Persistent Learning Capability: It's Your MOVE

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ABSTRACT

Meeting the anticipated strategic environment of persistent conflict requires the Military to modernize concepts and capabilities continuously and aggressively. The Army Learning Concept 2015 recognizes the need for a Persistent Learning Capability (PLC) to meet current and future Army training challenges. The PLC architecture provides Soldiers and Leaders with a dynamic and engaging method to gain 24/7 browser-based access to critical information and capabilities to train for the threats of tomorrow. The Training and Doctrine Command (TRADOC) selected the United States Army's Brigade Combat Team Modernization (BCTM) program to train Doctrine, Tactics, and Techniques as the first use case for the PLC.

The PLC design team divided the leader-centric training in two phases, self-paced asynchronous courseware and synchronous small-group online decision-making exercises, using the Multiuser Online Virtual Exercise (MOVE) application. The team designed and developed curricula around the principle that participants were remote and required flexibility. The MOVE integrated virtual-world environments, constructive simulation, and a suite of collaborative tools to create an "instructional wrapper" to assimilate unique Leader experiences and enable real-time coaching by observer trainers (OTs). Leaders and OTs collaborate online to create solutions to complex tactical problems using a 2D interactive map, and establish virtual trust via social networking. The instructional wrapper included a 3D terrain view to enhance visualization of the 2D plan, and "hot spots" enable Leaders to enter the virtual world as avatars to manipulate equipment.

TRADOC Analysis Center, White Sands Missile Range conducted a PLC Training Effectiveness Analysis. This paper will provide an outline of the program design and development, along with the results of the analysis across three dimensions: technology performance, potential for learning, and user acceptability.

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BACKGROUND

The United States Army Training and Doctrine Command (TRADOC) published the U.S. Army Learning Concept for 2015 on 20 January 2011. The Commander, TRADOC articulated a competitive learning environment that "…focuses on the opportunities presented by dynamic virtual environments … the blending of physical and virtual collaborative environments, and learning outcomes" (Army Learning Concept 2015, 2011). The ALC culminates years of advancements to mitigate current and future training challenges derived from the anticipated strategic environment of persistent conflict. For example, in 2001, the U.S. Army Intelligence Center recognized "…an increased requirement for career-long learning due to rapid technical change and ever-shifting international threats" (Berge, 2011). A decade of progress in technology and cultural change set the conditions to actuate the ALC.

TRADOC, Draft Persistent Learning Capability (PLC), Strategic Plan 2011-2015, dated April 29, 2011 states that "… the PLC include the ability to both persist and adapt as technologies emerge at a quicker pace than current structures allow. It will do this through the application of learning sciences and strategies, mobile delivery capabilities, social learning models, learning and content management capabilities, and innovative people." In addition PLC is further defined as having some of the following attributes, and "…will enable and support:

- Formal/Informal collaboration that supports instruction/facilitation, mentoring, and peer-to-peer exchanges, including Soldier created content through a social learning network
- Learning content and performance support applications that can be easily, discovered, accessed, and used on demand
- Facilitation of integrated multiplayer online virtual exercises
- Facilitation of brigade combat team (BCT) modernization training
- Training and education at Regional Learning Centers
- Dynamic content that remains relevant through rapid change process
- Adaptive learning/intelligent tutors
- Leverage of lessons learned via the 'Training Brain' to develop and deliver experienced based relevant learning
- Transfer of desired learning
- Blended learning strategies
- Creation of tracking and feedback tools"

MCOE identified Future Combat System Capability Packages 11 and 12 as DTT content with a target audience located at Fort Bliss. Validation and Verification (V&V) took place from 29 November 2010 through 17 December 2010 with 19 participants. Participants received asynchronous Interactive Multimedia Instruction (IMI) and synchronous collaborative learning via the Multiuser Online Virtual Exercise (MOVE). MOVE is a browser-enabled "instructional wrapper" that integrates three main multiuser components: a two-dimensional map serving as the common operating picture geosynchronized with three-dimensional terrain, a backend constructive simulation manipulated transparently by participants using drawing tools when developing military plans in the common operating picture, and collaborative tools for primary communication and ancillary presentation. MOVE served as a virtual collaborative environment expressed in the ALC. The participants experienced unique, nonlinear outcomes within a structured environment. One significant finding from V&V is that learning occurred.

