HONING INTERCULTURAL ENGAGEMENT SKILLS FOR STABILITY OPERATIONS WITH DARWARS AMBUSH! NK GAME-BASED TRAINING

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ABSTRACT

This paper describes the DARWARS Ambush! NK (non-kinetic) training approach and how virtual technology can be used to train intercultural communication and mental agility in the context of convoy operations and foot patrols.[1] Interaction enhancements required to accommodate its new emphasis on non-kinetic skills such as the ability to introduce instructor injects and real-time in-game assessment are discussed. We also briefly describe the experiences using these non-kinetic training missions and relative challenges of distributing the tool to the diverse DARWARS Ambush! user community.

1. INTRODUCTION

Stability Operations present a broad spectrum of challenges that result in numerous non-standard operational requirements. While the United States military is adept at performing kinetic operations, military leaders have identified gaps in home station training in the area of cross-cultural, non-kinetic engagements (Wong, 2004). Soldiers at all levels and across different disciplines or agencies require specific non-kinetic[2] competencies to succeed such as languages, regional and technical expertise, intercultural communication, interpersonal skills, and adaptive thinking. Each of these non-kinetic competencies is an essential element of leader development training for the U.S. Armed Forces. The military's next generation leaders must increasingly become warrior/diplomats.

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[1] DARWARS Ambush! NK was funded by DARPA (Defense Advanced Research Projects Agency) and is supported by the U.S. Army PEO STRI (Program Executive Office for Simulation, Training, and Instrumentation) for distribution within the Army and other government agencies.

[2] The US Army changed the term "non-kinetic" to "non-lethal" in 2007. In this paper, non-kinetic is used to refer to civilian engagement techniques that do not involve the use of force.

We turned to virtual game-based technology to provide a controlled environment wherein soldiers can be introduced to an array of experiences designed to foster non-kinetic awareness and intercultural communication competencies. We chose an existing game-based training environment – DARWARS Ambush! – as the basis for our development. A typical DARWARS Ambush! installation (see Figure 1) consists of a network of PC workstations or laptops connected via a local or wide area network, and supports training of up to platoon-sized elements. DARWARS Ambush! includes extensive documentation in the form of hardware setup instructions, a trainee guide, and instructor materials. For additional details about the system's capabilities, architecture, and its applications to small unit training see Diller, Roberts, Blankenship, & Nielsen (2004), Diller, Roberts, & Willmuth (2005) and Roberts, Diller & Schmitt(2006).

Figure 1. Ft. Lewis unit participates in urban convoy operation scenario. (Photo by Jason Kaye of The Northwest Guardian, the authorized newspaper of Ft. Lewis, used with permission.)

DARWARS Ambush! was conceived as a networked, multiplayer PC-based convoy trainer, allowing soldiers to experience lessons that others have learned and to construct their own scenarios based on actual experiences. Individual trainees move about in a shared virtual world, conduct mounted and dismounted operations, operate

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ground and air vehicles, use small arms and vehicle-mounted weapons, and communicate naturally over multiple radio nets. Tens of thousands of trainees have used DARWARS Ambush! to learn to anticipate and respond to new situations, while practicing and refining their tactics, techniques and procedures (TTPs). Since its initial deployment, several enhancements have been made to DARWARS Ambush! to increase the coverage and types of training for which it can be used; e.g., mission rehearsal, personnel security, route clearance, rules of engagement, and chemical, biological, radiological, nuclear, and high explosive (CBRNE) incidents. In particular, DARWARS Ambush! NK incorporates missions that emphasize non-kinetic skills in the context of tactical questioning, evidence collection, and detainee operations. In this paper, we discuss the design, development, and deployment of the DARWARS Ambush! NK mission modules, and use this example to illustrate how multiplayer games can be used to train non-kinetic skills and intercultural communication.

