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The Application of Gaming Techniques to Resident and Nonresident Instruction

by

Joseph A. Olmstead and James A. Salter

HUMAN RESOURCES RESEARCH ORGANIZATION
300 North Washington Street • Alexandria, Virginia 22314

September 1976

Prepared for:

U.S. Army Research Institute for the Behavioral and Social Sciences
1300 Wilson Boulevard
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This report describes the results of a project to develop a program of instruction with teaching materials and instructional and illustrative games to provide the U.S.Army Infantry School with the capability to use games and simulations in resident and nonresident courses of instruction. The program of instruction developed is modular, each block being a self-contained package, and is tactical in nature. It consist of 21 blocks requiring a total of 40 hours for administration.

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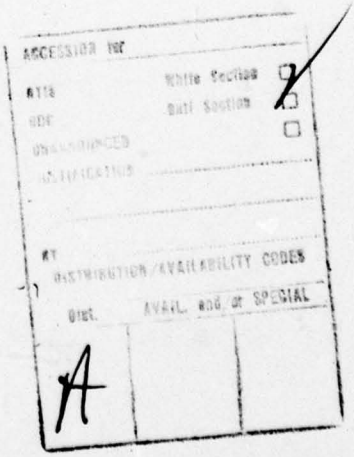
PREFACE

This report describes work performed by the Human Resources Research Organization (HumRRO) for a project with the overall objective of developing a program for training military instructors in the application of gaming techniques to resident and nonresident instruction. The project was conducted by HumRRO for the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI).

Work on the project was begun in February 1976 and completed in August 1976, and was conducted by personnel of the Columbus, Georgia, Research Office of HumRRO. Dr. Joseph A. Olmstead was Project Director. The HumRRO research staff consisted of Mr. James A. Salter and LTC (Retired) Fred K. Cleary. Mr. Thomas J. Thompson and Dr. Trueman R. Tremble of the ARI Fort Benning Field Unit designed the illustrative game described in the report.

Mr. Harold C. Strasel is Chief of the ARI Field Unit at Fort Benning and served as technical monitor of the project, assisted by Dr. Tremble.

The work was performed under Contract DAHC 19-76-C-0020, Modification No. 1, "Applications of Gaming Techniques to Resident and Nonresident Instruction."



CONTENTS

THE APPLICATION OF GAMING TECHNIQUES TO RESIDENT AND NONRESIDENT INSTRUCTION

INTRODUCTION

This report presents the results of a project designed to provide the U.S. Army Infantry School (USAIS) with the capability for training personnel in the use of games and simulations for instructional purposes. The specific objectives were to develop and test a program of instruction concerned with the use of games and simulations in education and training.

MILITARY TRAINING

A matter of continuing concern to the Army training community is the need to develop more effective and more efficient training at reduced costs. These concerns have led the Director of Instruction, U.S. Army Infantry School, to search for ways to increase the effectiveness of resident instruction and of the "carry over" of resident instruction to applications in field training.

One approach under consideration is the application of principles and techniques of gaming and simulation to military instruction. Increasingly, games and simulations have been found to be effective adjuncts to more conventional instructional methods in both public education and training within business and industry. Therefore, it may be feasible to incorporate into military instructional programs games and simulations that will afford students the opportunity to apply, under job realistic conditions, the concepts and principles learned through conventional service school instruction. Thus, games and simulations could be used to practice, elaborate, and reinforce the knowledges and skills learned in various school and field training situations.

To be able to employ gaming and simulation techniques effectively, The Infantry School requires the identification, development, and verification of techniques applicable to military instruction. In addition, it is necessary to train instructor personnel in development and use of the appropriate techniques.

RESEARCH PROBLEM

The Army Research Institute (ARI) has undertaken to assist The Infantry School in developing capabilities for application of gaming techniques to military instruction. In turn, the Human Resources Research Organization (HumRRO) was requested to conduct work in support of the ARI objective of assisting the Infantry School.

For HumRRO, the research problem included several requirements. A first requirement was to develop a program of instruction on the application of gaming techniques and principles to military instruction. The course was to be designed to train faculty and staff of The Infantry School in manual gaming and simulation so that they would be able to develop and conduct training through use of gaming and simulation techniques.

A second requirement was to develop a game that would illustrate the application of gaming techniques to training in The Infantry School. The game was to have two potential uses. First, it was to illustrate manual gaming techniques applicable to training in subjects taught in the Advanced Course of The Infantry School. Second, the illustrative game was to be designed so as to be usable in the program of instruction of the Advanced Course.

A third requirement was to present the program of instruction concerned with gaming techniques to selected members of the instructional staff of The Infantry School and to conduct a short-range evaluation of the program. Thus, a fully tested program, capable of immediate implementation, would be made available.