Training Requirement

Army's Brigade Combat Team Modernization (BCTM) program was selected as the first use case for the PLC that trained unit leadership in planning for the integration of new hardware systems into the full spectrum of operations.

The FCS Capability Packages 11/12 or "Increment 1 Systems" were intended to improve BCT's company-level Intelligence, Surveillance and Reconnaissance (ISR) capabilities as well as survivability and lethality (Figure 1). The systems include: ground robots, Unmanned Aircraft Systems (UASs), and ground sensors:

- Small Unmanned Ground Vehicle (SUGV)
- Tactical Unattended Ground Sensor (T-UGS)
- Unmanned Aircraft System (UAS)
- Urban Unattended Ground Sensor (U-UGS)

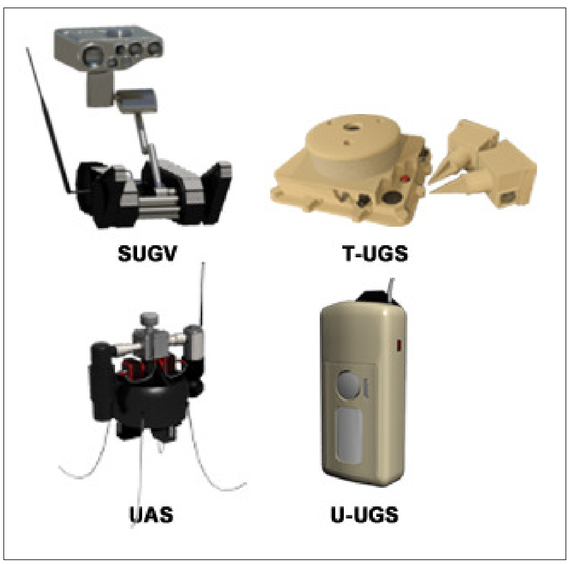

Figure 1: Increment 1 Systems

The newly acquired systems enhanced the BCT's Situational Awareness (SA) at the small-unit tactical level, allowing operational teams to develop the situation before making contact with enemy, to maneuver into positions of advantage, and to initiate decisive action quickly. Current warfighting doctrine was not intended to change with the addition of the systems; however, the operational characteristics of these new sensors require that unit planners should consider new and additional planning factors relating to the employment, sustainment, and recovery of the systems.

The scope of the pilot training program was to field courseware, hardware, and support services to assist in the fielding of the new systems. MCOE determined that the training needed to be leader-centric and focused primarily on operational planning and employment of systems at company and platoon levels.

Training Audience

19 Soldiers from the Army Evaluation Task Force (AETF) were identified as the target audience for the Validation and Verification conducted in November–December 2010. The training audience included 14 Noncommissioned Officers (NCOs) and 5 Officers. Most had previous DTT training on the Increment 1 Systems and were part of the evaluation team testing the sensors in the field environment. Among the participants there were 31 deployments to Iraq (OIF) and Afghanistan (OEF) (Table 1) (Gettman, 2011).

Table 1: Training Audience

		Total # of Deployments	
Rank	**n**	**OIF**	**OEF**
SGT	6	10	1
SSG	4	10	1
SFC	3	3	1
MSG	1	2	0
1LT	4	2	0
CPT	1	1	0
Total	**19**	**28**	**3**

PROGRAM DESIGN

The Army Learning Concept 2015 (ALC 2015) provided a way ahead for establishing a program design and learning architecture.

All course proponents can start now by taking the following three steps.

(1) Convert most classroom experiences into collaborative problem-solving events led by facilitators (vice-instructors) who engage learners

to think and understand the relevance and context of what they learn.

(2) Tailor learning to the individual learner's experience and competence level, based on the results of a pre-test and/or assessment.

