TOTAL CLASS INVOLVEMENT IN
SIMULATION GAME DEVELOPMENT

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This is to certify that the

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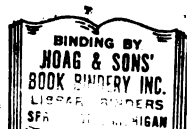TOTAL CLASS INVOLVEMENT IN
SIMULATION GAME DEVELOPMENT

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ABSTRACT

TOTAL CLASS INVOLVEMENT IN SIMULATION
GAME DEVELOPMENT

By

Ann Converse Shelly

Involvement of students in the development of simulation games for their own class use is a recurring topic in the professional literature. There have been, however, no systematic reports of how classes might develop simulation games nor of the effect of such procedures on those involved. The purposes of this study were to: (1) develop materials for a whole class to utilize in simulation game development, (2) test those materials in an instructional setting, and (3) revise the materials following testing. Since the sample used for the study consisted of undergraduate students in a course entitled "Methods of Teaching Social Studies in Elementary Schools," another facet of this study involved an examination of attitudes held by students, as future teachers, toward the process of total class development of simulation games.

The study sought to answer two basic questions:

1. Given a model for simulation game development and a series of modules designed to assist in the development, can a total class develop a simulation game?

2. Because the sample used will be future teachers, what are the feelings and attitudes that they held following the work in regard to the process of total class development of simulation games?

The sample consisted of undergraduate students enrolled in three sections of the course, "Methods of Teaching Elementary Social Studies in Elementary Schools" taught at Michigan State University. The three sections were similar in experience with and interest in simulation games, class level, and mean grade point average. The classes differed in size of group (30, 16, 31) and self-perception of academic ability.

The author's Model for Simulation Game Development used in this study was a heuristic model consisting of six categories: objective, simplified model, players, game goal, rules, and materials. While these steps were sequential in nature, free movement between them was encouraged. Six modules completed the materials packet. Based on the Model for Simulation Game Development, they provided information about objective, prerequisites, teaching strategies, and evaluation for six class meetings of fifty minutes each. Other instruments used were Student Data Questionnaire, Postclass Questionnaire, and Student Evaluation Form. The games produced by class sections were evaluated by three jurors.

All three class sections did develop, play, and debrief simulation games. The evaluators reported weaknesses in objectives for all games, choice of decision-making models, and role development. Students had identified most of the problems.

Students responded very positively to the process of total class game development. Quality of student participation, as estimated by students, was high. Estimates of learning for both the topic of the

game and the process of game development were also high. Responding
as future teachers, students were willing to state that they would
try the process with their own classes.

The Model for Simulation Game Development was revised on the
basis of results of this study. Revisions were designed to provide a
clearer and less complicated process for simulation game development.
There were three changes of a substantive nature: creation of a rounds
element, addition of a section on debriefing, and inclusion of a para-
graph suggesting revision and retesting of the game. The modules
were revised to match the revised Model for Simulation Game Development.
Substantive changes included addition of initial experiences, a longer
time span, and a module for revision of the game.

Recommendations for further research included five proposed
research designs as well as a general discussion of topics directly
germane to the present study. One topic meriting special attention
was the dynamics of group participation in simulation game development.

TOTAL CLASS INVOLVEMENT IN SIMULATION
GAME DEVELOPMENT

By

Ann Converse Shelly

A THESIS

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DEDICATION

This volume is dedicated to my husband, Robert, and our children, Marshall and Elizabeth, for their unconditional love and support over the past three years.

ACKNOWLEDGMENTS

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Chapter I

INTRODUCTION

Involvement of undergraduate students in the development of simulation games for their own class use is a recurring topic in the professional literature. Despite this, there have been no systematic reports of how classes might develop simulation games nor of the effect of such a procedure on the classes involved. It was the purpose of this study to: (1) design materials and strategies for use by a college class in methods of teaching elementary social studies for simulation game development; (2) test such materials and strategies under actual instructional conditions; and (3) revise the materials and strategies at the conclusion of instruction.

Background to the Study

Simulation games were among the first of the new techniques studied and used when the impetus for change in school curricula reached the social studies. The first games used were developed by subject matter experts and by game theory specialists. Following these games came simulations developed by educators at the university level. When classroom teachers began to feel the need for simulation games that met the needs of their own subjects and, more importantly, the needs of their own students, professional game designers began teaching game design to teachers so they could design games to meet specific demands of their situations.

Models for game development were developed and disseminated in the more popular journals for teachers. Many models were based on the idea that game development was less a science than an art, that development was guided by heuristic rules rather than specific, detailed laws. It is that that made possible the next phase in the use of games in schools. The movement emphasizing the self-determination of students and the attempts by students to have more say in the materials and techniques of their own education augmented the efforts of some game designers to have students design and play their own simulation games.

With the advent of less formally structured schools and classrooms, there was a need felt by many teachers for techniques which enabled them to become freer and which aided students in re-developing a self-deterministic attitude. Methods were needed that would help students practice decision-making and self-directed behaviors.[1] The development of games by students for their own use with the direction of the teacher and with the use of one of the heuristic models for simulation game development is one of the techniques that can aid teachers and students in developing and practicing skills needed for freer and more open-ended climates.

The use of student game development is certainly justified from the point of view of learning theory.[2] One of the chief ways in which people learn effectively is through manipulation of information,

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[1]John R. Raser, _Simulation and Society_ (Boston: Allyn and Bacon, Incorporated, 1969), pp. 114-115.

[2]See: Jerome Bruner, _Toward a Theory of Instruction_ (Cambridge, Massachusetts: Belknap Press, 1966) and J. Charles Jones, _Learning_ (Chicago: Harcourt, Brace and World, Inc., 1967).

especially when there is a utilitarian motive. In the process of game development, students first examine various processes which are operative in the problem area that concerns them. As they narrow the field of information to make their choice of process, they begin to explore various sources of information. Once the choice of topic and process is made, students begin to search for specific information, always in the context of the real-life problem (process) that they are examining. Thus, in the information gathering process, they manipulate information several times, always in the context of a situation relevant to them, i.e., the development of a simulation game they will play.[3] The effect of this type of contact with information is reinforcing and helps the developers maintain behaviors that are productive of learning. As they begin the process of developing the game, they must make decisions concerning the importance of the pieces of information in view of the process they are examining. Once they have decided that information should be a part of the simulation game, they must decide how it can best be represented in the game so that it enhances the simulation of reality.

During the play and evaluation of a group developed game (integral parts of the development process), students again manipulate the knowledge they have prepared, they make decisions and evaluate them within the simulation of reality. During the debriefing, player-developers first evaluate their play on the basis of the game itself. They must then evaluate the simulation game, relating the game to the

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[3]J. L. Fletcher, Donald A. Koeller, and David S. Martin, "The Caribou Hunting Games," Simulation and Gaming in Social Science, ed. Michael Inbar and Clarice S. Stoll, (New York: Free Press, 1972), p. 172.

reality that they originally studied. After revisons have been made, the cycle begins again, to continue until the developers are satisfied that their efforts have produced a reasonable representation of reality.

Not only do the students have continuous contact with information as they develop, play, and evaluate a simulation game, but they also have an opportunity to develop various information seeking skills as they search for additional information. The specific skills depend upon the type of process they are examining, but these can range from use of library resources to human resources (interviewing, writing, etc.) to valuing their own minds and experiences as a source of data. The mental skills for processing data and utilizing it are not neglected either. In order to translate the "raw" data into useful form, they must evaluate the information they have obtained in the light of the process they have chosen to simulate. They must synthesize the information that they chose as valuable and valid into forms useful in the simulation game. They then use the information to make decisions on courses of action within the game. When they have played the game, they again utilize the data as they analyze their play and the play of the game in relation to reality. They manipulate the data on virtually all of the cognitive levels of knowledge of specifics to evaluation in terms of external criteria.[4]

State of the Literature

In recent years, the popular literature concerning simulation games has contained many references to the possibility of whole class

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[4]Benjamin S. Bloom (ed.), _Taxonomy of Educational Objectives,_ _Handbook I: Cognitive Domain_ (New York: David McKay Company, Inc., 1956).

design of simulation games. Alice Kaplan Gordon said it most plainly

in her book, <u>Games for Growth</u>.

> Designing games can be an extremely difficult,
> frustrating activity. But like most creative efforts,
> it is highly rewarding. For the teacher, games design
> can not only produce useful, effective classroom
> exercises, but can be personally instructive. Even
> more exciting is the possibility of encouraging classes
> to design their own games, for the analysis and
> decision making necessary to creating a game is
> probably more educational than participation in a
> fully designed game.[5]

She stated the rationale for this by giving the following reasons:

(1) The dependence of the total class upon each individual's involve-

ment is an incentive to most students, (2) The activity has immediate

classroom application in addition to the educational value of the

search because each item must be evaluated and integrated into the

game, (3) The evaluation of each student's efforts rests in the

game and with his peers, (4) One group of justifications includes

the creation of a product that will be used by the class, (5) Finally,

the games will usually deal with real-life issues in real-life ways.

Gordon also stated that it would be best if the teacher attempting

this were familiar with game development through his or her experience.[6]

Simulation Games for the Social Studies Classroom by William

Nesbitt, a widely disseminated pamphlet, also encouraged the develop-

ment of games by students. Although no studies were cited, the author

assumed that it could be done. He said:

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[5]Alice Kaplan Gordon, <u>Games For Growth</u> (Palo Alto: Science
Research Associates, 1970), p. 122.

[6]Ibid., p. 123.

A student-designed game...may not turn out to have lasting value, for it might not teach the student-players those things it was designed to teach. Or, it might be too difficult to play. What is important is that the student-designer would have become involved in a process of learning familiar to an experimental scientist, bringing to bear a combination of historical research, imagination, and inquiry---learning to "grow his own plants" instead of having been handed "cut flowers."[7]

Cleo Cherryholmes in his article "Some Current Research on Effectiveness of Educational Simulation: Implications for Alternative Strategies" took a similar position. He pointed out that students take the role of scientists in finding, evaluating, and integrating parameters of the game and the situation that they are studying. Game construction raises problems of building explicit theory about the referent system. "...The learner should take the place of the scientist in discovering a subject such as a scientist discovers new information."[8]

"Understanding the Operation of Complex Social Systems" by Daniel Druckman made the same point. In discussing the student as the discoverer of knowledge, he said:

Actually, the advantages in terms of concept-learning over more traditional teaching methods may be more apparent in simulation design than in participation. In addition to representing the parameters of the system that is being reproduced, the designer is forced to make explicit the nature of the relationship between these parameters or processes.[9]

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[7] William A. Nesbitt, "Simulation Games for the Social Studies Classroom," New Dimensions, 1:1 (1968), p. 3-6.

[8] Cleo Cherryholms, "Some Current Research on Effectivenss of Educational Simulations: Implications for Alternative Strategies," American Behavioral Scientist, 10:2 (1966), p. 4-5.

[9] Daniel Druckman, "Understanding The Operation of Complex Social Systems," Simulation and Games, June, 1971, p. 175.

Druckman recognized that the quality of the end product would vary, but felt that the "ecology of discovery" was the real value of simulation game design.

John Raser in Simulation and Society reported that several teachers had at least involved their students in revision and development of simulation games. These teachers reported that there was an increase in learning through the developmental process that they had not seen in the game playing alone. Specific reports of how this was done and what kinds of testing were carried out were not available. The degree of student involvement in the original design process was limited, but the information suggested that students would be able to carry out the total process with guidance. Raser's analysis of the reports of student game design and of the indifferent results of research with simulation game playing and learning, led him to state:

> All the research on student learning, as far as I
> have been able to discover, was carried out in situations
> where students were merely required to play an already
> constructed game--and usually for only a few sessions.
> I have argued that the power of simulations, as a tool
> for developing and testing theory, derives less from
> their operation per se, than from attempting to construct
> and refine them.[10]

His own observations of the "few instances in which this approach has been used" indicated that students had been much more involved and had been pushed harder with more sustained interest than they had been in situations where they only played the game. Most specifically, he pointed out that this aspect of simulation gaming has been largely ignored by those studying the eduational effectiveness of simulation games.

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[10]Raser, op. cit., p. 131.

Project SIMILE attempted through the collection and analysis of hundreds of observations to produce a coherent statement about the field of educational simulations and games. Although they found this impossible to do (producing instead a list of hunches), the same type of reaction as those cited above was found. Guessing that participation may lead naturally to analysis of the simulation, respondents also felt "...And maybe the greatest learning occurs when students build their own simulations."[11]

Clearly the literature documented the positive feelings that many in the field of simulation gaming have for the idea of student development of simulation games. The authors mentioned above regard student design as a viable, valuable technique, but there is one basic gap in the literature. In order to evaluate the learning that may take place, the work of total class development of simulation games must take place. There were few suggestions concerning how an instructor might work with a class to develop a simulation game.

Statement of the Problem

The thrust of this study was to develop a model for simulation game design that was usable for students unfamiliar with the theoretical aspects of game theory and of simulation design in general; one that could be used by a whole class for the purpose of developing a simulation as a group. In addition, it was necessary that the model be combined with a method of use that allowed for both similar stages of development between groups and differences in the precise order of

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[11] *Occasional Newsletter About the Uses of Simulations and Games for Education and Training*, numbers two and three.

steps. The result of this work was a packet of materials that included a model for simulation game development and a series of lesson modules (lesson plans) for use with classes for total class development of games.

The second step in the study was to test this packet with classes to determine whether the classes could develop simulation games functioning as a single unit revise the packet of materials in view of the events (successes and failures) that occured in the process of testing. An evaluation of the simulation games was one facet of this step.

A final element of the problem was also the basis for the choice of the sample used. Total class development of simulation games involves not only the students in the class, but it must also include the instructor. In order to sample the attitudes of future teachers toward the process being studied, that population provided the "students" for the testing of the process and the materials developed. By taking part in the process of total class development of simulation games, it was hoped that future teachers would have an inside view of how it feels. They would be able to relate their attitudes toward the concept in terms of their prospective teaching. In addition, they would be responding as a group that was semi-skilled in simulation game development.

Questions to be Studied

The purpose of this study was best stated in the form of questions, rather than hypotheses:

1. Given a model for simulation game development and a series of modules designed to assist in the development, can a total class develop a simulation game?

2. Because the sample used will be future teachers, what are the feelings and attitudes that they held following the work in regard to the process of total class development of simulation games?

The two responsibilities growing out of this study were: (1) the development, testing, and revision of the packet of materials for total class development of simulation games, and (2) the generation of hypotheses for future, more rigorous study should it prove feasible.

Procedures for the Study

There were three phases in the study of total class involvement in simulation game development. Figure 1 illustrates the steps. The first phase was the development of the materials for use in the study. This involved the revision of an earlier model for Simulation Game Development to make it more suitable for use with a whole class. Development of the modules, based on the Model for Simulation Game Development, was also involved in this phase.

The second phase was the testing of the materials, the Model for Simulation Game Development and the modules. The six modules each occupied a time period of fifty minutes each. Three classes were used and each went through the entire process.

The final phase was the evaluative segment. The three elements of evaluation were the students' evaluation of the process, the evaluation of the class-developed simulation games by three people experiences in simulation game development, and evaluation and revision of the Model for Simulation Game Development and the modules.

