural US Cyber Team

Dr. Payne is the author of *Teach Your Kids to Code* and *Hacking for Kids* and has been teaching Cybersecurity & Computer Science since 1998. Dr. Payne has a Ph.D. in Computer Science from Georgia State University and a B.S. and M.Ed. from the University of North Georgia. Bryson is the coach of the #1 NSA Codebreaker Challenge team, the UNG CyberHawks.



About the US Cyber Games

The mission of the US Cyber Games is to bring talented cybersecurity athletes, coaches, and industry leaders together to build an elite US Cyber Team for global cybersecurity competition.

The US Cyber Games was founded by Katzcy, in cooperation with the National Initiative for Cybersecurity Education (NICE) program at the National Institute of Standards and Technology (NIST).



US Cyber Games, Season I



US Cyber Open CTF

May 2021: Applicants aged 18 to 26 from across the nation will compete in a two-week Capture the Flag (CTF) competition consisting of a series of virtual cybersecurity challenges.

- 680 registered to play
- 43 states
- 23% female, 70% male
- 32.6% people of color
- 12.5% military veterans
- 15.9% first-time CTF player



US Cyber Combine Invitational

July-August 2021: 60 athletes invited to participate in a number of virtual learning games and programs over eight weeks. During this qualifying phase, athletes underwent cyber aptitude evaluations, interviews with multiple coaches, and performed in an advanced CTF qualifier round.

- 60 athletes invited
- 23 states
- 23% female, 74% male & 3% prefer not to say
- 34.6% people of color



US Cyber Team Draft

October 5, 2021: Top 20 cybersecurity athletes plus 5 wildcards were selected to form the inaugural US Cyber Team to represent the United States at the International Cybersecurity Challenge (ICC) taking place June 14-17, 2022 in Athens, Greece.



Agenda

- Vision of The Accelerated Training Program
- Process of Selecting Athletes / Scholarships
- Season I Coaching Staff
- Structure of The Accelerated Training Program
- The ATP Experience – Teacher’s Perspective
- Results
- Lessons Learned
- Season II



Vision of The Accelerated Training Program

The Accelerated Training Program was created, developed, and lead by Jasmine Jackson to identify high-potential athletes who would benefit from special access to cybersecurity education, training, and mentoring. These individuals did not make the team but show potential for future seasons. This exclusive training program will allow athletes to take part in a six-month training program that includes small group mentorship with the coaches and can be renewed based on participants' continued dedication and progress. *Athletes who perform well in the program are automatically invited to the next season's US Cyber Combine.* A Scholarship Program has also been designated for an exclusive subset of these athletes.



Process of Selecting Athletes

- Jasmine created moniker/nickname - Accelerators
- Accelerators were selected by Jasmine
- 14 Accelerators selected
- 13 Accelerators completed the program



Scholarships

- 90-day access to HackTheBox (HTB) platform
- 90-day access TryHackMe (THM) platform
- 90-day access to Offensive Security's PEN-200 course with OSCP exam voucher
- 5 Accelerators received scholarships



Season I Coaching Staff

Head Coach – Dr. TJ O'Connor

- Ph.D./M.S., Computer Science NC State
- M.S., SANS Technology Institute
- Bachelors West Point
- Binary Exploitation Trainer



CTF Coach – Jasmine Jackson

- M.S., Computer Science
UNC Charlotte
- B.S., Computer Science
CSUEB
- Web Exploitation Trainer
- Collaborated Mobile
Security (Android)



RvB Coach – Dr. Dane Brown

- Ph.D., Computer Engineering VA Tech
- M.S., Computer Engineering Naval Postgraduate School
- B.S., Electrical Engineering U.S. Naval Academy
- Reverse Engineering Trainer



Senior Tech Mentor – Dr. Suzanna Schmeelk

- 9 advanced degrees
- 2 Ph.D., M.B.A., 5 M.S., B.S.
- Forensics, Networking, Cryptography Trainer
- Collaborated Mobile Security (Android)



