Realistic Training Using a Collaborative Simulation Environment

Kelly Ward, Dr. Denise Stevens
General Dynamics Information Technology
Orlando, Florida
Kelly.Ward@gdit.com, Denise.Stevens@gdit.com

Susan Marshall, Dean Marvin
Joint ADL Co-lab
Orlando, Florida
Susan.Marshall1@us.army.mil, Dean.Marvin@jointadlcolab.org

ABSTRACT

General Dynamics Information Technology, the Joint ADL Co-Lab, MAK Technologies Inc., and mGen Inc., developed a Marine Corps Planning Process (MCPP) Interactive Multimedia Instruction (IMI) prototype. This prototype includes three Sharable Content Objects (SCOs) that incorporate a High Level Architecture (HLA) compliant simulation and are accessible from a Sharable Content Object Reference Model (SCORM) 2004 conformant learning management system (LMS). This paper will describe the processes and outcome of the prototype project.

Using Expeditionary Warfare School (EWS) content, the SCOs present instruction and provide practice for Marine Corps S2 and S3 officers on how to produce Enemy Courses of Action (COA) and friendly COA. The students collaboratively learn about the MCPP and apply their knowledge by performing exercises in the Marine Air-Ground Task Force XXI (MAGTF-XXI) simulation. Upon completion of the training, the students run the game to analyze the Blue COA and then are assessed on their application of MCPP principles through a series of questions.

This paper will discuss the approach used to determine which portions of MCPP were appropriate to insert realistic training with simulation. Additionally, we will describe the methodology used to technically integrate HLA simulation into SCORM 2004 SCOs. As part of the prototype, a student assessment was developed using the HLA gaming simulation environment. This unique assessment strategy effectively measures the student's understanding of MCPP principles. The team discovered and documented several technical challenges as integration efforts were undertaken. The paper will describe how those challenges were overcome.

This paper will summarize the benefits available to the 21st Century Joint Force when incorporating realistic training using a collaborative simulation environment.

ABOUT THE AUTHORS

Kelly Ward is Director of Technology Modernization with General Dynamics Information Technology. She coordinates conversion of courseware to shareable content objects (SCOs) and application of SCORM standards for current and new customers. She has 22 years of experience in the management and production of WBT and CBT as well as analysis and design of infrastructures to support technology-based training.

Susan Marshall is a Principal Investigator for the Joint ADL Co-Lab. She has over 20 years of experience as a project engineer for the Navy and Army. Her areas of concentration at the Co-Lab include: Learning Content/Simulation Integration, and SCORM 2004 Applications. Mrs. Marshall earned a BS in Electrical Engineering from Marquette University, and MS in Industrial Engineering in Simulation from the University of Central Florida.

LtCol Dean Marvin, USMC (Ret) is a Senior Military Analyst at the Joint Advanced Distributed Learning Co-Lab in Orlando, FL. He helps lead the Research and Development efforts at the Co-Lab. LtCol. Marvin received a BA from Florida Southern College and an MAE from Chapman University.

Dr. Denise Stevens has more than 17 years experience in all aspects of the Instructional Systems Design process for product development including web-based, computer-based, print-based training as well as other distance learning applications. Dr. Stevens hold a doctoral degree in Curriculum and Instruction with an emphasis in Instructional Systems Design.

Realistic Training Using a Collaborative Simulation Environment

Kelly Ward, Dr. Denise Stevens
General Dynamics Information Technology
Orlando, Florida
Kelly.Ward@gdit.com, Denise.Stevens@gdit.com

Susan Marshall, Dean Marvin
Joint ADL Co-lab
Orlando, Florida
Susan.Marshall1@us.army.mil, Dean.Marvin@jointadlcolab.org

INTRODUCTION

Since 2001, numerous meetings, brainstorming sessions, investigations and experiments have been conducted in an effort to integrate the worlds of Advanced Distributed Learning (ADL) and High Level Architecture (HLA). Both initiatives have evolving interoperability specifications/standards. The HLA specification evolved from the training simulation community through the work at the Defense Modeling and Simulation Office (DMSO)[1] into a data interoperability medium for such systems. ADL defines the Sharable Content Object Reference Model (SCORM)[7] as an interoperability specification for Web-based, distributed, interactive multimedia instruction (IMI). By integrating these two worlds, simulations and distributed learning (DL), students may be provided with a more realistic and enriched learning experience.