Satisfaction of these requirements would provide The Infantry School with an effective means for developing its capability to use gaming and simulation techniques in its instructional programs. In addition, the School would be capable of exporting the techniques to those field-training situations for which it has proponency.

METHOD

DEVELOPMENT OF PROGRAM OF INSTRUCTION

The first requirement was to develop a program of instruction for training faculty and staff of The Infantry School in manual gaming and simulation. The course was to be developed so that the instruction could be later conducted by Infantry School personnel without major modification. Accordingly, the lesson plans and associated materials must be complete and contain guidance sufficient to enable later instructors to conduct the course without difficulty. Furthermore, the content should cover both the development of games and simulations and their use for instructional purposes, to include methods for evaluating their effectiveness.

To begin, HumRRO personnel reviewed games, both recreational and instructional, and literature concerned with the application of gaming techniques for training and instructional purposes. The objectives were to identify (1) games and gaming techniques that would be appropriate for application in military training settings, and (2) the training required to prepare individuals to develop and implement gaming and simulation techniques in military training.

Development of Training Objectives

ARI and Infantry School personnel examined the Advanced Course program of instruction and identified training objectives appropriate for development through games and gaming techniques. HumRRO personnel then examined the identified objectives and determined which types of games and gaming techniques would be most suitable for them. Those games and techniques identified as suitable were later incorporated into the gaming program of instruction.

Then, HumRRO personnel developed objectives for the program of instruction on gaming. Pursuant to guidance from ARI, the objectives were designed to cover the following areas:

(1) Application of gaming concepts and techniques to the subjects taught in the Infantry Officers Advanced Course, with emphases upon training in tactics and tactical operations.

(2) Knowledge of the fundamental principles, techniques, and other requirements for developing training based on manual gaming techniques.

(3) Ability to play and run the play of the illustrative game.

(4) Capacity to identify instructional needs appropriate for training based on gaming.

(5) Ability to develop manual games and gaming techniques for application to training in The Infantry School.

(6) Ability to evaluate the effectiveness of games.

Development of Program of Instruction

The training objectives were the basis for development of the required program of instruction. A tentative course schedule was developed, with short synopses of content for each time period. The schedule and synopses were reviewed by ARI and Infantry School personnel. Then, HumRRO staff members developed lesson plans, practical exercises, visual aids, and associated documents to be issued to students. These materials were reviewed by ARI and Infantry School personnel and some revisions were made as a result of their comments.

DEVELOPMENT OF ILLUSTRATIVE GAME

The illustrative game was developed concurrently with work on the program of instruction. At the beginning of the project, ARI provided a set of specifications for design of the game. The specifications were:

(1) Players. The game must be capable of training company commanders or battalion-level staff officers.

(2) Game Duration. Playable within two to four hours in the physical facilities available in an institutional or field setting.

(3) Game Structure. The game must permit:

(a) Free play execution of tactical operations.

(b) Two-sided play with one or more persons on a side.

(c) Capacity to play the game with or without controllers.

(d) Force structures and weapons of opposing forces based on the current U.S. and THREAT armies. The U.S. forces should represent combined arms units which allow players

to organize within mechanized infantry-heavy or armor-heavy task forces with appropriate organic and supporting arms. The equivalent THREAT force should allow the mechanized unit to be opposed in the attack, defense, delay, meeting engagement, and movement to contact.

(e) Capacity to play alternatives of the attack, defense, retrograde, meeting engagements, and movement to contact.

(f) Portrayal of terrain constraints and effects.

(g) Capacity to vary initial dispositions of forces, initial force structure, weapons systems, and weapon systems capabilities.

(h) Rules that preserve tactical fidelity and that are easily understood by the average company commander or battalion-level staff officer.

(i) Assessment of outcomes of tactical engagements.

(j) Manual or man-ascendant gaming techniques and paraphernalia that do not require computer support and that could be produced with resources inherent to The Infantry School.

(4) Game Controllers. Capacity to be administered by the faculty of The Infantry School.

The illustrative game was designed by ARI personnel, with technical assistance and development of prototype materials provided by HumRRO.

It was agreed that the gaming simulation component of a game-controlled, battalion-level command post exercise known as "LONGTHRUST," developed by the U.S. Army Combat Arms Training Board, was to be examined and modified to meet the above specifications. Thus, LONGTHRUST served as the foundation for the illustrative game. Initially, a segment of the LONGTHRUST game board, which depicts European terrain, was used as the board for the illustrative game and LONGTHRUST rules and paraphernalia were adapted. Furthermore, LONGTHRUST combat results tables were used for the initial version of the illustrative game.

