Simulation Gaming for Education in MyBase: The Future of Air Force Education and Training With Virtual World Learning

Andrew G. Stricker, Ph.D.
Air University
Innovations and Integration Division
(Andrew.Stricker@Maxwell.af.mil)

Larry Clemons
Air Education and Training Command
Future Learning Division
(Larry.Clemons@Randolph.af.mil)

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Abstract

Air Education & Training Command (AETC) published a white paper "On Learning: The Future of Air Force Education And Training" dated 30 January 2008. http://www.aetc.af.mil/shared/media/document/AFD-080130-066.pdf . This paper and presentation will present the key areas of the white paper to include the introduction of a simulation gaming kit for education used for leadership development. A key element of the game is an online 24/7 representation of an operation Air Force Base called MyBase. The simulation game is conducted at the Captain Lance P. Sijan Leadership Range on a MyBase region in Second Life. If possible, the paper presentation would include a live demonstration and tour of MyBase and the range.[1]

1. INTRODUCTION

While the Air Force is a leader in modeling and simulation, much work will be required to keep pace. Modeling and simulation is a key area where operations and training will need to be more closely integrated in the future. How will new technology enable the Air Force develop Airmen who are mentally flexible, agile, and capable of harnessing the intellectual capital of other Airmen? Are our established methods of training and educating adequate to maintain superiority with the accelerating pace of change? How do we educate and train a force of future warriors to out-think, out-maneuver, and out-fight numerically superior and intellectually equal future opponents, at a cost the country can afford to sustain? How will the military cope with this environment of accelerating change and the need for constant reinvention and continuous learning? The Air Force will do this by recruiting and developing Airmen with agile minds, capable of leveraging Air Force knowledge to accomplish the mission. They will provide a hedge against the vagaries of an uncertain and rapidly changing future threat environment. The Air Force needs to dramatically improve its ability to operate in the cognitive domain and increasing the intellectual capital of Airmen will be critical to the effort.

To succeed in its mission, the Air Force must enhance its traditional live training of Airmen. While getting the mix of live, virtual, and constructive delivery methods right is essential, the Air Force must move forward quickly in the development of new virtual and constructive simulation capabilities by leveraging both existing and emerging technology. One such development is the use of virtual worlds and immersive environments to facilitate learning.

One possible solution is MyBase, a U.S. Air Force virtual, exploratory and interactive environment and architecture that supports both continuous and precision learning. A future version of MyBase will be a private virtual environment providing for higher levels of security. The existing prototype version of MyBase is a public virtual environment in Second Life (SL). Second Life is a virtual 3D environment available to the public via the Internet (see http://secondlife.com).

MyBase is a virtual learning environment designed to enhance Air Force recruiting, training, education, and operations. It provides the means for Airmen to rapidly access the knowledge they need to make effective decisions and perform assigned tasks. Designed as a virtual Air Force Base, MyBase can be tailored to recruit the Millennial generation, inform the public, deliver precision learning, provide pre-deployment training or even conduct operational rehearsals.

An early benefit of MyBase for enhancing Air Force education was the introduction of a simulation gaming kit. A test game, titled *Operation Relief Worker Rescue Challenge*, was developed using the kit. The game is conducted using the MyBase Zeta gaming region located in SL. The game is played using SL avatars by participants (e.g., cadets, PME students, and instructors) and makes use

[1] Paper presented at the Spring Simulation Multiconference, (Military Modeling and Simulation Symposium), San Diego, CA, March 24, 2009.

of a 3D immersive environment wherein game participants collaboratively problem solve in a decision-making environment to address the game's challenge surrounding the rescue of hostages held by insurgents. The game is designed to support the instruction and assessment of interdependent leadership in a simulated naturalistic environment constructed on a virtual world gaming range.

The gaming range encompasses a large virtual world area wherein avatars freely move about and interact with life-like terrain, buildings, devices and equipment in the environment (see Figure 1). The range can be readily configured to support adaptations to the game (e.g., cultural-geographic-history contexts, building structures, tools, and supporting documentation content); to include adaptations to the game on basis of participant performance. The range also is equipped with systems for supporting team membership identification, tracking, scoring, voice and text communication among team members, team briefing rooms, video recording of game activity, target damage and scoring, simulated weather, various day and night conditions, assignment of equipment and tools to each team member, and game goal-oriented task action, timing and feedback controls for use by game referees.