Background

On 4 April 2003, key individuals from the training and simulation communities met at the Joint Advanced Distributed Learning (ADL) Co-Lab[4] in Orlando, FL to discuss how this technological marriage could best be applied to the needs of the Warfighter and to discuss potential requirements to advance the SCORM specifications. The efforts culminated in project criteria which provided the baseline for this prototype project. The purpose of this project was to develop a prototype system for the Joint ADL Co-Lab which demonstrates a rich, robust learning environment comprised of a learning management system (LMS), SCORM-conformant instruction, and a relevant scenario within an HLA-compliant simulation. By May 2004, the prototype team was created through the Joint ADL Co-lab Prototype Program and comprised of personnel from the Joint ADL Co-lab, General Dynamics Information Technology[3], MAK Technologies[5], and mGen Incorporated[6].

The prototype team focused on the Marine Corps' Expeditionary Warfare School (EWS) in Quantico, VA. Every Marine Captain is required to take EWS as part of his or her Professional Military Education (PME). Within the Marine Corps, there are approximately 5100 active duty and about 1900 Reserve Captains. There are three avenues available for Marines to complete EWS:

1) The Resident EWS
2) The faculty-led Seminar EWS Distance Education Program (DEP), and
3) The Individual Guided Study (IGS) DEP.

The EWS schoolhouse can accommodate just 190 Marine students each year, which means that the vast majority of Marine Captains complete EWS either through the Seminar DEP or the IGS DEP. The EWS Seminar DEP is offered to eligible students at specific locations throughout the world. The seminars consist of weekly two-hour sessions facilitated by adjunct faculty members. The Seminar DEP students proceed through the curriculum collectively with the seminar professor. The IGS DEP is available to students that choose to complete EWS independently and at their own pace often because they are not stationed near a Seminar Program or because their work schedule simply cannot accommodate attending the Seminar sessions.

EWS Curriculum

The EWS curriculum includes instructional emphasis on Marine Air Ground Task Force (MAGTF) command and control, combined arms operations, warfighting skills, tactical decision-making and expeditionary operations. Resident students are taught to plan and execute operational plans on the operational planning tool, Command and Control Personal Computer (C2PC). Throughout the curriculum, training at the Resident EWS is conducted in conjunction with practical exercises that utilize the Marine Corps Planning Process (MCPP). All the DEP students have identical training requirements; however, these students participate in scaled down, paper-based practical exercises.

Currently, the IGS students read doctrinal publications and work with paper-based scenarios. The HLA/SCORM Prototype project is intended to provide the IGS DEP student with a richer, more robust learning environment in which SCORM-conformant instruction is supported by the HLA-compliant

MAGTF-XXI simulation. Our approach was to embed a simulation into a DL course. The simulation is intended to provide a pictorial example of instruction as well as a means by which the students can practice and actually be assessed on the simulation.

MAGTF-XXI and HLA

The scenario for this prototype was developed within the HLA-compliant simulation, MAGTF-XXI, which is part of MÄK Technologies' SIMinterNET family of Intermediate Desktop Simulations. The MAGTF-XXI military tactical trainer is used at the EWS schoolhouse to enable students (in the roles of commanders and staff officers) to practice planning and execution skills within a simulated environment. By enhancing the EWS distance education program courseware with MAGTF-XXI, and recording the progress and results in the mGen Inc. Learning Management System (LMS), this prototype can potentially provide an effective and affordable hands-on experiential training program.

METHODOLOGY

In order to technically integrate MAGTF-XXI with SCORM-conformant courseware, the prototype team needed to decide how the simulation would be integrated into the program from an instructional perspective. To provide a more robust learning environment in which SCORM-conformant instruction is supported by the HLA-compliant MAGTF-XXI simulation, the following goals were set:

1) Incorporate the HLA-compliant MAGTF-XXI simulation where it made sense from an instructional standpoint thus creating Experiential Learning
2) Provide learning events that would allow for collaboration among the DEP students thus creating Collaborative Learning

To support the first goal, we determined that launching the simulation as an asset within a sharable content object (SCO) would maximize the flexibility for instructional designers to create simulation-based instructional strategies within instruction and also allow the designers to incorporate the simulation into an assessment SCO.

As instructional theories suggest, simulation is a form of experiential learning where students experience the reality of the scenario presented and gather meaning from it. Simulations promote the use of critical and evaluative thinking. The prototype team determined that the gaming simulation could be effectively used as a practice exercise where the students could practice the tasks taught in the SCO. This allowed for performance-based reinforcement of concepts as they are related to the MCPP. In addition, the prototype team wanted to use a simulation as an assessment component of the IMI.

