

Cybersecurity Career Engagement

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Motivation & Purpose

- Millions in federal and private dollars have been invested on the development of cybersecurity competitions such as Cyber Patriot, CCDC, Cyberlympics, and DC3.
- Participation in competition and challenge programs is growing exponentially – e.g. CyberPatriot expanded from 200 teams across 44 states 2009-10 to 650 teams in 48 states and 3 U.S. territories in 2010-11.
- Despite the rapid expansion, claims of effectiveness have been primarily qualitative and anecdotal (e.g. Cone et al., 2007; Rursch et al., 2010).

- The few empirical studies of competitions focus on technology validation rather than testing interest, engagement, and skill building (e.g. Beautement et al., 2009).
- Despite substantial investment in cybersecurity competitions, games, and challenges we lack an understanding of how these programs affect occupational interest and professional engagement.
- The purpose of this study is to explore cybersecurity career engagement among participants in the National Cyber League Fall 2012 pilot season.**

Cybersecurity Career Engagement among National Cyber League Participants

RQ – What is the relationship between competition experience and career engagement?

•**Approach:** Survey participants in the National Cyber League Fall pilot season competitions using the Utrecht Work Engagement (UWE 9) scale (Schaufeli et al., 2006)

“Engagement is a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption.”



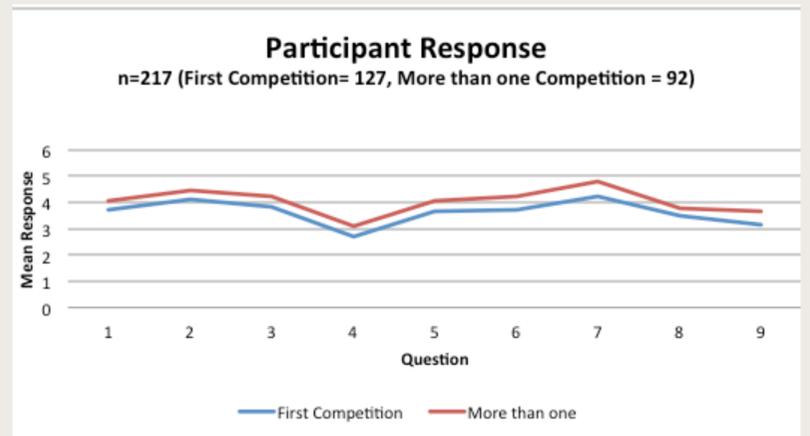
•NCL Fall Season – 3 competitions based on CompTIA Security+ Exam:

- Capture the Flag (Oct. 20)
- Logfile Anaysis (Nov. 3)
- Cryptography (Nov. 17)

•Participants - Currently enrolled students at accredited U.S. community colleges or 4-year colleges/universities

Status

- Preliminary analysis of NCL competition suggests that competition experience may not correlate with engagement;** 3 of 9 UWE items show significant differences between participants with different experiences
- Our preliminary analysis questions the untested assumption that competitions foster career engagement additional studies of this relationship should be made.



| Significant UWE Question | Number of Competitions | n | Mean | Std. Dev. | t | df | Sig. |
|--|------------------------|-----|------|-----------|--------|-----|--------|
| (6) I feel happy when I am participating in this competition | First Competition | 127 | 3.72 | 1.618 | -2.396 | 217 | 0.017* |
| | More than one | 92 | 4.24 | 1.557 | | | |
| (7) I feel like participating in this competition. | First Competition | 127 | 4.25 | 1.527 | -2.59 | 217 | 0.01* |
| | More than one | 92 | 4.77 | 1.376 | | | |
| (9) I feel strong and vigorous in this competition | First Competition | 127 | 3.15 | 1.638 | -2.119 | 217 | 0.035* |
| | More than one | 92 | 3.64 | 1.77 | | | |

Initial Thoughts

- Is UWE 9 the proper measure of engagement?
- Study design considerations - single snapshot vs. pre-test/post-test
- Next Steps: Analyze data from competitions 2 and 3

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2012 Science of Security
Community Meeting
Nov. 29-30, 2012
National Harbor, MD
<http://cps-vo.org/group/sosmtg>