(3) Dramatically reduce or eliminate instructor-led slide presentation lectures and begin using a blended learning approach that incorporates virtual and constructive simulations, gaming technology, or other technology-delivered instruction. (Army Learning Concept 2015, 2011)

The leader-centric training was divided in two phases, ranging from self-paced asynchronous courseware to synchronous small-group online decision-making exercises through the MOVE application.

For this pilot project, 71 hours of unit leader training were developed in five months and conducted entirely online with the 19 Soldiers of AETF located at Fort Bliss, TX and with facilitators remotely dispersed.

The nine (9) hours of asynchronous IMI lessons were accessed and scored using one of the Army's Learning Management Systems (LMS), AtlasPro. Lessons were approximately one (1) hour in length. A 20-question multiple-choice pre-test and post-test were created in AtlasPro for the IMI lessons.

The remaining 62 hours of synchronous lessons were conducted entirely in MOVE. The training audience was divided into platoon and company teams. Platoons ranged in size from 5 to 6 personnel with a Platoon Leader, Platoon Sergeant, and Squad Leaders. The company teams were comprised of 10 to 14 personnel with a Company Commander, Executive Officer, First Sergeant, Platoon Leaders, and Platoon Sergeants. Each team was led by an online facilitator who was responsible for evaluating the team through observations using a predetermined checklist of key events and activities for each lesson.

MOVE System Capabilities and Design

MOVE is a system of virtual worlds integrated with constructive simulations and a suite of collaborative tools to enable multi-echelon training. The MOVE design approach enables users to plan an operation using familiar battle command tools, icons, graphics, and collaborative tools, including video, eight-channel VOIP radio, whiteboards, and application-sharing. The plan is then implemented by teams of Soldiers in a first-person virtual world which is part of a larger environment created and controlled by the military constructive simulation. Leaders monitor the mission using 2D tools and influence the outcome by allocating assets such as indirect fire and reserve forces. Entities appear as avatars in the virtual world and are tracked as icons on the 2D map.

MOVE Components

MOVE is composed of:

- 2D Planning Map
- 3D Visualization Map/Digital Sand Table
- Collaborative Tools
- Virtual World
- Constructive Simulation
- Integration Subsystem

2D Planning Map

Currently, military leaders collaboratively create plans on a 2D map using doctrinally correct task organizations, drawing tools, and graphics. MOVE provides digital 2D maps that are easily recognizable representations of the current planning environment and are very efficient at displaying large amounts of information at a high level on highly simplified terrain information. They represent the basic input and deliverable for the military decision-making process at the command and staff levels.

3D Visualization Map/Digital Sand Table

MOVE provides a 3D map view to enhance visualization of the 2D plan over a simplified representation of the terrain by providing an orthographic projection of the normally 2D information (Wisher, 2001). This capability meets the same intent as a traditional sand table to see information in geographic perspective (Perla, 1990), except that the 3D view is continuously synchronized with data from the 2D maps and both the constructive and virtual worlds. (Belanich, et al., 2005).

This dynamic synchronization greatly enhances high-level visualization of the plan's relationship to terrain without the cognitive load and clutter associated with a fully immersive virtual worldview. Both the 2D map and the 3D terrain views are good examples of enabling the planner to see the abstraction of the "forest" without the confusing detail of the "trees."

Collaborative Tools

The MOVE collaborative tools component enables mission command functions. Mission command implies decentralization of capability and authority. Further, it implies that collaboration and trust are as important as command and control (FM 3.0, Operations, 2008). Collaboration informs situational understanding. Effective collaboration enables assessment, fosters critical analysis, and anticipates adaptation. It assumes that the strategic end state is not fixed. Collaboration allows operational commanders to recognize and react to changes in the situation. Operational commanders can then adjust operations so tactical actions remain linked to conditions in the operational environment.

Virtual World

The MOVE virtual world component provides a synthetic environment that includes the replication of warfighting equipment and operational environmental conditions, allows for the sharing of a common environment which multiple users can access, and supports interaction with simulated entities (including objects, avatars, and equipment) that mirror, in response fidelity, those that would occur in the real world (DODI 1322.18).