Limitations of the Study

The main limitation imposed upon this study was the lack of reported work in the area of total class development of simulation games. The effort here was to provide a basic model from which to work

Figure 1

STEPS INVOLVED IN THE STUDY OF TOTAL CLASS INVOLVEMENT
IN SIMULATION GAME DEVELOPMENT
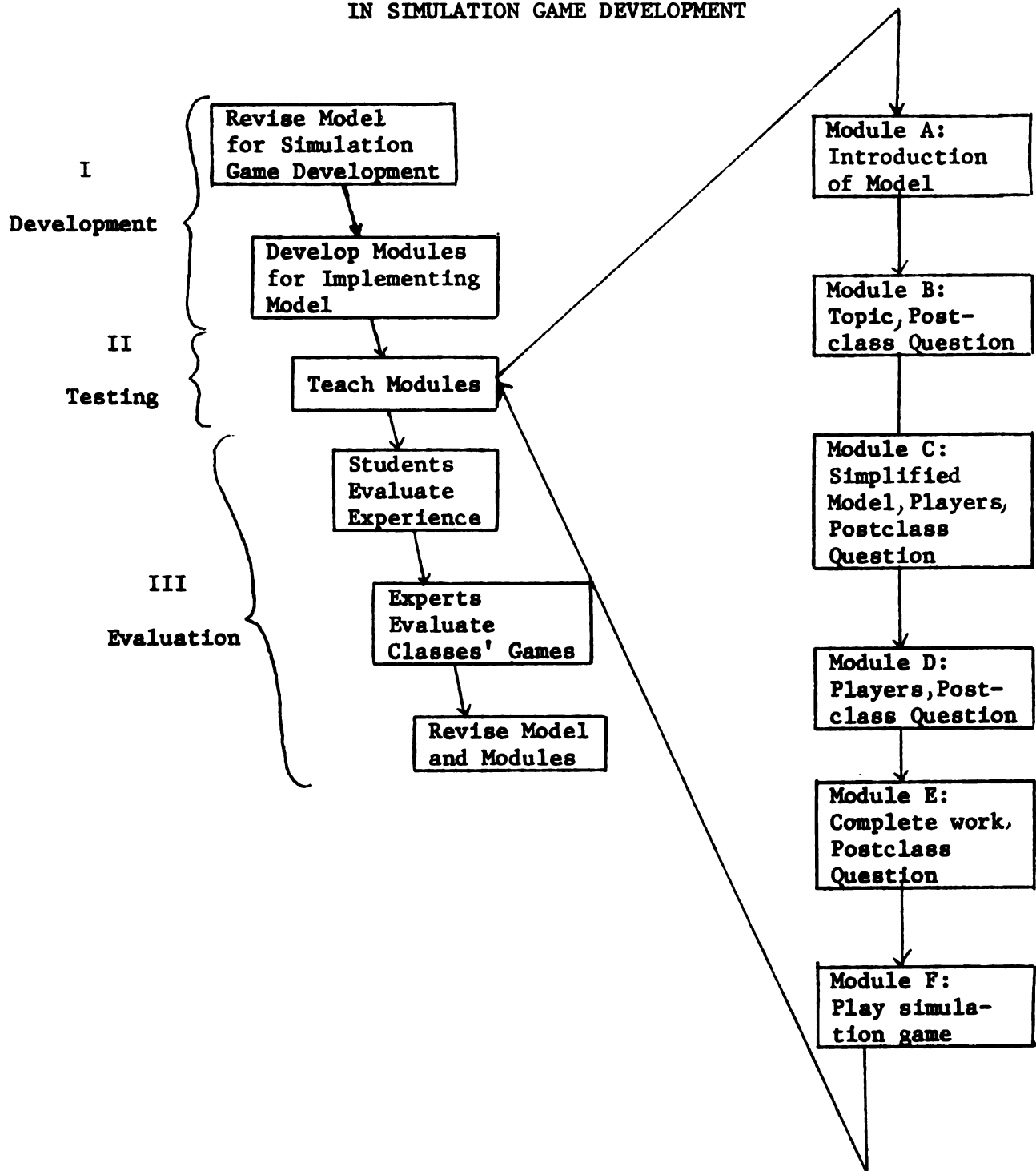
in future research and to develop hypotheses that might be tested in a more rigorous, controlled manner. The major question was whether or not a whole class, as a unit, could develop a simulation game. For this purpose the sample was small and select. There was no assumption of generalizability beyond the immediate population. If generalizability becomes an appropriate question, it is a focus for study that will follow.

Another specification about the study that must be made was the fact that the model for simulation game development used was not the only appropriate model in existence. No attempt was made to value this one above others. The question was the workability of this model and the value of the results, if any, that were produced through its use.

Basically, this study was a pilot of a pilot study with the major outcomes a packet of tested materials and hypotheses capable of being tested if the study indicated such research were possible.

Definition of Terms

There are many variations in the use of terminology in the field of simulation and gaming. For the purpose of this study, the following definitions were used. The only variation was the use of "game" and "simulation game" as interchangable in a form of shorthand that is frequent in the literature. There is often difficulty, in reality, in drawing hard and fast lines between the various categories, since each of the terms is often a part of the others. The basic elements of each are implicit in the definitions.

<u>Debriefing</u>: Games, role plays, simulations, and simulation games are followed by an analytic and evaluative session referred to here as the debriefing.

<u>Game</u>: A contest between two or more players seeking to win (gain their objective) according to rules.

<u>Role Play</u>: Participants assume roles in given situations. This can be loosely structured or quite highly structured. There is no win-lose element.

<u>Simulation</u>: A simulation is an operating model of a physical or social situation that simplifies reality. It allows practice in a less dangerous, less costly, less complicated environment.

<u>Simulation Game</u>: Players assume the roles of decision-makers in a simulated environment and seek to gain their objective according to specified rules and procedures.

Organization of the Paper

Because of the dearth of reported research related to the problem of total class development of simulation games, Chapter I included the state of the literature as well as the introduction to and background for the study.

The second chapter includes the model for simulation game development as well as the modules designed to implement it. The measures of attitude are presented and the samples are described.

Chapter III presents an analysis of the information gathered. It is organized around the major questions discussed previously:

1. Given a model for simulation game development and a series of modules designed to assist in the development, can a total class develop a simulation game?

2. Because the sample used will be future teachers, what
   are the feelings and attitudes that they held following
   the work in regard to the process of total class
   development of simulation games?

Chapter IV is a forward look based on the results of the study.
Two responsibilities are an examination of the materials developed
for this work and an examination of further research indicated by the
analysis.

Chapter II

PROCEDURES, MATERIALS, SAMPLE

The major elements of the study were: (1) preparation of
materials, (2) use of materials with the three sections of students,
and (3) evaluation of the process of total class involvement in
simulation game development, of the simulation games developed, and
of student attitudes (as future teachers) toward the process. The
chapter presents the methodology of the study, the Model for Simulation
Game Development, the modules (lesson plans) for implementation of
the model, a brief discussion of the attitudinal measures chosen, and,
finally a description of the sample utilized in the study.

Methodology of the Study

The study was divided into three phases. The first phase
included the preparation of materials. The Model for Simulation
Game Development was revised for use with college classes and modules
implementing the model were developed.

The second phase was the use of the materials with college
classes. The sample consisted of three sections of an undergraduate
course entitled Methods of Teaching Elementary Social Studies taught
in the College of Education at Michigan State University. The sections
involved in the study met three times a week for two weeks. Each
session was fifty minutes in length and one module was utilized for
each session.

Steps in data collection were as follows:

1. Administer Student Data Questionnaire.
2. Play of the simulation game War or Peace.
3. Module A.
4. Module B, C, D, E (each followed by 5).
5. Administer Postclass Questionnaire
6. Module F.
7. Administer Student Evaluation Form.
8. Evaluation of class-developed simulation games.

The final phase of this work involved analysis of the process of total class involvement in simulation game development, using the Postclass Questionnaire and Student Evaluation Form as well as tape recordings.[1] Also included was an evaluation of the student-developed games by experts in the field of simulation game design. Finally the students' attitudes (as future teachers) toward the instructional processes were examined.

Materials: Model for Simulation Game Development

The model presented below is similar to many of the models presented in the literature. This class of models is general in nature and flexible in the order of steps. Models for development of simulation games created by Shelly,[2] Gordon,[3] and Nesbitt[4] all belong to this class of heuristic guidelines. (See Figure 2 on the following page)

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[1]See Appendix B for copies of Postclass Questionnaire and Student Evaluation Form.

[2]An earlier version of the model presented here appeared in: Ann Shelly, A Program for Self-Instruction on Simulation Games unpublished manuscript, 1971.

[3]Alice Kaplan Gordon, Games for Growth (Palo Alto: Science Research Associates, 1970), chapter 5.

[4]William A. Nesbitt (ed.), "Simulation Games for the Social Studies Classroom," New Dimensions, 1:1, 1968.

Figure 2

HEURISTIC MODELS FOR SIMULATION GAME DEVELOPMENT

Shelly	Gordon	Abt
1. Define objectives	1. Define design objectives	1. Define overall objectives
2. Prepare simplified model and scenario	2. Determine scope of game	2. Determine scope
3. Chart the players decisions, resources	3. Identify key players in process	3. Identify key actors
4. State game goals	4. Define objectives of actors	4. Determine actors' objectives
5. Determine sequence of events and rules	5. Define actors' resources	5. Determine actors' resources
6. Prepare materials and test	6. Determine decision rules	6. Determine interaction sequence among actors
	7. Determine interaction sequence	7. Determine decision rules
	8. Identify external constraints	8. Determine external constraints
	9. Decide win criteria	9. Formulate win criteria
	10. Choose form of presentation	10. Prepare form of presentation

The intent was to guide the developer through processes that could serve as the basis for simulation games. In working with a total class situation, the more general type of model allowed for greater adaptability and was more open to changes if they became necessary. The model served as a guideline and a format against which the product was checked for completeness.

The Model for Simulation Game Development (Figure 3) utilized in this study consisted of six major sections: objective, simplified model, players, game goal, rules, and materials. While the basic plan was sequential, movement back and forth between sections was encouraged.

The first step was choice of topic, a process, by class members for the game they were to develop. The second, simplified model, involved reporting what happened in a "real life" setting. Determining who was involved in the simplified model, what decisions they had to make, and what their resources were was the students' task during the next step. Each player's game goal was set in step four by students. The final two steps, rules and materials, prepared the simulation game for test play by students.

The model for game development was supplemented with worksheets based upon charts in sections III, IV, and V. In addition, a practice sheet for analysis of simulation games was developed based upon the model. The purpose of this worksheet was to familiarize students with elements of simulation games and at least one way of representing reality within the constraints of a simulation.

Figure 3

MODEL FOR SIMULATION GAME DEVELOPMENT

I. **Objective:** What do you want to teach through the simulation game? It should be a process and there should be a pattern or model present. It is easier to develop a game around a decision-making process than something static and unchanging. As you write, think of the things you want to be able to do after you have played the game. Social studies content offers many examples of processes, ranging from historical events to human relations to government, etc.

II. **Simplified Model:** Think of a specific situation in which the process you have chosen is used. Describe that situation as completely as possible. Tell what happens, the order of events, who is involved. From this, write a brief descriptive statement (scenario) to introduce the simulation game.

III. **Players:** Who is involved in the situation you described above? Be sure you have a complete list. Use the chart outlined below to indicate what decisions each player makes, what the possible choices are, and what the results should be for each choice.

Player	Decision Topic	Choices	Outcomes

Be as complete as possible. When you have completed the charts for each player, look back over the charts and locate the resources each player or group of players uses. These could be money, good will, votes, etc. Use the next chart to record the resources.

Player	Resources

IV. <u>Game Goal</u>: State as simply as possible what the goal of each

player or groups of players is <u>for</u> <u>the</u> <u>game</u>.

Player	Game Goal

V. <u>Rules</u>: Examine the description of the situation again. Where

are there breaks in the action? What seem to be the natural

rounds? What does each player do in each round? How much

game time do you want to allot? Are there things that you need

to impose upon the players at some point during the game?

Crises, new laws, etc. Add them to the chart, indicating when

they are to be imposed and how.

Round	Event	Player	Moves	Time

VI. <u>Materials</u>:

A. Make a copy of the scenario for each player.

B. Write a description of each player or group of players.

C. List all materials that the players will need to perform
their duties and to use as resources.

D. List the rules (behavior guides) for the game and each
round.

Materials: Modules for Simulation Game Design

The second element of the packet of materials developed consisted of the lesson modules or plans. These modules were based on the model for simulation game design described above. Although the steps appear to be rigid, it is essential to remember that each module carried with it certain prerequisite or entry behaviors. If these had not been met fully, the instructor dealt with the problem directly and this required that the format remain basically flexible. One item to keep in mind was that a class might feel that a step previously regarded as complete was in need of revision. The freedom to make changes was implicit in the basic planning. The basic modules for total class development of simulation games used in this study are described below.

MODULE A

1. Purpose: Introduction of the model and brief discussion of its use.

2. Objective: After an explanation of the model, the students will participate in an abbreviated practice session involving an examination of a prepared game.

3. Prerequisite: The students will have participated in the play of War or Peace and will have been introduced to the concept of simulation games.

4. Teaching Strategies:
   a. Students will be given a copy of the model for simulation game development.
   b. The instructor will read and expand upon the description of each element of the model, using questioning to determine the extent of understanding on the part of the class.
   c. The students will receive copies of War or Peace, a simulation game in which they participated earlier.

d. With the instructor acting as moderator, the
    students will examine the game to identify the
    elements of the model as they are represented
    in the game.

5. **Evaluation:** Each student will complete a work sheet for
    the exercise described above by the next class meeting.

6. **Instructional Resources Required:**
    a. A copy of the Model for Simulation Game Develop-
        ment for each student.
    b. A copy of the simulation game, <u>War or Peace</u>, for
        each student.
    c. A copy of worksheet 1 for each student.

MODULE B

1. **Purpose:** Choice of the process to design the game around
    and first attempt to describe the simplified model.

2. **Objective:** The students will decide upon a process to
    design the game around and will produce a rough copy of the
    simplified model.

3. **Prerequisite:** The students will have completed Module A
    successfully.

4. **Teaching Strategies:**
    a. The instructor will review the section of the model
        entitled <u>Objective</u>.
    b. The instructor will ask for suggestions of processes
        that might be used in game design. Each suggestion
        will be listed on the board without comment.
    c. When all suggestions have been listed, the instructor
        will ask the students to evaluate them. The goal
        of the effort is to eliminate those which the class
        regards as unworkable. When all evaluative comments
        have been noted, the class will vote on the topic
        suggestions.
    d. When the topic choice is complete, the instructor
        will review the section of the model entitled
        <u>Simplified Model</u>.
    e. The instructor will ask students to list the elements
        of the model as they see them, writing all suggestions
        on the board without comment.
    f. The students will be given a worksheet to use to
        identify the elements of the simplified model and
        write a scenario.

5. Evaluation:
   a. The students will have chosen a process to use in development of the simulation game.
   b. The students will complete a worksheet concerning the elements of the simplified model and a scenario.

6. Instructional Materials Required:
   a. A copy of the model for Simulation Game Development for each student.
   b. A copy of worksheet 2 for each student.

MODULE C

1. Purpose: Completion of the simplified model and scenario. Begin work on Players.

2. Objective: The class will complete the basic simplified model. The class will identify the players involved in the model and will begin to fill out the Decision Chart.

3. Prerequisite: The students will have completed Module B successfully.

4. Teaching Strategies:
   a. Using the worksheets given out in module B, the students will identify the elements of the simplified model, while the instructor acts as moderator and records the suggestions of the students.
   b. When there are no more elements suggested, the students will order them and evaluate the relative importance and/or necessity of each.
   c. A group of students will be selected to write the complete model and the brief scenario.
   d. The decision chart will be introduced.
   e. The instructor will ask the class to identify one decision topic with its attendent choices and outcomes.
   f. Each student will be given a Decision Topic Chart to complete.

5. Evaluation:
   a. The small group will complete the scenario and the simplified model and prepare a copy for each class member.
   b. The remainder of the class will complete the worksheet, Decision Topic Chart.

6. Instructional Materials Required:
   a. Completed worksheet 2.
   b. A copy of worksheet 3 for each student.

MODULE D

1. **Purpose:** Completion of Decision Topic Chart, the Player Resource Chart, and the Game Goal Chart.

2. **Objective:** The class will complete the Decision Topic Chart, the Player Resource Chart, and the Game Goal Chart.

