

Preparing CyberSecurity Experts as Adjunct Faculty to Teach at the Post Secondary Level

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It is a well published concern that in order for the United States to maintain and expand its capabilities in the world of cybersecurity – whether planning new technologies and the internet of things (IoT), preparing defenses, constructing offensive tactics, or appropriate policies – a well-educated workforce is needed. To fill the numerous government jobs, many educational pathways have to be opened – including job training, community college programs and traditional four year and graduate programs. Each of these avenues educates and trains individuals to work at different levels and in different capacities in our ‘cyber’ world. Currently there is a capacity issue: students cannot readily be added to the education system, especially at the community college level, because trained faculty are scarce. The weak link in the cybersecurity workforce supply chain is often finding faculty who can be effective and provide the proper encouragement to students to join the cyber workforce. Therefore, success depends, in large part, on the capacity of our educational institutions to scale up and absorb increased numbers of students, as well as the capabilities of our educators.

The nation is looking to our community colleges as an untapped source of cybersecurity workers. According to the National Science Foundation, “Community colleges can play a critical role in giving students the hands-on skills that are needed on the front lines (of) defending computer networks”ⁱⁱ According to the American Association of Community Colleges, there has been huge growth in the percentage of higher education faculty teaching in community colleges and the biggest group contributing to that growth are part time faculty. And, while some community colleges have existing programs in cybersecurity and have dedicated full time faculty, according to the Center for Community College Student Engagement, more than 58% of community college classes are taught by adjunct faculty. While the data is not broken out by discipline, an informal conversation with local community colleges is that they rely heavily on adjunct faculty, and many adjuncts may have no teaching experience. A typical advertisement for a cyber-security faculty member at a community college includes “Bachelor's degree (Master's preferred) and five years of work experience as Computer Forensics professional, technical qualifications: (CompTIA Network+, CompTIA Security+, CISCO certifications, CISSP, SANS, Certified Ethical Hacker (CEH)), knowledge of Programming Languages, excellent written and oral communications skills, experience in leadership including a history initiating and managing change, working with others toward shared goals and developing others.” These

requirements can act as a barrier to many aspiring faculty members, thereby extending the mismatch between demand and supply.

Our answer: Tapping into cybersecurity experts as adjunct faculty. Cybersecurity experts in the workforce have the potential to fill the need for part-time cybersecurity faculty at the community college level. By tapping into the pool of working cyber security experts and retired individuals from government positions whose background fits the typical qualifications listed above, a viable long term strategy can be developed. These men and women, as government or private sector employees, often have had access to the latest technologies, wrestled with the current problems and policies facing the nation, have taken leadership roles and have a wide network upon which to rely for developing academic and career goals. In fact, they work with cybersecurity content on a daily basis.

Currently the Cybersecurity Teaching Corps project is exploring these possibilities through a research effort and a pilot “Teaching Cybersecurity at Community Colleges” online course (See Figure 1) funded by the U. S. Defense Departmentⁱⁱ. While CyberCorps graduates generally possess the requisite cybersecurity content knowledge and experience to teach at a Community College level, they typically do not have teaching experience or knowledge of diverse learning and assessment techniques. Furthermore, most CyberCorps alumni are not a product of the community college pathway and they do not know the community college student and their unique challenges/opportunities. One can target the Cybersecurity Teaching Corps course to CyberCorps alumni with 3 to 5 years of work experience to address the typical requirements for adjunct faculty in community colleges or more broadly, to expand available adjunct faculty at four-year colleges and elsewhere.

introduction to Community Colleges, Ethics and general structure of a course
The typical Community College student, Faculty codes, Crafting goals and objectives
Teaching concepts – moving from concrete to abstract
Teaching concepts – using group work in your class
Teaching concepts – using case studies in your class
Teaching concepts – using discussions during a class

Figure 1: Cybersecurity Teaching Corps Course Content

ⁱ NSF (2013) Available on the web on December 8, 2016
https://www.nsf.gov/news/special_reports/science_nation/cybersecurity.jsp