Title: GAUGING TRAINING EFFECTIVENESS OF VIRTUAL ENVIRONMENT SIMULATION BASED APPLICATIONS FOR AN INFANTRY SOLDIER TRAINING TASK

The U.S. Army Training and Doctrine Command's Army Learning Concept 2015 and Army Training Concept 2025 are documents that discuss the need for an adaptive soldier learning model with a flexible training delivery methodology. The U.S. Army has been investing in serious gaming technology for the past two decades as a cost effective means to teach tactics and strategy. Today, the U.S. Army is seeking to expand its application of virtual environment training to areas such as cultural awareness and human network analysis for the infantry soldier. These new expanded applications will require a higher level of non-determinant behavior inside the virtual environment.

To meet more of the training needs of the war fighter, the U.S. Army is looking beyond first person perspective games to the cooperative and social gaming experience offered by the MMOG (Massively Multiplayer Online Game) and the VWT (Virtual World Technology). Altogether, these classes of games have the potential to teach leadership skills, social acclimation skills, cultural awareness and practice skills, and critical thinking skills for problem solving in a cost effective manner. Unfortunately, even today there is a paucity of scientific research to support whether this potential may be realized or not.

A literature review was performed which covers current concepts in the usage of virtual environments for military individual and team training in the U.S. Army infantry soldier domains. There are many variables involved with the lifecycle of the virtual training activity including the acquisition, information assurance and cyber security, deployment, proper employment, content development and maintenance, and retirement. This discussion goes beyond the traditional topics of graphics and game engine technology and delves deeper into concepts of the importance of proper usage of the environments by the trainees.

This dissertation is composed of three studies with two subject pools: experienced soldiers and novice soldiers. The participants in the studies were randomly assigned to one of two training conditions. The training conditions were either a traditional slide-show in a classroom or a virtual environment based training system. The participants were then provided with training for a room clearing tasks in each of the conditions. The independent variables are training condition and soldier condition. The dependent variables are individual performance, team performance, stress questionnaire scores, and workload questionnaire scores. A number of relationships are explored in this dissertation. The first objective of these studies is to attempt to identify any effect the training conditions have on either individual performance or team performance. Lastly, these studies attempt to identify if there is any difference the training conditions have on novice versus experienced subjects' performance during a live assessment.

Major: Engineering

Educational Career:
Bachelor's of Mechanical Engineering, BS, 1998, Louisiana Tech University
Master's of Engineering, MS, 2001, Louisiana Tech University
Master's of Modeling and Simulation, MS, 2014, Louisiana Tech University

Committee in Charge:
Peter Kincaid, Chair, Engineering
Randall Shumaker, University of Central Florida
Daniel Barber, University of Central Florida
Robert Sottilare, U.S. Army Research Laboratory

Approved for distribution by Peter Kincaid, Committee Chair, on May 4, 2015.
The public is welcome to attend.