Constructive Simulation

The MOVE constructive simulation component is a highly complex high-resolution model that provides symbolic representation of the plan and terrain, and adjudication of the results of the plan, using calculations of movement and combat power. It also includes semi-automated forces to reduce the requirement for human role-players. All this enables training of command and staff tasks in military decision-making skills.

OneSAF is the primary constructive simulation currently integrated into MOVE. OneSAF is a constructive simulation that provides entity-level computer-generated forces (CGF) (PEO STRI, 2011). It models and simulates combat entities and systems. The entities have some level of autonomy that allows them to react based on their situational awareness. These entities are semi-automated in that they generally require human operators to do holistic planning, provide goals for goal-directed behaviors, etc. (Coolahan, et al., 2010). These semi-automated forces provide intelligent, doctrinally correct behaviors representing the modular force in the contemporary operating environment (James, Dyer, Wampler, 2008).

Integration Subsystem

The approach for integration was to federate a military constructive simulation, a web-based COTS (commercial off-the-shelf) virtual world, and a web mapping suite to create a fused visualization of plans, operations, and relationships to geo-specific terrain. A master database maintains individual entity-state data and integrates the virtual world and constructive simulation to provide a synchronized view of the battle space and plan (Figure2).

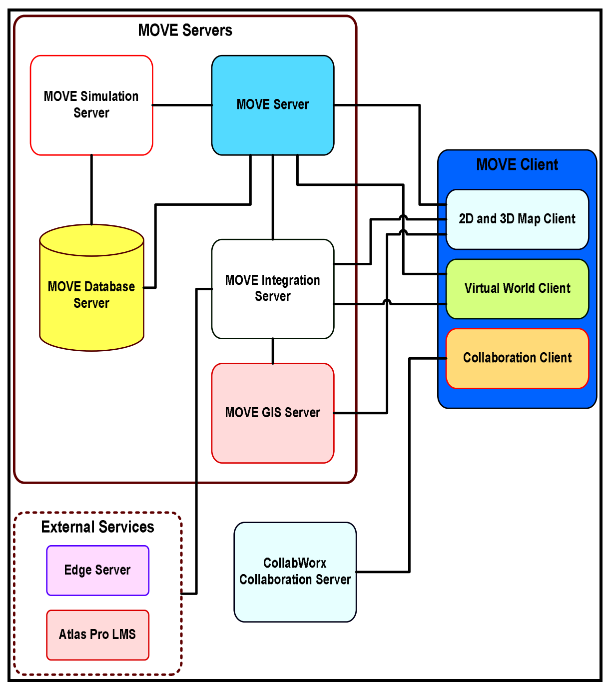

Figure 2: Simplified Shared-Reality System Architecture

All of these capabilities are based in the server cloud with customized interfaces provided in a web browser to reduce the load on the client and dramatically increase access to the system.

Phase I—Asynchronous Lessons

The asynchronous IMI lessons were designed as the foundational building blocks for the synchronous instruction. Both asynchronous and synchronous lessons opened with distinct mission scenarios involving the new equipment. All scenarios were created from a single overarching brigade mission order for achieving stability operations in a hostile border environment similar to that of Afghanistan and Pakistan. In the asynchronous lessons, Leaders were required to solve planning problems pertaining to specific employment and emplacement considerations for each of the individual systems (Figure 3). The IMI also provided unit leadership with a quick read-ahead package and online reference guide for the operational parameters of the new systems.

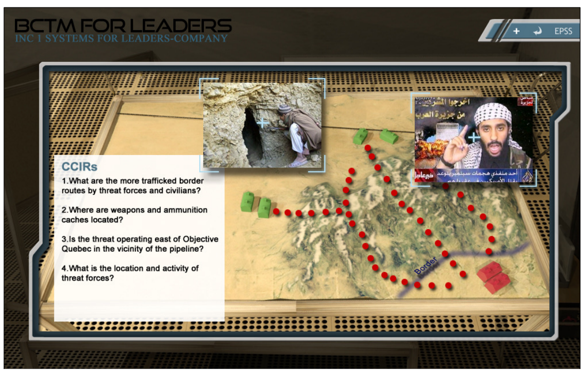

Figure 3: Asynchronous IMI—Scenario Introduction

The asynchronous development team was directed to create something innovative and not just another "page turner." The team came up with three methods to present the asynchronous material in a unique way.

