Enhancing Training Effectiveness of Legacy Training Products for Millennials

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Target Identification & Classification

- Target identification and classification key task for Army personnel;
- Identifying diverse targets can be difficult in ideal circumstances; moreso under poor visibility (FLIR, etc.)
- **Adequate training is important**

What kind of vehicle is this?

Legacy Training Products

- Recognition of Vehicles (ROC) training program (Rierson & Ahrens, 2006)
- Present soldiers with static imagery; post-training quiz to assess retention

Millennial Learners

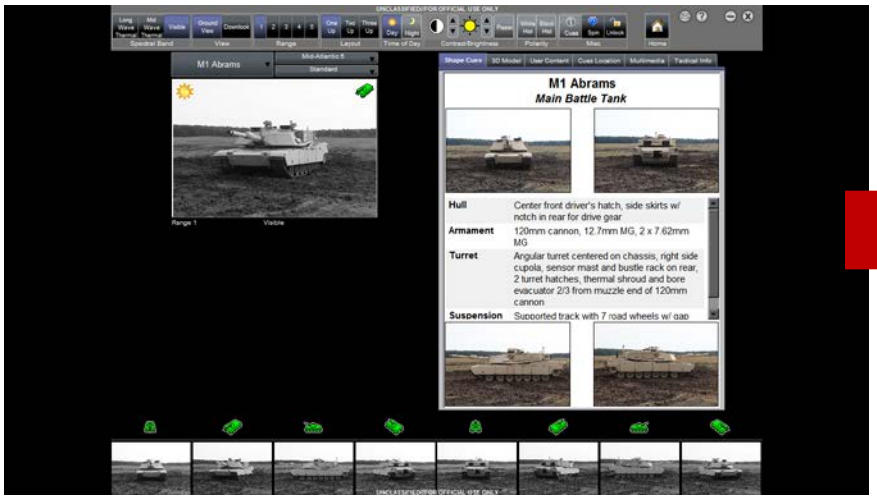
- Effective training: matching information presentation with expectations/needs of trainee
- "Millennial" learners prefer interactivity, greater involvement of technology (Mangold, 2007; Merritt, 2002)
- Experiential learning: less PowerPoint (Raines, 2002)

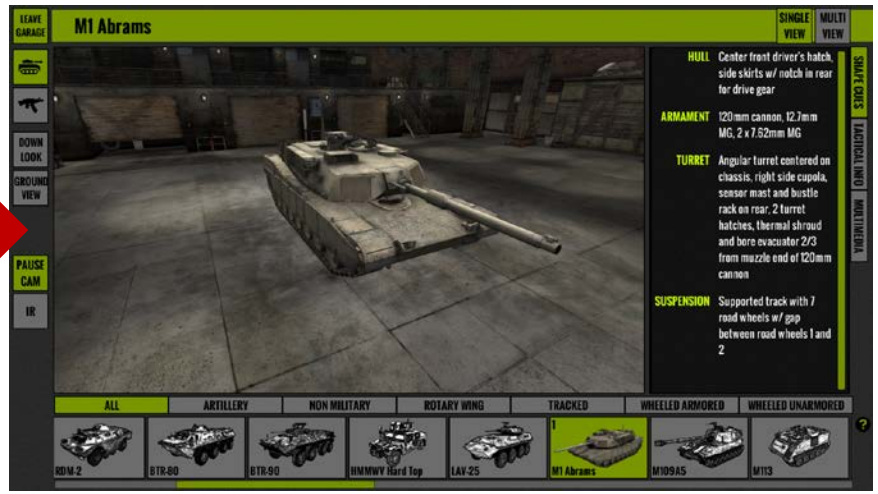
"Serious Games"

- Interactive video-games may address expectations of Millennial learners
- Interest in Serious Games as learning tool growing (Ferguson, 2007)
- Information presented in dynamic, captivating way; greater engagement of trainees = more learning (Raines, 2002)
- Review of Serious Games: more learning and long-term retention than traditional methods (Wouters, van Nimwegen, van Oostendorp, & van der Spek, 2013)
- **Serious games uniquely-suited to Millennials?**