Senior Tech Mentor – Dr. Bryson Payne

- Ph.D., Computer Science, Georgia State University
- M.Ed. / B.S., Mathematics, University of North Georgia
- Reverse Engineering (Windows) Trainer



Structure of The Accelerated Training Program

- . Pilot
- . Cohorts
- . Rotations
- . Subject matter same as US Combine
- . Recorded lectures
- . Accelerators competing in CTFs



The ATP Experience – Teachers' Perspective

Dr. Bryson Payne – Senior Tech Mentor, Reverse Engineering

- Getting to work with the cyber athletes one-on-one and in small groups weekly was the best part
- Opportunity to see first-hand their level of skill, and to see it grow
- Teaching in our area of expertise to some of the best cyber athletes in the country



The ATP Experience – Teachers' Perspective

- We were able to dive deeper into our specializations in the Accelerated Training Program than in regular classes or in the Combine training phase of the US Cyber Games
- Athletes had more individual time with each instructor, so they were able to achieve more in a few weeks than they might in a full-semester course
- Extra support via Discord helped between live sessions



Results

- Accelerators preferred cohorts
- Accelerators top choice was Reverse Engineering
- Accelerators second choice was Binary Exploitation
- Accelerator created Women in Cybersecurity (WiCys) chapter at their university
- Accelerators found the program helpful with their upcoming internships



Lessons Learned

- Discord is not the best option for content management
- Scheduling issues – Season I coaching staff on East Coast
- Limited Infrastructure – have scholarships for all accelerators not a select few
- “Accelerated”



Season II

- Introducing regions – East and West
- New Name: US Cyber Games Pipeline Program
- New Vision: Partnering with existing non-profits such as BlackGirlsHack (BGH), Blacks in Cybersecurity (BIC), and RAICES to develop and retain cyber athletes
- Link: [Building an Elite US Cyber Team | US Cyber Games](#)



Thank you...

- . Coaches
- . US Cyber Games
- . Accelerators



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 **NEW
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A Diverse Cyber Academy for Diverse People

Adam Bricker

Executive Director, Carolina Cyber Center
Montreat College

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Networking Breakout: Promote Career Discovery

Roland Varriale

Cybersecurity Analyst

Argonne National Laboratory

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The Role of Cybersecurity Leaders as Educators: Unconventional Approaches to Cybersecurity Talent Development and the Scarcity of Skill

Jeffrey Welgan
Chief Product Officer
CyberVista

The Role of Cybersecurity Leaders as Educators

Jeff Welgan, *Chief Product Officer*
CyberVista





As Chief Product Officer, Jeff Welgan oversees CyberVista's products and services. Focused on leading a data-driven approach to cybersecurity workforce development and training, Welgan and his product team strive to strengthen organizations by providing IT, cybersecurity, and cyber-enabled professionals with the knowledge and skills needed to succeed in an ever-changing and evolving industry.

Welgan carries over a decade's worth of experience supporting intelligence agencies and collaborating with leaders across private, public and government sectors. More recently, he has specialized in enterprise cyber workforce solutions, as well as executive & board-level cyber risk training. As a decorated US Navy Veteran and former Search and Rescue Swimmer, Welgan believes in leading from the front and empowering teams to excel beyond expectation.

Welgan also serves as a member of the Private Directors Association's cyber oversight board.

Agenda

- Current State of the Cybersecurity Workforce
- Outdated (Yet Still Active) Methods to Workforce Development
- Using an Unconventional Approach Through Data

Current State of the Cybersecurity Workforce

OPEN POSITIONS



~402,000

unfilled cybersecurity positions in the US in 2021

TALENT ACQUISITION



73%

of cybersecurity leaders struggle with sourcing experienced talent

TIME-TO-HIRE



35%

pointed to positions being left unfilled for 12 weeks or more

SALARIES



54%

of hiring managers believe salaries have increased in excess of 11% YoY

Current State of the Cybersecurity Workforce

STRATEGY EXECUTION



43%

of leaders reported internal skills is the most significant barrier to strategy execution, up from 39% in 2021

WORKFORCE DEVELOPMENT

The top priority for cybersecurity leaders is investing in training and certifications.