Figure 1.
Depiction of Virtual Gaming Range.

The use of a virtual gaming range for leadership development offers opportunities for flexible or seamless adaptation to rapidly shifting conditions while engaging learners via increased interactional bandwidth [see Hamilton, 2008]. Hamilton [2008] believes the means to provide opportunities for highly collaborative learning (e.g., how well people can learn together) and interactivity (across different parts of functional areas or organizations) increases the capacity for contextual mobility. Capacity for depth and layering of interaction with others and with content, involving high-speed interdependent activity provided by a virtual simulation game, can significantly enhance the learning experience and affective connection and meaning in learning [Hamilton, 2008, p. 5]. Virtual worlds offer prospects for contextual mobility in the learning environment via the means to [Hamilton, 2008, p. 5]:[2]

- Support learners and educators with moving in and out of virtual and real contexts
- Blend real and simulated face-to-face interactions
- Participate in and being part of the content learning space
- Provide greater emphasis on heterogeneous competencies functioning in unison within the learning space
- Provide for greater adaptation to individual learning needs, among peers, instructors, and with digital content
- Move in and out of collaboration, individual effort and reflective activity
- Facilitate organizational culture change

2. GAME LEARNING FOCUS

The learning focus of the *Operation Relief Worker Rescue Challenge* game centers on interdependent leadership. The theoretical framework of interdependent leadership is based on a constructive-developmental theory with the premise that people actively construct ways of understanding and making sense of experiences, with the interpretations of experience developmentally growing more complex over time [McCauley, et. al., 2008]. From this perspective leadership developmental movement occurs to better face increased complexity in the environment.

McCauley and associates characterize leadership culture and practices along developmental levels or orientations of conformer (dependent), achiever (independent), and collaborator (interdependent) [McCauley, et. al., 2008; Hughes & Stricker, 2009]. The conformer orientation is broadly characterized by the assumption that only people in positions of authority are responsible for leadership. An achiever orientation assumes that leadership is based on knowledge and expertise, thus placing strong reliance on experts and individual performance. With the collaborator or interdependent orientation leadership is assumed to be a collective activity requiring mutual inquiry, sense-making and learning, with accompanied ability to work across organizational boundaries to address complex, ill-defined and dynamic challenges.

Using this theoretical framework we constructed a game to be sufficiently complex, ill-defined and dynamic to create a

[2] Hamilton's list [2008] was modified to include the addition of "Facilitate organizational culture change."

valid "laboratory" for practicing collective sense-making, learning, and complex collaboration in the context of military decision making. Our goal was to simulate a naturalistic decision making (NDM) environment wherein interdependent leadership practices can be experienced and assessed given that an ill-structured problem or challenge is introduced, the best course of action (COA) is uncertain, competing goals are present, time pressure and constraints are dynamically put into play. Multiple-event-feedback loops are also introduced with unfolding game events coupled with knowledge-rich sources of additional information presented to the participants by game leaders.

We believe the key for a successful outcome to the challenge lies in the team's interdependent leadership practices to initially construct a plausible COA, assess unfolding events and adapt the COA using a vigilant or hypervigilant decision making strategy as the situation demands. Table 1 depicts differences between vigilant and hypervigilant decision making strategies [Johnston, Driskell, and Salas, 1997]:

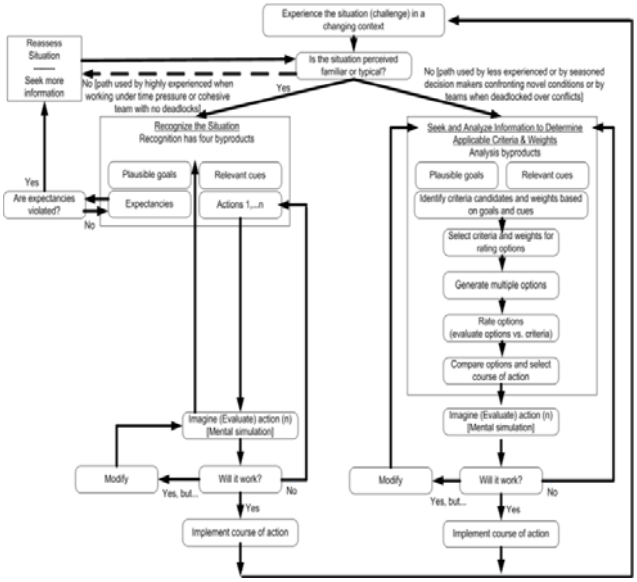
Table 1
Vigilant Versus Hypervigilant Decision Making

