OFF-THE-SHELF GAMES AND TRAINING: LESSONS LEARNED

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ABSTRACT

While there appear to be benefits of using low cost, off the shelf game technologies for training (e.g., cost, trainee motivation) there are many drawbacks with respect to doctrinal correctness and negative training transfer. This presentation will describe the various models, guidelines, and validation processes which are being developed for combining and using game elements, segments, scenarios, and practice missions for training.

1. INTRODUCTION

Technologically advanced simulators are rapidly being employed as training devices by commercial and defense entities and low cost alternatives are of interest for a comparable and more optimal return on investment. Notably, low cost off the shelf PC games are being easily acquired and used for classroom enhancement, off-time skills practice, and as training supplements. Recent advances in computer graphics, sound effects, artificial intelligence, networking and teaming capabilities provide more appealing reasons to use the software for training solutions. This form of training is often implemented without consideration of outcome performance or transfer of training. While empirical investigations and sound research exists, the findings are often inconsistent and misleading. A recent focus of the DoD is to determine which of the advanced training technology features and simulation systems actually contribute to an effect on operator training and performance outcome. For example, how necessary is motion base, complete mock-up, large screens, HMD's, versus low cost pc based simulations or off the shelf technologies for influencing immersion, contextual arousal, motivation and thus optimal training and practice conditions. A recent review of military and commercial applications of simulation-based training indicated a severe lack of research data regarding training effectiveness especially on specific transfer of training (Thurman, and Dunlap, 1999).

1.1 Benefits of OTS games.

PC based games are appealing not only for low cost solutions, but also for their adaptability and many uses. For example, embedded mission rehearsal capabilities are available for training anywhere and at anytime. The synthetic environments can be easily linked together for effectively training advanced skills, and shared cognitions in team training further facilitated by mission editor packages that allow for specific scenario and mission construction (Salopek, 1998).

The most notable advances in PC games have come in computer graphics, sound effects and immersive features (Laird, 2000) at a low cost. Additionally, commercial game developers are recently using reputable military data sources for developing their game models thus rendering a doctrinal face validity and making the OTS games even more attractive to the military (Coleman and Johnston, 1999). Likewise, artificial intelligence is representing more human characteristics, suggested to be enough to apply to tactical enemies, partners, support characters, and even units of individuals, such as a platoon (Laird, 2000). Because of this, it was suggested that the single most important feature recommended was currency of game, saying essentially that any game older than 1 year should not be considered in studies.

The motivational quality underlying games is suggested to come from challenge, uncertainty, and complexity. While these features impose a high degree of learner control they can inhibit training and acquisition of basic skills. The motivational qualities of games have been more useful in effecting the amount of time and quality of practice (Driskell, Hughes, and Garris-Reif, 1998).

1.2 Potential drawbacks and considerations

Traditionally, OTS first-person shooter games have been cumbersome and complicated to navigate, setup, execute, and succeed in missions. The games are designed to last for a long time in the hands of expert gamers and even communities that use cheat notes. Consequently, there are many options, missions, levels, scenarios, tools, weapons, and personalities that users must filter through and select. Expert gamers would need to be recruited just to interpret and prepare a scenario for classroom or practice uses and therefore the cost effectiveness is sacrificed. An effective solution to this is to have an expert gamer develop a game map. A game map reveals, in hierarchical form, a graphical presentation of each step of setting up all possible options, scenarios, missions, teams, etc. With this pictorial presentation, the trainer can easily match the training requirements to the potential game materials, options and setups and utilize the OTS environment in the fashion specifically relevant to the training.

When we refer to pc based games involving warlike activity as its objective, the perceived reality that the user experiences regarding the situation and people involved can play a major role in the amount of stress one experiences about the simulated situation (Wilson, Skelly, and Purvis, 1999). The most common criticism of using pc-based games for training, especially in a military environment, is the lack of situational stress and context of war. In a recent study geared at determining the doctrinal and contextual correctness of current pc based infantry games, most Army subject matter experts indicated that the games could not provide the level of realism needed to prepare individuals for tactics in the midst of real war (Morris, and Tarr, 2002). They also indicated that soldiers, if trained using games, would probably not be prepared for the mindset of war because the entertainment condition is drastically different in context (e.g., entertainment verses survival).

Considering the problematic context of entertainment, evidence shows that supplementing stress in game training may effectively produce necessary trainee reactions. Baker, Ware, Spires, and Osborn, (1966) induced threat via a severely displeased military supervisor during simulated combat game. Some individuals were stimulated by the stress and produce more effective performance while others became disorganized and poorly performed. More recently, Morris, Shirkey, Hancock, and Mouloua, (2002) examined the effects of supplementing an infantry OTS game based training session with realistic grotesque war scenes. This intervention produced more motivation and OTS game mission success in individuals than the unstressful control counterpart. It is suggested that contextually-enhanced material that produces positive or motivating stress, can produce higher outcome training performance from OTS games.

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