3. **Prerequisite:** The students will have successfully completed Module C.

4. **Teaching Strategies:**
    a. The instructor will ask the class to identify the players in the model.
    b. The instructor will ask the students to list the possible decision topics for each player. They will use the worksheets completed in Module C.
    c. The students will divide into groups, one for each player or group of players and complete the Decision Topic Chart, the Player Resource Chart and the Game Goal Chart for the player or group of players they are assigned.
    d. The instructor will serve as facilitator, moving between groups.

5. **Evaluation:** Each group of students will complete the three charts and prepare copies for each class member.

6. **Instructional Materials Required:**
    a. Completed worksheets from Module C.
    b. Copies of the Decision Topic Chart, the Player Resource Chart, the Game Goal Chart for each student.
    c. Copies of the scenario and the simplified model.

MODULE E

1. **Purpose:** Completion of the Rules Chart

2. **Objective:** The class will complete the Rules Chart.

3. **Prerequisite:** The students will have successfully completed Module D.

4. **Teaching Strategies:**
    a. The students will have copies of the completed scenario, simplified model, decision charts, resource charts, and game goal charts.
    b. The instructor will ask the students to check for consistency among the various charts.

      c. Errors will be corrected.
      d. Check with the students for the final form of the game.
          1. scenario
          2. rounds and rules (Rules Chart)
          3. description of players with resources and goals.
          4. list of materials needed.
      e. Assign group to prepare game for play (working with instructor).

5. Evaluation: The students will have completed the Rules Chart and have the rough form of the game ready.

6. Instructional Materials Required:
      a. Copies of the Rules Chart for each player.
      b. Copies of all previously prepared materials.

MODULE F

1. Purpose: Play of the simulation game developed by the class.

2. Objective: The students will play and evaluate the game that they have developed and revise it if necessary.

3. Prerequisite: The students will have successfully completed Module E.

4. Teaching Strategies: The students will play through the game with a class member acting as game director. They will debrief and evaluate the experience. The instructor will act as a critical observer. Each student will complete an evaluation form concerning the experience.

5. Evaluations: The class will play, as far as possible, the simulation game that they have developed. Each will evaluate the experience.

6. Instructional Materials Required: All materials required by the game and an evaluation form to be filled out by each student.

It should be emphasized that the worksheets (charts, etc.) were intended only as an aid for the individuals and for the class. For the purposes of this study, the focus was on the results produced by the whole class and the process by which they reached the decisions involved in the simulation game development.

Materials: Instruments

In addition to the model and worksheets and other materials, several instruments were used to gather descriptive information about the sample.[5] The first of these instruments was called the Student Data Questionnaire. Its purpose was collection of factual data concerning the students (previous knowledge of simulation games, self-estimated ability, etc.). The Postclass Questionnaire was used to examine attitudes toward the materials and the process of simulation game development. It quickly sampled feelings of confidence-confusion, etc. following Modules B through E.[6] A Student Evaluation Form was administered following the final module. Elements examined here were participation (others and self), and attitudes toward simulation game development (individual and class) and use, as well as the students' estimation of the value of the work they had done.

To provide additional information, the sessions were recorded and evaluated by the instructor. This provided a source of both specific comments and general impressionistic information concerning the process of simulation game development by the total class. Such recordings also suggested kinds of observations that might be useful for further research.

On additional evaluation was utilized. If one or more of the classes produced a simulation game, that game would be submitted to three people who were experienced in the development of simulation

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[5]The instruments are reproduced in full in Appendix B.

[6]Robert Fox, Margaret Luszki, and Richard Schmuck, _Diagnosing Classroom Learning Environments_ (Chicago: Science Research Associates, Inc., 1966), 17-19.

games. Rather than use a strict evaluation form, the evaluators

were given a list of questions to consider and were asked to state

the criteria they used.[7] There are several differing philosophies

in the area of simulation game development and, while this should be

reflected in the choice of evaluators, it should also be expressed

in the criteria they used. If the games were judged relatively

worthless or deficient in some major aspect, the use of the process,

the model, and the modules would be examined in the light of the

weaknesses found.

Description of the Sample

The sample used for testing the concept of total class involvement

in simulation game development consisted of three classes of under-

graduate students enrolled in a course entitled "Methods of Teaching

Social Studies in Elementary School," taught in the College of

Education at Michigan State University. Tables 2.1 to 2.6 give general

descriptive data for each of the classes and for the three classes

together.[8] The most distinctive difference between the classes, in

terms of the study, was the size of the groups was extremely small,

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[7]The list of questions given to the evaluators and their reactions
are found in Appendix C.

[8]For nominal data, a chi square test for significant difference
was used. For interval data, the t-test of difference means was used.
P .05 was the chosen level for significance. See: William L. Hayes
Statistics for Psychologists (New York: Holt, Rinehart and Winston,
1963) and Sidney Siegel, Nonparametric Statistics for the Behavioral
Sciences (New York: McGraw-Hill Book Company, Inc., 1956) for a
detailed discussion of the tests.

but Section 2 was approximately one-half the size of the other two groups.

Table 2.1 reports the class level of the students in each of the sections.

Table 2.1

CLASS LEVEL

SECTION	JUNIOR	SENIOR	OTHER	N
1	25	3	2	30
2	9	5	2	16
3	23	7	1	31
Total	57	15	5	77

Chi Square = 5.6591
df = 4
P = not significant

Class level of students in the three sections that comprised the sample was similar for all sections. The students were juniors and seniors in the University. A few were special students returning to college to qualify for an elementary level teaching certificate.

The second table reports the composition, by sex, of the three classes.

Table 2.2

SEX

SECTION	MALE	FEMALE	N
1	3	27	30
2	3	13	16
3	3	28	31
Total	9	68	77

Chi Square - 4.84
df = 2
P = not significant

There was a heavy predominance of females in the three sections. This was typical of the student population in the elementary education proglem. Since the three classes did not differ significantly in the ratio of men to women there was no opportunity to examine the effect of sex on the process of simulation game development.

Prior experience with simulation games was a factor which could have affected the group development of simulation games. Table 2.3 indicates the number of students in the sample who had participated in the play of one or more simulation games prior to the state of the study.

Table 2.3

PREVIOUS PARTICIPATION IN SIMULATION GAME

SECTION	YES	NO	N
1	8	22	30
2	7	9	16
3	10	21	31
Total	25	52	77

Chi Square = 1.763
df = 2
P = not significant

While some members of each section had participated in simulation games prior to the study, the proportion of experienced players was similar for each section.

Table 2.4 reports the students' self-rated knowledge of simulation games, either play or development or both.

Table 2.4

SELF-RATED KNOWLEDGE OF SIMULATION GAMES

SECTION	HIGH	MEDIUM	LOW	NONE	N
1	0	13	17	0	30
2	0	2	13	1	16
3	1	12	16	2	31
Total	1	27	46	3	77

Chi Square = 6.495
df = 6
P = not significant

Few students felt that they had no knowledge of simulation games or that they were highly knowledgable in the field. Again, the proportion of responses in each category was similar for each section. Only one student had previous experience in simulation game development and that was as an individual.

Students were also asked to rate their interest in the field of simulation games. Table 2.5 shows the self-ratings by section.

Table 2.5

SELF-RATED INTEREST IN SIMULATION GAMES

SECTION	HIGH	MEDIUM	LOW	NONE	N
1	20	10	0	0	30
2	4	11	1	0	16
3	21	10	0	0	31
Total	45	31	1	0	77

Chi Square = 7.452
df = 6
P = not significant

When asked to rate their interest in simulation games, all but one of the students placed themselves in the high or medium interest range. The proportion was not significantly different for the three sections.

Academic ability must be considered as a factor in the group development of simulation games, since the process was, at least in

part, an academic exercise. The student's cumulative grade point
was the most readily available measure, both to the researcher and
to the students. Self-perception of ability can be a strong influence
on the performance of students. The individuals were asked to rate
themselves in three areas of ability: overall, verbal, and quantitative.

Table 2.6

INDICATORS OF ACADEMIC ABILITY

SECTION	MEAN GPA[a]	MEAN SELF-RATED OVERALL ABILITY[b]	MEAN SELF-RATED VERBAL ABILITY[b]	MEAN SELF-RATED QUANTITATIVE ABILITY[b]	N
1	2.74	2.2[c]	2.3[d]	2.5[d]	30
2	3.06	1.8[c]	2.0[d]	2.0[d]	16
3	2.92	2.8[c]	1.8[d]	2.3	31
Total	2.87	2.2	2.0	2.0	77

[a]GPA is grade point average: 0 is low and 4.0 is high.
[b]Students rated themselves on a scale of 1 = high to 5 = low.
[c]P = .01
[d]P = .05

There were no significant differences between the sections in
grade point average. The mean for the total sample (2.87) was very
close to the all-university undergraduate average at that time (2.84).[9]

There were, however, significant differences among the three
sections in self-rated ability. Section 3 rated themselves highest
in terms of overall ability while sections 1 and 2 were nearly the same.

[9]Research section of Registrar's Office, Michigan State University,
June 1972.

In the area of verbal ability, section 1 rated themselves significantly higher than section 3 with section 2 in the middle. Section 1 rated themselves highest in the quantitative ability, differing significantly from section 3.

Summary

This chapter presented the materials, measures, and sample utilized in the study. The three sections comprising the sample were similar in most characteristics. Two basic differences were the size of the sections and student self-perception of academic ability.

Chapter 3 presents an analysis of the process based on the two questions presented in the first chapter.

1. Given a model for simulation game development and a series of modules designed to assist in the development, can a total class develop a simulation game?

2. Because the sample used will be future teachers, what are the feelings and attitudes that they held following the work in regard to the process of total class development of simulation games?

Chapter III

RESULTS

Chapter III presents the results of the study. The chapter is

divided into sections which focus on the following questions:

1. Given a model for simulation game development and a
   series of modules designed to assist in the develop-
   ment, can a total class develop a simulation game?

2. Because the sample used will be future teachers, what
   are the feelings and attitudes that they held following
   the work in regard to the process of total class
   development of simulation games?

The first section of the chapter includes the games developed by the

three class sections and the evaluations of the games. The second

section is an evaluation of the process of total class involvement

in simulation game development. The third reports the students'

attitudes, as future teachers, toward the process.

Simulation Games and Evaluations

Data for the first section was obtained from three sources:

(1) three games designed by subjects involved in the study, (2) three

evaluations of each of the three games, and (3) tape recordings of

class sessions. The completed games and evaluations are reported in

Appendix B.

Section I of the Sample

The first section produced a simulation game using group and

individual values as the topic. The objective was:

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the students, as individuals and in groups, will
discuss and make decisions about their personal
values.

The scenario,developed by the class, was brief and served
basically to place the students in groups. It specified that the
content of the exercise was to be values.

This is a game about values and what is important
to us as individuals and what links us to groups.
We will select values and bargain as group members
for tokens that represent these values.

Following development of the scenario, students focused on events
that might take place in the process described. The order of events
was based upon a group decision-making model. In order, the steps
were:

1. Class members generate list of values.

2. Class members create groups.

3. Groups set goals.

4. Groups and individuals bargain.

5. Groups report.

6. Groups re-set goals.

7. Class members debrief. (repeat 3-6 as deemed desirable).

To finish materials for play of their game, students developed
the rules. There were very basic to gaming, but had little reference
to the content area of the simulation game.

1. Group goals are kept secret.

2. Goals can be changed only in goal-setting rounds.

3. Total tokens must be at least 20 for all categories.

4. To bargain, uncross arms. Cross arms when player
   is not bargaining.

     5. During bargaining, keep tokens secret.

     6. Once players begin to bargain, they must complete
        a deal.

Debriefing questions, the final element developed by students, dealt

with group process and the effect of each person's membership in the

group.

     1. How did your group choose goals?

     2. Why did your group choose those goals?

     3. How did you bargain?

     4. Did you change your goals? How? Why?

     5. Did you change your bargaining strategy?

     6. How did you feel at each stage?

     Analysis. The evaluators found the objective as stated

basically unclear. It did not contain an observable terminal behavior

nor did it state the criteria to be employed in evaluating the success

of the simulation. They felt that the simulation format did not fit

the objective specifically although the vagueness of the objective

allowed for many interpretations. The simplified model was judged to

be a representation of reality, but lacking the representation of

consequences. Major weaknesses of the game were indicated in the

following areas: (1) unclear directions, (2) lack of representation

of consequences, and (3) the poor definition of "values." All three

evaluators considered the debriefing questions a strong element in

the simulation, although one questioned the relationship of the

questions to the objective.

During the play of the simulation game, the students found
that the objective did not represent what had happened in the game.
Discussion led the class to the decision that a different objective
dealing with group process and decision-making was more appropriate
than redesigning the game. The need for clearer instructions and
simpler rules more directly related to the game was obvious to the
players. Students agreed on the need to test the game with another
class after revision while the developers acted as observers and
evaluators.

Two major points surfaced during the game debriefing. First,
the students felt that they had discussed their own feelings about
group pressures in relation to individual values very openly during
the game development process. They agreed that the format of
development was a relatively non-threatening arena for values discussion.
Second, the simulation of group process presented, in capsule form, a
representation of many of the problems that the students had had in
the process of game development. They felt that the simulation
would be most useful in the study of intra-group and inter-group
functioning in problem solving.

Section II of the Sample

The simulation game designed by the second section differed
in many ways from that developed by the first class. Focusing first
on the objective, students stated:

> players will experience the role playing and
> decision making activities involved in a racially
> oriented student strike.

The content was much more specific and more of the reality of a situation was represented in the simulation. The scenario was quite specific and set the stage in a relatively concrete manner.

> City High School is a racially and ethnically mixed school with most minority students bused in. Black students are represented poorly in most after-school activities. Matters come to a head when no Black students are selected for the basketball team. Black and White students use this incident to focus general student dissatisfaction and a student strike results. The following groups are involved in trying to resolve the situation: Administration, students for the strike, students against the strike, teachers supporting striking students, teachers opposed to strike, parents for the strike, and parents opposed to the strike. All groups are racially mixed.

This class was mixed racially, ethnically, and economically. Its members drew heavily upon their individual memories of high school. The rounds for the simulation were drawn from the labor-management negotiation model.[1] They were:

1. Introducation

    a. assign to groups
    b. read scenario
    c. distribute profiles
    d. formulate statement

2. 1st all-school meeting

    a. administrators chair & begin meeting
    b. each group makes two minute statement
    c. try to reach agreement

3. Negotiation

    a. groups bargain in order to agree on plan
       to end strike

4. 2nd all-school meeting

    a. administration chairs & asks if agreement has
       been reached on any points

---

[8] The choice of the labor-management model was made by the students. The experimentor was not involved in the decision.

       b. follow-up and try to reach <u>consensus</u>!

5. (If agreement, games goes to debriefing.)
(If no agreement:

       a. Administration may use authority to call
         in police. Go to debriefing.
       b. Administration may declare another negotiation
         session. Recycle to round 3, etc.

6. Debriefing all students

    a. discussion of questions

Students, working in small groups, developed profiles for each of the
groups involved in the game. The profiles gave the positions and/or
goals of each group as well as the responsibilities of the group in
the game. Rules were kept to a minimum. Specifically, they were:

    A. Students must represent their group.

    B. Negotiation is carried on by one representative of the
       group with the other group leader.

Debriefing questions were omitted from the development process.

    <u>Analysis</u>. All three evaluators called attention to the lack
of a statement of expected learning in the objective. One evaluator,
a classroom teacher, viewed the objective, as well as the simulation,
in a more positive light than did the other evaluators. The simulation
was judged to be an appropriate representation of reality for the
objective except that realistic consequences were not presented. The
reality of the scenario and roles was recognized by evaluators; however,
roles were judged too specific, too restrictive for effective learning.
Also, rounds and rules were judged to need clarification to enhance the
play of the game. In general, "this seems to be a good workable game...
it seems sound and worthwhile on the whole. I think students would

enjoy playing it and the outcomes in terms of new understandings, attitudes, and empathy would justify its use."[2]

During play of the game students found that profiles needed clarification and that they should have allowed more room for decision-making within the profiles. In most other aspects, the simulation proved very playable.