65%

of respondents want to fill skills gaps across teams...

57%

however, say hiring, training, and retaining is a struggle

What Methods are Holding Us Back

Corporations Not Partnering with Academia

- Struggles to keep up with pace of industry changes
- Limited curriculum to address real-world challenges

Only Going After Top Talent

- Neglects “malleable” talent, transferable skills
- Discourages new applicants with limited experience
- “Poaching” displaces gap, not reduce it

Outdated & Ineffective Training Models

- Relying on certs only
- Leadership being hands-off
- Training without (the right) data



Taking an Unconventional Approach Using Data



Market Data

Stay ahead of trends for new technologies, organizational developments, and potential skill development needs.

Resources:

- CyberSeek
- Emsi Burning Glass
- NIST NICE Framework
- Industry & Human Capital Studies



Internal Data

Use analytics and training insights to track measurable behavior change, not just engagement and attendance.

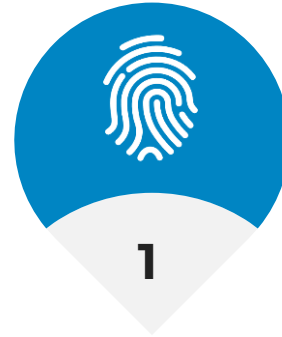
How to Use Internal Data

- Baseline skills by role, competency, NICE category, etc.
- Tailor training to meet specific skills gaps
- Uncover “hidden” talent

A Successful Data-Driven Approach Uses Multiple Tools

1. Align Workforce Skills to Roles

- Analyze & create job role profiles to identify competencies & skill proficiency
- Combine market data, industry frameworks, and internal initiatives to create a holistic people strategy
- Deploy role-based skills diagnostics to assess performance against expectations





Workforce Alignment Example

Cyber Defense Analyst, TIER 3

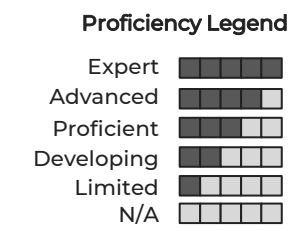
Cyber Defense Analysts use data collected from a variety of cyber defense tools (e.g., IDS alerts, firewalls, network traffic logs) to analyze events that occur within their environments for the purposes of mitigating threats and protecting/defending the enterprise from cyber-related threats. Primary responsibilities involve triaging events that come from any number of sources and working to understand the threat and ensuring any incidents get resolved or escalated accordingly. This role includes balanced knowledge and skills in alerting practices, as well as security engineering tasks along with mentoring junior Cyber Defense Analysts.

Asset / Inventory Management	□□□□□
Collection Operations	■□□□□
Computer Forensics	■□□□□
Computer Languages	■□□□□
Computer Network Defense	■□□□□
Computers and Electronics	■□□□□
Data Analysis	■□□□□
Data Management	■□□□□
Database Administration	□□□□□
Database Management Systems	■□□□□
Encryption	■□□□□
Enterprise Architecture	■□□□□
Identity Management	■□□□□
Incident Management	■□□□□
Information Assurance	■□□□□
Information Management	■□□□□
Information Systems/Network Security	■□□□□
Information Technology Assessment	■□□□□
Infrastructure Design	■□□□□
Intelligence Analysis	■□□□□
Mathematical Reasoning	□□□□□
Modeling and Simulation	□□□□□
Network Management	■□□□□
Operating Systems	■□□□□
Operations Support	■□□□□
Problem Solving	■□□□□
Requirements Analysis	■□□□□
Software Development	■□□□□
Software Testing and Evaluation	■□□□□
System Administration	■□□□□
Systems Integration	■□□□□
Systems Testing and Evaluation	■□□□□
Target Development	□□□□□
Technology Awareness	■□□□□
Telecommunications	□□□□□
Threat Analysis	■□□□□
Vulnerabilities Assessment	■□□□□
Web Technology	■□□□□



