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2025

Building Bridges:

*A Multi-University Cybersecurity
Clinic Model for CAE-CD
Community Impact*

Chris Simpson
National University

Teresa Macklin
CSU San Marcos

Bridging the Cybersecurity Gap Through Academic Collaboration

Presenting lessons learned and practical insights for institutions considering similar collaborative ventures

Purpose: To provide free security services to underserved organizations while giving students real-world experience

A \$1 Million Google-Funded Initiative

- First-of-its-kind collaboration between three California universities and a nonprofit to maximize impact while serving underserved communities
- Students from cybersecurity, homeland security, and computer science programs gain hands-on experience with real-world security challenges
- Free clinic model provides essential cybersecurity services to small businesses, nonprofits, and community organizations that couldn't otherwise afford them
- Innovative cross-institutional approach creates operational efficiencies through shared training, standardized service delivery, and centralized client intake

2025 CAE About Cybersecurity Clinics

Consortium of Cybersecurity Clinics

- Hosted by UC Berkeley, is an international network that connects university-based cybersecurity clinics to share knowledge, expand the clinic model, and aims to establish clinics in all 50 U.S. states by 2030
- Cybersecurity clinics provide essential security services to under-resourced community organizations while giving students hands-on experience in real-world scenarios
- Modeled after legal and medical clinics, these university-based programs deliver free cybersecurity assistance to clients who couldn't otherwise afford professional services
- Students offer a comprehensive range of technical assistance including vulnerability assessments, policy templates, incident response plans, and compliance certification guidance
- The clinic model prioritizes local impact, embedding public service values in future cybersecurity leaders while bringing needed expertise to organizations in their communities
- The Consortium of Cybersecurity Clinics is expanding this model internationally, with a vision to establish clinics in all 50 U.S. states by 2030

2025 The San Diego Cyber Clinic

- First-of-its-kind multi-institutional collaboration between CCOE, CSUSM, National University, and SDSU
- Provides free digital security services to under-resourced organizations while training students
- Aims to help protect small businesses, hospitals, schools, and energy grids from cyberattacks
- The only multi-institution clinic in the Consortium with a nonprofit industry partner leading the charge
- The clinic projects serving students graduating with MS and BS degrees in cybersecurity and training 1,015 students from related majors.
- Anticipated to serve 260 organizations over 6 years

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Meeting Critical Cybersecurity Needs

- Workforce Development & Community Protection
 - Cyber insecurity remains in the top 10 global risks over the next decade (WEF 2024)
 - Nearly 450,000 open cybersecurity jobs in the U.S., including 5,092 in San Diego region
 - San Diego: Regional hub with 1,000+ cyber firms, top-ranked education institutions
 - Demand for cyber professionals projected to grow 32% by 2033
 - Students gain AI and cybersecurity skills through hands-on experience with real-world clients

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San Diego Cyber Clinic Partners

- **San Diego Cyber Center of Excellence**

- San Diego-based nonprofit with 10 years of experience mobilizing industry, academia, and government to grow the regional cyber economy
- Focuses on cultivating a diverse cybersecurity workforce, promoting security across all sectors, and addressing infrastructure challenges
- Positions San Diego as a global hub for collaborative cybersecurity innovation through cross-sector partnerships

- **Cal State San Marcos**

- Forward-focused institution serving nearly 16,000 students across North San Diego, Southwest Riverside, and South Orange counties
- Ranks among national leaders in social mobility, increasing opportunities for underrepresented students
- Recognized as a Center of Academic Excellence in Cyber Defense Education by the National Security Agency

- **National University**

- Veteran-founded nonprofit and San Diego's largest private nonprofit university, offering 190+ online and on-campus programs
- Serves 130,000 learners annually through flexible four-week and eight-week classes designed for nontraditional, working, and military students
- Recognized as a Center of Academic Excellence in Cyber Defense Education by the National Security Agency