ARI and HumRRO personnel jointly developed the initial version. After development, this version was tested for realism, workability, and playability. As a result of this test, several modifications were introduced. First, it was concluded that the European terrain depicted in the LONGTHRUST game board did not present as great a variety of terrain features as was desired. Accordingly, the game board was changed to depict a segment of Fort Benning, Georgia. The second significant modification was introduction of probabilistic combat results tables. LONGTHRUST tables are deterministic, i.e., they do not provide for hit probabilities of weapons at varying distances and environmental conditions. After testing, it was decided that probabilistic tables should be used. Accordingly, combat results tables from a recently-developed gaming simulation, FIREFIGHT, were adapted for use with the illustrative game. A number of other modifications, principally in the game rules, resulted from the testing.

DEVELOPMENT OF AN INSTRUCTIONAL GAME

Tactical gaming simulations which possess reasonable content validity are extremely complex vehicles, especially with respect to rules which govern play and the computation of results. Because of this complexity, considerable study and practice are required before players become fully familiar with the procedures and rules.

To make learning easier and to speed the development of competence in playing the illustrative game, as well as similar games, an "instructional game" was developed. This instructional game was designed as a simplified version of the illustrative game, which would use the same basic rules and paraphernalia but would require only four moves to complete. The outstanding feature is a set of instructions which take players step-by-step through the moves, with detailed guidance as to the procedures and interpretation of rules and combat results computations.

The instructional game was conceived to be a transitional game which will introduce students to tactical gaming simulations and will equip them to play the illustrative game, and similar games, with only minimum additional learning of special procedures and rules. The gaming materials were designed to be compact and easily portable so that students may transport them without difficulty, thus, making possible use of the game for homework assignment and practice.

PRESENTATION OF PROGRAM OF INSTRUCTION

Two HumRRO personnel conducted the program of instruction for a select group of Infantry School instructors. The program was conducted in four-hour blocks, twice weekly for five weeks. The presentations were monitored by representatives of The Infantry School and ARI personnel.

EVALUATION

At the conclusion of the course, the questionnaire shown in Appendix A was completed by all students present on the last day. The questionnaire was designed to obtain student ratings of the total course, each separate block of instruction, and the methods of instruction. In addition, comments and recommendations of students were solicited.

RESULTS

THE PROGRAM OF INSTRUCTION

The first product of the project was a program of instruction (POI) designed to train military instructor personnel to develop and conduct manual gaming simulations for instructional purposes, and to use gaming techniques effectively in conjunction with more conventional content and teaching methods. The program was designed so that military instructors can conduct it after the initial pilot administration.

Instructional Objectives

Instructional objectives developed for the program are shown in Appendix B. It can be seen that the program encompasses eight objectives which include playing military gaming simulations; determining appropriateness, designing, developing, and evaluating gaming simulations for instructional purposes; and using gaming simulation techniques with conventional instructional methods.

Program Format

The program of instruction course outline appears in Appendix C. The program consists of 21 blocks ranging in length from one to three hours. Total time required for administration is 40 hours. Following are the titles of the various blocks with length and type of instruction indicated:

(1) Introduction to Course (2 hours)
Lecture-Conference: (a) Introduction, (b) History of Games, (c) Military Applications of Gaming.

(2) Concepts and Components in Simulations and Games (2 hours)
Lecture-Conference

(3) Types of Gaming Simulations I (2 hours)
Lecture-Conference

(4) Types of Gaming Simulations II (2 hours)
Practical Exercise: Play of military-developed games Tanker and Battalion Staff Game.

(5) Types of Gaming Simulations III (2 hours)
Lecture-Conference

(6) Types of Gaming Simulation IV (2 hours)
Practical Exercise: Play of instructional game, MECHSTART.

(7) Use of Games for Instructional Purposes I (2 hours)
Lecture-Conference

(8) Types of Gaming Simulation V (2 hours)
Practical Exercise: Play of commercial games, Kriegsspiel and Wurzburg

(9) Use of Games for Instructional Purposes II (1 hour)
Lecture-Conference

(10) Use of Games for Instructional Purposes III (3 hours)
Practical Exercise: Play of the illustrative game, TFAM ALPHA, under controlled conditions.

(11) Design of Gaming Simulation Systems I (2 hours)
Lecture-Conference: Design of Gaming Simulations

(12) Design of Gaming Simulation Systems II (2 hours)
Practical Exercise: Design of a Gaming Simulation

(13) Design of Gaming Simulation Systems III (2 hours)
Lecture-Conference: Design of Instructional Components

(14) Design of Gaming Simulation Systems IV (2 hours)
Practical Exercise: Design of an Instructional Component

(15) Evaluating Effectiveness I (1 hour)
Lecture-Conference: Determining playability and workability

(16) Use of Games for Instructional Purposes IV (3 hours)
Practical Exercise: Play of military-developed game, FIREFIGHT.

(17) Evaluating Effectiveness II (2 hours)
Lecture-Conference: Evaluating training effectiveness.