Leadership	Project Management	■□□□□	
	Strategic Planning	□□□□□	
	Teaching Others	■□□□□	
	Workforce Management	□□□□□	
	Business Continuity	□□□□□	
	Client Relationship Management	■□□□□	
	Contracting/Procurement	□□□□□	
	Data Privacy and Protection	■□□□□	
	External Awareness	■□□□□	
	Knowledge Management	■□□□□	
Operational	Legal, Government, and Jurisprudence	■□□□□	
	Organizational Awareness	■□□□□	
	Policy Management	□□□□□	
	Process Control	■□□□□	
	Risk Management	■□□□□	
	Third Party Oversight/Acquisition Management	□□□□□	
	Conflict Management	■□□□□	
	Critical Thinking	■□□□□	
	Professional	Interpersonal Skills	■□□□□
		Oral Communication	■□□□□
Presenting Effectively		■□□□□	
Written Communication		■□□□□	

Technical



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2. Cross-/Upskilling Mappings

- Gather insight into overall skills gaps and weaknesses
- Data-informed technical, operational, professional, and leadership skills development recommendations for career advancement

Cross-/Upskilling Example

CROSS-SKILL FOCUS Cybersecurity Engineer (TI/VM), L4

Learning Challenge: Very Difficult

Requires a high degree of specialization in previously low-priority competencies

CROSS-SKILL FOCUS Cybersecurity Engineer (SAS/3PS), L4

Learning Challenge: Very Difficult

Requires a high degree of specialization in previously low-priority competencies

CROSS-SKILL FOCUS Cybersecurity Engineer (OTS), L4

