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Research Report 1915

Exploring the Use of a Multiplayer Game to Execute Light Infantry Company Missions

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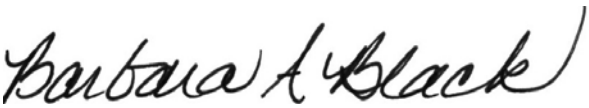

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14. ABSTRACT *(Maximum 200 words)*: Leaders and instructors in the Maneuver Captains Career Course (MCCC) at Fort Benning, Georgia, have had limited success using training games. Early efforts to provide the MCCC with training games resulted in mission scenarios that were broad in scope, but lacked depth and realistic functional effects, particularly those exhibited by computer-generated forces. In order to elevate the level of functional fidelity and meet training objectives, MCCC instructors explored the use of DARWARS Ambush, a multiplayer game that eliminated computer-generated forces, provided appropriate assets, and allowed MCCC Soldiers to control leader and subordinate entities during simulated Infantry company-level missions. This paper documents an exploratory evaluation of a multiplayer game to provide the MCCC with effective company-level simulated mission execution experiences. Forty Soldiers executed two missions during which each human entity on the simulated battlefield was controlled by a human Soldier. Researchers measured the extent to which the game provided control over assets, appropriate tactical capabilities, and the opportunity for Company Commanders to make and implement tactical decisions as conditions and events emerged. The Soldiers expressed their perceptions of the training value and effectiveness of the multiplayer game by completing a questionnaire. Results suggested that multiplayer games have some training potential, but that desired performance outcomes can only be realized when specific environmental and training conditions are met.

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EXPLORING THE USE OF A MULTIPLAYER GAME TO EXECUTE LIGHT INFANTRY COMPANY MISSIONS

EXECUTIVE SUMMARY

Research Requirement:

Starting in 2002, the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) at Fort Benning, Georgia, initiated a series of research efforts to assess the utility and effectiveness of PC-based simulations and games to train Infantry small-unit leaders. The Small Group Instructors and leaders at the Maneuver Captains Career Course (MCCC) were among the first to recognize the potential benefits of using low cost training simulations and games to supplement their program of instruction at a time when training resources were increasingly limited. Results from early assessments at the MCCC suggested that PC-based simulations and games showed promise, but that their effectiveness was hampered by tactical inaccuracies exhibited by computer-generated forces and by other game characteristics that reduced functional fidelity. In order to eliminate the issues with computer-generated forces and increase the fidelity of game training, the MCCC explored the use of DARWARS Ambush, a multiplayer game that required human Soldiers to control most of the entities on the simulated battlefield. Researchers at ARI were asked to conduct an exploratory evaluation of the multiplayer game that included developing tools to assess the tactical decision making proficiency of Company Commanders, to measure their perceptions of the value of a multiplayer game as a training tool, and to determine the extent to which the Ambush software could be manipulated to meet MCCC training objectives targeted for inclusion.

Procedure:

Forty Soldiers attending the MCCC executed two missions during which each human entity on the simulated battlefield was controlled by a live student. Researchers measured the extent to which the multiplayer game provided control over assets, appropriate tactical capabilities, and the opportunity for Company Commanders to make and implement tactical decisions as ambiguous conditions and events emerged. The Soldiers expressed their perceptions of the training value and effectiveness of the game by completing a questionnaire.

Findings:

Results suggested that multiplayer games have training potential, but that desired performance outcomes can only be realized when specific environmental and training conditions are met. Qualified instructors are needed to provide pre-mission instructions and practice, feedback and guidance during mission execution, and thoughtful after-action reviews that promote critical thinking and that link the game exercise with specific MCCC training objectives and the skills associated with them. The Ambush software proved to be flexible enough to accommodate modifications necessary for this research effort, and to provide opportunities for Soldiers to implement appropriate tactical decisions and actions. The issues with computer-

generated forces experienced during previous simulation and game evaluations were reduced sufficiently. Soldier perceptions of the value of the training exercise underscored the need for continued research on training games, particularly those that accommodate relatively large numbers of participants and assets on the simulated battlefield.

Utilization and Dissemination of Findings:

The results of this research will influence the future development, use, and assessment of games as viable training tools. Findings were discussed with key individuals from the Army training community at Fort Benning, as well as the commercial training technologies industry. Descriptions of the research have also been presented at meetings of the behavioral science community and at conferences devoted to understanding simulations and games.

EXPLORING THE USE OF A MULTIPLAYER GAME TO EXECUTE LIGHT INFANTRY COMPANY MISSIONS

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EXPLORING THE USE OF A MULTIPLAYER GAME TO EXECUTE DISMOUNTED LIGHT INFANTRY COMPANY MISSIONS

Introduction

Staring in January 2002, researchers at the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI), Fort Benning, Georgia, began evaluating the effectiveness of games used to train small-unit Infantry Soldiers (see Beal & Christ, 2004). The impetus for the use of and research into training games for the Infantry emerged from previous ARI examinations of much larger simulation systems with which Soldiers sharpened cognitive skills associated with situation awareness and tactical decision making (Pleban, Eakin, Salter, & Matthews, 2001). The relatively high cost of training with these complex simulation systems, compounded by decreasing training budgets, resulted in the development and integration of desk-top computer simulation and game technologies that were thought to enhance existing training and instructional methods with fewer resource expenditures, but with similar performance outcomes.

Though Infantry leaders and trainers recognized the limited potential for using game technologies almost immediately, some developers and advocates of military training games were quick to make overly optimistic claims about the potential and assumed benefits of games. The results from the first game evaluations using Infantry Soldiers as participants (Beal, 2005; see also Bonk & Dennen, 2005), accompanied by Hays' (2005) review of educational games, helped to temper those claims. In general, while relatively wide in scope, military training games tended to lack the necessary depth and functional fidelity for Soldiers to perform a range of cognitive and tactical skills according to doctrine and standard operating procedures. And contrary to widely held beliefs that games provided effective training, the extent to which game training was perceived by Soldiers as effective and valuable hinged on direct guidance from qualified human instructors and not necessarily on the games themselves (Beal, 2009).

Given their limitations, the games ARI evaluated filled an existing void in Infantry training. They provided Soldiers with mission execution experiences and tactical decision opportunities that were more realistic than existing methods of field training. For example, Soldiers attending the Maneuver Captains Career Course (MCCC) at Fort Benning, Georgia, rarely had the opportunity to lead field training events with company-sized missions that included some or all of the associated assets. Training games like Full Spectrum Command (see Beal & Christ, 2004) gave every MCCC Soldier multiple opportunities to complete simulated missions and allowed each Soldier to serve as the commander of his own computer-generated company without requiring his human peers to assume subordinate roles. However, these computer-generated forces often behaved in predetermined ways that reduced the believability and tactical fidelity of the mission execution experience. Soldiers were not able to exercise realistic command and control over their automated subordinates, nor were they able to observe realistic effects initiated by and against opposing forces.

To address the shortfalls with existing games and simulations that used automated forces, leaders at the Combined Arms and Tactics Directorate (CATD) and Small Group Instructors

(SGI) in the MCCC explored the use of DARWARS Ambush, a multiplayer game, to augment their training exercises.