(18) Evaluating Effectiveness III (2 hours)
Practical Exercise: Design of an Evaluation Study

(19) Modifying Current Instruction (1 hour)
Lecture-Conference

(20) Use of Games for Instructional Purposes (2 hours)
Practical Exercise: Play of the illustrative game, TEAM ALPHA, under uncontrolled conditions.

(21) Conclusion to Course (1 hour)
Conference

The program consists of 20 hours of lecture-conference and nine practical exercises which require a total of 20 hours to conduct. Practical exercises include both play of representative gaming simulations and practice in performance of functions required to design and evaluate gaming simulation systems. Included in the program materials are lesson outlines, all required visual aids, all recommended handout materials, and a bibliography concerned with the design and use of manual gaming simulations.

THE INSTRUCTIONAL GAME

The instructional game, developed by HumRRO, is named "MECHSTART." It is designed for play by persons who have (1) experience with modern mechanized infantry weapons systems and concepts and (2) a need to gain an introduction to the playing of complex military conflict games.

The game materials include:

(1) A game board.

(2) Gaming paraphernalia (markers, etc.)

(3) Instructions, including rules and scenario.

(4) Combat results tables.

(5) An example game, in which a four-move game is described and each move is analyzed to provide instruction in procedures, rule interpretation, and determination of combat results.

Prototypes of material for MECHSTART were transmitted to ARI as separate products of this project.

THE ILLUSTRATIVE GAME

The illustrative game is named "TEAM ALPHA." The game can be played by one or more players on each side and may be conducted with or without controllers or umpires. A variety of scenarios may be used with TEAM ALPHA, thus enhancing its value for instructional purposes.

Play of the game takes place on a board drawn to represent a 1:6,250 military map of terrain at Fort Benning, Georgia. A hexagonal grid system is superimposed over the standard topographic symbols and military grid system inherent to the map.

Materials for the game are:

(1) A document which contains all instructions, rules, procedural guidance necessary to use TEAM ALPHA in training.

(2) The game board.

(3) Cardboard counters representing the forces involved in the engagement simulated by the game.

(4) Dice used to determine the outcomes of events.

Prototypes of all materials for TEAM ALPHA were delivered to ARI as separate products of this project.

CONDUCT OF THE PROGRAM OF INSTRUCTION

Two HumRRO staff members conducted the course during June and July 1976 for a group of USAIS instructor personnel. Enrollment for the course was 12 people and attendance at the various sessions varied widely. The course was conducted in four-hour sessions, twice weekly for five weeks. ARI and USAIS personnel monitored the course throughout its duration.

EVALUATION OF THE PROGRAM OF INSTRUCTION

With respect to evaluation, HumRRO's assignment was to conduct a short-term evaluation of the program of instruction, to be based upon student reaction. It was planned that ARI personnel would then follow-up with longer-term evaluation of instructional effectiveness based upon accomplishment of the training objectives.

To accomplish the short term evaluation, the questionnaire shown in Appendix A was administered to all students present on the last day of the course. Eight students completed the questionnaire.

Tables 1, 2, and 3 summarize results for the scalable items of the questionnaire. From the tables, it can be seen that, upon completion of the course, students' evaluations were favorably to high favorable with respect to all evaluation points. As would be expected, some variability in mean scores between items were found. However, a predominance of favorable responses occurred for each item. Accordingly, it can be concluded that the course accomplished the purpose for which it was designed.

Table 1

Student Evaluation of Program of Instruction

Item		Mean	SD
Effectiveness of POI in Developing Knowledges and Skills:			
1.A.	For selecting and using manual gaming simulations for instruction	3.75	.46
1.B.	For designing, developing, and evaluating manual gaming simulations for instruction	4.38	1.06
Course Content:			
2.A.1.	Overall adequacy of coverage of topics	3.88	.84
2.A.2.	Overall clarity of treatment of content	4.00	.00
2.A.3.	Overall adequacy of visual aids	3.50	.76
Utilization:			
4.A.	Probability that you will use what you have learned in this course	4.13	1.36
Change of Attitudes:			
5.A.	Has this course changed your attitudes toward use of gaming simulations for instructional purposes	4.63	.52

Table 2

Student Evaluations of Specific Instructional Topics

Topic	Adequacy of Coverage		Clarity of Treatment		Instructional Utility	
	Mean	SD	Mean	SD	Mean	SD
6.A. History and Military Applications of Gaming	4.14	1.22	4.71	.49	3.14	1.58
6.B. Concepts and Components in Simulations and Games	4.29	.49	4.14	.52	4.00	1.16
6.C. Types of Gaming Simulations	4.38	.52	4.13	.64	4.13	.84
6.D. Use of Games for Instructional Purposes	4.38	.74	4.13	.64	4.13	.64
6.E. Design of Gaming Simulations	4.00	1.07	3.75	.64	3.88	.99
6.F. Design of Instructional Components of Gaming Simulation Systems	3.88	1.25	3.75	.87	3.88	1.25
6.G. Evaluating Effectiveness	4.50	.54	4.50	.54	4.63	.52
6.H. Modifying Current Instruction	3.86	1.36	3.71	.49	4.57	.54

