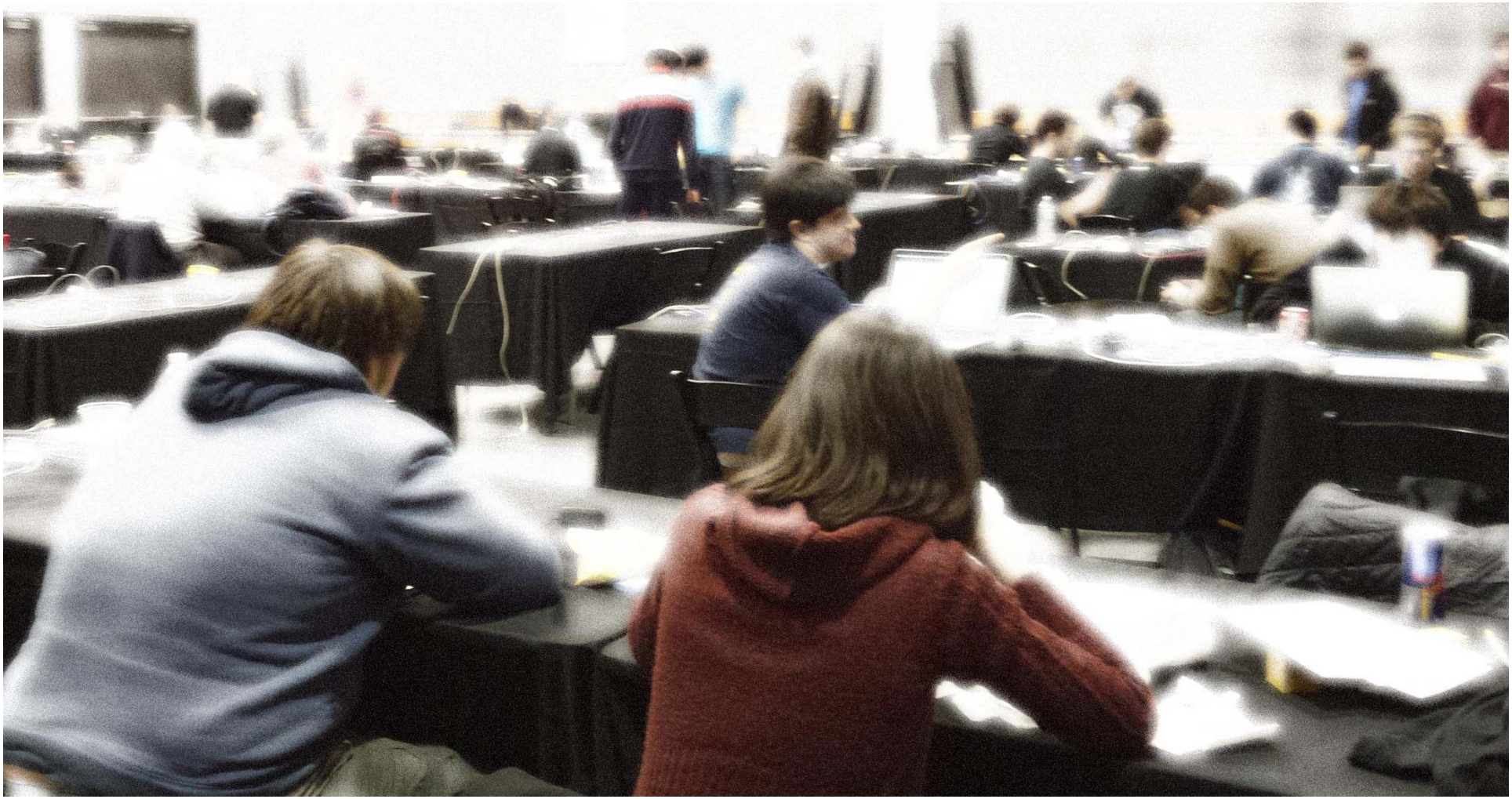
Multidisciplinary Experiential Learning for Holistic Cybersecurity Education, Research and Evaluation