Unlike the games used previously by the MCCC, the Ambush game required most friendly and opposing force entities on the simulated battlefield to be controlled by human Soldiers. Leaders at the MCCC requested the assistance of ARI to develop two simulated missions that reflected objectives from two MCCC training modules, and to conduct an exploratory assessment of the potential use of a multiplayer game as a training tool. The goals of the ARI research team were to assess whether the Ambush software had the flexibility to allow development of terrain and battlefield conditions unique to the MCCC training objectives, and to determine if the software could accommodate the necessary company-sized mission assets. The research team developed assessment tools so that MCCC instructors could measure the extent to which Soldiers implemented appropriate tactical tasks and decisions, and to record Soldiers' beliefs about the value of the multiplayer game training experience. This report documents the processes implemented and modifications made to the Ambush game in order to meet the MCCC's targeted purposes. It includes a description of the metrics developed for future training and assessment, presents pilot-test data on Soldiers' perceptions of the value of a multiplayer game as a training tool, and concludes with lessons learned from utilizing the game to supplement MCCC training.[1]

MCCC Training

Infantry and Armor Soldiers complete three phases of MCCC training before graduating from the course. The first phase represents a common core of knowledge that Soldiers complete on their own, via the internet. This phase of training can be completed at any time during the course, but must be completed before they graduate. During the second phase, Soldiers receive training on command fundamentals and troop-leading procedures. In addition, Soldiers train for full-spectrum, company-level operations for Light Infantry, Stryker Brigade Combat Team Infantry, and Armor/Mechanized so that they will be able to develop and execute orders and plans for all types of companies in a multitude of environments. In the third phase of MCCC training, Soldiers are placed into small groups and prepared to serve in an Infantry, Stryker, or Heavy Brigade Combat Team. This phase also provides more detailed technical and tactical training for company, battalion, and brigade operations relevant to anticipated future assignments and commands.

[1] Many of the efforts to evaluate games used for military-relevant training and pedagogical purposes still do not include combat experienced, active-duty Soldiers as participants. In addition, the steady increase in developing and using military games is, in part, a function of tightened resources for existing training and not on the basis of sound empirical support. One hopes that emerging reality might eventually validate games as capable of producing performance outcomes similar to existing training. However, researchers who provide reliable evidence for effective use of military training games lag far behind the momentum to produce and promote them. This underscores the increased need for more Soldier-driven research efforts, as opposed to military games research that includes non-Soldier samples.

Game Exploration in the MCCC

The MCCC program of instruction (POI) emphasizes mission analysis and planning, but provides few opportunities to execute company-level missions in either a simulated or a field environment. Typically, a small percentage of Soldiers in each class assess their plans during tactical exercises without troops (TEWT), which consist of a walk through the mission terrain while describing potential courses of action and discussing conditions under which plans and tactics might change. While valuable, TEWTs and other exercises similar to them do not capture the complexity, nor the unpredictability of a mission executed with simulated or live Soldiers acting as friendly and opposing forces. In addition, tactical exercises with troops in field settings are too resource intensive to conduct except on a very limited basis. The need for more realistic mission execution experiences without undo resource expenditures provided the impetus for exploring the use of computer-based games and simulations at the MCCC.

The Program executive Office for Simulation, Training, and Instrumentation (PEO-STRI) provided the MCCC with an initial exposure to Ambush, which was developed under the direction of the U.S. Defense Advanced Research Projects Agency (DARPA) *DARWARS* program. The Ambush multiplayer game was developed originally for convoy contingency training. In conjunction with the operational needs of the U.S. Army, DARPA extended the utility of Ambush by broadening its scope as a training tool to meet the needs of dismounted Infantry forces.

The Ambush software allows programmers to create simulated terrain and entities that closely approximate the operational environment. It also allows instructors and Observer/Controllers to observe a simulated mission execution from separate workstations and to control critical events and emerging conditions within the simulated environment during real-time mission execution.

Adapting Ambush for the MCCC

Two scenarios based on practical exercises from the second phase of the MCCC were adapted for execution using Ambush. The first scenario, named Bush Hill, allowed Soldiers to execute a simulated Light Infantry Company attack against an enemy Platoon in a disruption zone. The second scenario, named counterinsurgency (COIN) Stryker, allowed Soldiers to execute a simulated counter-insurgency operation in an urban environment with a Stryker Company.

Terrain Development. A computer software engineer modeled the simulated terrain for the Bush Hill scenario after an area consisting of rolling wooded hills at Fort Benning, Georgia. The area of downtown Columbus, Georgia, provided the model for the simulated terrain used in the COIN Stryker scenario. While it was not difficult to create the landscape required by the scenarios, Ambush was limited in its ability to represent details of some natural features like inland bodies of water (e.g., ponds, lakes, rivers, and creeks) at elevations above sea level. The Ambush software was also limited in its ability to represent some detailed, small-scale terrain features. Small creeks could not be rendered at all. General attributes of vegetation such as size, density, and distribution could be set to match the vegetation shown in maps and images, but Ambush could not represent individual plants with realistic detail. However, recent evaluations

of military training games suggested that Soldiers perceived training value regardless of the level of graphics fidelity, so long as functional fidelity was presented and maintained at an acceptable level (Beal, 2005). As such, MCCC instructors and Soldiers did not view the terrain limitations imposed by the Ambush software as impediments to reaching overall training objectives.

The Ambush software supported the ability to generate man-made features (e.g., buildings, bridges, and roads) well enough to meet the purposes for the COIN Stryker scenario. However, not all of the buildings sat flush when created on sloping ground. In some cases, part of a building's foundation hung in the air, creating an unrealistic gap underneath where entities could enter. To correct this, the terrain had to be flattened artificially so that buildings could fit flush to the ground. In addition, software limitations made it difficult to reproduce some aspects of buildings accurately such as shape and size proportional to the surroundings and unique architectural features. In some cases, the most accurate representation of a building was obtained by combining two virtual buildings or by sinking a building partially into the ground. Despite these limitations, the density, size, and shape of the buildings created for the COIN Stryker scenario served as a functional representation of an urban environment that met the requirements of the training exercise.

Script Development. "Scripts" are software program subroutines designed to generate predefined effects during game execution. To generate necessary battlefield effects relevant to company command experiences, a computer programmer developed scripts in addition to those already available in the Ambush software. Many of these added scripts were found via online game forums and could be modified to provide effects such as artillery fire, IED explosions, smoke, breaching obstacles, and re-equipping and regenerating terminated entities. The Ambush software proved sufficient for allowing the implementation of existing scripts and the creation of unique scripts for additional control and generation of a wide variety of events and effects.

Method[2]

Participants

Forty Soldiers attending the MCCC participated in this assessment exercise. All Soldiers held the rank of Captain. A senior SGI assigned 30 of the Soldiers to assume the roles of the friendly force. From these, one Soldier was assigned to play the role of Company Commander. The remaining 29 Soldiers assumed friendly subordinate roles. The remaining 10 Soldiers were assigned to serve as the opposing force.