2. DARWARS AMBUSH! NK

DARWARS Ambush NK! is a game-based solution for non-kinetic engagement training for use at home station or in-country. It consists of immersive multiplayer scenarios in a fictitious environment and builds on commercial computer game technology (Operation Flashpoint, developed by Bohemia Interactive Studios). The platform supports up to 64 players at a time, including roles for an instructor, soldiers, local nationals, observer/evaluators, and non-player-characters (NPC). Role-play is centered on exercising mental agility, intercultural communication, and non-kinetic stability operations competencies within different scenarios. Role-players use headsets with microphones to communicate and interact with others during the game-based training. Both private team communications channels and public channels are available for instructors and role-players. Instructors or training developers can also use the Mission Editor to customize and author content/actions for scenarios. Real-time injects that influences the actions taken by role players in the scenario help the instructor create opportunities for adaptive thinking and demonstration of leadership skills as the situation dynamically changes. The training design also includes a Sandia National Laboratories proprietary method of collecting real-time in-game assessment and feedback from observer controllers, subject matter experts, or peer learners in the role of evaluators (Raybourn, 2006, 2007b). The instantiation of real-time peer evaluations and assessments into the training experience builds metacognitive skills such as planning, analyzing, and assessing decision-making (Raybourn, 2006, 2007b). Finally, the after-action review application allows for bookmarks, replay of events, communications, and the display of real-time assessments.

Another new feature of the DARWARS Ambush NK! missions is the inclusion of a socio-cultural human terrain overlay for the DARWARS Ambush! geographical map. Sandia National Labs conducted an end user needs assessment workshop at Ft. Lewis, WA in February 2007 and with the expert contributions of Ft. Lewis subject matter experts generated the DARWARS Ambush NK! Training materials designed to aid home station training developers in designing non-kinetic engagement missions for convoy and dismounted operations training.

3. NON-KINETIC MISSION MODULES

Two non-kinetic/kinetic missions were developed. Both involve the use of human role players to create an authentic cultural texture and to allow for unconstrained interactions between soldiers and local nationals. However, care was taken to provide training opportunities for the entire team, not just the principals. The missions incorporate numerous non-player characters (NPCs) in the roles of civilians, opposing forces, Iraqi police, etc.

The missions are set against a broad, detailed cultural context, which provides a coherent back story for all participants, guidance for role players, material for intelligence briefings, and the ability to develop new missions with shared characters and overlapping themes that play out over successive training events. This "cultural overlay" encompasses specific geo-typical terrain areas simulated in DARWARS Ambush! Both missions were designed to focus on non-kinetic engagements occurring within a kinetic context and therefore offer the ability for the escalation of force (EOF).

3.1 NK Mission 1: Cordon and Knock

The first of the two missions was designed to hone tactical questioning, negotiation, and every soldier a sensor/ambassador in a cross-cultural setting. In the first mission, a squad receives an Operations Order to bring a local national (LN) from the village back to the FOB for questioning. As a trainee the goal of this mission is to successfully conduct intercultural tactical questioning to learn that LN's cousin is an Imam who is cooperating with US Government. The questioning allows the trainee to practice aspects of intercultural communication such as cultural awareness, language, listening, cultural norms, world view, and some nonverbal communication. The trainees can negotiate with the LN to return to Forward Operating Base (FOB) for questioning willfully and voluntarily, or they may decide otherwise. Trainees investigating a nearby marketplace may find questionable equipment for sale (e.g., weapons, night vision goggles) and communicating with merchants can provide additional information as to the whereabouts of the LN. Trainees conducting perimeter security may identify a

BOLO (be on look out for) and trainees engaging the LN may learn information to identify a local bomb maker. This information may also become a BOLO relevant to future scenarios.

A VBIED explosion or RPG attack can be triggered by the instructor to create an EOF situation for the unit. Note that triggering an EOF situation often suspends the non-kinetic engagement training. It is recommended that instructors initiate EOF when sufficient training in non-kinetic engagement skills has been demonstrated.

3.2 NK Mission 2: Detainee Operation

The second mission was designed to hone tactical questioning, evidence collection & detainee operations, and every soldier a sensor/ambassador in a cross-cultural setting. In this mission, the squad is directed to conduct a detainee operation and evidence collection mission at the home of a LN. The trainees' goal for this mission is to successfully perform evidence collection by identifying three items. Trainees should conduct tactical questioning to determine why items are in the LN's possession. Intercultural communication competences such as situational awareness, language, and understanding world view and communication style differences may be exercised. The situation is ambiguous however and may require that the unit advise higher (report up). As in the first mission, two unplanned events with differing levels of strength can be triggered by the instructor to create an EOF situation for the unit that exercises their ability to think adaptively.