Table 3

Student Confidence in Ability to Perform Objectives

Training Objective	Mean	SD
1. Play a military-oriented gaming simulation.	4.25	1.04
2. Prepare a design plan for testing the training effectiveness of a specified gaming simulation system.	4.13	.99
3. Analyze a training objective to specify the advantages and disadvantages of manual gaming simulation and to state whether manual gaming should be used as a training method.	3.75	1.28
4. Prepare a plan for the design of a manual gaming simulation system that will train for accomplishment of specified training objectives.	3.13	1.25
5. Play the illustrative game to its conclusion.	4.50	1.07
6. Serve as a controller (umpire) of the illustrative game.	4.25	1.17
7. Prepare a plan for testing the playability and workability of a manual gaming simulation system.	4.13	.99
8. Develop a plan for modifying manual gaming simulation techniques applied as part of current instruction.	3.75	.89

Provision was made on the questionnaire for comment and recommendations concerning both specific topics and methods, and the overall program. These items served as one basis for revision of the course materials and all student comments and recommendations have been provided to ARI personnel responsible for the project.

DISCUSSION

The overall objective of the project described herein was accomplished. The program of instruction with its associated teaching materials and the instructional and illustrative games, appears to provide The Infantry School with an effective means for developing a capability to use games and simulations in resident and nonresident courses.

Although the POI was developed specifically for The Infantry School, there appears to be no reason why its content would not be equally appropriate for use by any agency concerned with military instruction. However, since the gaming simulations played in the practical exercises are tactical, care should be taken to evaluate their appropriateness for use with students who do not possess knowledges and capabilities related to the functioning of maneuver elements in the combat arms. Where students do not possess such knowledges and capabilities, it will be necessary to substitute gaming simulations which are more suitable.

The program of instruction was developed according to a "modular" concept. That is, each block is a self-contained package that contains all information and materials needed to conduct it effectively. Modularization makes it possible to adapt the course to specific requirements of students. Where it is determined that particular knowledge or skills are not required by the instructor personnel of the administering school or agency, relevant blocks may be deleted. Similarly, if deemed desirable, the entire program can be offered but with students attending only those blocks which meet particular individual needs.

For best results, the directions, procedures, schedules, etc., that have been provided should be followed without deviation. Any modifications in content or procedures should be accomplished only after careful and thorough consideration of their potential effects upon accomplishment of the training objectives.

Determination of the ultimate instructional effectiveness of the course must await evaluation in terms of students' ability to meet the standards set out in the training objectives. However, "face validity" seems well established and student reaction to the course is positive and favorable. Accordingly, the program of instruction appears to be a suitable means for teaching instructors to apply gaming techniques to resident and nonresident instruction.

APPENDIX A

STUDENT REACTION FORM

STUDENT REACTION FORM
COURSE OF INSTRUCTION ON GAMING

There were 10 sessions of this course. Please indicate the number of sessions you attended. _____

GENERAL

1. The purpose of this POI is to provide students with the knowledges and skills necessary to select and use manual gaming simulations appropriately and effectively in instruction and to design, develop, and evaluate manual gaming simulations for instructional purposes. Please rate the overall effectiveness of this POI in developing knowledges and skills for each of the following. (Place an X in the blank which best describes your evaluation):

   A. Selecting and using manual gaming simulations for instruction.

_____	_____	_____	_____	_____
Highly Effective	Adequate	Moderately Effective	Somewhat Ineffective	Totally Ineffective

   B. Designing, developing, and evaluating manual gaming simulations for instruction.

_____	_____	_____	_____	_____
Highly Effective	Adequate	Moderately Effective	Somewhat Ineffective	Totally Ineffective

2. Course Content

   A. Please rate the overall content presented in the lecture/conference segments of the POI. Rate the content and not the instructor. Use the following scale and write in each blank the number on the scale that best fits your evaluation.

5 - Highly Effective
4 - Adequate
3 - Moderately Effective
2 - Somewhat Ineffective
1 - Totally Ineffective

Items to be Rated

_____ Overall adequacy of coverage of topics.

_____ Overall clarity of treatment of content.

_____ Overall adequacy of visual aids for reinforcing important points.

   B. Should other topics be covered?

_____ Yes _____ No

   C. If "Yes," what other topics should be included?

_____

_____

_____

D. Should any topics be deleted?

_____ Yes _____ No

E. If "Yes," what topics should be deleted?

_____

_____

_____

3. Practical Exercises

The following items are concerned with the practical exercises. Check one answer for each item. Note: "Practical exercises" included both the playing of games and the small-group work sessions.