Updating ROC Legacy Training

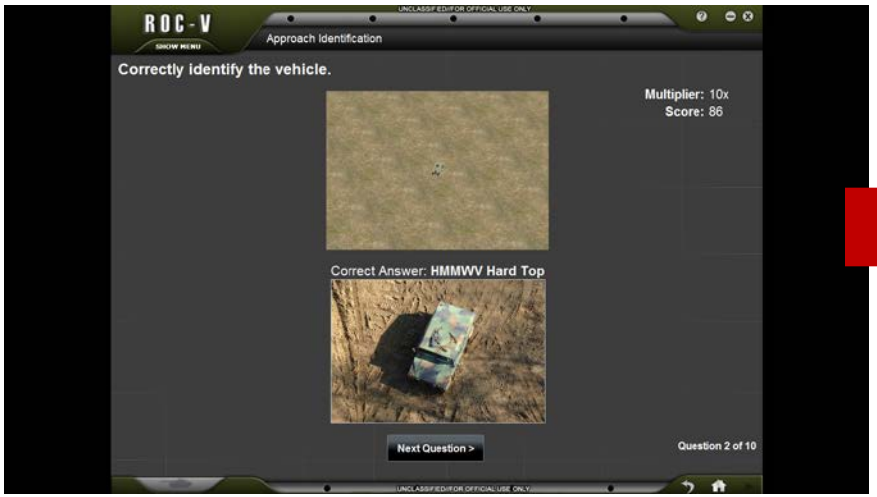
- Transition from static imagery to interactive 3-dimensional models





Updating ROC Legacy Training

- Transition from simple interactions (gradual zoom) to complex simulation-based engagements



Experimentation

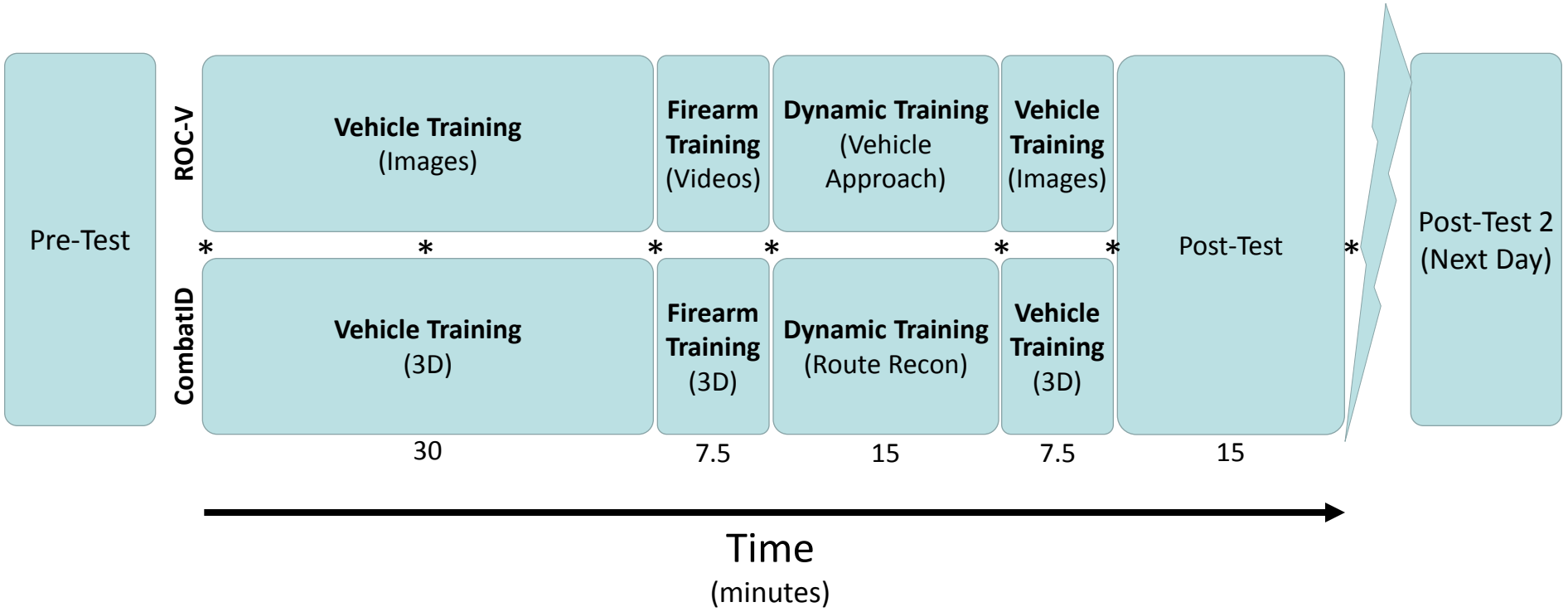
- Experimental protocol to compare two training programs: legacy (ROC-V) and new (CombatID)
- Goals two-fold:

1. Estimate training efficacy of new game-based platform;
   - *Similar means of presentation, but validation still required*
2. Compare self-reported trainee enjoyment, perceived usefulness of training, and mental workload across platforms.
   - *More enjoyment & perceived usefulness = more engaged;*
   - *More engaged = greater retention;* (McQuiggan, Lee, & Lester, 2007)
   - *Less workload = greater learning potential* (Berka et al., 2007)

Method

- Three training modules in each platform: vehicle, firearm, and dynamic.
  - Vehicle: Memorize set of 33 vehicles (either static imagery or 3D models);
  - Firearm: Memorize set of 12 firearms (either non-interactive videos or 3D models);
  - Dynamic: ROC-V "zoomed in" on crude 3D model, participant must identify; CombatID portrayed simulated patrol through hostile village

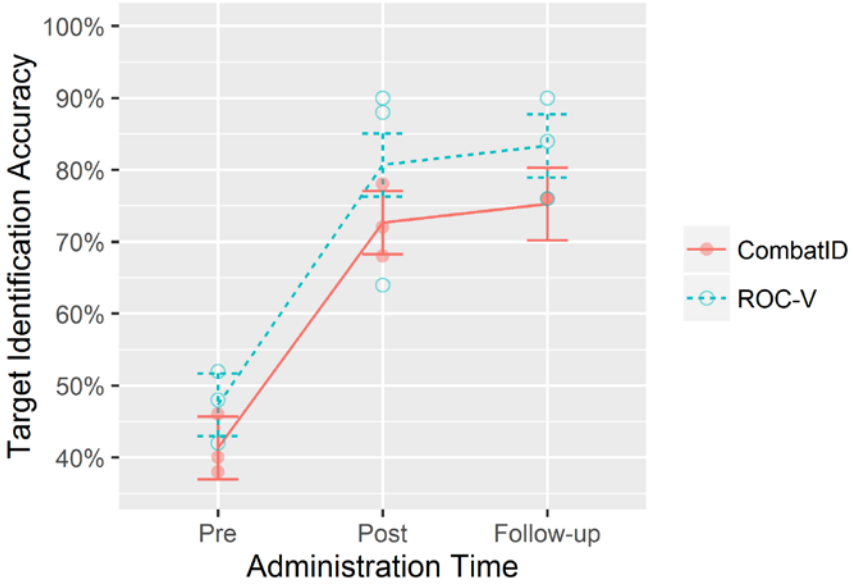
Method Overview



Asterisks represent self-report intervals: enjoyment and mental workload

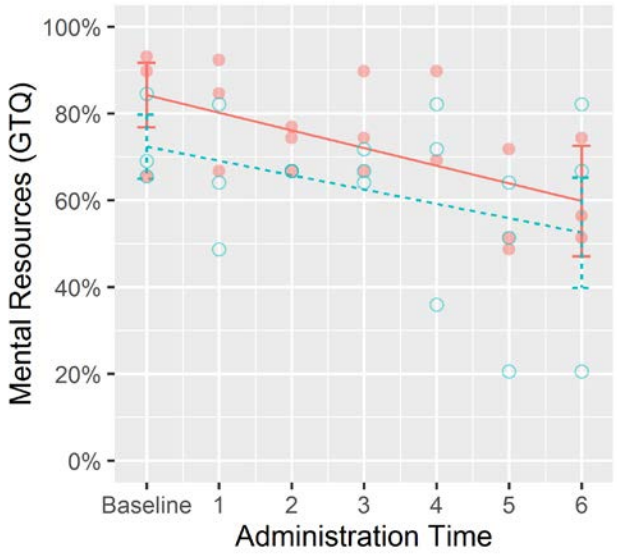
Results

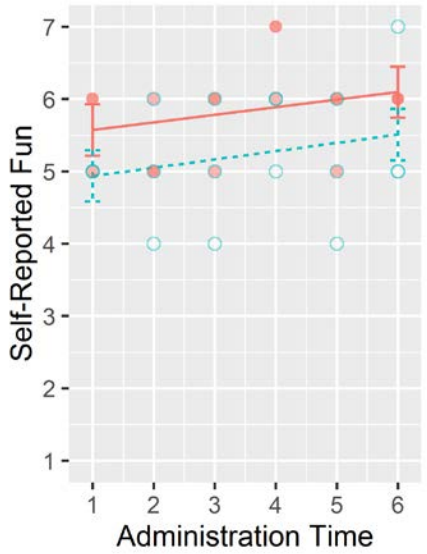
- Goal 1: Estimate training efficacy of game-based platform
  - Comparable performance for both training programs with slight (non-significant) advantage to legacy training product;
  - Baseline differences that are sustained over time (differences across groups would be minimized with larger sample)

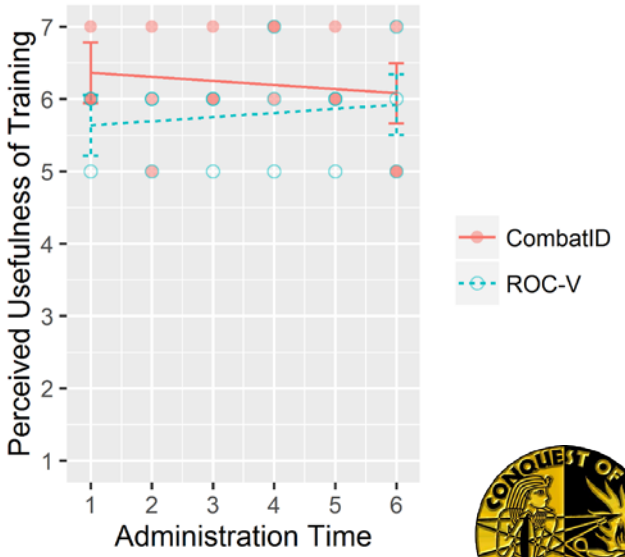


Results

- Goal 2: Compare self-reported trainee enjoyment, perceived usefulness of training, and mental workload across platforms
  - ➢ Comparable workload, fun, and perceived usefulness for both training programs;
  - ➢ Small differences favoring CombatID

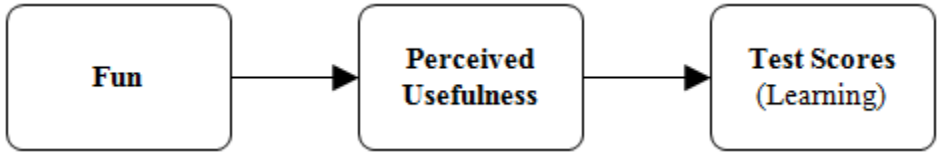






Role of Fun in Training

- Enjoyable training may promote engagement;