Measurement and Instruments

As an exploratory effort, the purposes of the research were to assess the extent to which the Ambush missions provided opportunities and capabilities for MCCC Soldiers to implement tactical decisions and tasks and to express their beliefs about the training value of the mission execution experience. The research team also developed measurement instruments to signify

[2] The following documents too large for inclusion in this report are available from the first author: Operations orders and supporting documents upon which the missions were based, friendly and opposing force compositions, lists of primary and supporting tasks for both missions, and the tactical decision rating scales for both missions.

Soldiers' proficiency with tasks and to rate the extent to which Soldiers implemented sound tactical decisions during Ambush training. Though these latter instruments were completed before the exercise began, they were not utilized during this research effort, but were developed to be used by the MCCC in the future.

Tactical Tasks. Working with MCCC leaders and senior instructors, the research team developed comprehensive lists of primary and supporting tactical tasks for the Bush Hill and COIN Stryker missions. These tasks were perceived as critical to successful mission completion and represented key objectives of the MCCC POI. The research team used this list of tasks as a basis to determine whether the Ambush software could support their implementation during simulated mission execution, and whether the Company Commander and the friendly force initiated the tasks. A simple rating strategy was developed to be used by MCCC instructors in the future to signify the extent to which Soldiers are proficient at implementing critical tasks during Ambush training: (a) are trained sufficiently to implement the tasks (T), (b) need practice with implementing the task (P), and (c) are untrained on the task (U). This rating system was not implemented during this evaluation effort.

Tactical Decisions. The Tactical Decision Rating Scale was developed to allow SGIs to rate the extent to which Soldiers recognize critical events upon which to base a decision, whether they are prompted to respond, whether they implement a decision, and the consequences for doing so. During mission execution, Soldiers are faced with a number of emerging critical events upon which to base decisions. The Tactical Decision Making Rating Scale is comprised of these events and will be used by the MCCC to rate tactical decisions in the future. The scale is shown in Table 1 below and follows the rating scales used in previous research with training games that were developed under the direction of MCCC leaders and senior instructors (Beal & Christ, 2004).

Table 1

Tactical Decision Rating Scale

Rating	Soldier's Response to Critical Event
1	Recognized critical event – prompted to respond - did nothing.
2	Recognized critical event – did nothing.
3	Failed to recognize critical event - prompted to respond- did nothing.
4	Failed to recognize critical event – did nothing.
5	Failed to recognize critical event – prompted to respond – implemented decision – negative outcome.
6	Failed to recognize critical event – prompted to respond – implemented decision – positive outcome.
7	Recognized critical event – implemented decision – negative outcome.
8	Recognized critical event – implemented decision – positive outcome.
9	Recognized critical event – implemented decision – positive outcome – implemented proactive decision.

Soldier Perception Questionnaire. The research team developed a questionnaire to allow Soldiers to express their views and beliefs about their training experience with a multiplayer

game, under the proscribed conditions (see Appendix A). Each Soldier was asked to indicate his perceptions about the game training for the following topics:

- Overall training value.
- Tactical training value.
- Adaptability and decision making opportunities.
- Realism and tactical accuracy.
- Motivation for training with simulations.
- Fidelity and functional accuracy.
- Overall opinion of the training experience.

Most of the items on the questionnaire were selected and modified from those used in previous military training games evaluations (Beal & Christ, 2004) and from methods generated for use in large-scale, immersive virtual environments (Singer & Witmer, 1996; Witmer & Singer, 1994; 1998).

Procedures

Lab Setting. A senior SGI and the research team set up two adjacent rooms in which to execute the exercise and conduct the evaluation. One room contained 10 computers that were operated by MCCC Soldiers who assumed the roles associated with the opposing force. The other room contained 30 computers used by Soldiers who comprised the friendly force, one of which was assigned the role of Company Commander. The room occupied by the friendly force also contained four additional computers, one of which was operated by an Observer/Controller to manage events and game effects during mission execution, and the remaining three were used by researchers to observe the missions and record data. The Observer/Controller and the members of the research team had the capability to view the virtual battle space through the eyes of any entity participating in the exercise.

Pre-Mission Familiarization with Ambush. Each Soldier was seated at a computer and given a head set through which to send and receive reports, and to monitor sounds on the simulated battlefield. The Observer/Controller provided 30 minutes of instructions on the computer functions necessary to complete the two missions. Following these instructions, Soldiers practiced using the computer functions for 15 minutes. Issues with and questions about computer functions raised by Soldiers were addressed by the Observer/Controller before mission execution was initiated.

Prior to beginning mission execution, the SGI and the Observer/Controller reviewed the Company Commander's intent for both missions and summarized the contents of the operations orders that friendly force Soldiers had received the day before the exercise. A similar review, relevant to their roles, was provided to Soldiers operating as the opposing force. Neither force was constrained by any predetermined scripted actions, except those for the friendly force that were necessary to carry out the Company Commander's plan.

Mission Execution. The Soldiers executed the Bush Hill mission first, followed by the COIN Stryker mission. Once mission execution began, the Company Commander was faced

with multiple opportunities to make decisions and implement actions based on information in the operations order and in response to critical events and emerging simulated battlefield conditions. Members of the research team viewed the mission as it unfolded on the monitors. They also circulated around the room, observed Soldiers' actions, and recorded data. The senior SGI offered solicited and unsolicited tactical guidance and asked questions and made statements to prompt appropriate tactical considerations and decisions. When a Soldier asked a question about any aspect of the training exercise, the SGI repeated the question so that all the Soldiers in their respective force could hear, and then answered the question for that particular force, or asked another Soldier from that force to answer the question. Soldiers in the friendly force could neither view nor hear any of the opposing force's activities that occurred in the adjacent room, and vice versa. Thus, observation of all actions initiated by the opposite force was confined to the simulated battlefield.

Following execution of each mission, the SGI conducted an after-action review with both groups of Soldiers. The after-action review began with questions posed to the Soldiers about the decisions upon which the Company Commander's plans were based. The Company Commander was given the opportunity to review the tactical components of his plan, discuss the rationale behind the decisions he made during the construction of his plan, and discuss the reasons why his plan was successful or unsuccessful based on his tactical decisions during mission execution. A dialogue between the SGI and the Soldiers continued until most or all of the critical events and decision points were discussed. To conclude the after-action review the SGI offered suggestions and additional guidance for success with the missions in general, and then discussed the Soldiers' beliefs about the efficacy of using a multiplayer game as a training tool.

Results

Analyses of Tactical Tasks

As part of this exploratory effort, the research team analyzed the extent to which the tactical tasks associated with the Bush Hill and COIN Stryker missions were initiated by the Company Commander and the friendly force. When tactical tasks were not initiated during mission execution, the research team determined whether their non-execution was a function of time constraints, game constraints, or emerging conditions on the simulated battlefield. These were determined by observation during mission execution, by inquiries during after-action reviews, and by testing the capabilities of the software. Results of these analyses for both missions are described below.

Bush Hill Mission. The Bush Hill mission was developed to allow the Company Commander and the friendly force to execute 22 of the supporting tactical tasks associated with the following objectives according to MCCC instructional intent:

- Conduct tactical movement.
- Conduct a deliberate attack.
- Take action on contact.
- Breach an obstacle.
- Conduct consolidation and reorganization.