Vigilant Decision Making	Hypervigilant Decision Making
A. Decision maker thoroughly scans all available information B. Decision maker scans information in a systematic and sequential manner C. Decision maker devotes a consistent amount of attention to each data point D. Decision maker reviews all alternatives before making a decision	A. Decision maker scans only that information needed to make an assessment B. Decision maker scans information in any sequence C. Decision maker rapidly attends to selected data points D. Decision maker reviews needed information only when required

It is expected that for most of the game it will be beneficial to switch appropriately between a vigilant and hypervigilant decision making strategy depending on changing levels of time pressure and other constraints. In 1989, Gary A. Klein, introduced the recognition-primed decision (RPD) model which describes how decisionmakers can intuitively recognize a plausible COA without the use of a multiple option or detailed analytic decision making process when under time pressure. Klein [1989] argued that increased time pressure may prevent the use of analytic decision strategies. Klein suggested that it made little sense to adopt a time-consuming analytic strategy when time is severely limited, to painstakingly review all available information when experience can suggest what information is relevant, and to evaluate comparable data across all options when incomplete or ambiguous data make it difficult to compare options [1989, pp 58-59].

Research on the RPD model consistently shows skilled decisionmakers usually generate a good COA on their first try [Klein, et. al., 1995]. Further research, by Johnston, Driskell, and Salas [1997], showed intuitive decision processes result in higher performance than do analytical processes. Later, John F. Schmitt and Klein developed an applied version of RPD to better account for the value of collaborative adaptations, involving analytic strategies, to an initial COA [1999]. Continued studies of decision making in natural settings have demonstrated that decisionmakers employ hypervigilant and vigilant (analytic) strategies at different times, depending on the problem situation, their level of experience and other factors [Killion, 2000]. Thus, we believe by manipulating the problem or challenge time, situational novelty, and task constraints, the game context can be instructionally adapted for priming participants to consider whether to employ a vigilant or hypervigilant decision making strategy as the situation demands (i.e., when a team is not cohesive, there's deadlock over conflicts, members are inexperienced, or seasoned decisionmakers are confronting novel conditions). It is further believed a team's successful switching between and use of decision making strategies, to successfully address the challenge, will rest largely on the use of interdependent leadership practices. Figure 2 depicts our strategy option decision (SOD) model constructed on the basis of Klein's initial RPD model and Killion's research on mixed modes of decision making. The SOD model serves to help game instructors evaluate the decision making strategy employed by participants. It is expected the effective use of interdependent leadership practices by the participants will be a significant factor for appropriate switching and application of a decision making strategy.

Figure 2
Strategy Option Decision (SOD) Model*



Interdependent leadership practices include the solicitation of diverse or fresh perspectives, facilitation or seeking out shared sense-making, co-construction of direction and commitment, staying open to adapting the COA and engaging in self-authorized switching of decision making strategies. In essence, we wanted to introduce the right mix of time pressure, situational novelty, and constraints with the game's ill-structured problem or challenge to provide opportunity for participants to gain experience and insight with using interdependent leadership practices and help with balancing the complementary analytic and recognitional decision making strategies.

3. GAME DESIGN

Our game design is dependent on the use of a framework for integrating an instructional approach for scenario-based learning anchored to a real-life challenge presented within a simulated NDM environment.

3.1 Game Scenario

Our game scenario involves relief workers that have been taken hostage by insurgents (the Red Team; membership consist of instructors) and held in the battle-torn area modeled for the game at the MyBase Zeta gaming region. The Blue team's (students) challenge is to locate and extract the relief workers to a safety zone within the region (announced by the game Referee Command Authority; referee members identified by orange jackets) within the time constraints for each of the phases of the challenge with as few casualties and minimal collateral damage as possible. Blue Team members are assessed on leadership practices associated with interdependent logic and competency with balancing vigilant and hypervigilant decision making strategies across game context phases associated with the challenge.