- First, to avoid the look and feel of page turning, students navigated lesson content through the use of "nested" menus and notifications that instructional passages had been completed. The IMI made use of forward and back arrows only after a student had successfully completed an instructional area.
- Second, the asynchronous lessons were intended to be Leader-centric and succinct. Most of the new equipment's operational data were culled from the instruction and placed in an embedded job aid, allowing unit leaders to access system operational data if required in asynchronous or synchronous lessons.
- Finally, the asynchronous IMI included 3D virtual environments developed in the UNITY Game Engine to allow students visually to practice and rehearse skills necessary for employing or emplacing sensors in virtual village and terrain environments.

Phase II—Synchronous Exercises

After completing Phase I, and equipped with the basic skills and knowledge of the new systems, the asynchronous learner was assigned to a small group or unit. Once in the unit, the training audience maintained their military occupation and role:

- Infantry Company Commander
- Infantry Company Executive Officer
- Infantry Company First Sergeant
- Infantry Platoon Leader
- Infantry Platoon Sergeant
- Infantry Squad Leader

Synchronous lessons were designed to be learner-centric with platoon and company leaders responsible for creating operational plans for employing and emplacing Increment 1 Systems. Communication was conducted with MOVE's online video and audio controls. The MOVE's communication package included two-way video, text-based online chat, and point-to-point and broadcast audio communications.

Exercises were driven by web-enabled, sharable documents, 2D map overlays, and a 2D/3D game environment. Once the team had formulated their system employment plans, the facilitators were then able to inspect visually and assess the team's equipment employment plans (Figure 4).

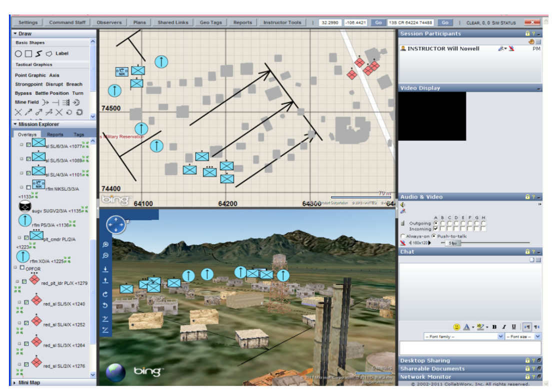

Figure 4: MOVE Platform Environment

Sequencing of Lessons & Exercises

Lesson sequencing was fundamental to the design of the course. The paradigm shift from teacher-centric instruction to learner-centered instruction has caused "new needs for ways to sequence instruction" (Reigeluth, 1999). Design strategy for the project was elaborative in nature and the instructional lesson and the lesson content for both the asynchronous and synchronous lessons were sequenced from simple to complex (Table 2).

Table 2: Design Strategy

Crawl – Identify	
Asynchronous IMI (Levels II–III) 9 hours	System Fundamentals
Walk – Comprehend/Assess	
Synchronous Exercises (Level III) 44 hours	Planning Exercises
Run – Anticipate/Adapt	
Synchronous Exercises (Level IV) 18 hours	Integration Exercises

System Fundamentals (Identify)

Asynchronous IMI lessons (Level III) were designed to provide the unit leaders with fundamental skills and knowledge for understanding the functions, capabilities, and characteristics of the Increment 1 Systems. The standalone asynchronous IMI lessons started with Company- and Battalion-level overviews (Figure 5). The next four lessons were focused on the operating parameters for the individual sensor systems. These lessons provided the student with a greater level of granularity for the systems capabilities and for the planning considerations. The last two IMI lessons discussed the integration issues and use of the new systems at the Battalion and Company levels.