4. REAL-TIME IN-GAME ASSESSMENT & PEER EVALUATION

The creation of a new trainee role, the role of the peer OC/Evaluator, allows both trainees and experts such as observer controllers (OC) to provide real-time, in-game performance & feedback evaluation (Raybourn, 2007b). Up to 20 trainees may perform the OC/Evaluator role in a given training session. This role enables more trainees to actively reflect on and evaluate the effects of one's actions and the ways they might have responded or acted in actual complex, unpredictable, and dangerous settings. Trainees in the OC/Evaluator role are later held accountable during the after action review (AAR) since their aggregated time-stamped evaluations are recorded and can be displayed for large group discussion. Statistical analyses are performed on the assessments and can be displayed immediately following the training session from the after action review system. Unsolicited comments can be recorded at any time, and an instructor can request an evaluation of a particular event or trainee.

This novel approach for enhancing cognitive agility and introducing real-time, in-game assessments during training was originally developed for the Special Forces Adaptive Training and Leadership program and has been in use at Ft. Bragg since 2003 (Raybourn et. al., 2005, Raybourn, 2007b). This approach places evaluators in the training event, and gives them the ability to assess performance and comment on events as they unfold. The Observer Controller/Evaluator interface shown below allows users to track the activities of any character in the mission from that character's point of view with the expressed purpose of evaluating performance in real-time. Evaluations are initiated by the instructor who sends requests for evaluations to all the OC/Evaluators. Presently there are 10 non-kinetic engagement competencies from which to choose, including several that address intercultural communication. Users can tailor this list to achieve the evaluation of a desired mission-specific competency. When an evaluation request is triggered by the instructor, a dialog box like the one shown in the following screenshot will appear on the OC/Evaluators' screens. The non-kinetic engagement competency (in this case "utilizes the ability of others") is displayed below. OC/Evaluators then click in the response field to display a quantitative scale used to evaluate performance.

Figure 2. OC/Evaluator interface.

A field labeled **O/C Event** allows users to type free-text annotations at any time. Clicking the **Log Event** button records this annotation along with a time-stamp. The annotation event and quantitative evaluation will be available during the AAR. OC/Evaluators can also communicate through a voice channel.

OC/Evaluators may be instructors, leaders, cultural subject matter experts, or peers. When peers perform the role of observer/evaluators, they hone metacognitive skills that are critical to developing critical thinking skills. Metacognitive skills are defined as the ability to analyze and reflect on the way one or others think, discern different tasks or problems requiring different types of

cognitive strategies, and employ those strategies to enhance learning and performance. Knowledge is considered to be metacognitive in nature if it results in *strategic* use toward the accomplishment of a goal. By participating in both player and OC/Evaluator roles, trainees practice important non-kinetic engagement skills such as gauging successful interactions, paying attention to communication, providing feedback for which one is held accountable during the AAR, and identifying core competencies.

Adapting this approach to a multiplayer environment, one with multiple observers and multiple trainees, necessitated some changes to the DARWARS Ambush! trainer developed in earlier instantiations.

5. GAME ENHANCEMENTS

Several enhancements to DARWARS Ambush! were required to accommodate its new emphasis on non-kinetic skills. In addition to the game interface enhancements described above, we now describe our solutions for allowing instructor-controlled injects (e.g., to trigger escalation of force decisions), controlling crowds of NPCs, allowing inspections of objects (e.g., while conducting a house search), allowing dialogue interactions with NPCs, and the need for unique individuals within the civilian population.

Instructor injects

A participant in the role of instructor has available several actions for affecting events as action unfolds during a training session. The following examples illustrate the range injects under the control of an instructor in DARWARS Ambush! NK:

• Activate opposing forces (OPFOR). He will fire a RPG.

• Activate VBIED attack.

• Activate OPFOR team. They will mount an attack.