- Conduct a defense.
- Conduct a passage of lines as the stationary unit.

The research team assessed the extent to which the Company Commander and the friendly force initiated the supporting tactical tasks and the reasons for their non-execution. Table 2 shows the results of this assessment.

Of the 22 supporting tactical tasks for the Bush Hill mission, only *clear a trench line* could not be executed because of the game's software limitations. All other tasks were executable, though nine were not initiated because of time constraints and emerging conditions during the simulated mission.

Table 2

Extent to which Supporting Tactical Tasks were Initiated during Bush Hill Mission Execution

Supporting task	**Task initiated**	**Task not initiated due to time constraints**	**Task not initiated due to game constraints**	**Task not initiated due to emerging conditions**
Movement begins in accordance with operation order (OPORD)	X			
Navigates correctly to check points and phase lines	X			
Moves from the line of departure (LD), through the assault position to support positions, assault positions, or breach or bypass sites.	X			
Reacts to visual contact (Element is in immediate danger)	X			
Reacts to visual contact (Element was NOT in immediate danger)	X			
React to enemy direct fire	X			
React to enemy indirect fire	X			
Commander's actions on contact	X			
Deploy to assault positions	X			
Conditions set for the assault	X			
Assault	X			
Link up with Scouts		X		
Conduct a leader's reconnaissance.		X		
Consolidation and Reorganization on the Objective		X		
Establish hasty defense		X		
Forward passage of Stryker Brigade Combat Team (SBCT)		X		
Clear a trench line			X	
Breach observation point (OP) Protective Obstacles				X
Reacts to visual contact of enemy or unknown aircraft. (Element was in immediate danger)				X
Reacts to visual contact of enemy or unknown aircraft (element is NOT in immediate danger)				X
React to a Possible Improvised Explosive Device (IED)				X

COIN Stryker Mission. The COIN Stryker mission was developed to allow the Company Commander and the friendly force to execute 19 of the supporting tactical tasks associated with the following MCCC training objectives:

- Conduct a tactical road march.
- Conduct a cordon and search in a built-up area.
- Control civil disturbance operations.
- Establish checkpoints and or roadblocks.
- Conduct a withdrawal

The extent to which the Company Commander and the friendly force initiated the supporting tactical tasks, and reasons for their non-execution, are shown in Table 3. Only two of the 19 tasks were not initiated during the simulated mission. Of those two tasks, The element constructs a road block was not supported by the game's software.

Table 3

Extent to which Supporting Tactical Tasks were Initiated during COIN Stryker Mission Execution

Supporting task	**Task initiated**	**Task not initiated due to time constraints**	**Task not initiated due to game constraints**	**Task not initiated due to emerging conditions**
Convoy commander initiates convoy.	X			
Convoy commander reports convoy information to higher HQ staff element.	X			
Convoy commander enforces march discipline.	X			
Unit employs march discipline.	X			
Unit conducts convoy through an urban area.	X			
Convoy commander monitors unit crossing rendezvous point (RP).	X			
The element properly reacts to a suspected or known IED/ Vehicle-Borne Improvised Explosive Device (VBIED) while mounted.	X			
React to a possible Improvised Explosive Device (IED)	X			
Defend Convoy Elements	X			
Conducts movement into the area to be searched	X			
Establishes the cordon (cordon element)	X			
Conducts the search (search element)	X			
Unit commander or designated representative controls the unit's rate of search and directs reorganization as needed.	X			
Clear a building (Platoon/Squad)	X			
Verifies the location and/or route of the roadblock and/or checkpoint	X			
Establishes security and defensive positions	X			
The element constructs a roadblock.			X	
Conduct critical site security	X			
Prepare for a suspected VBIED/Person-Borne IED (PBIED) attack				X

Soldier Perception Questionnaire

The Soldier Perception Questionnaire was developed to document the reactions of Soldiers to their experiences with the simulation. This questionnaire included a total of 47 items that were divided among six categories. Soldiers rated the first 44 items by choosing one response from a seven-point scale, and completed items 45 through 47 by answering "Yes" or "No" (see Appendix A).

Analyses of Five Categories of Questionnaire Items. The first 44 items on this questionnaire represented the following five categories of interest: (a) overall training value, (b) tactical training value, (c) adaptability and decision making, (d) realism, and (e) motivation. Analyses were conducted to determine the internal consistency and reliability of the items in each category. Table 4 shows the results of these analyses.

Table 4

Internal Consistency and Reliability for Each Category of Items from the Soldier Perception Questionnaire

Category of Items	**Cronbach's Alpha**	**Items from Company Commander Perception Questionnaire**
Overall Training Value	.83	1 – 7
Tactical Training Value	.79	8 – 15
Adaptability and Decision-Making	.72	16 – 25
Realism	.89	26 – 39
Motivation to Train	.62	40 - 44

Note: A Cronbach's alpha of at least .60 represents an acceptable level of reliability.

Ratings Percentages for Selected Items from the Soldier Perception Questionnaire. The ratings from the Soldier Perception Questionnaire were analyzed consistently with Soldier ratings from previous game evaluations. For each item on the questionnaire, the percentage of ratings was calculated for each rating category (i.e., 1 though 7). The percentages of ratings for the lowest three categories (1 though 3) were summed, as were the percentages of ratings from the highest three categories (5 though 7), whereas the percentages of middle ratings (4) were ignored. The differences in these summed ratings were calculated for each item, and then the distribution of differences was analyzed to determine a criterion for inclusion in the results section. When the difference in low and high summed ratings percentages for any item was at least 30%, the item was included in one of the tables below.

The questionnaire items associated with the Overall Training Value that met the criterion explained above are shown in Table 5. The majority of Soldiers believed that they needed more time using Ambush and that the overall experience provided by the multiplayer game was challenging. However, the ratings suggested Soldiers believed that the value of a multiplayer game for helping them to better understand how to lead a company, and to lead a company in a unit and in combat, was lacking.

Table 5

Ratings Percentages for Selected Items from the Soldier Perception Questionnaire for Overall Training Value

Questionnaire Item	**Ratings % Low / High**
How would you describe the amount of time you used Ambush?	20 / 66 Too much / Need more
How challenging to the student Company Commander was the overall experience provided by Ambush?	16 / 49 Not / Very
In your opinion, did Ambush have a valuable impact on helping the student Company Commander better understand how to lead a company?	57 / 12 No value / Great value
In your opinion, did Ambush have a valuable impact on preparing the student Company Commander to lead a company in his unit?	52 / 20 No value / Great value
In your opinion, did Ambush have a valuable impact on preparing the student Company Commander to lead a company in combat?	55 / 23 No value / Great value

Three items relevant to Tactical Training Value met the criterion for inclusion in Table 6. The Soldiers' ratings suggested that the multiplayer game exercise did not provide enough meaningful practice for reacting to enemy contact during urban operations. Regarding the two questions about the perceived importance of an instructor, a majority of Soldiers believed that instructor feedback, coaching, and tactical guidance was important. In addition, Soldiers felt that a qualified instructor should guide them through an after-action review following the simulated missions.