Representative titles include:

- Inc 1 Systems Employment for Leaders – CO
- SUGV Employment for Leaders – Platoon
- U-UGS Emplacement for Leaders – Platoon

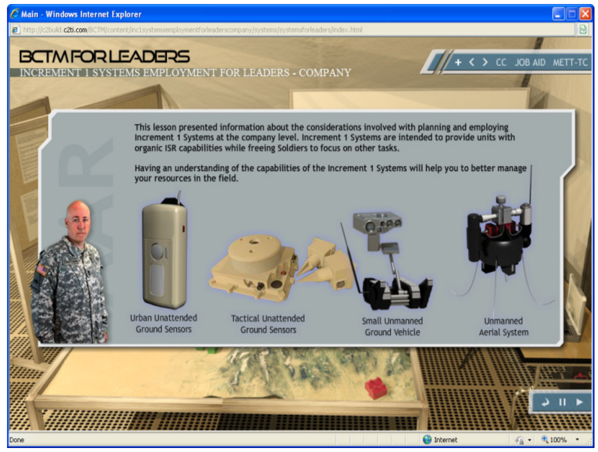

Figure 5: Company-Level Overview IMI Screen

Asynchronous lessons were structured as building blocks, starting with general overviews of the four systems and how they might be used in the field. The initial two lessons were followed with systems-specific details on operating characteristics and limitations to provide the Leaders with a sense of how the systems might be used in various terrains and conditions. Finally, the last two lessons were more complex and started to discuss the new system integration issues.

Asynchronous lessons were designed to be taken prior to synchronous MOVE exercises. The blended-learning strategy between asynchronous and synchronous lessons allowed unit Leaders to grasp the fundamentals of the operational parameters, employment considerations, and employment techniques for each of the Increment 1 Systems.

Planning Exercises (Comprehend/Assess)

Of the 62 hours of synchronous lessons, 44 hours were Level III, and were designed to create tactical scenarios in the MOVE environment in which small unit teams had to address various planning employment or emplacement considerations for each of the Increment 1 Systems. Facilitators in the MOVE environment provided a brief lesson introduction that included the lesson objectives and expected outcomes for the team. To set the planning exercises into motion, the facilitator presented a web-enabled briefing that sketched out the Commander's intent for the Mission, Enemy, Terrain and Weather, Troops and Support available, Time available, Civil considerations (METT-TC) for each lesson. As part of the web-enabled presentation, a Fragmentary Order (FRAGO) was provided online and as a reference document located in MOVE's document archive.

Once the facilitator had established the scenario, the team was required to discuss and create a plan to use the new equipment to accomplish the mission. Plans were discussed and drawn on the 2D Map in MOVE. Typically, the unit needed to consider the impact of METT-TC on the system and the mission, and how to task-organize the platoon. The team needed to determine who would be responsible for emplacement or operation of the system, who would have overwatch (security) responsibilities, and who would be responsible for the recovery of the systems once the mission was completed.

The Level III synchronous lessons were also sequenced to provide more complex problems to the training audience over time. The initial Level III lessons were generic in mission and scope. These first four lessons were designed to introduce a single system and a generic training problem:

- How to Employ Class 1 UAS – Company
- How to Employ the SUGV – Platoon
- How to Emplace the T-UGS – Platoon
- How to Emplace the U-UGS – Platoon

These four initial synchronous lessons allowed the training audience and the facilitator to become familiar with the MOVE environment and with how to use the collaborative environment to solve basic planning problems for the Increment 1 Systems.

The remaining Level III synchronous lessons were designed to be more specific in nature. The training audience received scenarios with specific Increment 1 System missions. These complicated, involved exercises required that students consider more of the operational characteristics of the Increment 1 Systems, presented in the asynchronous lessons and the embedded Increment 1 System job aid. Here are some representative titles:

- Emplace T-UGS During Combat Ops in Urban Terrain
- Employ SUGV to Support Investigating Point Obstacles

Integration Exercises (Anticipate/Adapt)

The Level IV synchronous lessons were designed to be the most challenging. Level IV lessons required that the team plan not just how a new system would be used in a specific mission, but how the new system would be integrated and used with all of the other organic equipment and procedures that the unit had at its disposal. In other words, the team needed to plan not only for the new equipment, but also for all of the current equipment in the units command. Representative Level IV synchronous lesson titles include:

- Conduct a Cordon and Search – Infantry Rifle Company
- Conduct a Defense – Infantry Rifle Platoon
- Scout PLT – Conduct Route Reconnaissance

The Level IV lessons were designed to make students solve problems by applying deliberate planning measures found in the initial IMI job aid and Level III synchronous lessons.