To support the second goal, the prototype team determined that adding informal collaborative tools would promote interaction between the DL students. Collaborative interaction would maximize the team's learning as they progressed through the instruction and practice.

To technically accomplish these goals, several pieces of information would be collected by the SCO to prepare to launch the simulation. The launch information needed to be stored in a location that was accessible by both the SCO and the simulation. Additionally, information that would be gathered from the simulation needed to be stored in a location that was accessible from the SCO and the LMS. Several pieces of software called "shared assets" were developed to support this communication flow including: multiplayer setup, file transfer, launcher, and collector.

Instructional Strategies

A number of instructional challenges presented themselves as the prototype team attempted to identify when and where in the IMI prototype to use the complex capabilities available in MAGTF-XXI. Is it possible to control the gaming simulation to make it an instructionally effective practice and assessment component? How is the IMI prototype going to provide a collaborative environment for DL students in a SCO? As an initial step in the prototype development process, the prototype team first conducted a thorough analysis of the EWS curriculum to identify which Terminal Learning Objectives (TLO) and Enabling Learning Objectives (ELO) would best lend themselves to the inclusion of collaborative wargaming simulation for practice and assessment. The MCPP curriculum included 18 TLOs, but as a result of the analysis, only the following objectives were selected:

TLO 6.0: Develop Enemy Force Situation
TLO 13.0: Develop the Course of Action (COA) that Best Accomplishes the Mission
TLO 18.0: Execute the MCPP by Completing the Modified Most Likely/Most Dangerous/Friendly COAs

Portions of each TLO became the basis of three SCOs in this prototype.

SCOs 6, 13, 18

TLOs 6.0 and 13.0 are performance-based and support the tasks performed in the game scenario presented as part of TLO 18.0. The prototype team selected portions of TLO 6.0 to provide the S2 and S3 role players with recap instruction and practice on how to produce most-likely and most dangerous Enemy Courses of Action (ECOA). SCO 6 covers the five basic steps for determining Enemy Courses of Action (ECOA). The second step – ***Identify the Full Set of COAs Available to the Threat*** – contains two practical exercises which launch scenarios within the HLA-compliant simulation. In the first practical exercise, the students are tasked to create a situation template within the scenario. When they launch the simulation, the File Transfer applet downloads a scenario to each individual workstation and the Launch applet opens the scenario within the simulation. The students join the common workspace and work together to create the template. Once completed, the students exit the simulation to return to the courseware. The next screen provides feedback and remediation by presenting one good solution with which the students can compare their solution. The students, based upon their review and discussion, are given the opportunity to re-launch the simulation and modify their situation template as needed.

In support of TLO 13.0, ***Develop the Course of Action that Best Accomplishes the Mission***, SCO 13 presents the steps to develop a friendly course of action which is the second step of the MCPP. SCO 13 presents the students with instruction and practice on how to develop one friendly COA sketch and narrative. As in SCO 6, the students are given practical exercises and opportunities to refine their solutions within the COA Graphic and COA Narrative branch of the instruction.

This strategy is utilized for each practical exercise within SCO 6 and SCO 13. The MAGTF simulation program was modified to save the scenario upon exit to ensure that the students would be able to leave and return to the exercise.

To assess TLO 18.0, ***Execute the MCPP by Completing the Modified Most Likely/Most Dangerous/Friendly COAs***, the students execute the gaming simulation presented in SCO 18. Once they run the game to completion, they exit the game and return to the SCO. Their understanding of the MCPP is tested by answering questions based upon their analysis to determine whether the provided COA was suitable, acceptable, and feasible.

Cooperative Instruction

A significant benefit of the EWS schoolhouse environment over IGS – and to a large degree over the seminar program – is the ability to work as a team through problems. A foundation of the MCPP curriculum at the schoolhouse is the team's performance during the capstone exercise using MAGTF-XXI. To reinforce team skills for IGS students, the prototype team included a multi-student, team-based training strategy into the prototype. To promote positive interdependence, the students advance through the instruction together. Then they are linked with their teammate so that one will not succeed unless the other succeeds. Each practice exercise is completed together to support group processing and team-building skills. Through cooperative exercises, the students use leadership, decision-making, trust-building, communication, and conflict-management skills.