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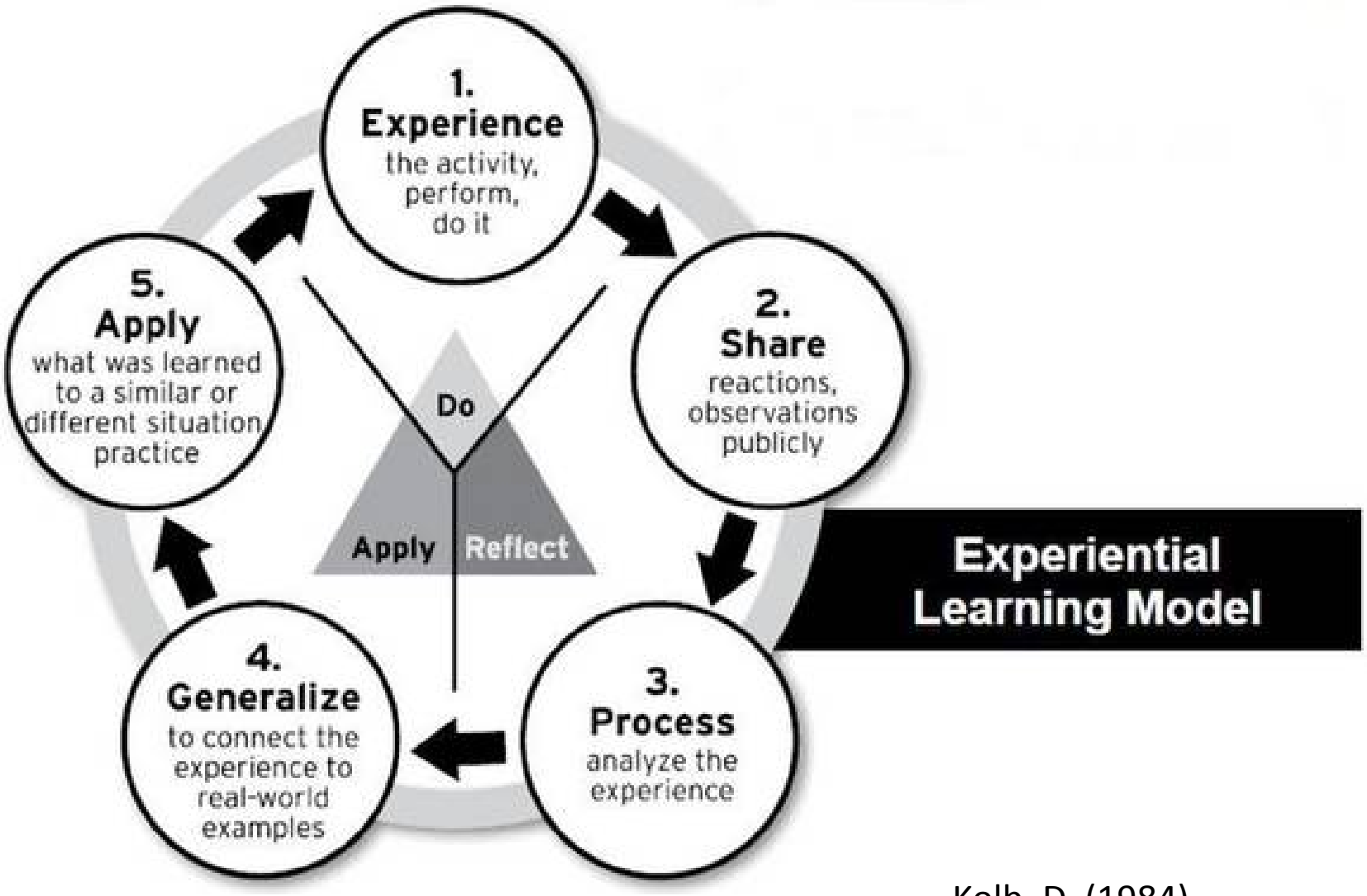
Acknowledgements