Debriefing pointed out the students' failure to develop questions for discussion, but was continued without questions. There was general agreement in the class that questions were needed and should be formulated prior to play. In this case, discussion centered on accuracy of role portrayal and feelings of the players in each role. Second, the class dealt with group process, focusing on the statements of position that they felt most severely blocked communication. Finally, debriefing focused on the students' feelings of increased understanding of the roles represented in the simulation.

Section III of the Sample

The third section chose school planning as their topic for simulation game development. The objective for the game was given for two areas of learning.

> Students will state and attempt to plan a school
> based on their ideas of what education should be
> like. They will also examine group process in
> decision making.

The scenario developed by the class section was brief and provided only a little insight into the problem.

> There has been much dissatisfaction with the schools
> in your city. A new school is being formed and has
> been funded by a foundation. You are a member of the
> group chosen to form the new school.

---

[2]See Appendix C, comments of Evaluator 3.

The students were not asked to play any specific role beyond that of "school planner." The directions stated specifically that the player should follow his or her own educational philosophy. The model used for the simulation was basically a decision-making one. Rounds were simple and utilized data gathered from players to organize groups in the game.

1. Introduction

    a. Present scenario
    b. Select chairman

2. Grouping

    a. Count off by 5
    b. Group 1s, 2s, etc.
    c. List 5 areas necessary to schools
    d. Choose spokesmen

3. Select topics

    a. Each groups reports list
    b. Refine list
    c. Vote to choose five topics
    d. Assign topics to previous groups

4. Decisions on topics

    a. Discuss topic
    b. Research
    c. Prepare position statement

5. General meetings

    a. Each group reports & discussion follows immediately
    b. Check for and resolve conflicts
    c. Prepare final report

Rules were simple and specified the parameters within the group would function:

1. Student acts as chairman with teacher's aid.

2. Group decides on topics, but must end with five topics.

3. Small group reports must be reached through consensus.

4. The final report must contain no conflicting statements.

This class concentrated on producing debriefing questions that focused on the issue they believed most important: the conflict between real and ideal.

1. Does the final report reflect your views of education?

2. What part did you play in each round?

3. How does your school compare with real schools?

4. Would you like to try your school?

5. How were decisions made in the small group? The large group?

Analysis. As with the other games, evaluators felt that the objective was not precise enough, that it lacked real consequences. One problem noted concerning the simulation was that the level and/or type of school was not specifically stated in the game. All three evaluators felt that specific roles reflecting factions within communities would enhance the representation of reality. Most evaluators felt that the directions for play needed to be much more specific (especially "list five areas necessary to schools"). In general, it was felt that the simulation would provide a basis for discussion of educational theories and objectives, but that clarification was needed.

Play of the simulation went very smoothly and players utilized play to complete the information necessary. They focused on very general aspects of education. Group process was one of the primary areas of learning. Many differences in educational philosophy surfaced as students discussed the "new" schools.

In debriefing, the students echoed the evaluators in feeling a need for more specific roles representing factions in the community. The

opportunity to work through group process procedures in a task setting was regarded as valuable, as was the freedom to select the five areas of focus. The objective was evaluated and the consensus among the students was that it stated quite specifically what they wanted in the simulation, i.e., the attempt to plan a school and the examination of group process (large and small groups).

Summary of Games and Evaluations

All three class sections did produce simulation games which were playable. During debriefing, the classes tended to be aware of the problems also mentioned by the evaluations. The changes that they suggested would correct many of the problems identified by the evaluators. Students in the third section, for example, felt that the objective stated exactly what they wanted from the simulation. In all cases students expressed the need to have more time for testing and revision of the games that were developed.

Analysis of the Process

The final student evaluation form included several questions that dealt with the process of simulation game development. One element of concern was whether the amount of information presented with each module was sufficient. Table 3.1 presents the responses to this question by section and by module.

Across sections and modules, the students felt that the information presented was sufficient to allow them to complete the work of the specific module. Module D which contained the Player Decision Chart was felt to be a little less clear than the other five

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Table 3.1

AVERAGE RATING: AMOUNT OF INFORMATION*

Module Section	A	B	C	D	E	F
1	1.4	1.2	1.5	1.4	1.4	1.4
2	2.0	2.1	1.6	2.1	1.9	1.9
3	2.2	2.1	2.2	2.5	2.0	2.0

* Scale 1 = more sufficient; 5 = insufficient

modules. Students in Section 3, across modules, felt that the informa-
tion was less sufficient than did the other two sections.

Participation of individual students, based on self-perception,
is reported in Table 3.2. The average self-rated participation is
reported by module and by section.

Table 3.2

AVERAGE SELF-RATED PARTICIPATION*

Module Section	A	B	C	D	E	F
1	2.5	2.6	2.4	1.8	2.3	1.7
2	2.5	2.5	2.1	2.3	2.3	2.0
3	2.3	2.3	2.2	2.1	2.0	2.0

* Scale 1 = high; 5 = low

The averages of self-rated participation were similar across
section and module. Highest ratings were for Module F when each section
test played the simulation game that they had developed. In sections
1 and 3, the ratings increased as the classes were more deeply involved
in the game design process. Section 2 varied from this trend in
Module C where the class had to re-evaluate its choice of topic. They
had chosen, and decided to remain with, the emotionally charged issue
of racial discrimination in schools.

Individual ratings of the total class participation provided
one measure of the students' evaluation of total class involvement.
Table 3.3 presents the average individual rating of total class
participation by section and module.

Table 3.3

AVERAGE INDIVIDUAL RATING OF TOTAL CLASS PARTICIPATION*

Module Section	A	B	C	D	E	F
1	2.6	2.5	2.4	2.8	2.7	2.2
2	2.9	2.8	2.8	2.6	2.5	2.2
3	2.8	2.7	2.8	2.7	2.6	2.4

* Scale 1 = high; 5 = low

The participation in the process of simulation game design was rated
slightly above average (3) for all modules. Module F, test play of
the game the class developed, showed the highest level of class

participation for all sections. For the first five modules, the average ratings were similar within sections and across modules.

Following Modules B, C, D, and E, a questionnaire was administered. The seven questions were designed to provide immediate feedback for the instructor concerning student perceptions about the amount of learning, the clarity of information presented, need for assistance, participation, and the teacher's presentation. The data are reported in percentages by section. The responses for each foil are reported by module.

Table 3.4

Question 1

	HOW MUCH DO YOU FEEL YOU LEARNED TODAY?															
Foil	A. Don't think I learned much				B. Learned a little bit				C. Learned quite a lot				D. Learned a lot today			
Module	B	C	D	E	B	C	D	E	B	C	D	E	B	C	D	E
Section 1	16	6	26	11	53	56	16	32	26	33	37	32	5	6	21	26
Section 2	15	0	10	0	77	38	70	38	8	23	20	46	0	8	0	15
Section 3	11	22	25	14	72	67	50	71	17	6	13	7	0	6	13	7

The percentage of responses falling within foils B and C remained high across modules. The self-perceived amount of learning was lower for Module D, when students developed the rules for their games and little new material was used.

Table 3.5

	HOW CLEAR WAS IT WHY WE WERE DOING TODAY'S ACTIVITIES?															
Foil	A. Very clear to me				B. Pretty clear to me				C. Not so clear				D. Not clear at all			
Module	B	C	D	E	B	C	D	E	B	C	D	E	B	C	D	E
Section 1	37	33	32	53	58	50	58	42	5	17	5	5	0	0	5	0
Section 2	31	11	50	31	62	89	40	69	8	0	10	0	0	0	0	0
Section 3	72	33	50	29	22	33	25	71	6	28	25	0	0	6	0	0

Students reported feelings of clarity for all of the modules. In Modules C and D, some students indicated that the purpose of these activities was not as clear as in other modules, although the percentage was not large.

Table 3.6

Question 3

	HOW OFTEN DID YOU FEEL LOST DURING THIS CLASS PERIOD?															
Foil	A. Lost most of the time				B. Lost quite a few times				C. Lost a couple of times				D. Not lost at all			
Module	B	C	D	E	B	C	D	E	B	C	D	E	B	C	D	E
Section 1	0	0	11	0	0	0	0	5	42	33	47	21	58	67	42	74
Section 2	0	0	0	0	8	0	0	8	31	44	70	46	62	56	30	46
Section 3	0	11	0	0	22	11	13	14	22	39	25	21	56	33	63	57

Few students reported feeling lost during the class periods examined (Modules B through D). Class section 3, however, differed from class sections 1 and 2 in the percent choosing foil B (lost quite a few times). Although the number of responses in the category remained below one-fourth of the students for class section 3, it varies widely from the almost total absence of that response for the other sections.

Table 3.7

Question 4

	HOW OFTEN DID YOU FEEL YOU WANTED SOME EXTRA HELP DURING THIS CLASS PERIOD TODAY?															
Foil	A. Wanted help quite a few times				B. Wanted help several times				C. Wanted help once or twice				D. Wanted no help			
Module	B	C	D	E	B	C	D	E	B	C	D	E	B	C	D	E
Section 1	0	0	5	0	0	11	11	5	32	33	37	26	65	56	47	68
Section 2	0	0	0	0	0	0	10	15	46	67	40	31	54	33	50	54
Section 3	6	11	13	0	11	6	13	0	17	22	0	36	67	56	75	57

Most students reported little need for help during the modules evaluated. Module D, completion of the player information, did show a slight, consistent rise for all class sections in percentage reporting a need for help several times during the session. Class section 3 again differed from the other sections, reporting slightly more desire for help.

Table 3.8

Question 5

	HOW OFTEN DID YOU SEE SOMEBODY ELSE NEEDING HELP DURING CLASS PERIOD TODAY?															
Foil	A. Saw somebody needing help a lot				B. Saw somebody needing help quite a few times				C. Saw somebody needing help a few times				D. Saw nobody needing help			
Module	B	C	D	E	B	C	D	E	B	C	D	E	B	C	D	E
Section 1	0	0	5	0	5	6	11	0	5	39	32	37	84	50	53	58
Section 2	0	0	0	15	15	11	0	0	38	56	30	38	46	33	70	46
Section 3	0	11	13	0	6	0	0	0	22	22	38	29	67	61	50	64

Another means of ascertaining need for help is to ask if a student saw others needing help. For all three sections of students, the response pattern supported the findings above. Students seldom saw someone else needing help.

Table 3.9

Question 6

	HOW DO YOU FEEL ABOUT YOUR PARTICIPATION IN THE DISCUSSION THIS LAST PERIOD?															
Foil	A. Not satisfied at all				B. Not very satisfied				C. Fairly satisfied				D. Very satisfied			
Module	B	C	D	E	B	C	D	E	B	C	D	E	B	C	D	E
Section 1	16	6	5	11	42	6	53	21	32	67	37	37	11	22	5	32
Section 2	8	0	20	8	0	0	10	15	46	56	40	38	46	44	30	38
Section 3	6	6	13	0	17	11	13	29	67	50	63	50	11	28	13	14

Students in all three class sections reported satisfaction with their participation in the four modules. Specific deviations from the general attitude occurred in section 1 for modules B and D. Section 2 reported the highest percentage of responses in the very satisfied category.

Table 3.10

Question 7

	HOW DO YOU FEEL ABOUT WHAT THE TEACHER DID IN THIS LAST CLASS PERIOD?															
Foil	A. Very Satisfied				B. Pretty well satisfied				C. Only a little satisfied				D. Not satisfied			
Module	B	C	D	E	B	C	D	E	B	C	D	E	B	C	D	E
Section 1	37	22	37	42	47	61	47	37	16	11	16	16	0	6	0	5
Section 2	23	11	40	46	62	78	50	38	15	0	0	8	0	11	0	0
Section 3	17	6	13	29	50	50	75	57	33	33	13	7	0	0	0	7

Satisfaction with the teacher's activities was generally high. Module B had the highest incidence of low satisfaction. The lesson involved the choice of topic and the teacher's role was minimal since students chose the topic.

Student reactions indicated that the modules, the information, and the rationale for the various tasks were quite clear and few students reported feeling lost during any of the four modules.

Questions referring to felt needs for extra help showed most students needing little or no help beyond that given in the session.

Student reports concerned with their satisfaction with their participation indicated that most of the class members felt fairly satisfied or very satisfied with the part that they played.

In general, the question referring to the instructor's part in the module indicated satisfaction with the role played by the instructor. Module B, decision point for the game topic, reflected the non-directive part played by the instructor and the sense of frustration that often accompanies this technique.

Each session (module) for each class was tape recorded. Analysis of the tapes provided several kinds of information: congruence with planned modules, indications of student participation, and information about the types of teacher-student interaction during the modules.

The class sessions followed the planned modules closely. There were two major deviations from the specified order. In Module C (intended to deal with the simplified model and scenario), Section II re-evaluated its choice of topic. In a heated debate, many of the students indicated their discomfort in working with the issue of race in a racially mixed class. The consensus was to remain with that topic. The other deviation occured in all sections. It was necessary during Modules D or E to restate the objective for the simulation game in the light of the work completed. These variations from the plan were well within the framework of the Model for Simulation Game Development.

Student participation, as accurately as could be determined from audio tapes, seemed to be close to the student perceptions reported above. In all three sections, leadership by four or five students with

input from ten to fifteen others was the norm. In the final module, the play of the game produced extremely high levels of involvement. This is typical of the play of simulation games generally.

Teacher-student interaction varied with the module and stayed well within the expected parameters. Module A, primarily information distribution, was teacher-dominated with the exception of the analysis of War or Peace, the demonstration game, which was student dominated. In Modules B through E, the primary pattern of interaction was student-dominant with the instructor acting as recorder and, at times, as mediator for discussions of the various elements of the games. During the final module (F), the game produced a student-directed experience while the instructor acted as an observer. The debriefing was led by a student with assistance from the instructor. In general, the content and the decisions connected with the simulations came from the students while the instructor acted as a source of information about gaming.

Attitudes as Future Teachers

The usefulness of a teaching technique is directly related to the feeling of teachers about that technique. Since the students in the sample for this work are future teachers, their attitudes and feeling toward the process of total class involvement in simulation game development can provide indicators of the perceptions of more experiences teachers.

The attitudes reported below were those of people who had had little exposure to the classroom as teachers. A further limitation was the impossibility, for this study, of following students through classroom experience to see if attitudes they expressed were reflected

in behaviors. The data, collected on the Student Evaluation Form should
be regarded as tentative rather than conclusive, in view of these
restrictions.

One element that affects perceptions of teachers toward teaching
techniques is how much they feel that they have learned when exposed
to the technique. Table 3.11 reports the students' self-estimate of
learning about simulation games. The figures are percentage responding
in each category (much learned to little learned).

Table 3.11

SELF-ESTIMATE OF LEARNING: SIMULATION GAMES*

Section	Much 1	2	3	4	Little 5
1	67	27	7	0	0
2	50	20	25	5	0
3	58	24	13	0	3

* Given in percentage

In all three class sections, the responses were predominately in the
positive range. Students, as a group, reported high estimates of
learning in the area of simulation games.

Another area of learning the students were asked to evaluate
was the content area chosen to base the game on in each section.
Table 3.12 reports percentage of responses in each category (much
learned to little learned).

Table 3.12

SELF-ESTIMATE OF LEARNING: TOPIC OF GAME

Section	Much 1	2	3	4	Little 5
1	67	13	20	0	0
2	40	30	20	5	0
3	49	23	15	6	6

* Given in percentage

The responses indicated very positive estimates of learning in the three very different content areas (values, racial discrimination, and education). Students chose average and higher ratings of learning almost exclusively.