Assessment Strategy

One of the prototype team's objectives was to use the gaming simulation as a performance assessment tool. This involved the development of a method to measure student's performance while being in the simulation. The intent was to identify parameters and metrics for measuring successful actions while being in the game. These parameters were to be based on a set of critical points that were to be captured from the HLA federated object model. However, the team realized that there was too much data in the HLA federated object model to assess without replicating the functions of an intelligent tutoring system. In addition, there are no distinct "right" or "wrong" answers in the execution of the Course of Action (COA) development process. While some "answers" may be described as better (or worse) than others, there is often no clear distinction that differentiates between these choices. In other words, a "less-than-perfect" answer may still be acceptable. Based on these constraints, the team created a subset list of basic location and "damage state" information to cull out of the HLA data.

To test the prototype's potential to use HLA data from within SCO 18, the "damage state" of the units was used to assess the student's ability to analyze a COA. A series of questions was developed to ask the student's opinion of the COA (whether or not it is suitable, acceptable, and feasible). These questions were presented upon completion of the simulation and were programmed to evaluate each answer against the "damage state" data received from the simulation. For example, although a Yes/No question remained the same, "Yes" would be evaluated as either correct or incorrect depending on the outcome of the game. If the student answered correctly, the students would be presented additional questions. If the student answered incorrectly, they were instructed to review the materials before retrying to answer the questions again. This assessment strategy was used as a very simplistic means to test the decision-making skills of the student.

Technical Challenges

Instructional design must be the driving force behind the decision of how and when to use an advanced strategy such as simulation in distributed learning. Once that decision is made, however, a technical team must determine how to implement the strategy. A number of technical challenges presented themselves with the chosen instructional design strategies. Practical decisions needed to be made including: whether the simulation should return data to the SCO or directly to the LMS; which data from the simulation should be stored; and how to store the simulation data in the LMS using the SCORM 2004 data model.

Additionally, several technical hurdles needed to be overcome:

- Create an environment where two DL players could interact with each other in a collaborative environment and also interact with a SCORM 2004 conformant LMS individually.
- Create a method for students to leave the training environment and return again without losing their progress within the simulation.
- Create a method to analyze and return the volume of information available from the HLA simulation when running the game.

These challenges required tailoring of all three environments as described below.

Collaborative Environment

Distance learning is often a self-paced activity with a single student. To create a collaborative environment, the prototype team relied upon manual coordination and electronic data sharing. Synchronous communication methods such as instant messenger programs, voice-over IP, or telephone were recommended as students completed activities. Additionally, the MAGTF-XXI simulation provided a rich collaborative environment in multiplayer mode that the prototype team wanted to utilize during the practice exercises.

In order for two or more users to participate in a multiplayer session, MAGTF-XXI required that one workstation initiate the simulation as a "host." While this was a manual selection in the simulation program, the prototype requirement was to automatically launch the simulation from within the SCO. To overcome this challenge, a java applet was developed to connect end users for participation in a multiplayer simulation within MAGTF-XXI. The SCO launched the java applet to capture the host/client role and created a file within the simulation directory. Next, the simulation itself was modified to read this file. The Extensible Markup Language (XML)[2] was selected as the format for this file to facilitate possible future extensions of HLA or SCORM. Through this setting, students were able to join a common session for collaborative activity.

An additional java applet was created to launch the simulation using a set of design parameters. With this benefit, the instructional designer was able to select a unique MAGTF-XXI scenario that supported a cooperative activity. The scenario files were then included in the SCORM content package with the SCO. The java applet downloaded the appropriate scenario files based upon the design parameter and then launched that scenario. The students joined into the same session to complete their cooperative exercise in the HLA simulation. The SCO instructed the students to create a situation template together, and each student's action was transmitted and affected the image on the other student's workstation.

Bookmarking in a Simulation

The prototype also had a requirement to support the common distance learning feature that allowed students to leave training in the middle of a lesson and return at a later time. This difficult challenge required that the simulation be modified to support 'exit and return.' Additionally, the SCO would need to download scenario files for the first practice exercise attempt, but if the students left the SCO when they were viewing a practice exercise, then they would need to return to the same scenario file. Downloading the scenario files would have 'restarted' the practice exercise; therefore another option was needed.

To fully support bookmarking and provide flexibility to use different scenarios within a SCO, the scenario files were downloaded before the student reached the practice exercise page. Also, the simulation program was modified to automatically save the session state when the student exited the simulation. When the student returned to the "bookmarked" practice exercise page of the SCO and launched the simulation again, the java applet would launch the simulation with the scenario file parameter as before. Since the student's bookmark was past the download page, the simulation launched the existing scenario with the "saved state" to allow the student to continue with the exercise. This redesign still supported the ability to use different scenarios for each practice exercise while also providing the student with bookmarking in both the SCO and the scenario.