Table 6

Ratings Percentages for Selected Items from the Soldier Perception Questionnaire for Tactical Training Value

Questionnaire Item	**Ratings % Low / High**
To what extent did Ambush provide the student Company Commander with opportunities to practice reacting to enemy contact during urban operations?	77 / 6 Not many / Many
To what extent should a qualified instructor be present to provide the student Company Commander with feedback, coaching, and tactical guidance during Ambush exercises?	21 / 65 Not required / Required
To what extent should a qualified instructor be present to guide the student Company Commander through an Ambush after-action review?	9 / 83 Not required / Required

Four items associated with Adaptability and Decision-Making category received ratings that met the criterion for inclusion and are shown in Table 7. The Soldiers' ratings suggested that while the Company Commander made appropriate tactical decisions, the exercise can improve the extent to which it provides opportunities to rehearse decisions relevant to company command.

Table 7

Ratings Percentages for Selected Items from the Soldier Perception Questionnaire for Adaptability and Decision-Making

Questionnaire Item	**Ratings % Low / High**
To what extent did Ambush permit the student Company Commander to rehearse the types of decisions a Company Commander must make during urban operations?	63 / 11 Not at all / Very much
To what extent did OPFOR actions permit the student to rehearse the types of decisions made by a Company Commander?	49 / 9 Not at all / Very much
How well did the student Company Commander make decisions during Ambush exercises?	12 / 60 Not at all / Very much
Do you believe the student Company Commander Ambush missions would have been more successful if he had made different decisions during execution?	42 / 12 Not at all / Absolutely

The ratings percentages for five items linked to the Realism of Ambush are shown in Table 8. The majority of Soldiers believed that the level of perceived realism of the Ambush exercise was insufficient to provide an effective training experience and to portray company mission conditions and unit operations accurately. In addition, Soldiers reported that the multiplayer game training experience was less consistent with their own field training exercises, and that mission relevance to the current operational conditions (COE) could be improved.

Table 8

Ratings Percentages for Selected Items from the Ambush Soldier Perception Questionnaire for Realism of Ambush

Questionnaire Item	**Ratings % Low / High**
Was the overall realism of Ambush good enough to provide the student Company Commander with an effective training experience?	66 / 15 Nowhere near / Most definitely
How realistically did Ambush portray the conditions of a company mission in an urban environment?	74 / 3 Not at all / Completely
To what extent did the scenarios (missions) used in Ambush accurately portray what you experienced during company-level unit operations?	54 / 23 Not at all / Very much
How much were Ambush experiences consistent with your experiences during urban operations field training exercises?	69 / 3 Not consistent / Very consistent
To what extent were the Ambush scenarios (missions) relevant to the current operational conditions (COE)?	54 / 23 Not at all / Completely

Two questionnaire items associated with motivation for training with the multiplayer game are shown in Table 9. These ratings percentages show that Soldiers believed that the ability to execute their plan was a good reason to use the game. The ratings suggest also that the majority of Soldiers were engaged during the exercise.

Table 9

Ratings Percentages for Selected Items from the Soldier Perception Questionnaire for Motivation for Training with a Multiplayer Game

Questionnaire Item	**Ratings % Low / High**
How important is being able to execute your plan a reason for you to want to use Ambush?	25 / 54 Not at all / Very much
Overall, how engaged were you during the ambush exercise?	23 / 53 Not at all / Very much

The results from the final three items on the questionnaire are shown in Table 10. The large majority of Soldiers reported that the Ambush exercise did not teach them anything new about conducting urban operations or making appropriate decisions. The majority of Soldiers did believe that they learned something new about how to adapt to emerging battlefield conditions.

Table 10

Response Percentages for Soldiers' Overall Opinion of the Multiplayer Game Training Experience

Questionnaire Item	**%Yes**
Did Ambush teach you something new about how a Company Commander should conduct urban operations?	9
Did Ambush teach you something new about how a Company Commander should adapt to emerging battlefield conditions?	54
Did Ambush teach you something new about how to make appropriate decisions as a Company Commander during urban operations?	20

Discussion

Soldier Perceptions of the Multiplayer Game Training Exercise

Training Value. A large majority of Soldiers comprising both the friendly and opposing forces believed that eight hours of Ambush training was sufficient; though only about half felt that the overall experience presented a challenge to the Company Commander. Most of the Soldiers believed that the exercise had a less valuable impact on preparing a student Company Commander to lead a company in a unit and into combat when compared to other non-game training, in general. For this exploratory evaluation, these were important impressions to consider because all of the participating Soldiers had combat experience during Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) company missions.

Part of the reason for Soldier perceptions of relatively low training value may have been a function of their tactical experiences during simulated mission execution. The vast majority reported that the exercise presented few opportunities to react to enemy contact, either realistic or otherwise, even though the opposing force was comprised of real Soldiers and not computer-generated forces. Additionally, the friendly force, to include the Company Commander, was

presented with few occasions to rehearse decisions and to demonstrate agility in response to, or in anticipation of emerging conditions. The decisions that *were* made by the Company Commander were deemed appropriate, and the Soldiers did not believe that the mission would have been more successful had the Company Commander made different ones. However, in large measure, the plan and the decisions implemented by the Company Commander dictated actions made by friendly and opposing forces and, therefore, dictated the environmental conditions and the events that occurred as a function of them. Though the Company Commander's plan and execution were viewed by the Soldiers as appropriate and viable, opportunities to base and rehearse decisions on emerging conditions, at least in part, were directly related to the actions of the Company Commander and the consequences of his actions. Therefore, to some degree, the overall success of the missions, along with the extent to which participants agreed that it was a success, hinged on the tactical proficiency, decisions, actions, and reactions of the Company Commander.

Previous evaluations of training games with Infantry Soldiers showed that their perception of training value was not adversely affected when graphics fidelity was relatively simple. However, this was true only when graphics fidelity did not impact functional fidelity by presenting simulated conditions that were perceived by participating Soldiers as irrelevant, unrealistic, or that prohibited tactical actions followed by realistic consequences. In the case of Ambush, Soldiers believed that the overall realism created for and presented during the simulated missions was not sufficient to provide effective company-level training. The majority of Soldiers reported that improvements in realism needed to be made with the simulated urban environment and the conditions experienced during company operations executed within it. In addition, few Soldiers believed that the simulated experiences offered by the missions were consistent with their own experiences in the operational environment. Yet, in spite of shortfalls with perceived realism, the majority of Soldiers were engaged during the exercise and reported that they learned new ways to adapt to emerging battlefield conditions as a Company Commander. These views, combined with the idea that qualified instructors were needed to ensure an appropriate training outcome, suggested that the perception of overall training value was affected by the instructional approach, the missions developed for the exercise, the Company Commander's actions and decisions, the events created and experienced during mission execution, and by the constraints and artifacts imposed by the game's software.