A. Mix of practical exercises and lecture/conference sessions.

_____ There should have been more practical exercises and less lecture/conference sessions.

_____ The mix of practical exercises and lecture/conferences was about right.

_____ There should have been less practical exercises and more lecture/conferences.

B. Types of practical exercises.

_____ The mix between playing games and other types of exercises was about right.

_____ There should have been more playing of games and less of other types of exercises.

_____ There should have been less playing of games and more of other types of exercises.

C. Can you think of any way the practical exercise part of the POI could be improved?

_____ Yes _____ No

D. If "Yes," how could it be improved?

_____

_____

_____

4. Utilization

A. What is the probability that you will use what you have learned in this course?

_____	_____	_____	_____	_____
Highly Probable	Probably	Maybe	Not Very Probable	Highly Unlikely

B. In what ways do you think you may use what you have learned?

_____

_____

_____

_____

C. If the probability of use is low, please indicate why.

_____

_____

_____

5. A. Has this course changed your attitudes toward use of gaming simulations for instructional purposes?

_____ I am now more favorable than before the course.

_____ No change, but I am still favorable.

_____ No change, but I am still dubious.

_____ No change, but I am still negative.

_____ My attitudes are now less favorable.

B. If your attitudes have changed, what was it about the course that caused you to change? _____

_____

_____

_____

SPECIFIC

6. Use the following scale to rate the content of instruction on each of the course topics shown below. Note that a "topic" included both lecture/conference and associated practical exercises. Rate the overall instruction on each topic in terms of (1) adequacy, (2) clarity, and (3) instructional utility (utility for teaching about gaming simulations). Rate the content and methods, not the instructor.

5 - Highly Effective
4 - Adequate
3 - Moderately Effective
2 - Somewhat Ineffective
1 - Totally Ineffective

Topic	Rating
A. History and Military Applications of Gaming	_____ Adequacy of Coverage _____ Clarity of Treatment _____ Instructional Utility
B. Concepts and Components in Simulations and Games	_____ Adequacy of Coverage _____ Clarity of Treatment _____ Instructional Utility
C. Types of Gaming Simulations	_____ Adequacy of Coverage _____ Clarity of Treatment _____ Instructional Utility
D. Use of Games for Instructional Purposes	_____ Adequacy of Coverage _____ Clarity of Treatment _____ Instructional Utility
E. Design of Gaming Simulations	_____ Adequacy of Coverage _____ Clarity of Treatment _____ Instructional Utility
F. Design of Instructional Components of Gaming Simulation Systems	_____ Adequacy of Coverage _____ Clarity of Treatment _____ Instructional Utility
G. Evaluating Effectiveness	_____ Adequacy of Coverage _____ Clarity of Treatment _____ Instructional Utility
H. Modifying Current Instruction	_____ Adequacy of Coverage _____ Clarity of Treatment _____ Instructional Utility

7. For instruction on any topic in 6, above, that you rated as moderately effective or less, please indicate how the instruction could be improved. Comment upon both content and method. In doing so, please indicate the topic upon which you are commenting.

_____

_____

_____

_____

_____

_____

8. Use the following scale to indicate your confidence in your ability, upon course completion, to satisfactorily demonstrate accomplishment of each of the training objectives for the course. A copy of the training objectives is attached.

5 - Highly Confident
4 - Moderately Confident
3 - Somewhat Confident
2 - Not Very Confident
1 - Not Confident At All

_____ Training Objective 1

_____ Training Objective 2

_____ Training Objective 3

_____ Training Objective 4

_____ Training Objective 5

_____ Training Objective 6

_____ Training Objective 7

_____ Training Objective 8

COMMENTS

Please make any comments about the course content, methods, or ways of improving it that you care to make or that have not been covered in the preceding items.

APPENDIX B

INSTRUCTIONAL OBJECTIVES

Annex B

INSTRUCTIONAL OBJECTIVES

TRAINING OBJECTIVE 1

Training Task: Play a military-oriented manual gaming simulation.

Condition: Given an opposing player with an appropriate entry level in the military subjects covered by the gaming simulation; a complete gaming simulation designed for play within a prescribed time period and including gaming paraphernalia and instructions; a period of time to study rules for play of the gaming simulation adequate for completion of the game within the prescribed time period.

Standard: The player must complete play of the game within the prescribed time period correctly according to its rules without violating any rule more than once.

TRAINING OBJECTIVE 2

Training Task: Prepare a design plan for testing the training effectiveness of a specified gaming simulation system.