LMS and Applet Support of HLA

Utilizing the existing SCORM 2004 specification allowed the prototype team to leverage the packaging, navigation, launch and API communication capabilities of this specification. The diverse nature, wealth and complexity of simulation runtime data, however, became readily apparent after the repository needs of the simulation were identified. The HLA specification provides standards for the shared data packets, but the amount and type of information varies based upon the type of simulation and the goal of the scenario. The MAGTF-XXI simulation required multiple encodings and scenario files to be stored for multiplayer simulation sessions. The proprietary nature and encoding of the data included in the files was determined not to be useful or reasonable for a data repository or LMS. Much of the data was determined to be useful only within the scope of the proprietary software that created it. Therefore, it appeared unrealistic to modify the SCORM specification to accommodate a specific set of simulation runtime data.

For this prototype, a java applet was developed to return a small set of simulation runtime data back to the SCO. The data elements included Entity id, force type, damage state, latitude, longitude, and altitude. The current SCORM data model does not have a logical place to retain this data, so "damage state" data was saved in the SCORM ‘Comments from Learner’ data model element.

For future research, the most accommodating approach would be not to force the LMS or repository provider to decipher an ever changing array of files, encodings, proprietary information and relational entries. Instead, a preferred methodology identified by the prototype team would be to provide a repository location on the LMS server to hold this runtime data. For research purposes, the mGen LMS was modified to read an extended SCORM specification to accommodate repository requests. A SCO could request a relational repository URL with a unique student, group of students (session), or assignment scope using a new data model element: "mgen.session.repository_url." Once a request is made for the repository URL, the LMS would create a new web directory on the server, grant read/write access to the new directory to allow uploads and downloads, and return the corresponding URL through the API. The LMS would be responsible for recording the new repository location as part of the session information for the user and supplying the URL for subsequent requests. Using this new data model element, the SCO would be able to upload and download the scenario files to the repository. This feature would better support bookmarking within the simulation by allowing the modified scenario files to be uploaded when a student exits the simulation and SCO before completion and then downloaded in the next training session. Additionally, the modified scenario files would be useful to faculty for conducting after action reviews when students needed additional feedback or remediation.

USE CASE FOR HLA/SCORM INTEGRATION

The prototype team created team-based training that is SCORM 2004 conformant and integrated the HLA-compliant simulation. This environment has the potential to significantly benefit distance learning students by providing them with realistic training events. The prototype use case below describes how the environment may support future training events.

Two distance learning students request enrollment in the Marine Corps Planning Process Distance Learning Course. An administrator assigns them to a cooperative team, enrolls each of them into the IMI, and then establishes their initial communication plan. On day one at a predetermined time, the two students log in to the mGen Learning Management System and access their training plans. As illustrated in Figure 1, when the students each select the MCPP IMI, the first page of the courseware is loaded. They would also establish communication using Voice-Over-IP or some other method.

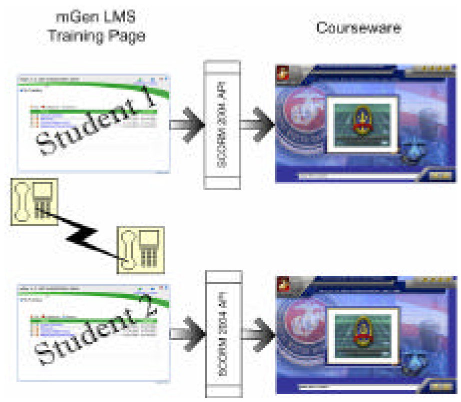

Figure 1. Students Launch Courseware, Initiate Communication

Once they move into the courseware, the students select their respective multiplayer role settings necessary for running the MAGTF-XXI simulation in multiplayer mode. Notice in Figure 2, Student 1 has selected the Host role and Student 2 has selected the Client role. This means that the Host station will execute the more intensive programming functions.