Student teams needed to analyze and anticipate future requirements and conditions set out in the scenario. Facilitators needed to ensure that students were working towards planning how their new Increment 1 Systems work in concert with their current operational procedures and weapon systems. Students need to determine what effect the emplacement of their sensors might have on the battlefield, and the operational impact the systems might have on the success or failure of the mission. Facilitators needed to observe and listen carefully to the team's planning discussions and, if necessary, to prompt the students with "what if?" questions to ensure that they were assessing the situation and balancing mission requirements and risks.

Instructors vs. Facilitators

Leaders and OTs collaborate online to create solutions to complex tactical problems using a 2D interactive map and establish virtual trust via social networking.

Although the training audience was located at Fort Bliss, TX for V&V, the Instructor/facilitators were spread across the country:

- Atlanta, GA
- Huntsville, AL
- Seattle, WA

- Newport News, VA
- Radcliff, KY
- Columbus, GA
- Fort Leavenworth, KS
- Fort Bliss, TX

The single greatest challenge and lesson learned from this pilot lay in defining the role of the subject matter expert (SME) as a facilitator in MOVE. After the first synchronous lesson rehearsal, the role of the SMEs was recognized as the linchpin–the determinant of the pilot's success or failure. Nearly 90% of the scheduled training was synchronous, and student acceptance of MOVE and the instructional validity of the program rested largely on the ability of the SMEs to assist student teams in solving operational planning problems in the MOVE environment.

Initially, the design team sought SMEs who had recent infantry experience in military tactics and were knowledgeable in the Increment 1 Systems. The first challenge was finding the right mix of qualifications for the SMEs. Next, the design team did not recognize the significance of the role of the SME. SMEs needed to be facilitators—and not instructors. The challenge was the logistics involved in organizing a widely dispersed team of SMEs operating in a new training platform.

- The initial synchronous lesson support packages started out as Instructor Startup Guides rather than Facilitator Guides. This may have helped to set the stage for the SMEs to lecture rather than facilitate. The first rehearsal showed that a "sage on the stage" was probably the wrong approach in attempting to train planning operations and problem solving. Too much talking from the instructor caused the students to become uninterested and hesitant to speak in the MOVE environment. Rather than the students discussing and making planning decisions, they were waiting for the instructor to tell them what to do.
- SMEs were widely separated by geographical location, and assigned as part-time employees to the project. They were also assigned to a specific Increment 1 Systems and typically worked with a single ISD as a partner. These factors, along with time zone differentials, helped to create a stovepipe effect. It became a challenge to arrange for lesson rehearsals with all SMEs present and to share lessons learned in facilitation techniques in the MOVE environment.

The initial synchronous lesson rehearsal revealed that the MOVE and synchronous environments need a facilitator and not an instructor. The first step our designed team undertook was to turn the initial Instructor Startup Guide into a standardized Facilitator Guide divided into three parts: Introduction/Online Presentation, Exercise, and After-Action Review (AAR). The revamped Facilitator Guides included recommendations for how long each topic should be discussed and the topics to be covered during each event. SMEs were provided with an outline describing the actions for the facilitator, the expected student actions, and key events for which the facilitator should look or which the facilitator should foster.

We began to see progress fairly quickly at Validation and Verification (V&V). Beyond creating a robust Facilitator Guide, several other actions occurred:

- Conference calls for daily "Hot Washes" were held between all V&V observers and SMEs
- More backchannel chatter occurred among SMEs
- SMEs observed each other during exercise execution with students
- SMEs appeared to become more comfortable with the MOVE technology as they conducted more synchronous sessions
- Overtime SMEs became less directive in part because students had learned synchronous lesson requirements and initiated activity independently of the SME
- Students expressed the desire for their own leadership to participate and assist in the facilitation of the exercise.