3.2 Game Context Phases

Phase I: Challenge Pre-Brief. Initial situation awareness and hostage rescue COA planning by Blue Team members (conducted in the range Game Situation Room located in the AOC). Rescue planning includes ground and air support for rescue operation and communication techniques (includes text and voice).

Phase II: Blue Team Insertion into Conflict Region of Zeta. Team members insert into battle torn area of Zeta and perform reconnaissance of situation to include location of hostage, number of insurgents (and assessment of insurgent strength and combat capabilities).

Phase III: Hostage Removal. Team members, adapting COA plan as required, extract hostage from battle torn area of Zeta while minimizing casualties and collateral damage.

Phase IV: Challenge Out-Brief. Red team conducts interviews with Blue team members using prompts associated with interdependent leadership practice assessments. Interviews are analyzed, and factored along with Red Team, Referee Command Authority, and Game Leaders observations (using assessment rubrics), for out-brief with Blue team members. The out-brief provides feedback on the degree to which Blue team performance reflected effective use of interdependent leadership practices for appropriate switching and application of a decision making strategy. The out-brief is conducted jointly by Referee Command Authority with Red team members providing feedback and discussion with Blue Team members. Additionally, pre- and post-challenge surveys are also administered and used to help with Blue team assessment and feedback.

3.3 Instructional Design Framework

Competent performance with military decision making strategies, using interdependent leadership practices, drove the overall instructional design of the test game. Competency-driven design (CDD) best describes our instructional design framework used to address the game's learning focus on interdependent leadership practices in the context of a simulated NDM environment.

CDD-based design depends on the use of instructional theories and principles that place emphasis on using real-life challenges for development [Bransford, et. al., 1990, Bransford, Brown, & Cocking, (Eds.), 2000, and Brophy, 2003, Aug]. Since we wanted our game participants to learn the value of adaptive decision making strategies with interdependent leadership practices we focused on Bransford's [1990] work with an adaptive expertise development approach named, "Anchored Modular Inquiry." Bransford's work has been applied and studied across several curriculum redesign projects involving Northwestern, MIT, Harvard, Vanderbilt, and University of Texas. Results, over the past several years, demonstrate significant gains in the development of adaptive expertise among their learners [Brophy, 2003].

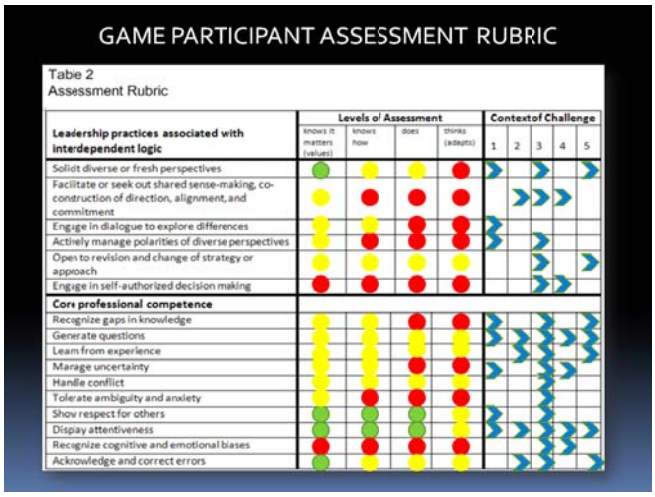
With the use of Anchored Modular Inquiry in the CDD-based design framework, learners are introduced to authentic and open-ended problems and assisted with learning different decision making strategies to better discern and value how situations are actually addressed or solved in the real world. Situations take the form of complex, real-world challenges. The learner is engaged experientially to think and adapt as an experienced practitioner; to adaptively apply skills and decision making strategies successfully to a challenge. In particular, the approach focuses on the development of metacognitive knowledge and skills to better discern the appropriateness

and effectiveness of decision making strategies in the context of real-world problem solving. Thus, we wanted our CDD-based framework to support the use of Anchored Modular Inquiry, via a game, wherein participants can experience and learn to value interdependent leadership practices and appropriate decision making strategies in a simulated NDM environment. To this end, we used the following features of our CDD-based framework to help guide the design, development, testing, and implementation of the game:

- *Establish logic framework.* We identified leadership practices associated with interdependent logic and the core professional competence needed for effective use of vigilant and hypervigilant decision making strategies.
- *Develop high-level design to support the logic framework.* We developed a high-level design to support learning: (a) KNOWS IT MATTERS (VALUES): learns to value leadership practices associated with interdependent logic and core professional competence needed for effective vigilant and hypervigilant decision making strategies; (b) KNOWS HOW: knows how to apply leadership practices associated with interdependent logic and how to apply competencies associated with effective vigilant and hypervigilant decision making strategies; (c) DOES: demonstrates the application of leadership practices associated with interdependent logic, along with the competencies associated with effective vigilant and hypervigilant decision making strategies, in simulated context; and (d) THINKS (ADAPTS): can apply metacognitive knowledge and skills for adapting decision making strategies appropriately to changing demands, introduced during the game for successful performance.
- *Create detailed game design blueprint.* We designed the game phases to support the logic framework for the game. Learning resources and game tasks were identified and designed for each phase of the game.
- *Storyboard blueprint design for the game.* We identified, described, and prioritized game events and tasks within each phase, supporting data collection tools, instructional material, and simulated NDM environment features to support the logic framework of the game.
- *Develop, test, and pilot game phases, technologies, and resources using review stage releases.* We iteratively developed, tested, and piloted the game phases across development stages for feature releases and fine-tuned for completeness and overall quality. Supporting technology and infrastructure were developed or put into place in sufficient time to adequately test and pilot game phases and supporting services across development stages.
- *Implement game and support services.* Implementation of the game was preceded with training game support staff and establishing game management and evaluation processes.

3.4 Assessment of Participant Learning and Performance

The CDD-based framework places emphasis on thoughtful observations and interpretive feedback provided to game participants. Also, emphasis is placed on the value of developing enduring understanding. Gardner and Hatch [1989], define understanding as a "sufficient grasp of concepts, principle or skills so that one can bring them to bear on new problems and situations, deciding in which ways one's present competencies can suffice and in which ways one may require new skills or knowledge." Thus, we wanted to assess game participants on their deeper understanding of interdependent leadership and decision-making experience encountered in the game's simulated NDM environment. Wiggins [1988] uses the term authentic assessments to describe the unique characteristics of assessing learners using performance tasks and activities involving real-world challenges. We developed rubrics to help us authentically assess how well game participants are able to understand, value and apply leadership practices associated with interdependent logic and core competencies associated with selecting and using decision making strategies (see Table 2 below for Alpha 1 test rubric).



Rubrics are used to assess participants across the five challenge contexts of the game:

- Initial exposure to situation or challenge
- Assessment of situation

- COA determination
- Implementation of COA
- Feedback and interpretation

We also use data from participant interviews and surveys in the analysis on the role of interdependent leadership practices for the selection and use of decision making strategies. Results from the Alpha 1 test of the game included analysis of range systems (see Table 3 below depicting Alpha 1 test range system results).

Table 3. ALPHA 1 Range Systems Results

Combat team scoring	Composite rubric not developed
Game activation notices	IOC: Alarms & notices to gamers
Gamer assessment devices	Assessment tools not tested
Game task flags	Gamer flow thru phases not tested
Mobile learning devices	iPod connection not tested
Weapons and aircraft	Not fully integrated
Region-facility access	IOC: 60 avatars
Communication devices	IOC: VOIP & media control panels
Range cameras	IOC: Streaming feeds & control
Dynamic range effects	IOC: Integrated systems control
AOC control stations	IOC: Range staff controllable
Game timing clocks	IOC: Game clocks functional
Streaming video	Interruptions across regions

4. GAME DEVELOPMENT

Working groups are used for organizing collaborative efforts across several areas of expertise and institutions to develop the game. Each working group is described below.