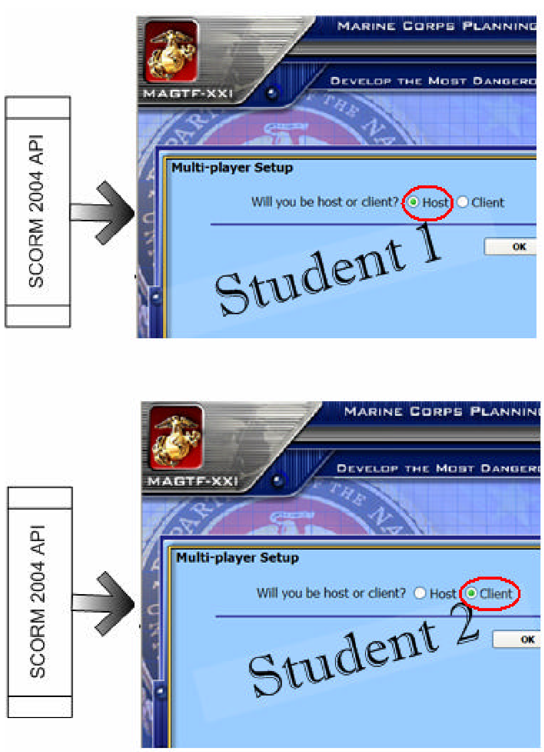

Figure 2. Students choose Multi-player Roles

As the students proceed through the training pages together, the required scenarios for upcoming practice exercises are downloaded to their workstations in the background. In Figure 3, the SCO launches the File Transfer applet which requests scenario files from the LMS server. The server downloads the files into the MAGTF-XXI directory structure on the workstation's hard drive.

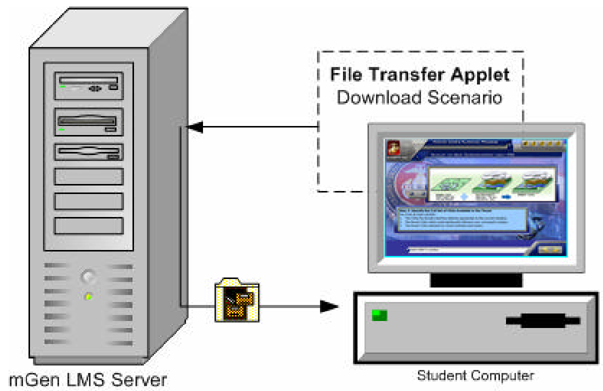

Figure 3. File Transfer Applet

When the students reach the practice exercise page, they are provided with instructions and directed to launch the simulation. When each student clicks the "Scenario" button, a Launcher asset reads the multiplayer role setting from the file created earlier on each student's workstation. The Launcher builds a launch string for the simulation application using this parameter and the practice exercise scenario file name. The simulation reads the string to open the appropriate scenario and also joins the two students together in an HLA federation. As the students collaborate together to move units, create avenues of approach, etc., the new positions and objects are transmitted over the RTI to the other workstation connected to the same federate. Their shared workspace reflects both students' actions. This sequence is illustrated in Figure 4.