- NSF CAREER Award No. 1453040

Walk Through

- Experiential Learning (EL)?
- CTFs & EL for Criminology/ Criminal Justice
- Multidisciplinary EL

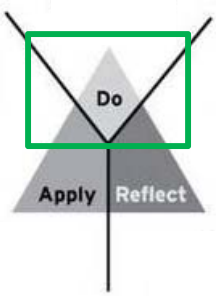
What is Experiential Learning (EL)?



Kolb, D. (1984)

CTFs & Experiential Learning for Criminology/Criminal Justice Students

DO



1. Experience

Research

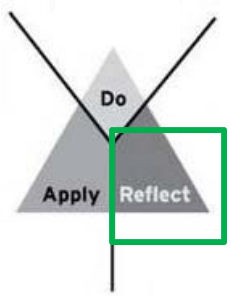
- Design
- Implementation
  - Conduct Interviews & Observations

Cyber attack/security

- Experience “real-time” attack-defense



REFLECT



Research

- Research Experience
- *Doing* Research
- Self/Group Challenges

Cyber attack/security

- Adversaries/Defenders
- Attack techniques
- Organizational Dynamics

1. Experience

2. Share

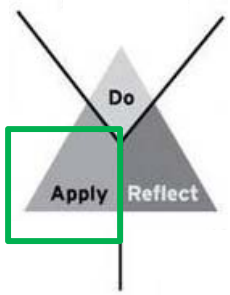
3. Process

4. Generalize

5. Apply



APPLY



Research

- Stronger skills
- Other CTFs

Cyber attack/security

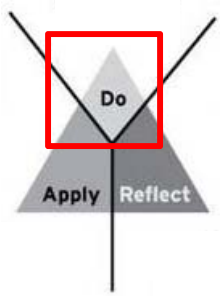
- Dynamic /Complex Attack-defense
- Adaptive trajectories
- Group traits

5. Apply

4. Generalize



Challenges: Difficulty & Clarity



1. Experience

- Newcomers
- Frustration
- Detrimental

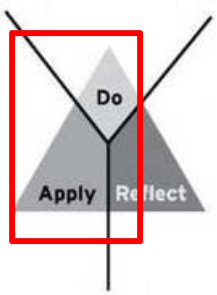
2. Share

3. Process

4. Generalize

5. Apply

Challenges: Time



1. Experience

2. Share

3. Process

4. Generalize

5. Apply

- Fatigue
- Departs from reality

Multidisciplinary Experiential Learning (MEL): Benefits, Challenges & Possible Solutions

MEL: Why is it important?

- It's already practiced & valued
  - Limited integration of hard & soft sciences
  - Holistic Research on Cyberattacks and Cybersecurity
- Cyberattacks/security
  - Breaking down disciplinary barriers
  - Innovation
  - Enhancing learning experience
  - Improving validation and transparency

MEL: Challenges

- CTF Logistics
  - Different discipline-specific EL
- Pre/Post Interactions
  - Fatigue, frustration, discomfort

Possible Solutions

- Hybrids
- Prior Meetup
- Pre/Break/Post Interactions
- Audio/Video Recordings

Upcoming MEL Work

- Multidisciplinary Team (August 2015 -)
  - Graduate & undergraduate
  - CS; ECE; CCJ
  - Innovative Research & Education
    - Communicate Across Disciplines!



Upcoming MEL Research

- Red/Blue + CTFs (September 2015-)
  - Group Dynamics
  - Adaptive Decision-Making
  - Attack Trajectories
  - Dynamic/Proactive Defense



Multidisciplinary Experiential Learning for Holistic Cybersecurity Education, Research and Evaluation



Thank you
Comments/Questions?

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