Condition: As a USAIS instructor; given a workable and validated manual gaming simulation designed to accomplish specific military-oriented objectives.

Standard: Two of three experts in the measurement and testing of training effectiveness judge that, if implemented, the test plan would produce results that reliably and validly indicate whether the system is effective for training the target population.

TRAINING OBJECTIVE 3

Training Task: Analyze a training objective to specify the advantages and disadvantages of manual gaming simulation and to state whether manual gaming should be used as a training method.

Condition: Given a training objective in military instruction presented in conventional military fashion.

Standard: For four of five separate and independent training objectives, correctly state for each the advantages and disadvantages of manual gaming simulation as a training method in terms of cost and effectiveness and correctly conclude whether the advantages of manual gaming simulation are such that it should be selected as a training method.

TRAINING OBJECTIVE 4

Training Task: Prepare a plan for the design of a manual gaming simulation system that will train for accomplishment of specified training objectives.

Condition: Given training objectives judged to be appropriate for training through gaming simulation and presented in conventional military fashion.

Standard: Two of three individuals expert in the development of gaming systems judge that the design plan describes all tasks required for development of a manual gaming simulation system and that the implemented design would effectively train for accomplishment of the objective.

TRAINING OBJECTIVE 5

Training Task: Play the illustrative game to its conclusion.

Condition: Given an opposing player with an appropriate entry level in U.S. company-level tactics and in the tactics of threat forces; a complete copy of the illustrative game to include gaming paraphernalia and instructions; an adequate period of time to study the rules for playing the gaming simulation; free-play mode of play of the illustrative game.

Standard: The player completes a play of the illustrative game correctly according to the rules of the game without violating any rule more than once.

TRAINING OBJECTIVE 6

Training Task: Serve as a controller (umpire) of the illustrative game.

Condition: Given opposing players with appropriate entry levels in U.S. company-level tactics and in the tactics of threat forces; a complete copy of the illustrative game to include gaming paraphernalia and instructions; an adequate period of time to study the rules for play of the gaming simulation; controlled mode of play of the illustrative game.

Standard: Play of the illustrative game is completed with the controller's permitting no more than one violation of each rule and with the controller's providing consistent and accurate interpretations of situations not covered by the rules of the game.

TRAINING OBJECTIVE 7

Training Task: Prepare a plan for testing the playability and workability of a manual gaming simulation system.

Condition: Given a manual gaming simulation system designed to train according to specifications including designated training objectives; specifications for the manual gaming simulation system.

Standard: Two of three experts in the development and testing of gaming and simulations judge that if the test plan were implemented with players from the target training population, reliable and valid measures pertaining to the workability and playability of the gaming simulation system would be obtained. Workability refers to issues related to complete play of the gaming simulation system in terms of its specifications. Playability refers to the ease/difficulty with which the game can be played.

TRAINING OBJECTIVE 8

Training Task: Develop a plan for modifying manual gaming simulation techniques applied as part of current instruction.

Condition: Given an example of current instruction in which techniques of manual gaming simulation are used as part of the training methods and in which the contributions of the techniques to training effectiveness are identifiable.

Standard: Two of three experts in gaming and simulation judge that the planned modification will increase the gaming techniques' contribution to the effectiveness of the instruction.

APPENDIX C

PROGRAM OF INSTRUCTION COURSE OUTLINE

COURSE OUTLINE

I. Introduction to Course (2 hours).

Method - Lecture/Discussion.

A. Welcome

B. Administrative Details.

C. Overview of Course.

D. Introduction to this block of instruction.

E. History of Gaming

II. Concepts and Components in Simulations and Games (2 hours).

Method - Lecture/Discussion.

A. Introduction

B. The Fundamental Concept - "Manual Gaming Simulation System".

C. Definition of Game.

D. Definition of Simulation.

E. Definition of Gaming Simulation.

F. Ways of Categorizing or Distinguishing Among Gaming Simulations.

G. Ways of Employing Gaming Simulation.

H. Summary.

III. Types of Gaming Simulations I (2 hours)

Method - Lecture/Discussion.