Subjects were asked to express their opinions of total class development of simulation games on a scale from positive to negative. Their responses are reported in percentage of response in each category in Table 3.13.

Table 3.13

OPINION OF CLASS DEVELOPMENT OF GAMES*

Section	Positive 1	2	3	4	Negative 5
1	60	13	27	0	0
2	40	35	10	15	0
3	42	19	16	13	9

* Given in percentage

Responses were predominately positive. In all three class sections, the students indicated that they had generally high opinions of the process of total class development of simulation games.

Table 3.14 reports student response to questioning about individual development of games in relation to group development.

Table 3.14

PREFERENCE FOR INDIVIDUAL GAME DEVELOPMENT*

Section	Yes	No
1	27	73
2	30	70
3	48	52

* Reported in percentage

Although the responses were not completely one-sided, the trend was not to prefer individuals development of simulation games. Section 3 was almost evenly divided, a very different response than Sections 1 and 2, although the greater number of responses were negative.

Feelings of competence in a given area can determine the teachers' willingness to attempt to use a given technique with their classes. Table 3.15 reports the student's responses to the question of their felt competence in the area of simulation game design.

Table 3.15

DO YOU FEEL YOU COULD DEVELOP YOUR OWN GAME
AS A RESULT OF THIS EXERCISE?*

Section	Yes	No
1	93	7
2	97	3
3	87	13

* Reported in percentage

Response pattern was extremely positive for all class sections.

Students indicate strong feelings of competence in simulation game

development.

The focal element of this discussion is whether the students

in the sample would indicate a willingness to try total group develop-

ment of simulation games. Table 3.16 reports the student response

to direct questioning.

Table 3.16

WOULD YOU TRY TO DEVELOP GAMES WITH YOUR CLASSES?*

Section	Yes	No
1	93	7
2	95	5
3	94	6

* Reported in percentage

The students were very positive in making this initial statement of willingness to attempt group game development. A less direct measure of student attitude toward using this technique was also utilized. By asking what was the lowest grade level group game development could be usefully employed, students' acceptance of this technique could be inferred. Table 3.17 shows the student responses.

Table 3.17

WHAT IS THE LOWEST GRADE LEVEL AT WHICH GROUP GAME
DEVELOPMENT COULD BE DONE?*

Section	Kindergarten	2nd	4th	6th	9th
1	27	20	47	6	0
2	20	35	35	10	0
3	23	26	32	19	0

* Reported in percentage

All of the respondents felt that by ninth grade groups could develop simulation games. A majority in all sections felt that by fourth grade the technique would be viable. Not only did the students indicate a willingness to try group development of games, but also they felt it was a viable technique for the elementary school.

Summary

The study dealt with two questions. The first was concerned with the viability of total class development of simulation games. All three class sections involved did produce and play simulation games.

The games were evaluated and, although weaknesses were found in the elements of the games, the evaluators felt the simulation had merit. The process evaluations indicated that the Model for Simulation Game Development and the modules used in this study provide sufficient information and allowed a high level of participation in the perceptions of the students.

The second question focused on the attitudes of the sample as future teachers. The students reported highly positive reactions to the process and felt total class involvement in the development of simulation games could be a viable, useful tool in the elementary school.

The final chapter of this thesis is based on the responsibilities assumed with this type of study. First, the results are discussed and conclusions reported. Second, the Model for Game Development and the modules used are examined in relation to the data generated by their use. Finally, recommendations are made for further study.

Chapter IV

SUMMARY, CONCLUSIONS, RECOMMENDATIONS

The basic responsibilities of this chapter are summarized in
the following categories. First, the results of the study are
reiterated. Second, the conclusions are ennumerated. Third, the
materials developed for the study are revised in the light of the
results of this work and, finally, suggestions for further study
are presented.

Summary of Results

Two major questions were examined in the course of this study
of total class involvement in simulation game development. The first
dealt with the viability of the process.

> Given a model for simulation game development and
> a series of modules designed to assist in the
> development, can a total class develop a simulation
> game?

All three class sections developed, played, and debriefed simulation
games. Total class involvement in simulation game development was,
for this sample, a viable process.

The first element of this question concerned the games and
evaluations of them. Three people, expert in the area of simulation
game design, evaluated each game. Weaknesses were found in all three
games. The objectives were viewed as weak and unclear. In general,

the evaluators felt that the decision-making models were not the most
appropriate ones available for the topics chosen (values, racial tension
in schools, and school development and planning). Role development
was incomplete in all three simulations. The students identified most
of the weaknesses found by the evaluators. Time limitations restricted
revision of the games and testing of those revisions by the classes.
All three class sections identified the need for revision and testing
to create more complete and more worthwhile simulation games. The
evaluators did rate the games as basically valuable for class use,
especially if the major weaknesses could have been corrected.

The second concern was the process of total class involvement
in simulation game development. Student evaluations on the Postclass
Questionnaire and Final Student Evaluation Form indicated a high degree
of satisfaction with the process. Student participation, as estimated
by students and from recordings of the class sessions, was quite high.
Estimates of learning for both the topic of the game and the process
of game development showed that students felt they had learned a great
deal. Questions referring to the information presented in the Model
for Simulation Game Development and the modules elicited reports of
satisfaction with the amount of clarity of the material and directions.
Class section 3 varied occasionally from the pattern of positive
responses presented above, although not in a consistent fashion.

The second question fealt with the attitudes of the sample as
representative of a specific group, future elementary school teachers.

> Because the sample used will be future teachers, what
> are the feelings and attitudes that they held following
> the work in regard to the process of total class
> development of simulation games?

The data showed highly positive ratings of learning, both in the content areas of the games and about simulation games themselves. Responses to questions concerned with felt confidence in the area of game design elicited equally positive responses. Given the direction of their feelings, the students were asked whether they would attempt total class development of simulation games themselves as a measure of basic commitment. The response was very positive, indicating a willingness to consider the process for their own use. The data supported the viability of total class development of simulation games for use with future teachers and the presentation of the process for their own future possible use.

The results of the study indicated that total class development of simulation games was a viable process and that the products had some value, even standing alone. Reflected in several ways on different questions student response to the process was very positive. When students were asked if they would consider the process of total class game development for their own future use, the response was very favorable.

Conclusions

The following conclusions can be drawn from this study.

1. For this sample of university students, the process of total class involvement in simulation game development was a viable one. All three classes did produce playble games.

2. Debriefing session comments by students and evaluators' reports indicated that more time was needed to produce simulation games with fewer flaws, than the games

developed in this study. Specifically, additional modules for revision and evaluation of student-produced games were suggested.[1]

3. More emphasis should have been placed on the flexibility of the Model for Simulation Game Development and the time for the modules should have been more adaptable to the demands of the topics and the students.

4. Student response to total class simulation game development was very positive. The motivational power of simulation games was evidenced by the high level of student involvement and satisfaction for the final module (play of game). Student evaluation of the experiences indicated that the process of game development was a motivating technique. Student participation for all modules was high.

5. The Model for Simulation Game Development included sufficient information about the process of game development. The evaluators' comments indicated that more attention should have been given to the objective, the simplified model, and the rounds-rules segments. Student comments supported this evaluation.

6. Responses of the sample as future teachers indicated a willingness to consider total class involvement in simulation game development for classroom use. Because the students had limited experience in the schoolroom, the generalizability of these responses was restricted.

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[1]For further substantion of this conclusion, see: Cleo Cherryholmes, "Some Current Research on Effectiveness of Educational Simulations: Implications for Alternative Strategies," _American Behavioral Scientist_, 10:2 (1966), p. 4-5.

Observation during actual teaching experience would

be needed to make more specific statements in this

area.

7. Class section 3 varied from class sections 1 and 2 on

many of the attitude measures. No reason was identified

as the specific cause of the deviations. It was a

large group as was section 2. It was the last of the

three class sections to meet for each module. The

topic chosen by section 3 was the least defined of the

three and there were fewer elements of gaming involved.

The basic question here was whether the process of total class

development of simulation games was possible. Since all three class

sections did develop games, the answer, for this sample, was a very

positive "yes". The remaining conclusions for this study were indicators

of needed revisions in the Model for Simulation Game Development and

the modules as well as of directions for further study.

Conclusions: Revision of Materials

The author's Model for Simulation Game Development was the

basis for the entire process. Since the form it took was so vital,

the revisions are presented below in the format of the complete,

revised model.[2] Figure 4 presents the revised model. The changes

made were based on students' comments, evaluator comments, and instructor

evaluation.

The changes from the original to the revised version of the

model were basically organizational in nature. The revised version

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[2]See Appendix A and Chapter 2 for the initial version of the
Model for Simulation Game Development.

Figure 4

REVISED MODEL FOR SIMULATION GAMES DEVELOPMENT

Keep in mind that you do not have to complete each step before proceeding
to the next. As the game takes shape, you will move back and forth
as you think of new elements or new ways to present items or deletions.

I. Topic: What do you want to teach? It should be a process.
    It is easier to develop a game around a decision-making process
    than something static and unchanging. Social studies content
    offers many examples of processes, ranging from historical
    events to human relations to government, etc.

II. Objective: What is the teacher's purpose for using such a
    simulation? What do you want to be able to do after you have
    played the game? The format of the behavioral objective
    (conditions, behavior, criteria) provides a pattern for stating
    the final learning clearly and simply.

III. Simplified Model: Think of a specific situation in which the
    process you have chosen is used. Describe that situation as
    completely as possible. Tell what happens, the order of events,
    who is involved. From this, a complete picture of the situation
    should appear.

IV. Players and Resources: Who is involved in the situation you
    described above? Be sure you have a complete list. Examine
    the players and the things that they do in the situation and
    locate the resources each player or group of players uses.
    These could be money, good will, votes, etc. Use the chart
    to record the resources.

Player	Resources

V. <u>Player Decision Guides</u>: Use the chart below to indicate what
decisions each player makes in the situation, what the possible
choices are, and what the results might be for each choice.

Player	Decision Topic	Choices	Outcomes

VI. <u>Game Goal</u>: State as simply as possible what the goal of each
player or group of players is <u>for</u> <u>the</u> <u>game</u>.

Player	Game Goal

VII. <u>Rounds</u>: Examine the description of the situation developed in the
simplified model. Where are there breaks in the action? What
seems to be the natural rounds? How much game time do you want
to allot for each round? Are there things that you need to
impose upon the players at some point(s) during the game? Crises,
new laws, new players, etc. Add them to the chart, indicating
when they should be imposed and how.

Round	Events	Players	Moves	Time

VIII. <u>Debriefing Questions</u>: These are the questions to be discussed at
the conclusion of the simulation game play. Be sure to cover all

intended types of learning, to provide for process learning, and for the emotional reactions of the players. Remember that these questions should be flexible and should allow for the actual events of play.

IX. **Materials**: This is the section that allows for the gathering together of all the information that you have been working on and creating the final form of the simulation game.

    A. **Scenario**: From the simplified model, write a brief descriptive statement to introduce the game to the players. This is to set the stage.

    B. **Player Profiles**: Write a description of each player or group of players that includes the game goal, the decision topics, and the resources of that role. This is to provide the players with a "personality" to represent.

    C. **Rules**: What must the players do to make the game progress? What things may they not do? Be sure that the list is as complete as possible.

    D. **Game Materials**: In addition to the items listed above, what things will the players need to play the game? These could be tokens, data books, etc.

    E. **Teacher Guide**: Be sure to include all the information that the game director will need. This should include all the information gathered during the game development process as well as anything that you think might be necessary.

After you have developed and played your game, you will need to evaluate it and make any revisions that are necessary. After you have revised the game, you may wish to test it yourself again or try it with another group of players.

of the model was designed to provide a clearer and less complicated process for simulation game development. There were three changes of a substantive nature: creation of a rounds element, addition of a section on debriefing questions, and inclusion of a paragraph suggesting revision and retesting of the game.

Separation of rounds from the rules section was primarily to facilitate student exploration of possible alternatives for their simulation game and to clarify the format of the product. Omission of debriefing questions by class section 2 pointed out the necessity of a section providing for development of debriefing questions. Addition of the final paragraph suggesting revision and retesting of the game was based on student comments and recommendations of evaluators.

The second element of the packet of materials was the series of modules (lesson plans) devised to implement the Model for Simulation Game Development. Changes, based not only on revisions in the model but also on the experiences of the three classes, are presented in this section.[3]

More emphasis should be placed on two elements of the process of group development of games. First, the time utilized for this process must be flexible. The limitation in the study of six class periods of fifty minutes each created problems in areas where decision-making took time and, most significantly, in the play-evaluation-revision elements of the process. Second, the statement that the steps are flexible in order must be emphasized by the instructor. The

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[3]See Chapter 2 for initial version of the modules.

difficulty here was created by the concreteness of the modules and was augmented by the time constraints of this study. If time restrictions were eliminated or lessened, the problem of the concreteness of the modules could perhaps be reduced. After a class and the instructor have been through the process once, it might be possible to eliminate the modules, except as a general pattern.

The revised package of modules is summarized here. It must be emphasized that the time for each module as well as for the entire series is flexible and that each module allows for the revision of any materials previously completed. Only the purpose and content of each module are given. The prerequisite for each module is the successful completion of the previous one (with the exception of Module A, which assumes no experience with simulation games). The objective grows out of the purpose and the evaluation would be explicitly stated in the objective.

Module A

1. Purpose: To introduce students to the area of simulation gaming through the play of a game.

2. Content: Students will play and debrief the simulation game War or Peace.

Module B

1. Purpose: To introduce the Model for Simulation Game Development by analyzing the game War or Peace.

2. Content: Students will use the Model for Simulation Game Development to analyze the game War or Peace, identifying each element of gaming as it occurs in the written material and as it occurs in the play.

Module C

1. Purpose: To begin the process of game development by choosing a topic.

2. Content: Using the Model for Simulation Game Development, the students will discuss and decide upon a <u>topic</u> for their class-developed game. When a topic has been chosen, the students will decide upon the educational <u>objective</u> for the game, preferably using the behavioral format.

Module D

1. Purpose: To develop the simplified model from which the game will be formed.

2. Content: Using the guidelines in the Model and by doing research in the area chosen, students will build an accurate picture of the situation they have decided upon. When this is complete, the objective should be used to aid them in simplifying the model until the elements that they wish to teach are strongest while the picture remains accurate.

Module E

1. Purpose: To complete the list of players for the simulation game and to determine their resources.

2. Content: Referring back to the simplified model, students will identify those players or groups of players that are essential to the play of the game. When this list is complete, students will fill out Worksheet 1 (Player Resources Chart).

Module F

1. Purpose: To complete work on the player decision guides and game goals.

2. Content: Using the simplified model, the player list, and the resource worksheet, students will build a Player Decision Guide for each player. It may be necessary to do further research for this Worksheet 2. When the player guides are complete, a game goal (Worksheet 3) should be set for each player. Utilizing the Model for Simulation Game Development, students, at this point, should check back over completed sections (I-VI) for accuracy and congruence.

Module G

1. Purpose: To determine the rounds and to establish the debriefing
   questions.

2. Content: Students will use the information gathered thus far to
   complete Worksheet 4 (Rounds Chart). The section of the model
   provides guidelines for the information. The debriefing questions
   should be developed to reflect the objective and the information
   in the simplified model (III).

Module H

1. Purpose: Completion of the simulation game and presentation of
   it in playable form.

2. Content: The final section of the Model for Simulation Game
   Development provides a checklist for the materials needed to
   create a playable form of the simulation game. An essential
   element in this module is the final check for congruence in all
   sections of the Model for Simulation Game Development. Any
   necessary adjustments can be made at this time.

Module I

1. Purpose: To play the game developed by the class.

2. Content: Students will play and debrief the game that they have
   developed in the manner they have planned it.

Module J

1. Purpose: To evaluate and revise the group-developed simulation
   game.

2. Content: Using one of the forms available for evaluation of simula-
   tion games, the information provided by observers (teacher and any
   others), and their own reactions to the play of the simulation
   game, students will evaluate and revise their game.