Game Stewardship. Members of this group include the chairs of each working group along with game leaders. The Game Stewardship group establishes game rules and participant criteria under direction from game leaders. The working group also reviews game development steps to help ensure milestones are reached and various development efforts are integrated together for desired outcomes. Members also establish game development timelines, development reviews, organize a test-run of the game, and actual game execution. Many of the working group chairs and Game Stewardship members serve as members of the AOC or game referees during game execution.

Game Design. This working group (using the Competency-driven Design framework), works closely with game leadership to define the learning focus and supporting game logic, phases, and activities necessary for effectively addressing targeted competency-development needs, performance goals, and learning objectives for participants. The design work supports the learning focus of the game to instruct and assess interdependent leadership framing and practices by teams participating in a simulated NDM environment involving a tactical military operation to rescue relief workers. Members also work closely with the Game Assessment and Evaluation members to develop assessment rubrics and game development and execution evaluation methods.

Game Assessment and Evaluation. This working group develops assessment rubrics (to include the use of pre- and post-game interviews) and game development and execution evaluation methods. Assessment rubrics include real-time game assessment data collection during game play for use by game leaders to adjust game activity, support individual or team performance feedback or adaptation of the game on the basis of performance.

Game Process Scripting. Game Process Scripting members work closely with Game Design working group members to construct Sequencing Path Scripts (SPSs). SPSs visually depict planned game-path activity and options expected to be offered to participants at each phase. Activity and options along possible participant paths are identified via nodes along the path. Each game-path node shows current game phase, challenge context, expected start, duration, exit times. Also, each node depicts expected participant information provided by game leaders, response choices and follow-on paths, supporting range systems and devices (to include data collected by systems or devices), and adaptations to systems or devices depending on data or other specified participant responses. Node information is organized in a table referenced back to the ID for the game path node. Each node table also includes space for game leaders and AOC members to record actual game times, choices, and outcomes. The SPSs are organized and provided to each game AOC member and used for game rehearsals and for conducting the game.

Range Systems and Game Devices. Members of this working group, along with Range Staff, help support the introduction, usage, adaptation or adjustments to range systems and devices expected to support planned game activity by participants. Range Systems and Game Devices members also help the Game Process Scripting working group with documenting the range systems, the type and frequency of data collected by each system or device at the appropriate game-path node (this is documented using the SPSs initially crafted by the Game Process Scripting working group).

Game Participant Community. This working group helps game leaders with identifying selection criteria for game participants (both Blue and Red team membership criteria). Members, working closely with game leaders, also help

with soliciting, selecting and notifying game participants of game times, rules, game learning focus and phases (usually done in collaboration with game leaders providing information to participants via briefings and orientation tours). Members also help with substitution effort if a game participant is unavailable and help with participant arbitration during the game if disagreements arise over a game event or referee action. The Game Participant Community also helps the Game Assessment and Evaluation working group with participant interviews or other data collection efforts involving game participants. Members create and maintain a Game Roster showing all participants and roles (including AOC members and referees).

Game Set and Communication Media Design. Members of the Game Set and Communication Media Design assist game leaders with determining and establishing the design of supporting range terrain, buildings, equipment, tools, participant media (e.g, video, audio, and visuals; including interactive media and real-time communication devices), and other placement of range items in support of desired cultural, historical, and geographical context desired for the game. The Game Set and Communications Media Design working group may also assist with changing the game set design during the game as desired by game leaders. At the conclusion of a game, members prepare for and help package unique game fixtures for future reuse and assist range staff with cleaning up the range after game phases as necessary.

Range Staff. Members of this group consist of permanent range staff who maintain the range in-between games and help game leaders (with assistance from working groups) to configure and operate the range in support of a game. Members may also help with range orientation tours.

5. GAME EXECUTION

We identified the following steps to help prepare for game execution in our virtual world gaming range.

Step 1. Game leaders use our range *Simulation Gaming for Education Kit*[4] to configure the game by identifying the desired learning outcomes and competencies for participants, supporting scenario, cultural-geographical-historical context, Red and Blue team composition, game referees, game reading assignments for participants, game contingencies for adapting the game on basis of team performance, performance and assessment scoring criteria, etc. Work on Step 1 occurs several weeks before game execution. Also, during Step 1, game leaders work closely with range staff to establish the desired terrain, buildings, tools, and other game items required to support the cultural-geographical-historical context for the game.