By the end of the first week of V&V, SMEs were briefly introducing the synchronous lessons and turning the planning operation over to the company or platoon leaders. Over time, SMEs and students both began to recognize what a good exercise looked and felt like.

TRAINING EFFECTIVENESS ANALYSIS OF EXAMPLE SHARED-REALITY SYSTEM—MOVE

A training effectiveness analysis (TEA) was conducted of an example shared-reality system: MOVE was sponsored by the Army Training Support Center and designed for Leader training in the military decision-making process. The TEA was conducted by TRADOC Analysis Center, White Sands Missile Range, in collaboration with the Maneuver Center of Excellence and the Future Force Integration Directorate (Figure 6).

The test case for the TEA was doctrine and tactics training for unit leadership on effectively integrating Brigade Combat Team Modernization Increment 1 Systems into unit combat operations. The test bed consisted of the leadership of an Infantry Company with the Army Evaluation Task Force at Fort Bliss, TX. This intact Company leadership group consisted of five Officers (Commander, Executive Officer, three Platoon Leaders) and 14 Noncommissioned Officers (First Sergeant, three Platoon Sergeants, 10 Squad Leaders).

Figure 6: Audience for Training Effectiveness Analysis Use Case Consisted of Officers and NCOs of an Infantry Company

Training consisted of interactive multimedia instruction with MOVE collaborative planning exercises with coaches and unit leadership. The exercises consisted of 60 facilitated collaborative sessions over 11 days of training, progressing from Platoon- to Company-level tactical operations planning and execution.

While only draft findings have been published, initial results are encouraging. The Company leadership judged the training conducted via MOVE to have been "to standard" and recommended using it for training the first unit equipped with the sensors (see Figure 7). The Soldiers were initially skeptical of training using the MOVE system, but ultimately reacted positively after learning the system interface and becoming actively engaged in solving tactical problems during the sessions. Additionally, the Soldiers gained more confidence as they began to explore the system capabilities and to innovate actively in leveraging those capabilities to support learning and collaboration (Gettman, 2011).

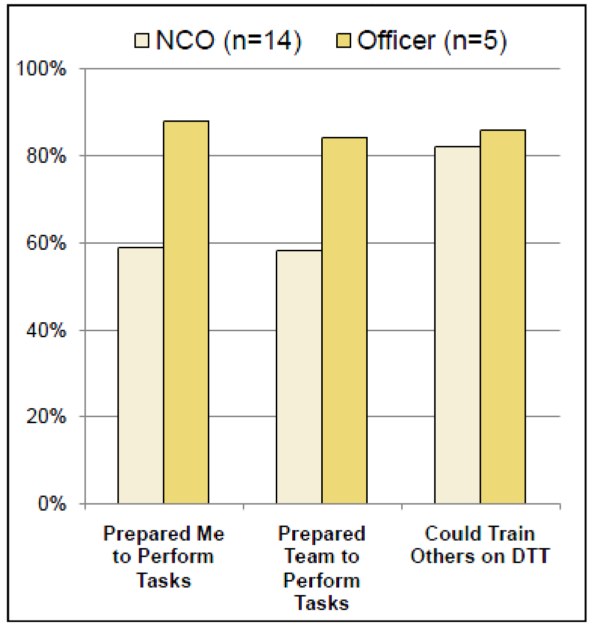

Figure 7: Example Responses to MOVE Effectiveness Survey Questions by Officers and NCOs

Other results from the draft findings include:

- Technology Performance—this evaluation factor scored the lowest due to persistent software-related problems and continuous connectivity issues. The initial concept to conduct the V&V with wireless connections was replaced with the installation of TI line and onsite technical staff.
- Potential for Learning—this evaluation factor scored a superior. The facilitator-in-the-loop was critical to ensuring the Soldiers engaged in the exercises and collectively conducted planning and execution of the scenarios. They did not instruct.
- User Acceptability—this evaluation factor was generally positive. The MOVE interface was easy to learn and use, while the training content was easy to read, understand, relevant for employment of sensor systems.

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