- **San Diego State University**

- Major R1 public research institution serving 37,000 students with bachelor's degrees in 97 areas, master's in 87 fields, and 25 doctoral programs
- Ranks as the #1 California State University in federal research support and stands among top public research universities in California
- Committed to inclusive excellence with over 50% students of color and recognition as both a Hispanic-Serving Institution (HSI) and Asian American Native American Pacific Islander-Serving Institution (AANAPISI)



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San Diego Cyber Center of Excellence

- Client Pipeline
- Marketing
- Grant administration and reporting
- Consortium of Cyber Clinics liaison
- Fundraising

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Cal State San Marcos

- Clinic work as capstone experience for graduating cybersecurity students (MS and BS programs)
- Possible to expand to other majors over time
- Two semester capstone process
- First, developing proposal, project management, tools training
- Second, perform actual project with client, deliver report
- Goals include:
 - Practical, workplace experience for students:
 - Teamwork, project management, cybersecurity tools, customer service, client communication
 - Service to the community



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National
University

- Capstones to Clinics (BS and MS CYB programs)
- Three month capstone classes
- Over 200 external projects completed
- Formalize assessment process
- Providing students with Enterprise Like tools to enhance employability
- Improve customer experience
- Provide clinic opportunity to Cybersecurity adjacent programs

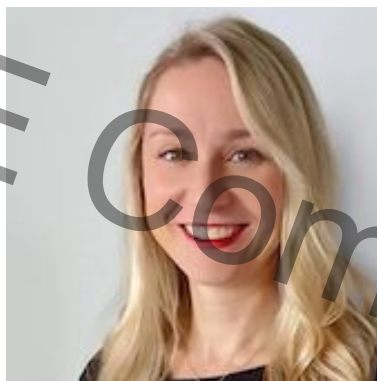
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San Diego
State
University

- Largest student population of institutions (37,000)
- Focus on serving students of multiple and diverse programs and departments at SDSU
- Centered on intra-campus partnerships to holistically involve students, staff and faculty (CIO, ITSO, HSEC)
- Clinic provides an option for an interdisciplinary capstone project or internship for advisors of many different SDSU programs and departments

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Meet the Team



Lisa Easterly, M.B.A



Teresa Macklin, J.D.



Chris Simpson, M.S.



Lance Larson, Ph.D.



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The Grant

Grant funded by Google.org, the company's philanthropic arm, is part of a \$25 million collaboration with the Consortium of Cybersecurity Clinics.

- \$1 million in Google.org funding for the San Diego Cyber Clinic
- Additional support includes volunteer mentorship from Google employees
- Google Titan Security Keys and scholarships for Google Career Certificate in Cybersecurity
- Part of larger initiative launching 15 new cybersecurity clinics in 2024
- Supports Consortium of Cybersecurity Clinics' vision to establish a clinic in every U.S. state by 2030
- Serves as a model for regional collaboratives nationwide



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Example Services

- Cybersecurity Risk Assessment
- Incident Response Planning
- Disaster Recovery Planning
- Security Controls
- Penetration Test
- Open Source Intelligence Assessment
- Cybersecurity Policy
- Security Awareness Training
- Cybersecurity Performance Metrics
- Cybersecurity Product Evaluation
- Threat Intelligence Briefing

Symposium

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Challenge: Different Schedules

- Each university has different schedule
 - CSUSM - two-semester capstone process
 - Semester 1 - proposal, project plan and training on tools
 - Semester 2 - capstone project execution, completion
 - Presentation and publication of report
 - San Diego State University - not aligned with a specific course
 - Open to any student that completes required training
 - Student training includes Google Cybersecurity Certificate and cybersecurity tools training
 - National University - three month capstone class
 - Culminating experience for Cybersecurity MS or BS
 - Cybersecurity tools and training incorporated
 - Completion of deliverables and presentation on project

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Challenge: Sharing Information