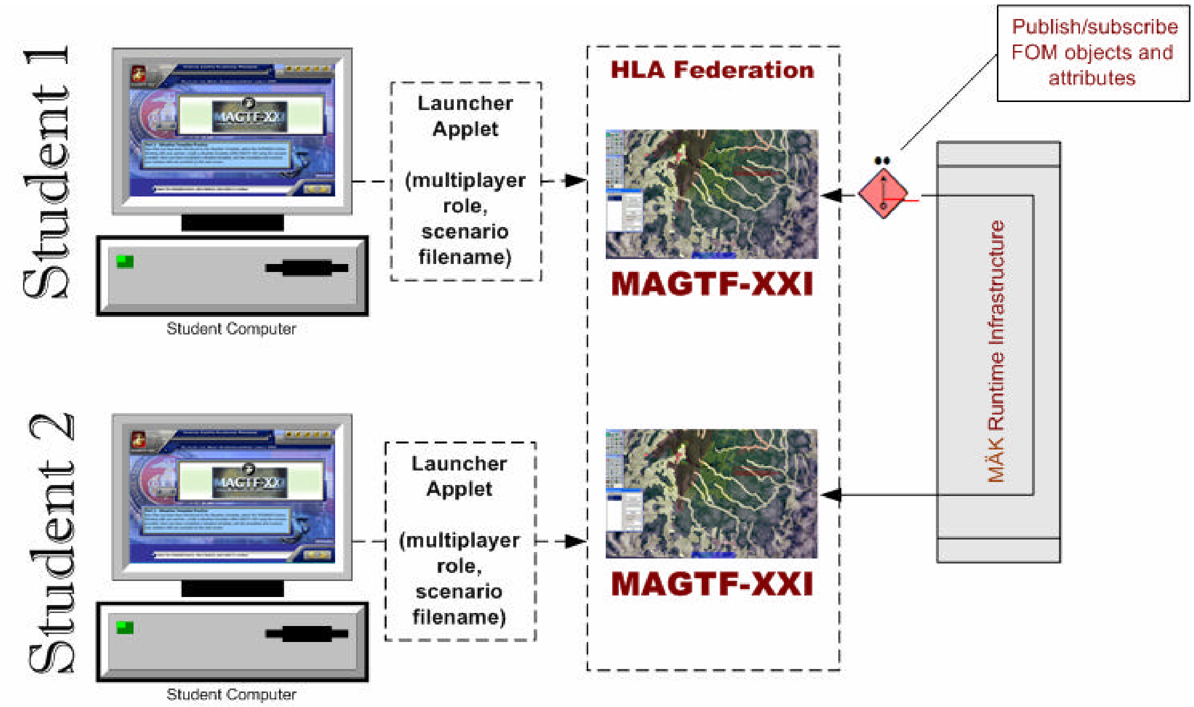

Figure 4. Students Collaborate in Virtual Workspace

Once the students have completed their exercise, they exit from MAGTF-XXI. The federation ends and the Launcher applet returns "end" to the SCO. The students continue through the SCO, completing additional exercises until they reach the end of the SCO. The SCO sends the completion status to the mGen LMS (Figure 5) to provide the students with credit for the instructional SCO. Both SCO 6 and SCO 13 operate in the same fashion.

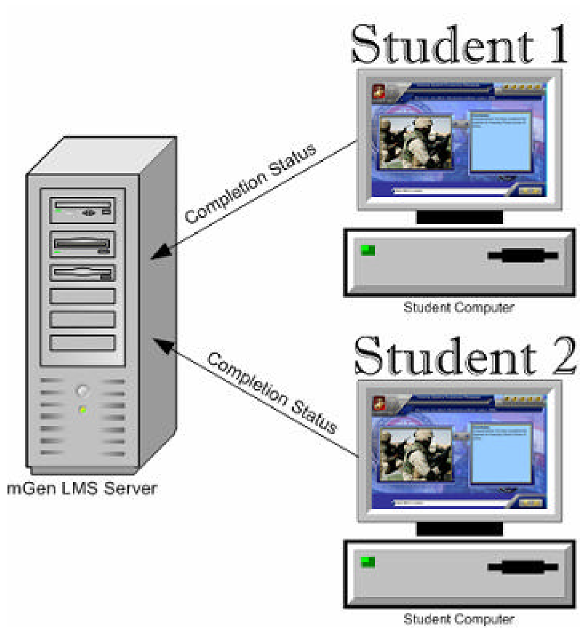

Figure 5. Completion Status Recorded for Each Student

Finally, this prototype team developed an assessment SCO to demonstrate how the simulation may be incorporated into a test within the distance learning environment. Figure 6 demonstrates the data flow between the SCO, the assets, and the LMS. Using the same technologies described above, SCO 18 opened with the multiplayer setting page (A). This setting is requested at the start of all SCOs using the simulation engine to ensure that the Launcher file is written to the workstation. The scenario for the assessment is downloaded (B) to the workstation as well. When the simulation is launched (C), an additional collector asset is launched (D) at the same time. The collector asset captures a subset of data every time data is passed to the RTI. For this prototype, the subset included the location, unit information, and "damage state." Once the simulation closes, the collector sends the last captured data back to the SCO. The SCO uses the simulation result data set to score the assessment questions (E) but also records the data set in the LMS. The data set becomes additional information within the student's record that may be accessed in the future by faculty members.

