Benefits of the Application of Game-based Technology to Military Training

Steve Jarvis
SERIGAMEX 2008
11th November 2008
What are ‘serious games’?

What are the benefits of serious games?

Factors influencing when it may be appropriate to use a serious game

Example of a serious game and results of a trial
What is a ‘serious game’?

• A video game developed for a serious purpose such as training

• Consider using ‘immersive training simulation’ with those people that object to the word ‘game’

• Types of serious game
  – Customised Commercial Off-the-Shelf (COTS) game
  – Low fidelity 2-dimensional or 3-dimensional game
  – Higher fidelity 3-dimensional game
Game-based Technology
The key question as far as Training Doctrine Command‘s Project Office for Gaming is concerned, is not what a game can do, but what requirement it fills… …Just because someone has the latest and greatest graphics engine, and the gameplay is great, doesn't mean it meets training requirements.”

Robert Bowen, Civilian Chief for the TRADOC speaking to TSJ in January 2008
A target audience of gamers will demand training that is as engaging.
Games are engaging and engagement is critical to learning
Safe practice with realistic scenarios
Supports distributed team training with human and computer-controlled avatars
Potential for more cost-effective training through reuse of graphical assets and scenarios
The benefits of any effective technology-based training

- Increased learner control
- Increased access to learning
- Greater consistency of learning
New Learning Technologies and how they may help address Military Drivers

Enhanced collective capability → mobile, Web 2.0, **serious games**, virtual worlds
Operational capability with reduced personnel → mobile, performance support
More flexible, work-based learning → mobile, performance support, Web 2.0
Deployed training → mobile, Web 2.0, **serious games**
Language and cultural awareness → mobile, performance support, Web 2.0, **serious games**
More reliable equipment → mobile, performance support
Increased complexity → mobile, performance support
Recruitment and retention → **serious games**, virtual worlds
Hypothesis being tested:

- Large target audience
- Crucial subject matter (i.e. serious health, safety and financial consequences from poor performance)
- Target audience less motivated to learn subject matter (e.g. as a consequence of the perception that the subject matter is dull)
- Type of learning suited to game-based learning (e.g. decision making, attitude change, team-working skills…)
- Where practice is important for task proficiency
Areas for serious game prototypes

- Medical triage
- Healthcare infection control
- Military communication asset management

**Decision-making**

- **Priorities for Medical Triage**
  - Walking: Yes → Priority 1 (Immediate)
  - Walking: No → Breathing
    - Breathing: Yes → Priority 2 (Urgent)
    - Breathing: No → Dead
  - Breathing: No → Respiratory Rate
    - Respiratory Rate: Over 2 sec → Priority 2 (Urgent)
    - Respiratory Rate: 9 or less → Priority 3 (Delayed)
    - Respiratory Rate: 30 or more → Priority 1 (Immediate)
  - Breathing: No → Capillary Refill
    - Capillary Refill: 2 sec or under → Priority 2 (Urgent)
    - Capillary Refill: Over 2 sec → Priority 3 (Delayed)

**Attitude change**

- UK Community Health Practice employing 5000 Staff

**Leadership & team skills**

- UK Defence College of Communication and Information Systems
Positive results from trials of triage simulation using games technology

% of participants correctly implementing the steps in triage sieve for 8 casualties

<table>
<thead>
<tr>
<th>Control (N = 44)</th>
<th>Game (N = 47)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7%</td>
<td>28%</td>
</tr>
</tbody>
</table>

Statistically significant
User-centred design approach

Process


Tools & Techniques

Pre-analysis Assessment Tool → Post-analysis Game Selection Tool

Learning Needs Analysis → Human Factors Analysis → Learner Questionnaire

Trials Implementation → User Group → Scenario Creation → Pre-prototypes

Project Time
Role of the pre-prototype
• There are perceived benefits from the use of game-based technology for training

• Game-based technology is applicable in certain situations from results of trials

• Game-based technology can be deployed, but what really matters is knowing when it should be deployed and how it should be deployed
Synthetic Environments for Training