A. Introduction.

B. Computer Use in Gaming Simulations.

C. Manual Gaming Simulations - Three Dimensional

D. Manual Gaming Simulation - Two Dimensional

E. Summary.

IV. Types of Gaming Simulations II (2 hours)

Method - Practical Exercise

A. Introduction to Tanker Game.

B. Play of "Tanker."

C. Introduction to Battalion Staff Game.

D. Play of "Battalion Staff."

E. Class Discussion.

F. Instructor Summary.

V. Types of Gaming Simulations III (2 hours).

Method - Lecture/Discussion

A. Introduction.

B. Flat Terrain (Game Board) Simulations.

C. Two-Dimensional Unit Simulations.

D. Variations in Game Rules

E. Significant Military Gaming Simulations for Instructional Purposes.

VI. Types of Gaming Simulations IV (2 hours).

Method - Practical Exercise

A. Introduction to Kriegsspiel.

B. Play of Kriegsspiel.

C. Introduction to Wurzburg.

D. Play of Wurzburg.

E. Class Discussion.

F. Instructor Summary.

VII. Use of Games for Instructional Purposes I (2 hours)

A. Introduction

B. Learning Principles Applicable to Gaming

C. Knowledges and Skills Acquired Through Gaming.

D. Types of Training Objectives Most Effectively Accomplished with Games.

E. Requirements for Effective Instruction Through Gaming.

F. Meeting Instructional Needs.

G. Summary.

VIII. Types of Gaming Simulations V: The Introductory Game (2 hours).

Method - Practical Experience.

A. Introduction to MECHSTART, the Introductory Game

B. Play of MECHSTART.

C. Class Discussion.

D. Summary.

IX. Use of Games for Instructional Purposes II (One hour)

Method - Lecture/Discussion.

A. Introduction.

B. Instructional Effectiveness of Gaming Simulations.

C. Advantages and Disadvantages of Gaming Simulations.

D. Resources Required to Develop Manual Gaming Simulation Systems.

E. Resources Required to Implement Training with Games.

F. Summary

X. Use of Games for Instructional Purposes III (3 hours).

Method - Practical Exercise.

A. Introduction to Illustrative Game, TEAM ALPHA.

B. Orientation.

C. Play of Game Under Controlled (with Controller) Conditions.

D. Class Discussion and Analysis

E. Summary.

XI. Design of Gaming Simulation Systen I (2 hours).

Method - Lecture/Discussion.

A. Introduction.

B. Gaming Simulation Component.

C. Steps in Designing Gaming Simulations.

D. Developing a Game Model.

E. Specifying Inputs and Boundary Conditions.

F. Designing and Communicating Game Rules.

G. Designing Gaming Simulation Paraphenalia.

H. Testing the Design.

I. The Reward of Building a Gaming Simulation.

J. Summary of Gaming Simulation Design Procedures.

XII. Design of Gaming Simulation Systems II: Design of a Gaming Simulation (2 hours).

Method - Practical Exercise.

A. Introduction.

B. Exercise - Design a Gaming Simulation

C. Class Discussion and Analysis

D. Summary.

XIII. Design of Gaming Simulations III (2 hours).

Method - Lecture/Discussion.

A. Introduction.

B. Developing Instructional Objectives.

C. Designing Instructional Scenarios.

D. Designing an Evaluation System.

E. Feedback and Critique Procedures.

F. Summary.

XIV. Design of Gaming Simulation System IV: Design Instructional Component (2 hours).

Method - Practical Exercise.

A. Introduction.

B. Exercise - Design an Instructional Component of a Gaming Simulation System.

C. Class Discussion and Analysis.

D. Summary.

XV. Evaluating Effectiveness I (One hour).

Method - Lecture/Discussion.

A. Introduction - Determining Playability and Workability.

B. Definitions.

C. Issues to be Addressed.

D. Steps in Pre-Testing Workability of a Gaming Simulation.

E. Summary.

XVI Use of Games for Instructional Purposes IV (3 hours).

Method - Practical Exercise.

A. Introduction to FIREFIGHT, a Platoon-level Game.

B. Play of FIREFIGHT II.

C. Class Analysis and Discussion.

D. Summary.

XVII. Evaluating Effectiveness II (Two hours).

Method - Lecture/Discussion

A. Introduction - Determining Training Effectiveness.

B. Training Effectiveness

C. Validity of Gaming Simulations.

D. Criteria.

E. Design of Effectiveness Evaluations.

F. Summary.

XVIII. Evaluating Effectiveness III: Design an Evaluation Study (2 hours).

Method - Practical Exercise.

A. Introduction.

B. Exercise - Group Assignment - Design an Effectiveness Evaluation Study.

C. Class Discussion and Analysis.

D. Summary.

XIX. Modifying Current Instruction (One hour).

Method - Lecture/Discussion

A. Introduction.

B. Gaming Simulation Techniques in Current Instruction.

C. Criteria for Assessing Instructional Contributions.

D. Procedures for Assessing Contributions.

E. Modifying Techniques to Improve Instruction.

F. Evaluating Modifications.

G. Summary.

XX. Use of Games for Instructional Purposes V (2 hours).

Method - Practical Experience.

A. Use of Illustrative Game Without Controllers.

B. Play of TEAM ALPHA Without Controllers.

C. Class Discussion and Analysis.

D. Summary.

XXI. Conclusion to Course.

Method - Lecture/Discussion.

A. Introduction.

B. Class Discussion of Central Issues and Problems.

C. Summary of Course.

F. Concluding Remarks.