Learning Challenge: Very Difficult

Requires a high degree of specialization in previously low-priority competencies

CROSS-SKILL FOCUS Sr. Cybersecurity Risk Analyst., L4

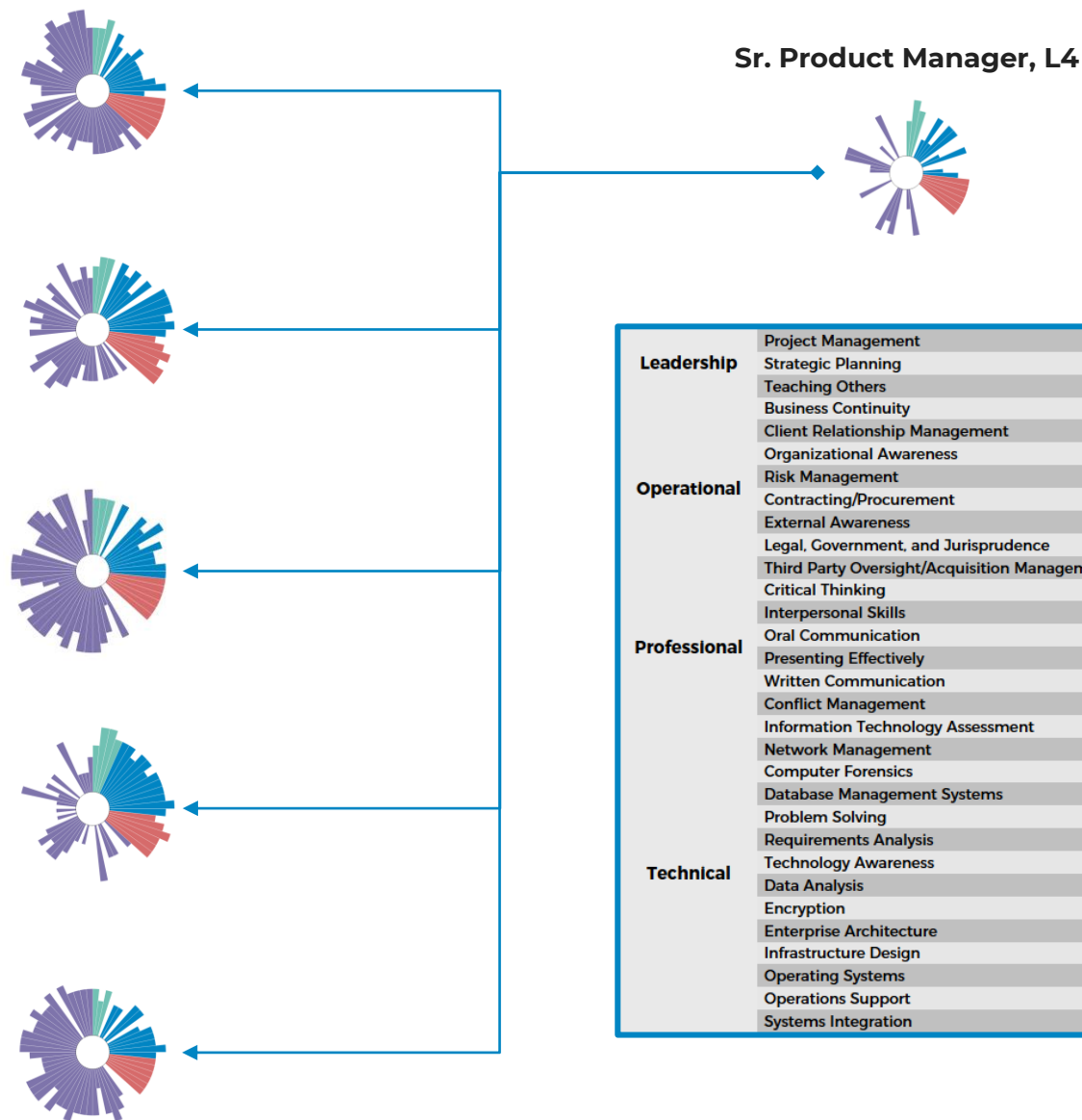
Learning Challenge: Difficult

Requires a moderate degree of specialization in previously low-priority competencies

CROSS-SKILL FOCUS Sr. Product Security Eng., L4

Learning Challenge: Very Difficult

Requires a high degree of specialization in previously low-priority competencies



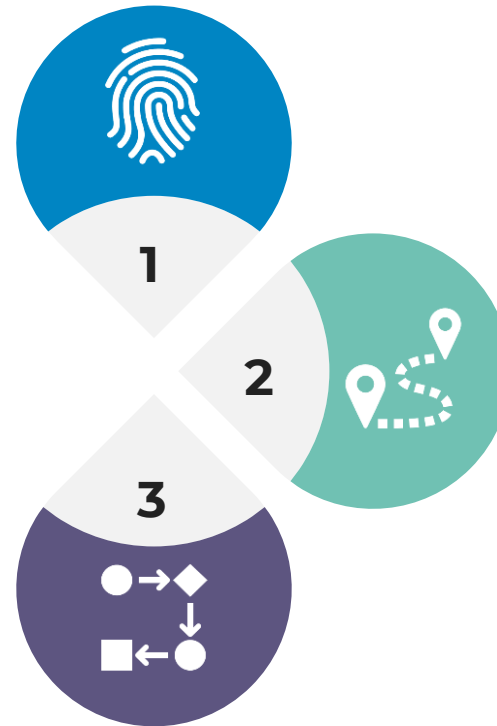
Upskill Focus Areas

Leadership	Project Management	1
	Strategic Planning	1
	Teaching Others	1
	Business Continuity	2
	Client Relationship Management	2
Operational	Organizational Awareness	2
	Risk Management	2
	Contracting/Procurement	1
	External Awareness	1
	Legal, Government, and Jurisprudence	1
Professional	Third Party Oversight/Acquisition Management	1
	Critical Thinking	2
	Interpersonal Skills	2
	Oral Communication	2
	Presenting Effectively	2
Technical	Written Communication	2
	Conflict Management	1
	Information Technology Assessment	5
	Network Management	3
	Computer Forensics	2
	Database Management Systems	2
	Problem Solving	2
	Requirements Analysis	2
	Technology Awareness	2
	Data Analysis	1
Encryption	1	
Enterprise Architecture	1	
Infrastructure Design	1	
Operating Systems	1	
Operations Support	1	
Systems Integration	1	