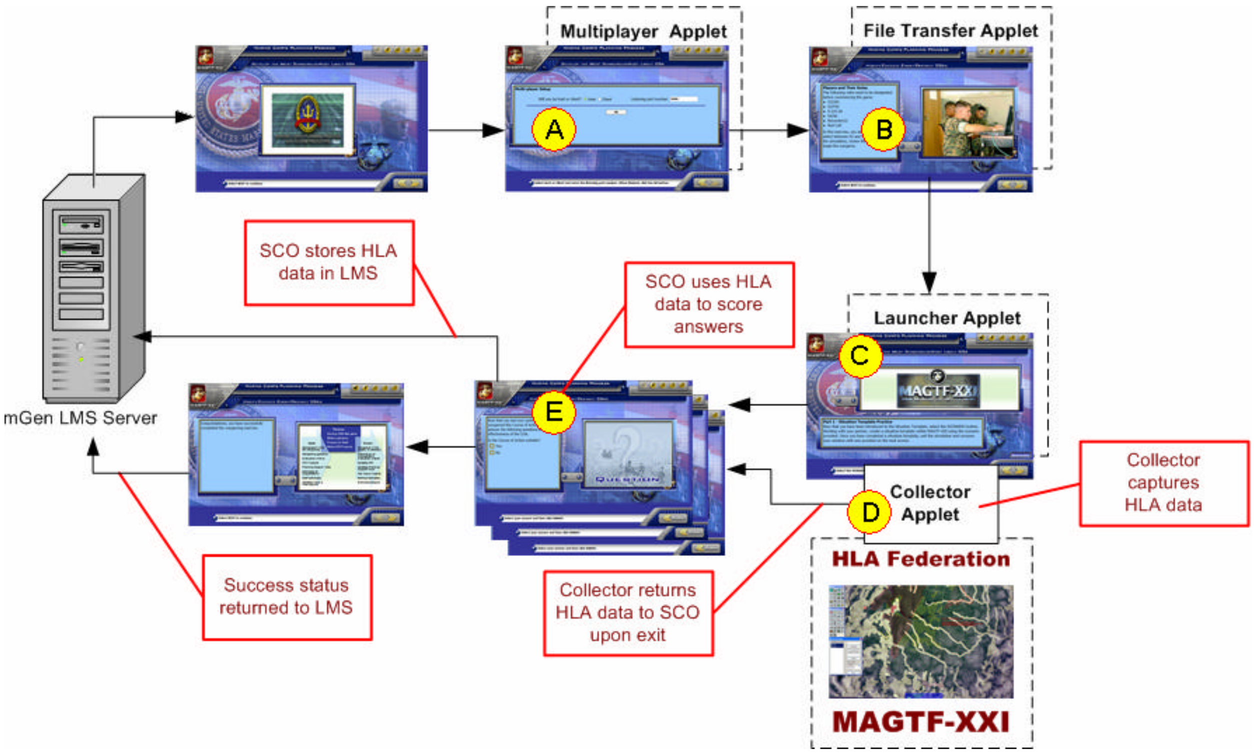

Figure 6. Data Flow using a Simulation in an Assessment SCO

SUMMARY

Obviously, a simulation/game-based environment can be much more engaging than a paper-based IMI—especially for tactics training. If done correctly, simulations/games provide realistic tactical situations and the potential for unlimited practice sessions. Furthermore, the simulation/game environment has inherent collaborative capabilities that can be shared by geographically dispersed students, and the results can be shared by faculty or mentors for assessment/evaluation of student work.

Embedding a simulation/game-based environment in the military's various Individual Guided Studies curricula would be a tremendous asset for all distributed learning students. Each of the services provides career-level schools that teach Joint/Service planning processes and other tactical curricula that would be well suited for this type of environment. This concept provides a "teach - practice – teach (or remediate) – test" environment. What our team envisions is a training/learning environment in which students are taught tactics, techniques, and procedures through interactive IMI. Once the student has proceeded through the basic instruction, he or she will enter a virtual tactical environment for practice and/or testing.

HLA-compliant simulations are not the only answer for all of our DL requirements, but the legacy assets that are currently being used throughout the military may be repurposed to enrich the DL student's experience. One overwhelming advantage is that simulations such as MAGTF-XXI are currently used for large-scale Marine and Joint exercises. Therefore, it provides a "train the way you fight" learning environment.

ACKNOWLEDGEMENTS

The authors wish to recognize Scot Peterson with mGen Incorporated, and Brian Spaulding with MÄK Technologies, for their innovation and ingenuity in the design and development of the prototype project.

REFERENCES

[1]Defense Modeling and Simulation Office (DMSO). https://www.dmso.mil/public/

[2]Extensible Markup Language (XML). World Wide Web (W3) Consortium Architecture Domain. http://www.w3.org/XML/

[3]General Dynamics Information Technology. http://www.gdit.com/

[4]Joint Advanced Distributed Learning Co-Lab. http://www.jointadlcolab.org/

[5]MÄK Technologies. http://www.mak.com/

[6]mGen, Inc. http://www.mgen.com/

[7]Sharable Content Object Reference Model (SCORM). http://www.adlnet.gov/scorm/index.cfm