- Collaborating across organizations
 - Account management for shared tools and services
 - Impediment: Purchased resources are licensed to the campus that purchased them.
- Different university IT Systems
 - Original theory: share resources (i.e. sharepoint, teams, etc.)
 - Impediment: campus resources require campus user account, and campus policy makes it difficult to grant accounts to external participants
- Current solution
 - Google drive hosted by SDSU
 - Basecamp provided by NU
 - Teams meetings hosted by CSUSM
 - Zoom and zoom webinar capability hosted by SDSU and CCOE
- Potential Solutions
 - Clinic Google Workspace



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Challenge: Legal Requirements

- Differing campus models/policies on intellectual property, collection of data, and risk management
- Private vs Public institutions
- Solution:
 - Building common documents for client and student agreements
 - Template docs modified for each campus



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Challenge: Tools, Licenses, and Procurement

- Grant objective to provide students with enterprise level tools
- Challenges
 - Different procurement systems
 - Negotiating licensing with vendor
 - Ongoing: license struggle with the “check out” model
 - Systems to support tools
- Solutions:
 - Considering hosted tools
 - Quarterly meetings with finance teams
 - Suggestion
 - create a separate entity for your collaborative clinic and have that separate entity license the tools



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Challenge: Confidential Information

- Challenge
 - Securely store, control access to client info
 - Ensure client information confidentiality is protected
 - Operational practices (encryption, storage restrictions, etc.)
 - Priority to ensure proper disposition of client info at close of project
- Solutions
 - Student laptops - limit student collection and storage of client data to these clinic/campus-owned laptops?
 - Impediment - cost and maintenance of laptops
 - Shared space - require student to store data only in clinic/campus-owned space where access can be strictly controlled
 - Impediment - no good solution (yet) for collaboration projects
- *Note: This problem not entirely due to collaboration, but exacerbated by cross-campus team*



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Challenge: Different Models (Capstone v Training)

- CSUSM and NU: Clinic is “culminating experience” (Calif Title 5 Sec 40510 for CSUSM) as capstone project
 - Cybersecurity knowledge gained from BS and MS programs
- SDSU: Clinic can be a capstone project but students (subject to their specific program advisor approval) may also take the clinic experience as part of an internship, work experience, practicum.
 - Cybersecurity knowledge gained from Google Cybersecurity Certification (via Coursera)
- All: Students Specific knowledge of cybersecurity tools, project management, customer communication
- Training led by SDSU, individual schools supporting their students
 - Shared training content in google drive



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Progress To Date

- Quarterly webinars with Google Mentors
- Monthly advising sessions with Google mentors
- Pre and post project surveys
- Completed x projects
- Utilizing following tools:
 - Axio
 - Basecamp
 - Rapid7 Vulnerability Scanner
 - Security Studio
- Clinic Content



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Completed Projects

Examples of current and completed projects:

- CMMC Assessment (In-progress)
- Vulnerability assessments for:
 - Small DoD trucking contractor
 - Local school
 - Local water authority
 - Small business working on state projects
 - Small restaurant
- CMMC training



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2025 CAE Changes!

- CSU San Marcos:
 - Changing capstone model to take place any semester
 - Considering: adopting SDSU model to open clinic to other majors
- NU:
 - Considering additional programs for clinic support
 - Having students develop clinic materials
- SDSU:
 - Expanding maximum student participants from 15 to 20 per semester
 - Assigning students recommended prerequisite training and certifications 30 days before Clinic's semester start

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Summary of Key Benefits

- The multi-institution collaboration maximizes regional impact through shared resources, tools, and training while leveraging each partner's unique strengths and expertise
- CCOE's established industry relationships and 10 years of experience provide robust client outreach, ensuring a sustainable pipeline of organizations needing cybersecurity assistance
- Unified curriculum and content development across three universities creates consistent, high-quality training materials and standardized service delivery procedures
- The clinic addresses a critical gap by providing professional-grade cybersecurity services to under-resourced organizations that could not otherwise afford or access this essential protection



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Summary of Challenges

- Procuring tools across multiple organizations
- Identifying resources for protecting client data
- Aligning legal requirements across universities

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Questions?