• Activate sniper.

• Modify the behavior of the crowd that gathers in front of the LN's house. Available crowd behaviors include: wander, assemble, swarm, throw rocks, flee, and become peaceful.

In addition to these injects, it is always possible to have participants play Civilian or OPFOR roles, which allows for more nuanced and more varied behaviors.

Inspections

By clicking on objects in the scene, users can more closely inspect their contents and other details. Examples include examining a desk, bookcases, pictures, crates, account books and hidden rooms. Detailed images and descriptive text associated with objects that can be inspected compensate for the limitations in resolution of modeled objects in the 3-D scene, and allow for the close examination of objects required for house search, as one example.

Dialogues

Limited conversations with NPCs are supported through the use of predefined dialogue trees. These typically capture short exchanges in which the user chooses among 3-4 options and the NPC responds appropriately. Either the trainee or the NPC can initiate the conversation. Although the choices are limited, different paths through the dialogue tree represent different approaches to tactical questioning. Figure 3 shows a market scene across the street from the LN's house. Soldiers encounter a variety of merchants and children with whom they can strike up a conversation. A willingness to engage in questioning is rewarded with information useful within the current or future missions.

Figure 3: Scene in front of LN's house, showing a crowd gathering and the nearby market

6. USER MODIFICATION & MISSION AUTHORING

Providing non-kinetic training missions in DARWARS Ambush! takes advantage of an established, far-reaching distribution channel for getting this training into the hands of units quickly. The other hallmark of DARWARS Ambush!—extensive user modification and mission authoring—ensures that these missions will be adapted to the individualized training needs of units.

Documentation and user-modifiable scripts are available for all the enhancements mentioned above. For example, a simple but effective crowd aggregation model was created, controlled by two behavior parameters: *congregation tendency*, which varies roughly from "flee" to "meander" to "gather" to "swarm"; and *aggression level*, which varies from "oblivious" to "observing" to "chanting" to "yelling" to "rock throwing" to "shooting

weapons". Crowd membership can vary in number and can include civilians and (disguised) OPFOR. Either an instructor or triggering events within the scenario can modify these variables during a training session to create a variety of challenging situations for trainees to contend with, or to create appropriate responses to their actions. Sample missions were also developed to illustrate new capabilities, including crowd control, conversational dialogs, and object inspections.

7. USER EXPERIENCES

Since providing the new module for download to a very active user community we have received only minor feedback. The Ambush! user employs DARWARS Ambush! to train cognitive skills to small units in preparation for deployment for combat convoy operations. One of the comments provided by NK users is that it is important to them that the training be relatively simplistic. They move trainees through rapidly and do not have much time for training on elaborate "knobology" and complex instructor injection. The typical time for train-up of a user on DARWARS Ambush! and other game tools is 20 minutes. The expectation with games unlike their larger and traditional simulation brethren is that they are not only portable and easy to set up but do not require lengthy train-the-trainer or trainee sessions.

Figure 4: Maneuver Support Center students in a DARWARS Ambush! train-the-trainer class

It is anticipated that Army schools who are brand new DARWARS Ambush! users will take greater advantage of this non-lethal capability.

8. CONCLUSION

The U.S. Military's Contemporary Operating Environment is a complex, geo-political situation in which military personnel are increasingly called to be able to dynamically shift between kinetic and non-kinetic operations occurring in a cultural context. Appropriate training at all echelons is of critical importance. DARWARS Ambush! NK provides an environment in which personnel can be trained for current and future cross-cultural stability operations. Honing intercultural communication competencies and understanding the Human terrain are key objectives of DARWARS Ambush! NK.

DARWARS Ambush! is being used at hundreds installations but not every installation will have the time or training requirements to take advantage of all the capabilities provided in the training system. One of the advantages to having a flexible and low overhead training system like DARWARS Ambush! is that it can easily be customized to the users' needs. Additionally, for a relatively small investment, an important capability may be provided to many diverse users. DARWARS Ambush!, its NK mission modules and many other capabilities is the flagship for a significant investment by the government in commercial game technology. Projects like this one constitute just the beginning of new possibilities and paths forward.

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