The process should not stop at this point. The next steps would

involve play and evaluation of the student developed game with other

classes following the pattern of Modules H-J above.

Primary changes involved matching the modules to the revised

Model for Simulation Game Development, addition of introductory

experiences, and formal development of a revision-retesting module.

Also, the increase in time needed for the series of modules should

be noted.

Recommendation: Research Designs

This section is organized around several suggested research designs.[4]

Each design is formulated to test, in a more rigorous manner, one or

more of the areas studied in this work. Listing of specific measures

and development of testing devised is not the purpose here.

Design I: The purpose of Design I is to test the viability of

total class development of simulation games with other than college

levels. In this case, a high school class is suggested. The primary

concern is whether the process will work at this level.

	Pre-testing	Treatment	Post-testing
1.	X	Total Class Development of Simulation Games	X

More than one class could be utilized for this design. Pre-testing

should include gathering data about the sample. Continuous observation

by a trained observer should provide across-time data. Post-testing

should include attitude measures. The major element for this design

would be evaluation of the product, if any, by experts in the area

of simulation game design.

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[4]Notation and designs are adapted from Donald T. Campbell and
Julian C. Stanley, Experimental and Quasi-experimental Designs for
Research (Chicago: Rand McNally and Company, 1963).

Basically, the hypothesis for the study could be:

> The class will develop, play, and evaluate a simulation game using the Model for Simulation Game Development and the modules designed to implement the model in the classroom.

Design II: The purpose of Design II is to test the concept of total class development of simulation games with active teachers to determine whether they would use the technique with their classes after going through the experience themselves. The data from the present study showed that pre-student teaching students in education had extremely positive responses to the process and that they would consider using it themselves. The need here is to test attitudes and actual implementation with active teachers.

	Pre-testing	Treatment	Post-testing	Delayed post-testing
1.	X_1	Total Class Game Development	X_1 X_2	X_3

Pre-testing (X_1) would include collection of data about the sample, active teachers, that would concentrate on attitudes toward simulation games, development of simulation games, and the possibility of teachers developing games with their classes. Post-testing would include the same attitude investigation (X_1) as well as evaluations of any game produced (X_2). Delayed post-testing (X_3) would be the major test for this design: observation of classrooms to see if the teachers actually implement class development of simulation games.

The hypotheses for this design could be:

1. The teachers as a group will design, play, and evaluate a simulation game using the Model for Simulation Game Development and the modules designed to implement the model.

2. The teachers will implement the concept of total class development of simulation games in their classes after participating in the process themselves.

Design III: The purpose of Design III would be to test the effect of group size on the process of total group development of simulation games. In the study just completed, there was no data to indicate the effects of group size on the process. There were, however, comments from students in the sample and observations from the instructor that indicated that some differences did occur. In addition, student responses to Final Student Evaluation questions showed some differences that could not be explained, but might be due to group size.

	Groups	Pre-testing		Post-testing
1.	15	X	Total Class Game Development	X
2.	30	X	Total Class Game Development	X

Pre-testing would include gathering of data about the sample. Post-testing would concentrate on the attitudes of the two groups toward the process of total class development of simulation games. Also included would be evaluations of simulation games produced by the groups.

Hypotheses for this design could be:

1. Both classes will produce and play a simulation game using the Model for Simulation Game Development and the modules designed to implement the model.

2. The small group (15) will produce a game with fewer weaknesses than the large group (30) will.

3. The smaller group will indicate more positive attitudes toward the process of group game development than the larger group.

Design IV: The purpose of Design IV is to suggest one way in which more information may be gathered about the learning that may take place during the use of simulation gaming techniques.

	Pre-testing	Treatment	Post-testing	Delayed Post-testing
1.	X	Total Class Game Development	X	X
2.	X	Utilization of Simulation Game	X	X
3.	X	Traditional Classrooms	X	X

Measures used for pre, post, and delayed post-testing would be measures of cognitive learning connected with the content of the experience (identical for all three classes) and tests designed to examine learning styles of sample members. The ideal arrangement for this study would be random assignment of subjects to three classes; however, this is seldom possible in reality. For this reason, pre-testing should also include the gathering of data about the sample. Post-testing should include evaluations of any game developed by class 1.

The hypotheses for this design could be:

1. Students in the class using the total class development of simulation games will learn more than those using simulation games who will learn more than those in the traditional classroom.

2. Learning from the process of total class development of simulation games will be more lasting than for those using simulation games which will be longer lasting than the learning in a traditional classroom.

3. Students in the class utilizing total class development will produce and play a simulation game.

Recommendations: Discussion

      The recommendations made in this section are more general than those discussed previously and less directly derived from data gathered during this study. Four major areas of thought are examined: (1) the relationship of individual, small group, and large group development of simulation games, (2) the effects of the process on the levels of cognitive learning, (3) the effects of previous experiences and learning on the process, and (3) the effects of total class involvement in simulation game development on classroom environment.

      The relationship of large group development of simulation games to small group (4-6) and individual design is worth future investigation. Repeated practice in a variety of environments should increase the level of skill possessed by the student developers. The quality of the product, a simulation game, should improve with repeated attempts to develop games. In addition to the simulation-related items mentioned, the cognitive learning skills emphasized by the process should be reinforced through exposure to situations requiring their use. Ability to work with others in task-oriented group settings should develop through the process. For study, the most rewarding ordering of the three processes would be: (1) total class development of simulation games, (2) small group development of games, and (3) individual development of games. The rationale for this sequence is based on the following ideas. Class development provides for instruction and guided practice with the instructor at initial exposure to game development. Small group design should allow combining of individual skills with peer instruction and evaluation. Individual development of games, the most demanding, would be testing of skills emphasized in this sequence.

Game theorists have hypothesized that simulation game develop-
ment involves manipulation of data at all levels of the cognitive
domain.[5] Bloom lists these levels as: (1) knowledge, (2) comprehension,
(3) application, (4) analysis, (5) synthesis, and (6) evaluation.[6]
If game development does emphasize the use of intellectual skills at
all levels, investigation should reveal the presence or absence of data
manipulation at each level. If all levels of the cognitive domain are
used, further research might show an increase in the students' skills
in handling data in other situations. Thus, development and transfer
of cognitive skills would be foci of study.

Efforts to investigate the effects of previous learning and
experience upon the process of total class involvement in simulation
game development would include many areas of interest. Students with
a great deal of experience in playing simulation games should perform
with greater expertise in game development than would students with little
or no experience. Because many of the intellectual skills utilized in
development and play of simulation games are closely related to those
skills generally called inquiry skills, it is possible that students
who have participated in inquiry exercises would be more able in
simulation game design. Previous experience with the substantive content
of the simulation game being developed by a group would probably effect
the performance of the individual in the process as well as the functioning
of the group. Investigation should include not only effects for individual

[5]John R. Raser, Simulation and Society (Boston: Allyn and
Bacon, Inc., 1969), pp. 114-5.

[6]David S. Krathwahl, Benjamin S. Bloom, and Bertram B. Masia,
Taxonomy of Educational Objectives, Handbook I: Cognitive Domain
(New York: David McKay Company, Inc., 1964).

students, but also effects of high levels of substantive knowledge upon leadership patterns developed during the process. A final element that should be included in future investigations of group development of games is self-perceptions of ability and the relationship of those perceptions to individual responses to and participation in group activities. Game design is an intellectual activity and those students who felt highly confident of their ability to handle intellectual matters would probably feel more positive about the process than those who did not feel self-confident. There are many other areas in which individual characteristics could effect the process of group development of simulation games, the areas of and magnitude of learning, and the quality of the product. Those mentioned above were suggested by the response of individual students in the sample used for this study.

Game Development as Group Process

The final area suggested for further study is an outgrowth of the instructor's observations during the work and several of the theories advanced by the advocates of total class development of simulation games. Because it is a group process, the focus for study would be the overall development of the class as a group. Schmuck and Schmuck, in Group Processes in the Classroom, have determined, through their analysis of relevant research that the following are stages in the development of a class.[7]

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[7] Richard A. Schmuck and Patricia A. Schmuck, Group Processes in the Classroom (Dubuque, Iowa; William C. Brown Company, Publishers, 1971), pp. 120-126.

Stage 1 includes acceptance, inclusion, membership, and trust as characteristics. During this stage, students try to determine what their role is in relation to the others in the class, to gain membership. Academic work usually goes well since students are on their best behavior. Testing of each other's reactions is the focus.

Stage 2 focuses on patterns of influence and communication within the group. Students form cliques and become aware of those who are most influencial in academic matters and class functioning.

Stage 3 centers upon productivity and goal attainment for those groups who have passed through the first two stages. At this level, students are to work in a group or groups to achieve a goal set by the group. Groups find or develop effective ways to work together.

Stage 4 includes characteristics developed in previous stages and focuses on flexible norms. Groups at this level accept a variety of learning styles. Here also a group has the ability to evaluate their status and solve problems within the group.

Stages 3 and 4 are those usually described by teachers as ideal or nearly ideal conditions within a classroom. Total class involvement in simulation game development may offer one means of helping a class reach these desired levels. The game development process may "force" students into situations where they must, as a group, develop characteristics of the third and fourth stages or fail in the project, as outlined by the modules.

Observations during the course of this study indicated that this type of investigation might explain deviations in Postclass Questionnaire

data. Differences between groups which were "felt" rather than concrete might be explained through observations that concentrated on level of group development in the class.

Investigation of effects of group simulation game development upon the level of development of the group would be complex and difficult to do; especially if, as Gibb's research indicates, each group must begin with stage 1 at each meeting.[8] Methods of determining the validity of this generalization and its effects, if true, must be developed. The relationship of total class development of simulation games to group maturation does, however, seem to be worthy of further research.

Reflections

The process of total class development of simulation games, so often recommended in the literature, is a viable one. The packet of materials, Model for Simulation Game Development and modules designed to implement it, have been revised and are ready for further testing through classroom use.

Future teachers in an elementary methods of teaching social studies course reacted in an extremely positive manner to the process of class game development. The viability of the process as a way of teaching about games as well as a possible technique for use in teaching was supported. Further research would be necessary to establish this objectively, however.

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[9]Ibid., pp. 118-119.

Perhaps the most significant result of this study was the variety and extent of further research indicated. This was the second major purpose of the work. Total class development of simulation games could provide a new "window" on questions dealing with such topics as learning styles, cognitive learning during gaming, and, especially, group developmwnt within the classroom.

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APPENDIX A

STUDENT MATERIALS

The materials given to the students involved in this study are reproduced in this appendix. The Model for Simulation Game Development was given to students prior to the first module. It was used to analyze a demonstration simulation game, War or Peace. Students were then given each worksheet prior to the module for which it was used. The intent was not that the worksheets would produce a final product, but that they would help generate ideas.

War or Peace: A Simulation Game

by JOHN D. GEARON

THIS is a simple international relations game that can be played by ninth-grade classes in world history. Aside from the enjoyment students derive from playing the game, the activity is designed to provide a genuine learning experience. It may be used to introduce or to strengthen several valuable historical insights.

As a model of international relations, for example, the game can be effectively used to point out the condition of international anarchy that has been an important part of the affairs of people and nations throughout history. A fundamental pattern of international relations, the concept of balance of power, may also emerge clearly as a discovery of the students during their playing of the game. Too, international relations terms come to be better understood in classroom action—such terms as foreign policy, crisis, alliance, diplomacy, treaty, neutrality, and peace conference.

The classroom becomes during the game an imaginary world made up of a continent and an island—the arena of interaction of seven sovereign nations. A map of this little world (Figure 1) and a chart showing the relative war powers of the nations (Figure 2) are all the materials a student needs to play the game. These may be duplicated and given to the students, or they may be drawn on the chalkboard and copied by each student.

The numbers presented in Figure 2 for army and navy do not correspond to numbers of men, regiments, divisions, or ships of war. They are relative figures that express the comparative war powers of the nations. "NMF" stands for National Morale Factor. All nations are equal in NMF, and these NMF points cannot be taken away from the students who make up the original nations.

Once each student has a copy of the map and the chart, three steps are necessary to set up the game:

1. Students may be divided into small groups for the game by counting off by sevens. Number 1's are Androsians; number 2's, Atweenans; number 3's, Bismanians; and so on.

2. The map is oriented to the classroom in the students' minds as it appears to the teacher in front of the class so they may find the relative positions of their nations in the room. Once they have located their respective countries, they may form small circles of chairs as their national headquarters.

3. Their first job, when settled, is to pick a ruler for the nation to serve as chairman of the team and to speak out

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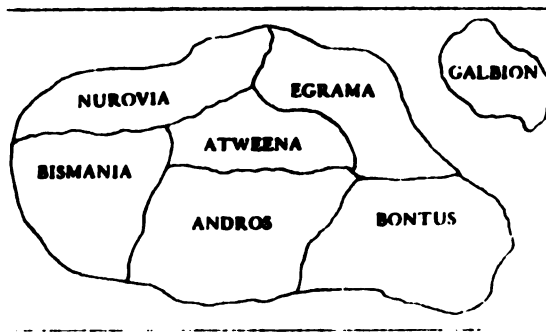
FIGURE 1
THE CONTINENT AND THE ISLAND

FIGURE 2
RELATIVE WAR POWERS OF THE NATIONS

Nation	Army	Navy	NMF	Total
Andros	700	600	240	1540
Atweena	1000	0	240	1240
Bismania	800	700	240	1740
Bontus	460	400	240	1100
Egrama	520	400	240	1160
Galbion	500	1000	240	1740
Nurovia	500	500	240	1240

internationally. The ruler may be either a king or a queen—or perhaps a prime minister or a president. The teacher calls the roll of the nations and each ruler responds, introducing himself in a dignified manner by title, name, and country: "King Alfred of Bismania!" or "Queen Mary of Atweena!" No suggestion is to be given by the teacher as to the ruler's power. Decision making within the nations is to be left entirely to the students who make up the nation-teams.

Before the game begins the students are given some ideas as to the realities of the international power situation as it exists according to the map and the chart. Atweena, a landlocked nation, has no navy, but it does have the most powerful army. Galbion, an island nation, has the largest navy. The two most powerful nations are Bismania and Galbion. The two weakest are Bontus and Egrama. It is a competitive and hostile world and each nation is faced with a different problem in maintaining its power, security, and independence.

The basic rules and pattern of the game should now be explained. In any war the more powerful nation, or alliance of nations, always wins and dictates the terms of the peace settlement. In a war a defeated nation can lose some or all of the power of its army,

navy, and its territory on the map to the victorious nation or nations.

Students who belong to a nation that has been wiped out of existence in war and its power and territory lost can continue as a part of the game with their NMF points. They may stay together as a group without nation status to negotiate for the restoration of their independence in return for the use of their NMF points in another war. As a group, they may join another nation with their NMF points. Or, they may go as individual refugees to join other nations, each taking along his equal share of the NMF points.

The game is played in cycles of well-defined phases, and each cycle begins with an international crisis. The basic four phases for the first cycle are: (1) planning foreign policy; (2) negotiations; (3) international declarations; and (4) peace conference. In later cycles additional phases of planning foreign policy, negotiations, or special international conferences may be called for on the request of the rulers of two or more nations.

Crisis. The game begins in the first cycle with a predetermined international crisis. A state of war exists between Nurovia and Atweena. It must be emphasized to the students that neither side is to be considered the aggressor; there is no right or wrong that can be attached to either; and all possibilities for peace have been thoroughly exhausted. The peace and security of every other nation is threatened. Atweena will conquer Nurovia unless Nurovia is able to bargain successfully to bring other nations into the war on her side. Atweena is, therefore, forced to seek allies. Every nation is faced with the decision to enter the war or remain neutral, on whose side to fight, and what kind of bargain to make for joining one side or the other.