Game Artifacts That Affected Mission Execution

The research team identified 22 and 19 supporting tactical tasks for the Bush Hill and COIN Stryker missions, respectively. During mission execution, the research team determined which of these tasks were initiated by the friendly force and which were not as a function of time, game, and software constraints, emerging conditions, and by choice of the Company Commander. The Ambush software, in a state modified for MCCC training purposes, allowed the friendly force the *opportunity* to initiate all but two of the tasks. This suggested that, regardless of the decisions and actions implemented by the friendly force under the direction of the Company Commander, the game facilitated execution experiences toward meeting the MCCC's training objectives for the two POI modules driving the exercise. However, there were emergent software and hardware issues of concern that may have impacted the Company

Commander's decisions to execute additional or related tactical actions according to MCCC doctrine and standard operating procedures.

Movement. The training exercise was limited to four hours for each simulated mission. The MCCC POI training objective required that these types of training missions start from the line of departure. However, in order to complete a simulated mission in four hours, the company had to begin the simulated missions positioned forward of the line of departure. Under more realistic circumstances, this line would have been crossed at 1900 the prior evening. Adhering to a realistic time line was deemed by the SGIs as neither practical nor necessary to meet overarching instructional goals. Therefore, the simulated mission began forward of the line of departure, which resulted in eliminating the Soldiers' opportunities to experience events that would have occurred had the mission adhered to a realistic mission time line.

Force Organization. Even with a reduced time line, at the start of the simulated exercise the friendly force Soldiers spent up to 45 minutes organizing themselves according to the Company Commander's task organization. From a tactical standpoint, forces should not remain stationary for this long. Instead, they maneuver to positions defined for the assault quickly to avoid exposure to enemy detection and targeting. The cause for this non-typical delay was inherent in the design of the missions, which organized simulated entities by default. This default positioning of troops was different than the Company Commander intended. To organize on the simulated battlefield, a Soldier had to identify his corresponding simulated entity, identify other friendly force entities, and then regroup according to the task organization given to the company by the commander. This process of regrouping was further complicated because Soldiers had an unnaturally narrow field of vision, as viewed on their monitors, which was much less than the typical field of vision Soldiers had in the real world. The Company Commander was forced to increase the tempo of the mission to make up for time that was lost during task organization.

Communication. The Soldiers used headsets to communicate and listen to events as they unfolded during the exercise. The Soldiers comprising the friendly force experienced some difficulties with the communications network that affected command and control. The Company Commander sometimes deselected platoon networks mistakenly, resulting in his inability to monitor platoon communications. In addition, some Soldiers applied inadequate discipline with radio use as a function of approaching the exercise casually, as opposed to regarding it as serious training.

In reality, Army Infantry units have squad radios that permit more networks than the five provided by the simulation (i.e., four networks for the friendly force and one for the opposing force), which limited Soldiers' ability to communicate. Upon completion of the Bush Hill mission, the research team determined that the communications software could support seven networks, which were all incorporated during the subsequent COIN Stryker mission. This served to increase the proficiency of communications that occurred during the COIN Stryker mission, but did little to improve some Soldiers' informal approach to the exercise.

Ambient Light. The simulation of darkness in Ambush was never truly dark. This allowed Soldiers to navigate without the need for night vision equipment and in the absence of

tactical limits imposed by true darkness. The Soldiers began executing the simulated missions in near full daylight, which affected the Company Commander's tactical decisions associated with movement. Moving troops in daylight reduced the ability to maneuver out of enemy visual contact effectively and decreased the probability of detecting the enemy before being seen by him. The Company Commander was forced to increase his operational tempo because of the excessive light. During real world training events, mission success would normally require a deliberate and relatively slow operational tempo that neither the level of ambient light in Ambush, nor the time constraints on training facilitated.

An increase in operational tempo was attributed also, in part, to impatience or undisciplined actions on the part of Soldiers in both the friendly and opposing forces. In addition, the subtle tactics and actions (e.g., hand and arm signals, coordinated squad movements) emitted by Soldiers during these types of missions in the real world are uniquely human and were not replicable during the simulated exercise. As such, a rush of action from one violent contact to another during these missions, contributing further to an increased operational tempo, mirrored the unregulated Soldier behavior that was observed during previous training game evaluations (see Beal, 2005).

Computer Performance. Computer hardware and processing shortfalls limited the effectiveness of the COIN Stryker mission substantially. During mission execution, computer lag (i.e., failure of the server computer, the Soldiers' computers, and the network to produce virtual events in real time) resulted in unpredictable pauses. Soldiers experienced delays in events and movements of entities when the computers froze, and then jumped ahead to catch up to previously entered commands. These jumps prohibited Soldiers from observing events and actions, which they would have been able to observe, had the events unfolded in real time. The computer lags became more frequent and lasted longer as events on the simulated battlefield became more complex, particularly during moments of heavy enemy contact.

The lags had pronounced effects on the Soldiers' actions. For example, friendly force Soldiers in one weapons platoon inadvertently eliminated two of their vehicles by crashing into trees or into each other. These problems were a function of Soldiers' inability to experience real-time feedback on their actions when their computers froze. Another friendly force element in this same weapons platoon hit an improvised explosive device and disabled their vehicle because they could not observe the physical cues associated with the device during a lag.

Computer lags caused some Soldiers to become separated from others during movement. Several Soldiers were temporarily lost when their computers lagged and they fell behind other Soldiers they were following. Other Soldiers had to delay execution of an order from the Company Commander in order to reassemble after they had been separated from each other. In general, the lags imposed unrealistic constraints on the movement of friendly force elements throughout the entire COIN Stryker mission.

Friendly Force Density. The Company Commander was unable to mass the effects of combat power on the objective to the extent he had planned during the COIN Stryker mission. Two of the three shaping operations required friendly force elements to provide supporting fires to the assault from locations at the maximum range of some weapons systems and from locations

partially masked by terrain. The Ambush software replicated the allowances and the constraints of this situation effectively. A fourth shaping operation required the friendly force elements to establish a blocking position. The cumulative effect of all these actions on the available force structure resulted in an insufficient number of Soldiers to mass combat power on the objective according to doctrine and the Company Commander's intent.

Infantry missions conducted in complex urban environments require sufficient friendly force density to provide an interlocking series of check points, road blocks, and patrols. Moreover, each individual Soldier, and to some extent each combat vehicle, must be an independent entity, which was not possible during the Ambush exercise. Most of the discrete actions emitted by Soldiers could be done to standard. However, the overall company mission objective, as outlined in the MCCC POI, could not be performed to standard with the limited number of participating Soldiers and the strain placed on computer processing. As such, the Soldiers behaved differently during simulated mission execution than they probably would have had the appropriate density of forces and vehicles been available.

Lessons Learned

The purposes for exploring the use of a multiplayer game in the MCCC were to: (a) determine the extent to which the Ambush software could be modified to meet selected MCCC training objectives, (b) provide realistic simulated mission execution experiences that included many of the company-level assets not available for existing field training, (c) eliminate the issues inherent in computer-generated forces by having human Soldiers control simulated entities, and (d) to assess whether MCCC Soldiers believed that the training exercise was valuable and effective. In preparation for future multiplayer game training exercises, methods and tools were developed to assess the extent to which Soldiers attending the MCCC were proficient at implementing tactical decisions, predicting and adapting to emerging battlefield conditions, and improving their ability to lead an Infantry company.