Step 2. Game leaders, with the help of range staff, host a pre-game orientation for team leaders and game referees at the range. Game terrain, buildings, tools, and other game items are pre-positioned in the range for the orientation. Orientation provides the opportunity for game leadership to acquaint other leaders with the game intent, structure, and phases with the range environment and to help with identifying and addressing known and anticipated constraints for game participants.

Step 3. Pre-game learning resources/assignments are provided to game participants (includes online readings and pre-game surveys, assignments for participants). Facilities and tools for pre-game assignments are provided at the range AOC building for game participants. Step 3 typically occurs within 1 to 2 weeks before the start of the game.

Step 4. Game activation at range site. Range equipment for supporting the game is tested and game leadership take positions in the AOC overlooking the range. Step 4 occurs 1 to 2 hours before the game starts for the participants.

Step 5. Game participants attend Challenge Pre-brief at range AOC Alpha briefing room. Game leaders introduce game staff, referees, brief participants on game scenario, game rules, range equipment and placed items, and game phases (with duration times). Step 5 is Phase I of the game. The range game clock does not start until Phase II, thus Phase I can occur the day before the start of Phase II if desired by game leaders.

Step 6. Phase II starts by game participants taking positions in the range (initial team positions are determined by game leaders). The official game clock starts at Phase II, to include team score tracking on range displays. Phase II activities are focused on Blue team reconnaissance and assessment of situation.

Step 7. Phase III starts by determination of game leaders or as previously set based on elapsed time for Phase II activities to cease. Phase III activities for the test game is focused on hostage(s) removal by determination and implementation of a rescue COA plan while minimizing casualties and collateral damage. Phase III activities last as long as predetermined time constraints or as determined by game leaders on the basis of team performances. The range game clock ends at Phase III.

[4] The *Simulation Gaming for Education Kit* is an electronic document, with a supporting relational database, that can be used by game designers to identify and structure game phases and activities to address desired learning outcomes and competencies for game participants.

Step 8. Phase IV starts. The major activity of Phase IV is the Challenge out-brief for game participants. Since Phase IV involves the analysis, feedback, and interpretation of game participant performance (includes post-game surveys and interviews with participants, along with analysis of game data) the Challenge out-brief can be delayed for 1 or 2 days after the completion of Phase III to provide for sufficient analysis and out-brief development time for game leaders.

Step 9. Game closeout. The range and AOC area are cleaned up for future use by another game initiative. Unique game fixtures (buildings, tools, etc.) are stored for reuse by the game. Lessons learned from the game are used to improve the game for future use and effectiveness.

6. CONCLUSION

From maintenance to medicine to fire fighting and flying, education and training experiences can be enhanced through multi-media and multi-sensory inputs. Virtual learning, supported by well-designed simulation games for education and training, can supplement, or in some cases replace, live skills training when either cognitive or psychomotor. MyBase represents the capabilities that can power greater capability for our Air Force to be an agile and adaptive learning organization.

Our future Airmen are comfortable with simulation games and they will enjoy learning and working in virtual world environments. Due to the sophisticated social networking websites in operation today, our newest Airmen will be extremely comfortable networking, collaborating, and learning through MyBase. Through MyBase, these interactions will be possible from any location around the world at any time of night or day.

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Biographies

Dr. Andrew G. Stricker serves as a distributed learning architect for Air University. Previously he served as Associate Provost for Innovation Through Technology at Vanderbilt University and as Director for the Cognition and Instructional Technologies Laboratories at Texas A&M University.

Larry Clemons is an Air Force civilian Program Analyst at HQ Air Education & Training Command, Randolph AFB, Texas. Mr. Clemons is a retired Air Force pilot with more than 20 years of flight experience including a combat tour in Vietnam. He holds both a Bachelor and Masters degrees in education and psychology.

Note: All labels and names used for the test simulation game actors, countries, and organizations are fictional. The simulation game is intended only for instructional purposes and views expressed in this paper are solely related to the authors and do not reflect official policy or positions held by the U.S. Air Force, DoD, or the U.S. government.