- Engaged participants may be more receptive to the usefulness of the training, resulting in greater test scores



Role of Fun in Training

- Result: fun associated with usefulness; presence of both associated with greater test scores

Discussion: Overall Accuracy

- For the most part, there were no differences between training conditions;
- Both training protocols resulted in greater performance;
- **New training program is likely (at least) sufficient**

Discussion: Cognitive Resources

- Cognitive resources are limited; sustained mental effort drains from a limited supply (Baumeister, Muraven, & Tice, 2000; Warm, Parasuraman, & Matthews, 2008)

- **Training ought to maximize results while minimizing demands on trainees**

- Non-significant differences, but small effect favoring CombatID; future investigation should explore this effect

Discussion: Perceived Fun

- Millennials less likely to attend to non-interactive lectures;
- Our trainees who viewed programs as both fun and useful achieved higher scores;
- **New CombatID may be uniquely able to leverage this effect among Millennials, whose expectations differ from past generations'**

Discussion: Future Development

- Current CombatID version limited in scope and capability;
- New requirements:
  - Greater scope of data collection;
  - More customizability (number of targets, frequency of targets, hostility of targets, etc.)
  - Computer adaptive testing: difficulty adapts to individual operator needs (cf. SAT/GRE)

Conclusion

- We presented preliminary validation efforts for new game-based training protocol (CombatID);
- CombatID trainees reported slightly more enjoyment and perceived usefulness of training;
- Greater perceptions of enjoyment and usefulness related to higher post-test scores.

Thank You; Questions?

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