A Successful Data-Driven Approach Uses Multiple Tools

1. Align Workforce Skills to Roles

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2. Cross-/Upskilling Mappings

- Gather insight into overall skills gaps and weaknesses
- Data-informed technical, operational, professional, and leadership skills development recommendations for career advancement

3. Configured Training Pathways

- Build training roadmaps that adapts to unique role or skill needs
- Map role-based training for horizontal and vertical transitions
- Incorporate learning paths for non-traditional talent

Configured Training Pathways Example

Out-of-the-box training solutions often do not address the specific needs of an organization's workforce, and all-you-can-eat options leave too much at the table unused. Companies/people need a unique training solution for their unique job roles and people alike.

Recommendation: Use findings from Workforce Alignments, Mappings, and NICE Diagnostic, to develop configured or customized role-based training paths that are more effective for the cyber workforce and training budgets.

Example of a Customized New Hire Training Path

New Hires:



Sec+ Holders:



- Security Essentials
- Certifications
- Role-Based



Practice Tests Available for All Courses

A Successful Data-Driven Approach Uses Multiple Tools

1. Align Workforce Skills to Roles

- Analyze & create job role profiles to identify competencies & skill proficiency
- Combine market data, industry frameworks, and internal initiatives to create a holistic people strategy
- Deploy role-based skills diagnostics to assess performance against expectations

4. Effective Stakeholder Engagement

- **C-Suite:** Manage cyber workforce budgetary needs based on data
- **Cybersecurity Managers/Practitioners:** Nuanced insight into team/individual development needs and training plans
- **HR:** Collaborate to address job classification issues and hiring methods
- **Third Party Vendors and Training Providers**



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Example of How Data Can Enhance Stakeholder Engagement

Oftentimes, the broad categorization of cyber-related titles in organizations' job classifications obfuscate the knowledge and skills differentiation of many of the functional roles captured within classification structures.

Recommendation: Use the data from the Workforce Alignments to inform job classifications during the next assessment period.

Example where job classification has overly-broadened a cyber-related title.

Job Family	Job Title
Cybersecurity	Cybersecurity Engineer
Cybersecurity Risk & Compliance	Cybersecurity Risk Analyst

Whether official or informal, having the job classification structured with a functional component will clarify the expected skills and assist with sourcing and training talent.

Job Function
Security Advisory Services
Third-Party Security
Operations & Technology Security
Threat Intelligence
Vulnerability Management
Risk Oversight
Training & Awareness

Benefits of Data-Driven Approach to Workforce Development

Organizational Benefits

- Configurable Solution
- Measurable Impact
- Supports Org. Goals
- Improve Talent Pipeline
- Cost Efficiency



Employee Advantages

- Individualized Training
- Efficient Use of Time
- Defined Career Pathways
- Org. Commitment to Growth

Design Principles for Cyber Leaders as Educators

Hire When Found



Hire top talent when you find it, not just when you need it.

Always Recruit



Never stop recruiting activities. Keep some job postings “evergreen”.

Modify Roles as Needed



Don't seek talent for specific roles. Create and or modify roles based on employee interests and skill sets.

Invest 1/3 of Time



Leaders should spend 1/3 of their time on people development.

Stay Ahead of Trends



Use market and internal data to get ahead of trends and potential skill needs.

Address Training Needs



Leaders should acquire or create a broad curriculum of course content to meet diverse learning needs.

ABOUT

CYBERVISTA

Transform your workforce today to meet tomorrow's cybersecurity challenges.

CyberVista is a cybersecurity training and workforce development company established in 2016, based on a profound need to change the way organizations identify and develop cybersecurity talent.

Our data-driven approach gives organizations the visibility to make better training decisions, build the right skills, and drive defense.

Thank you!

Jeff Welgan,
Chief Product Officer

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