Planning foreign policy. This first phase of the first cycle should last about five minutes. Each nation goes into secret conference to decide what to do in the crisis, what its long term foreign policy ought to be, and what nations its ambassadors should visit for negotiations. No communication with other nations is permitted during this phase.

Negotiations. In this phase, lasting about ten minutes, rulers are not allowed to leave their countries. National objectives are to be carried out by sending diplomats to confer secretly—and quietly—with the rulers of other nations. Rulers should generally receive only one diplomat at a time, and they have the right to refuse to confer with any nation's diplomats.

International declarations. Diplomats return to their own countries. Rulers stand. The five nations not originally concerned in the war are asked, in order, to declare themselves. The teacher's question is "War or peace?" If the answer is for war the nation must state whether it is joining Atweena or Nurovia. Nothing else can be stated by the rulers. The teacher totals the powers of the belligerents and announces the results of the war.

Peace conference. If more than the original two nations were involved in the war, the victorious rulers go to a peace conference to decide what is to be done with the defeated. At the end of a period of from five to ten minutes they must announce whether the defeated are to be wiped out of existence or merely weakened and left alive. The victor, or victors, may revise the map of the world on a chalkboard for all to see, but the changes of national strength need not be given to any nation not involved in the war. Thus ends the first cycle of the game.

The game continues with an intermediate cycle of three phases. The nations meet for planning their postwar foreign policy, and this action is followed by a phase of negotiations. The rulers then stand for international declarations. They are called in alphabetical order and the question is still "War or peace?" The answer can be "Peace!" Or any nation may declare war on any other nation. No nation can commit any other nation in its declaration.

The first declaration of war precipitates a crisis. When this happens the declarations stop and the game goes into a new cycle of phases the same as in the first cycle. This is the pattern of the game from then on.

The game can come to an abrupt end during any time of international declarations if all nations declare for peace. Unfortunately this has never happened in the experience of the writer. If it does happen, perhaps there is real hope for the future of mankind.

MODEL FOR SIMULATION GAME DEVELOPMENT

Keep in mind that you do not have to complete each step before preceeding
to the next. As the game takes shape, you will move back and forth as
you think of new elements or new ways to present items or deletions.

    I.   Objective: What do you want to teach? It should be a process.
It is easier to develop a game around a decision-making process
than something static and unchanging. As you write, think of
the things you want to be able to do after you have played the
game. Social studies content offers many examples of processes,
ranging from historical events to human relations to government,
etc.

   II.   Simplified Model: Think of a specific situation in which the
process you have chosen is used. Describe that situation as
completely as possible. Tell what happens, the order of events,
who is involved. From this, write a brief, descriptive statement
(scenario) to introduce the game.

 III.   Players: Who is involved in the situation you described above?
Be sure you have a complete list. Use the chart outlined below
to indicate what decisions each player makes, what the possible
choices are, and what the results should be for each choice.

Player	Decision Topic	Choices	Outcomes

Be as complete as possible. When you have completed the charts
for each player or group of players, look back over the charts

and locate the resources each player or group of players uses. These could be money, good will, votes, etc. Use this next chart to record the resources.

Player	Resources

IV. <u>Game Goal</u>: State as simply as possible what the goal of each player or group of players is for the game.

Player	Game Goal

V. <u>Rules</u>: Examine the description of the situation again. Where are there breaks in the action? What seems to be the natural rounds? What does each player do in each round? How much game time do you want to allot? Are there any things you need to impose upon the players at some point during the game? Crises, new laws, etc. Add them to the chart indicating when they are to be imposed and how.

Round	Event	Player	Moves	Time

VI. <u>Materials</u>:

A. Make a copy of the scenario for each player.

B. Write a description of each player or group of players.

C. List all materials that the players will need to perform their duties and to use as resources.

D. List the rules (behavior guides) for the game and for each round.

Name _____

Student No. _____

Section _____

WORKSHEET 1: MODEL FOR GAME DEVELOPMENT

1. Objective

2. Simplified Model

3. Players (Use a separate sheet of paper and the chart outlined below)

Player	Decision Topic	Choices	Outcomes

3a. Resources (Use a separate sheet of paper and the chart outlined below)

Player	Resources

4. Game Goal (Use a separate sheet of paper and the chart below)

Player	Goal

5. Rules (Use a separate sheet of paper and the chart below)

Round	Event	Player	Moves	Time (approx.)

6. Materials

Name _____

Student No. _____

Section _____

WORKSHEET 2

1. **Objective:** What is the game about?

2. **Simplified Model:** What happens in the situation you chose? In what order? Who is involved?

3. **Scenario:** A brief descriptive statement to introduce the game.

Name _____

Student No. _____

Section _____

WORKSHEET 3: DECISION TOPIC CHART

Player	Decision Topic	Choices	Outcomes

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WORKSHEET 4

Player Resources Chart

Player	Resources

Game Goal Chart

Player	Game Goal

Name

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WORKSHEET 5

Name _____

Student No. _____

Section _____

Round	Event	Player	Moves	Time

APPENDIX B

INSTRUMENTS

The following measures are not standardized tests. They represent an attempt to gather information concerning students and their attitudes prior to, during, and following the experience with group development of games. The Postclass Reactions measure was administered as the final item in modules B, C, D, and E.* The Student Evaluation Form was completed following the final module.

STUDENT DATA QUESTIONNAIRE

Name _____

Campus Address _____

Student Number _____ Phone Number _____

Approximate Total Grade Point _____ Class Rank _____

What is (are) your teaching major(s):

What is (are) your teaching minor(s):

Have you participated in educational simulation games? Yes _____ No _____

If yes, please list the names and the circumstances of the play. Use the back if necessary.

Based upon your experience, reading, or conversations, etc., how would you rate your knowledge of simulation games?

High _____   Medium _____   Low _____   None _____

How would you rate your interest in simulation games?

High _____   Medium _____   Low _____   None _____   Cannot state _____

Please explain your rating:

Given what you know of your own abilities (SAT scores, GPA, etc.), how would you rate yourself:

Overall: High---Low
Quantitative Skills: High---Low
Verbal Skills: High---Low

You had a choice between the Methods of Teaching Science and the Methods of Teaching Social Studies courses. Why did you elect social studies?

What grade level(s) are you most interested in teaching?

How many courses have you had in each of the following disciplines?

Anthropology _____   Economics _____   Geography _____   History _____
Sociology _____   Political Science _____   Psychology _____   Philosophy _____

POSTCLASS REACTIONS

Here are some questions about what happened in class today. Number from
1 to 7 on your OWN paper and indicate the letter which best tells how
you feel about what happened today. There are no right or wrong answers.
Please be sure to turn your answer sheet in at the end of class.

1. How much do you feel you learned today?

    a. Don't think I learned much.
    b. Learned a little bit.
    c. Learned quite a lot.
    d. Learned a lot today.

2. How clear was it why we were doing today's activities?

    a. Very clear to me.
    b. Pretty clear to me.
    c. Not so very clear.
    d. Not clear at all.

3. How often did you feel lost during this class period?

    a. Lost most of the time.
    b. Lost quite a few times.
    c. Lost a couple of times.
    d. Not lost at all.

4. How often did you feel you wanted some extra help during this
    class period today?

    a. Wanted help quite a few times.
    b. Wanted help several times.
    c. Wanted a little help once or twice.
    d. Wanted no help.

5. How often did you see somebody else needing help during our class
    period today?

    a. Saw somebody needing help a lot.
    b. Saw somebody needing help quite a few times.
    c. Saw somebody needing help a few times.
    d. Saw nobody needing help.

6. How do you feel about your participation in the discussion this last period?

    a. Not satisfied at all.
    b. Not very satisfied.
    c. Fairly satisfied.
    d. Very satisfied.

7. How do you feel about what the teacher did in this last class period?

    a. Very satisfied.
    b. Pretty well satisfied.
    c. Only a little satisfied.
    d. Not satisfied.

STUDENT EVALUATION FORM

In order to evaluate a teaching method, it is essential that the instructor have the opinions of the student involved. Please answer as completely as possible and as honestly as possible. This will have no effect upon your grade for this exercise.

1. How would you rate your participation in the six lessons?

    Module A High--Low

    Module B High--Low

    Module C High--Low

    Module D High--Low

    Module E High--Low

    Module F High--Low

2. How would you rate the class participation?

    Module A Total Class---Very Few

    Module B Total Class---Very Few

    Module C Total Class---Very Few

    Module D Total Class---Very Few

    Module E Total Class---Very Few

    Module F Total Class---Very Few

3. The information you were given at each stage in the game development process was:

    Module A Sufficient--Inadequate

    Module B Sufficient--Inadequate

    Module C Sufficient--Inadequate

    Module D Sufficient--Inadequate

    Module E Sufficient--Inadequate

    Module F Sufficient--Inadequate

4. How much did you learn about the process of game development?

   Much----------------------------------None

5. How much did you learn of the content of the game topic?

   Much----------------------------------None

6. Did you like developing your own game:

   a. As a class

      Much----------------------------------Not at all

   b. Would you prefer to develop a game as an individual? Yes ___ No ___

   c. Do you feel that you could develop your own game as a result
      of this exercise?

      Yes _____ No _____

   d. Would you try to develop games with your classes (when you teach)?

      Yes _____ No _____

   e. What grade levels do you think could do this? _____

Please write a general statement concerning your reaction to the game
development. Include any comments that you think might help the
instructor evaluate it honestly.

APPENDIX C

SIMULATION GAMES AND EVALUATORS' REPORTS

The three games developed through the study are reported as the classes wrote them. The questions distributed to the evaluators and their comments on the games are also included.

Simulation Game

I. Objective: Students will state and attempt to plan a school
                based on their ideas of what education should be
                like. They will also examine group process in
                decision making.

II. Scenario: There has been much dissatisfaction with the schools
                in your city. A new school is being formed and has
                been funded by a foundation. You are a member of
                the group chosen to form the new school.

III. Rounds

Round	Event	Players	Moves	Time
1	Introduction	all students	1. Present scenario 2. Select chairman	+5 minutes
2	Grouping	all students (groups)	1. Count off by 5 2. Group 1s, 2s, etc. 3. List 5 areas necessary to schools 4. Choose spokesmen	+10 minutes
3	Select topics	all students	1. Each group reports list 2. Refine list 3. Vote to choose five topics 4. Assign topics to previous groups	+10 minutes
4	Decisions on topics	groups	1. Discuss topic 2. Research 3. Prepare position statement	
5	General meetings	all students	1. Each group reports & discussion follows immediately 2. Check for and resolve conflicts 3. Prepare final report	

IV. Rules

    1. Student acts as chairman with teacher's aid.
    2. Group decides on topics, but must end with five topics.
    3. Small group reports must be reached through consensus.
    4. The final report must contain no conflicting statements.

V. Materials

    1. Dittos and Machine
           or
       Overhead projectors
    2. Chalkboard

VI. Debriefing questions

    1. Does the final report reflect your views of education?
    2. What part did you play in each round?
    3. How does your school compare with real schools?
    4. Would you like to try your school?
    5. How were decisions made in the small group? The large group?

Simulation Game

I. Objective: Students will experience the role playing and decision
                 making activities involved in a racially oriented
                 student strike.

II. Scenario: City High School is a racially and ethnically mixed
                 school with most minority students bussed in. Black
                 students are represented poorly in most after-school
                 activities. Matters come to a head when no Black
                 students are selected for the basketball team. Black
                 and White students use this incident to focus general
                 student dissatisfaction and a student strike results.
                 The following groups are involved in trying to resolve
                 the situation: Administration, students for the
                 strike, students against the strike, teachers
                 supporting the striking students, teachers opposed
                 to strike, parents for the strike, and parents
                 opposed to the strike. All groups are racially mixed.

III. Rounds

Round	Event	Players	Moves		Time
1	Introduc-tion	all students	1.	assign to groups	20 minutes
			2.	read scenario	
			3.	distribute profile	
			4.	forumlate state-ment	
2	1st all-school meeting	all 7 groups	1.	administrators chair & begin meeting	25 minutes
			2.	each group makes 2 minute state-ment	
			3.	try to reach agreement	
3	Negotia-tions	all 7 groups	1.	groups bargain in order to agree on plan to end strike	25-30 minutes
4	2nd all-school meeting	all 7 groups	1.	administration chairs & ask if agreement has been reached on any points	50 minutes
			2.	follow-up and try to reach consensus!	

5   (If agreement, game goes to debriefing.)
     (If no agreement:
                    a. Administration may use authority to call
                        in police. Go to debriefing.
                    b. Administration may declare another
                        negotiation session. Recycle to round
                        3, etc.)

6   Debriefing all students   1. discussion of   as needed
                                       questions

IV. Materials:

Profiles of each group.

A. Administration

The administration of this school feels it is their respon-
sibility to provide every child an education. We feel that a
student strike interfers with the learning process and therefore
cannot tolerate such action.

We therefore request that all students return to classes
Monday. The administration feels that we must have this school
operating on a normal basis in order to ensure that every student
may learn. At the present time, students attending classes are
being deprived their right to learn.

We will do all in our power to confer with those involved in
the conflict to bring about a solution that will be acceptable
to both sides. It is our position that every child in this
school is equal, and we must leave the evaluation of specific
abilities to faculty involved.

You will chair the meetings and will act to keep order.
You may inpose the rules of the meeting or let the whole meeting
decide them.

B. Students for strike

Demands and Stands

1. If we are going to go to this school we should be a part
    of every activity that goes on if we are qualified.

2. A public school is supposed to draw from all possible
    resources when putting together a team for competitive
    purposes.

3. We no longer have community schools as traditional
    conventional society wants us to believe. The community
    today is county wide.

Objectives

1. Fire B-ball coach for being incapable of being sensitive to needs of minority group members. Student body should hear applicants and have voice in decision of new coach.

2. Require all teachers in school to take part in 3-day seminar that shows conditions in the ghetto and restate their responsibility as teachers.

3. Set up human relations council composed of students, faculty, and number of administrators.

C. Students against the strike

1. Things were fine before bussing was started -- now these people come in and because they can't take over the basketball team, they cause all kinds of trouble.

2. We cannot have a learning situation in which there is no order -- we had nothing against bussing before it infringed on our ability to communicate with our teachers.

3. These decision-makers are not elected by the students and are not subject to correction by them. We are students in school to learn, not to run it. School and classes must resume now.

D. Parents for the strike

1. Parents for the strike demand equal representation of blacks on the basketball team and free and equal participation on other school activities.

2. We demand that when a racially tense situation occurs within the school system or in school related activities that the administration take a stand immediately and work for a resolution of difference that is fair to both parties involved.

3. In case our demands are not met by the school administration we will carry these demands to higher authorities and will withdraw our children from school until a satisfactory decision has been reached.

E. Parents against the strike

Beliefs:
    Students are subordinate to authority--school and parents.
    Strikes are illegal.
    Strikes hinder your education.
    You are irresponsible. The school is not to be judged by you.

G. Teachers against the strike

Strikes are stopping the educative process and they don't have the effect they once did. They are an everyday occurance.

Granted strikes may have some effect but the time that strikes waste could be better used in a meeting of all interest groups. We do feel that the players have a justified complaint but don't feel that it should disrupt normal school processes.

We will continue to hold class--all are expected to attend.

V. Rules

A. Students must represent their group.
B. Negotiation is carried on by one representative of the group with the other group leader.

Simulation Game

I.   Objective: The students, as individuals and in groups, will
                  discuss and make decisions about their personal
                  values.

II. Scenario: This is a game about values and what is important
                 to us as individuals and what links us to groups.
                 We will select values and bargain as group members
                 for tokens that represent these values.