Modifying Ambush to Meet MCCC Training Objectives

The research team demonstrated that the Ambush software could be modified for specific training purposes beyond those for which it was originally intended. However, these modifications required the knowledge, time, and expertise of an experienced game software engineer. It is unlikely that Infantry leaders and instructors will have the time and expertise to make software modifications similar to those required during this effort. As such, the Ambush missions created for the MCCC remain static in their breadth and scope, unless a follow on contracted effort is initiated to expand or modify them to include additional training purposes.

The difficulty with modifying games and simulations to keep them current with operationally-relevant training is not a new issue. For example, even games that were developed specifically for MCCC training with direct input and consistent support from SGIs required the skills of software engineers to make simple modifications to existing missions, let alone to create new ones (Beal & Christ, 2004). Training game developers and researchers have made some efforts to respond to the criticism that games, in general, are not flexible enough to allow uncomplicated and time-efficient alterations to meet shifting training objectives. The trade-offs

for flexibility have often included a loss of graphics fidelity and functional realism, along with compromises that reduce the capacity to maintain tactical complexity (Beal, 2005).

Though a multiplayer game like Ambush may allow Soldiers to plan for and initiate the varied decisions and actions required to execute a company-level mission successfully, the extent to which these capabilities are exploited depends more upon the Soldiers, their instructors, and the training environment than the game itself. Soldiers and trainers who approach game training as a viable method for practicing and honing their skills will tend to reap more of the available benefits and report a more positive outlook on the experience, in general. Those who arrive with a preconceived negative viewpoint toward games tend to emit behaviors that do not always demonstrate adherence to doctrine and standard operating procedures. A qualified instructor can help create an appropriate learning environment by approaching game training in the same manner he would approach any other serious training exercise, to include pre-exercise instructions, feedback during execution, and after-action reviews to promote critical thinking and performance improvements. The results from this effort, along with all the other Infantry training game evaluations conducted by ARI, suggest that the pedagogic efficacy of games hinges heavily on the presence and active participation of qualified instructors and the positive attitude they foster in the training environment.

Providing Realistic Simulated Execution Experiences.

As with other games used to train Infantry Soldiers, Ambush filled a void where realistic mission execution experiences were lacking. Soldiers rarely had the opportunity to experience the complexity of coordinating some or all of the assets available to a Company Commander during MCCC training exercises. Nor were Soldiers given frequent opportunities to rehearse the tactical decisions that can help determine combat effectiveness at the company level. Games and simulations can provide repetitive mission execution experiences, albeit experiences that are limited by the constraints imposed by the games.

During this exercise, both time and technology constraints affected observed performance outcomes and probably had a negative impact on perceived training value. In addition, coordinating the assignment of 40 Soldiers prior to the exercise, preparing them to assume their respective roles during the missions, and attempting to ensure that they all remained engaged in appropriate behavior during mission execution proved to be much more difficult than during previous game training exercises where Soldiers used stand-alone games and simulations. Pre-mission preparation was difficult because of the high operational tempo of the MCCC POI, which meant that some participating Soldiers were not able to study the operations order and the Company Commander's plan and troop organization prior to the exercise. In addition, mission pauses from insufficient computer processing resulted in frequent expressions of frustration during mission execution (e.g., *"This computer is a piece of shit!"*).

From the research team's perspective, data collection became the most difficult process to implement effectively. Researchers observed events as they unfolded on the simulated battlefield by viewing mission execution from computer monitors. However, the span of actions and events that could be viewed at any given time on one monitor was slight in proportion to the sum of events that occurred and upon which the data should have been based. Ideally, collecting

data for the Company Commander and for each Soldier that served in the friendly or opposing force would have required an automated system of data capture that allowed observation and analysis after the missions were completed. Assigning a researcher to observe and collect data for each Soldier during mission execution was simply not feasible.

Eliminating Issues Inherent in Computer-Generated Forces

Given the problems with computer-generated entities that surfaced during previous game evaluations, the prospect of using a multiplayer game seemed attractive to researchers, leaders, and trainers. The fact that almost every simulated entity on the battlefield had to be controlled by a human Soldier added to the expectation that using a game like Ambush could lead to better participation, improved realism, and a stronger pedagogic impact. Demonstrating that these expectations could be fulfilled would require a direct empirical comparison between performance outcomes from using a multiplayer game and using a stand-alone system. To date, no such military-relevant research comparisons have been published. Therefore, the extent to which a multiplayer game improves performance over existing field training and other computer-based games and simulations remains unknown.

Replacing computer-generated entities with human Soldiers eliminated the issues inherent in the former, but some familiar issues affecting mission success emerged with the latter. Along with Soldiers' preconceived ideas about game training, as discussed earlier, their proficiency with computer games affected their ability to act appropriately and to contribute to mission success. As one might have expected, the Soldiers who were proficient were able to spend much more of their time executing orders and using the simulated environment to their advantage compared to Soldiers who needed to focus on computer functions and controls.

Assessing Perceived Training Value

Previous evaluations have shown that participating Soldiers' negative perceptions of their performance and the value of game training can contradict their actual performance and what they learned. But to detect these types of discrepancies, both perceptions and performance must be measured. Only the former was assessed during this evaluation.

The Soldiers gave comparatively low ratings to describe their experiences with a multiplayer game. However, the data are insufficient to distinguish accurately whether those ratings were the result of the game itself, the issues with computer processing, the Company Commander's plan and tactical decisions, the Soldiers' preconceived ideas about training games, or their experiences during mission execution. We suspect that Soldier perceptions were a function of some interaction of all these aspects of the exercise, though we do not know the extent to which any one component contributed more or less than the others.

Looking Ahead

Much more research into the use of multiplayer games for Soldiers is needed before researchers, trainers, and leaders can determine if performance outcomes match or exceed those produced by existing classroom, simulation, and field training events. While some may promote

games as viable and cost-effective supplemental military training tools, empirical evidence is needed as a foundation for making decisions about training and resource expenditures. Current non-game training methods may be imperfect, expensive, and limited in breadth, but they are usually based on long experience and a solid historical link between training and the type of Soldier skills they produce. Game training has no such historical link, which underscores the need for continued skepticism, research, and forthcoming empirical support.

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Appendix A

Soldier Perception Questionnaire

Print your name_____

Your responses to items in this questionnaire should be based on your experience using Ambush. Respond to the following questions by marking an "X" in the appropriate box of the 7-point scale.

Part 1. Overall Training Value of Ambush

1. To what extent did Ambush provide the student Company Commander with an effective training experience?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL SOMEWHAT VERY MUCH

2. In your opinion, how desirable is it to use a training tool like Ambush to gain experience as a Company Commander?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL DESIRABLE SOMEWHAT DESIRABLE VERY DESIRABLE

3. How would you describe the amount of time you used Ambush?

|_____|_____|_____|_____|_____|_____|_____|
TOO MUCH TIME RIGHT AMOUNT OF TIME NEED MORE TIME

4. How challenging to the student Company Commander was the overall experience provided by Ambush?

|_____|_____|_____|_____|_____|_____|_____|
NOT CHALLENGING MODERATELY CHALLENGING VERY CHALLENGING

5. In your opinion, did Ambush have a valuable impact on helping the student Company Commander better understand how to lead a company?

|_____|_____|_____|_____|_____|_____|_____|
NO VALUE SOME VALUE GREAT VALUE

6. In your opinion, will using Ambush have a valuable impact on preparing the student Company Commander to lead a company in his unit?

|_____|_____|_____|_____|_____|_____|_____|
NO VALUE — SOME VALUE — GREAT VALUE

7. In your opinion, will using Ambush have a valuable impact on preparing the student Company Commander to lead a company in combat?

|_____|_____|_____|_____|_____|_____|_____|
NO VALUE — SOME VALUE — GREAT VALUE

Part 2. Tactical Training Value of Ambush

8. To what extent did Ambush provide meaningful practice to the student Company Commander for exercising command and control over company operations?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL — SOMEWHAT — VERY MUCH

9. To what extent did Ambush provide the student Company Commander with opportunities to practice reacting to enemy contact during urban operations?

|_____|_____|_____|_____|_____|_____|_____|
NO OPPORTUNITIES — SOME OPPORTUNITIES — MANY OPPORTUNITIES

10. To what extent did Ambush provide meaningful practice to the student Company Commander for understanding how company-level fire control measures are executed?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL — SOMEWHAT — VERY MUCH

11. To what extent did Ambush help the student Company Commander better understand the influence of METT-TC factors on leading a company?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL — SOMEWHAT — VERY MUCH

12. For the Bush Hill mission, to what extent did Ambush provide the student Company Commander with meaningful practice for understanding how company-level movement to contact is controlled?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL SOMEWHAT VERY MUCH

13. To what extent did Ambush provide the student Company Commander with meaningful practice for understanding how movement routes must be designated according to the terrain?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL SOMEWHAT VERY MUCH

14. To what extent should a qualified instructor be present to provide the student Company Commander with feedback, coaching, and tactical guidance during Ambush exercises?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL REQUIRED SOMEWHAT REQUIRED VERY MUCH REQUIRED

15. To what extent should a qualified instructor be present to guide the student Company Commander through an Ambush after-action review?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL REQUIRED SOMEWHAT REQUIRED VERY MUCH REQUIRED

Part 3. Adaptability and Decision-Making with Ambush

16. To what extent was the student Company Commander given opportunities to adapt to emerging battlefield conditions during the Ambush exercises?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL SOMEWHAT VERY MUCH

17. How well did the student Company Commander adapt to emerging battlefield conditions during Ambush exercises?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL WELL SOMEWHAT VERY WELL

18. To what extent can Ambush prepare the student Company Commander to adapt to emerging conditions in combat?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL SOMEWHAT VERY MUCH

19. To what extent did Ambush permit the student Company Commander to rehearse the types of decisions a Company Commander must make during urban operations?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL SOMEWHAT VERY MUCH

20. To what extent did OPFOR actions permit the student to rehearse the types of decisions made by a Company Commander?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL SOMEWHAT VERY MUCH

21. To what extent did Ambush allow the student Company Commander to make the <u>tactical</u> decisions that are made when leading a company?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL SOMEWHAT VERY MUCH

22. How well did the student Company Commander make decisions during Ambush exercises?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL SOMEWHAT VERY WELL
WELL

23. To what extent did Ambush ***add*** to the student Company Commander's MCCC training for learning the decisions associated with effectively leading a company?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL SOMEWHAT VERY MUCH

24. To what extent did the student Company Commander change his plan during Ambush as a result of changing conditions and/or emerging threats?

|_____|_____|_____|_____|_____|_____|_____|
NO CHANGE SOME CHANGE COMPLETE CHANGE

25. Do you believe the student Company Commander's Ambush missions would have been more successful if he had made different decisions during execution?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL MAYBE ABSOLUTELY

Part 4. Realism of Ambush

26. Was the overall realism of Ambush good enough to provide the student Company Commander with an effective training experience?

|_____|_____|_____|_____|_____|_____|_____|
NO WHERE NEAR GOOD ENOUGH APPROACHING GOOD ENOUGH MOST DEFINITELY GOOD ENOUGH

27. How captivated or drawn in was the student Company Commander by events and actions presented during Ambush exercises?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL SOMEWHAT COMPLETELY

28. How captivated or drawn in were <u>you</u> by events and actions presented during Ambush exercises?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL SOMEWHAT COMPLETELY

29. How realistically did Ambush portray the conditions of a company mission in an urban environment?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL SOMEWHAT COMPLETELY

30. Were there moments during Ambush when you felt completely focused on the tasks associated with a company mission?

|_____|_____|_____|_____|_____|_____|_____|
NONE OCCASIONALLY FREQUENTLY

31. To what extent did the <u>scenarios</u> used in Ambush accurately portray what you experienced during company-level unit operations?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL SOMEWHAT VERY MUCH

32. How much were Ambush experiences consistent with your experiences during urban operations field training exercises?

|_____|_____|_____|_____|_____|_____|_____|
NOT CONSISTENT — MODERATELY CONSISTENT — VERY CONSISTENT

33. To what extent did Ambush accurately simulate the tasks and conditions specified in current company command training exercises?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL — SOMEWHAT — VERY MUCH

34. To what extent were the Ambush scenarios relevant to the current operating conditions (COE)?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL — SOMEWHAT — VERY MUCH

35. How realistically did Ambush allow actions made by members of the company?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL — SOMEWHAT — COMPLETELY

36. How realistically did Ambush allow actions made by the enemy?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL — SOMEWHAT — COMPLETELY

37. Overall, how much could you focus on the experiences created by Ambush rather than on the computer keyboard functions?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL — SOMEWHAT — VERY MUCH

38. To what extent was an effective portrayal of a light Infantry/Stryker company constrained by force structure, personnel, or equipment in the game?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL — SOMEWHAT — COMPLETELY

39. To what extent did supporting actions made by automated forces contribute to realistic battlefield actions?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL SOMEWHAT COMPLETELY

Part 5. Motivation for Training with Ambush

40. How important is a desire to practice making company command decisions a reason for you to want to use Ambush?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL SOMEWHAT VERY MUCH

41. How important is the desire to learn combat skills a reason for you to want to use Ambush?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL SOMEWHAT VERY MUCH

42. How important is being able to execute your plan a reason for you to want to use Ambush?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL SOMEWHAT VERY MUCH

43. How important is fun and/or personal entertainment a reason for you to want to use Ambush?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL SOMEWHAT VERY MUCH

44. Overall, how engaged were you during the Ambush exercises?

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL SOMEWHAT VERY MUCH

Part 6. Overall Opinion of the SimFX Training Experience

45. Did Ambush teach you something new about how a Company Commander should conduct urban operations? **Circle one: Yes No**

46. Did Ambush teach you something new about how a Company Commander should adapt to emerging battlefield conditions? **Circle one: Yes No**

47. Did Ambush teach you something new about how to make appropriate decisions as a Company Commander during urban operations? **Circle one: Yes No**

END