III. Rounds

Round	Event	Players	Moves	Time
1	Generate list of values	class members	1. Ask each student to list 5 important things 2. List 5 most common values	(day before play)
2	Create groups	class members	1. Number off to create groups of 4-6 students 2. Distribute tokens	5 minutes
3	Set goals	groups	1. Reach consensus on group goals 2. Report secretly to moderator	10-15 minutes
4	Bargaining	groups & individuals	1. Individuals bargain with each other to achieve group goals	15 minutes+
5	Report	groups	1. Groups state whether or not they reached goals	2-5 minutes
6	Re-set goals	groups	1. Decide to stop or not 2. Decide on goals 3. Report to moniter	10-15 minutes
7+	(repeat 3-5 as deemed desirable)			
end	debriefing	class members	Discussion	(as necessary)

IV. Rules

1. Group goals are kept secret.
2. Goals can be changed only in goal-setting rounds.
3. Total tokens must be at least 20 for all categories.
4. To bargain, uncross arms
    Cross arms when player is not bargaining.
5. During bargaining, keep tokens secret.
6. Once players begin to bargain, they must complete a deal.

V. Materials

1. Tokens -- 30 each of 5 colors
2. Goal Report Cards

VI. Debriefing questions

1. How did your group choose goals?
2. Why did your group choose those goals?
3. How did you bargain?
4. Did you change your goals? How? Why?
5. Did you change your bargaining strategy?
6. How did you feel at each stage?

QUESTIONS DISTRIBUTED TO THE EVALUATORS

1. Is the objective of the game clear?

2. Does the simulation fit the objective?

3. To the best of your knowledge, is the game a simulation of reality?

4. What weaknesses do you see in the game?

5. What strong points do you see in the game?

6. Does the game seem complete?

7. If not complete, do you still see it as valuable?

8. What criteria are you using to evaluate the game?

COMMENTS ON GAMES

Evaluator 1

First, I shall give you some general comments about your procedures and materials for providing students with an opportunity to design games. Then, I shall present specific comments about each of the games. The comments will generally correspond to your questionnaire.

General Comments

1. I think your game model is an excellent beginning. It includes all of the design tasks in a good sequence. It is flexible enough so that it can be modified and extended to adjust for the data you get from your first tryout.

2. The students should be required to choose a referent system and an objective with which they are sufficiently familiar to be able to state principles underlying the operation of the referent system. This requirement should be carefully monitored by the teacher and incorporated in the game design model (step III).

3. The objective should be carefully stated in operational terms and the designers should be required to justify each aspect of the game in terms of its contribution to achieving the objective.

4. The parts of the game should be evaluated by trying it out on a group other than the designers. The feedback thus obtained is invaluable for teaching how to design games.

5. There are some prerequisite skills to game design. These include: ability to write behavioral objectives; ability to describe and analyze tasks so as to identify underlying concepts and principles; knowledge of game mechanisms, e.g., how to represent chance events in various ways; how to write instructions. These skills should be taught before the design model is used. As an alternative instructional procedure, the teacher might design mini-lessons to teach the prerequisite skills and make them available to the class.

6. It is easy to criticize specific technical points about the games that were produced. The criticisms should be balanced with the observation that all three games represent remarkably good products for the time the students had available. In addition, I am sure that design experience will enable the students to appreciate the value of games as an instructional device and will enable many of them to design games for their students when they become teachers.

7. Before they begin designing, students should have read some textual material about the purpose and characteristics of educational games. The Simulation Games for the Social Studies Classroom, or Alice Kaplan Gordon's Games for Growth, SRA, Palo Alto, 1970, or Elliot Carlson's Learning Through Games, Public Affairs Press, Washington, D.C., 1969, are examples.

Also, the students should have the opportunity to examine games, both published and designed by other students. The relation-

ship between the exercises in your design model and the game

characteristics should be pointed out.

Section 1

1. Objective not clear; includes process and product. Standards

    for evaluating achievement of objective not included. "Make

    decisions" not sufficiently operational to judge effectiveness

    of game.

2. Not clear that game and objective are related. How do individuals

    bargain to achieve separate goals? Students bargain for tokens

    which represent a secret priority list. The play of the game

    doesn't provide for "bargaining" about the value of various

    goals; merely about collecting tokens.

3. Groups can reach consensus on relative value of various goals

    and can order them sequentially. But bargaining for tokens

    with other groups (I assume this is the activity in Round 4)

    is not a realistic way for groups to confront each other's

    differing goals.

4. Weaknesses

    (a) Instructions not clear, i.e., how to bargain; relation-
        ship of tokens to individual values and to group goals;
        basis for resetting goals;

    (b) No plan for evaluating game. Designers should not test
        game on themselves. By doing so, they did not notice
        the lack of clarity in objectives and instructions.

(c) No clear referent system. Where and how could players use what they learned in the game?

(d) No indication of consequences for players' actions.

(e) No indication of principles to account for players' actions or consequences of these actions.

(f) Game does not seem suitable for organization in rounds.

5. If weaknesses were eliminated, game might provide milieu for learning about how individuals reach consensus on differing values. Debriefing questions are good.

6. Too much reliance on debreifing to achieve completeness and closure.

7. See 5.

8. (a) Operationally stated objective.

(b) Principles, game conditions, action options, consequences and resources similar to referent system.

(c) Clear instructions.

(d) Achieving the game object related to achieving the learning objective.

(e) Game providing practice not available, too costly, or dangerous in referent system.

(f) Game must take into account player's prerequisite knowledge and skill.

(g) Game must fit into curricular context, if any.

(h) Game must meet physical and time constraints of course.

Section 2

1, 2 and 3, 4.   Objective is not clear and misses the point of

the referent system. Presumably, the objective of the game

is to enable students to empathize sufficiently with the

seven interest groups so that they could generate arguments

that accurately represent the various points of view.

The game presents the arguments and various points of view to

the players and this does not give players the opportunity to

become actively involved in generating them. In the latter

case, some empathy or at least tolerance may develop.

5, 6.   In a role play situation such as this, a terminal

debriefing is extremely valuable to allow players to "survey"

what they did and attempt to understand their decisions and

actions. An important input to the debriefing is objective

feedback of actions and decisions. This information should

be collected according to a previously developed plan, which

could consist of a set of questions relating to player

actions, to guide the observer. In the debriefing, the

players should be required to produce a product. This

requirement will structure the discussion and resist its

degeneration into a bull-session. The product could be:

(a) generating a list of "interests" or values and incentives

which affect the behavior of each of the groups; and (b)

generating a compromise solution for all groups.

8. Same criteris as in Section 1.

<u>Section 3</u>

Most of the comments on the previous games apply here also. The objective is inadequate because it does not describe a learning outcome and it is not derived from a referent system. If the learning outcome is inferred, e.g., in this one, to be able to state the principles that account for group processes in group decision making, the game provides an opportunity to discover these principles. However, the game is not sufficiently well designed so that consequences of good or poor application of the principles will result in recognizable consequences.

COMMENTS ON GAMES

Evaluator 2

Note: Some comments are made for each game, but often general comments are made under the heading of one game which apply to all three.

Section 1

1. The objective of the game is not clear. It refers primarily to means rather than ends. There are no descriptions of conditions, criteria, and behavior.

2. The simulation does fit the objective as stated, but the objective is stated so vaguely that many things could fit into its description.

3. I wonder about the realism of the consequences for a player's behavior: what really happens when you do bargain with other people in order to make them conform to your values? Why are group goals kept secret? Is this done in real bargaining sessions? Why do they cross and uncross their arms during the game? In addition, there are no guiding principles to determine realistic consequences for player's reactions. Perhaps natural outcomes may occur within the game; but because the game is set up in an unrealistic fashion, I doubt that the consequences will be realistic.

4. I thought the scenario was particularly vague, and that the concept, _values_, was not carefully defined. I had some doubts about the debriefing questions; were they directly related to the objective? The game certainly doesn't seem

complete, if we are talking about the real-world system
where people try to influence other people's values. The
game rules are vague: what are people bargaining for, and
why, once players begin to bargain, must they complete a deal?

8. What criteria am I using to evaluate the game?

First, I checked to see if the objective was a statement
of outcome. Second, I checked to see if the conditions and
the behavior in the objective do conform to some real-world
situation and behavior. Third, I checked consequences --
realistic consequences -- determined by the principles that
operate in the system represented by the game, with appropriate
probabilities attached to them. Fourth, I judged the game's
comprehensiveness -- does it deal with those aspects of the
real-world system that are necessary to reach the objective;
and fifth, I asked: is the student likely to learn from the
game? I'm sure that the student is likely to learn something
from any experience, but from this game, and the others
listed, I have no idea what students would learn because the
objective is vague. For all the games mentioned, I feel a
need for data to show what the games teach.

Section 2

The same comments apply regarding the objective -- this is a
statement of means rather than ends. As in all the other games, there
is a weakness in having only one scenario; students simply practice
once in a situation, and don't get a chance to practice again or

demonstrate that they have learned from the first trial. There are
no principles mentioned here and there are no realistic consequences
provided. There is no data related to results of playing the game.
In this particular game, there is no umpire to preside when disputes
are made about the game rules. The role play and conditions of this
particular game seem to be highly realistic, but there are a lack of
realistic consequences. There is no definition of debriefing and no
questions listed for debriefing.

Section 3

My response to Section III's game is much the same as the first
two. I think the initial organization of the game, although necessary,
is probably unrealistic. It may be more realistic to group players
according to what their educational goals might be like. I think
it would be more realistic to have these people represent factions with
a particular point of view. In this game, there are no consequences
and no principles to guide the people's actions to see what would
really happen. In this game, for example, there are no consequences
to show what is likely to happen when an educational plan is put into
action. I do not believe in the realism of the research required for
people to make the decisions in this game.

In addition, the debriefing questions do not seem to relate
to the objective.

COMMENTS ON GAMES

Evaluator 3

Section 1

1. It is not quite clear as to how students will make decisions
    about their personal values or what kinds of decisions they
    will make, but I assumed these questions would be answered
    in the game itself. If so, the objective seems adequate.

2. The simulation does not exactly fit the objective? The phrase
    "make decisions about their personal values" bothers me,
    inasmuch as during the course of the game it is not clear
    how or when they do so. I can't see how decisions made will
    directly affect their personal values. The decisions will be
    quite superficial, I think.

    The use of tokens to represent the values (in some ways,
    never defined), might make the tokens supreme, rather than the
    values themselves. To paraphrase McLuhan, the tokens might
    become the message.

3. If the tokens would represent such material values as money,
    jewelry, real property, yes. But if they would represent
    such intangible values as love, or enjoyment, or peace, I
    cannot see how the bargaining process is reality.

4. The major weakenss is that the directions are incomplete.
    Examples: (a) Round 1. The directions say, "Ask students
    to list 5 important things"; "list 5 most common values".

If I were using this simulation with adults, I would need clarification. "Things" is not necessarily the same as "values". What kinds of things, or values, are intended? Are only material values (money, jobs, homes) represented by the use of the word "things?" If so, it should be stated clearly. Some examples are needed; (b) Round 2. How are the tokens distributed?; (c) Rounds 3 and 4. How do the tokens represent values? An example here would answer many questions. This is a major point, and needs to be much clearer; (d) Round 5. Are the reports given orally?; (e) Round 6, step 2. "Decide on goals." Shouldn't this be "decide on new goals," since they have done this before? Or does this sentence suggest the students could keep the same goals (even though by now they would not be secret any more), or set new goals, if they wish?; (f) What is the purpose of keeping the goals secret?

5. This game has possibilities. I think the basic objectives are sound. The rules need to be more specific.

   The debriefing questions are very good and the most worthwhile part of the simulation. I can see some very effective dis-cussions arising from the use of these questions.

6. As I said in my answer to question 4, it depends upon what kinds of values are considered.

7. Yes, the game could be edited and it would have a good use.

8. My major criteria is whether I could present this simulation as is to a group of students or adults; whether I can visualize

each step clearly in doing so. I try to think of questions

or stopping points the participants would get hung up on.

I am influenced mainly by Dr. Garry Shirts' philosophy.

See his "Inventory of Hunches."

9. I am certain the class had a workable game and they knew

how the rules worked. They did not seem able to put these

rules clearly.

This type of game, working on personal values, is much

harder to do than a strict simulation of superficial conditions,

and much harder to work out. It has potential, but would

take further study and testing.

Section 2

1. It is very well stated. I would like to see it go further,

however, and state what students might be expected to learn;

the outcomes (changes in attitudes, better understanding of

the problems, etc.).

2. Yes, for the most part. See my answers to question 4.

3. Yes, it seems to fit life today.

4. (a) Step 3 in Round 2, "try to reach agreement," seems to

be part of Round 3, "negotiation." If there is a difference

between the steps, what is it?

(b) The roles seem too structures in some cases. The groups

(like Administration, and Students For The Strike) really

have their statements written for them so completely that

Step 4 of Round 1, "formulate statement" seems unnecessary.

(c) The roles suffers from having different authors. They are not uniform in style nor format. In some cases they are unclear. Examples: (1) Administration -- part of the profile says "we", part "you", in apparently referring to the same persons; (2) Students Against The Strike -- paragraphs are not clear as to subject. Who are "these people" in paragraph 1, and "these decision makers" in paragraph 3? Paragraph 2 apparently refers to something not given in the scenario nor anywhere else in the game, a mention of students inability "to communicate with our teachers."; (3) Parents Against The Strike -- "You are irresponsible..." To whom does this sentence refer? The strikers? or the strikers' parents?

5. The game is well laid out and thought out. The scenario is clear, and the moves in most cases are clear. Some of the group profiles are very well written. (Also see my answer to question 9).

6. Yes. Round 5 deals with closure very well.

7. (not necessary to answer)

8. My major criteria, as an author of simulations, is whether I feel I could present this game to a group of students or adults. I try to visualize each step and anticipate hangups and problem areas. (This is theoretical, of course. A major test would be to actually present it.)

9. This seems to be a good workable game. Some editing is necessary, but it seems sound and worthwhile on the whole. I think students would enjoy playing it and the outcomes in terms of new understandings and attitudes, and empathy, would justify its use.

Section 3

1. Fairly clear. I would like to see something dealing with suggested outcomes in terms of new understandings and/or attitudes.

2. Yes, except that nowhere is there any suggestion as to the . level or type of school (elementary, junior high, high, junior college, university, etc.), not any move where the level is decided. Perhaps this is one of the first moves of Round 3, but it is not so stated. When the students of Section 3 played this game, how or when did they settle the question?

3. Yes, except that in reality a group choosing a new school under these conditions would probably be representative or the community and thus balanced with educators, parents, administrators, professional persons, business people, students, and (hopefully) minority groups.

4. (a) Nowhere has the type of school been stated; (b) The location of the school would also be important. This is not stated; (c) Round 2, move 3, "list 5 areas necessary to schools." I have trouble visualizing five areas. Would they be physical areas in the school plant (library, classrooms, physical education, etc.), or educational areas (mathematics, social sciences, languages, science, art, etc.)? The directions should be more clear here. Even the listing of five seems arbutrary--why five, and not four, or perhaps even six?;

(d) Round 3, move 4. Who assigns the topics, and how?;

(e) Materials are listed under V, but no suggestions as to why, or how they might be used; (f) No time limits are given for Rounds 4 and 5. Obviously they would take much time, particularly research; (g) Debriefing questions are listed, but no mention of how or when they are to be used.

5. I can see many good points. The most valuable one is the discussion of personal educational theories and objectives, and how an ideal school could implement them. This sort of discussion would be especially valuable for groupf of teachers, teacher education students, administrators, students, and even parents.

    If one of the areas includes "equipment and supplies," this would be valuable, also.

    The debriefing questions are well stated and would provoke some good discussions.

6. Yes.

7. (not applicable)

8. Having invented and used simulations for several years, my chief criteria is whether I could visualize its use with a group of students and adults.

9. This seems to be a good simulation and would be valuable to many situations, with only a small amound of editing. This class had a good idea and worked it out well.