

Guide to Instructional Simulation and Gaming for the Classroom

S. Joseph Levine, Ph.D., Editor
1975. Used with permission

Drs. Ward and Levine were colleagues at Michigan State University and collaborated on several projects. The effective use of instructional simulations was one of those projects. This manuscript is included in the Archives for that reason.

Table of Contents

Introduction.....	i-ii
Chapter 1: Teaching with Instructional Games (S. Joseph Levine).....	1-9
Chapter 2: Designing and Using Role Plays (S. Joseph Levine).....	10-16
Chapter 3: Communicating Concepts through Simulations (S. Joseph Levine).....	17-22
Chapter 4: Conducting Simulation/Games in the Classroom (William A. Anderson).....	23-30
Chapter 5: Formative Evaluation for Games and Simulations (George F. Sergeant).....	31-39
Chapter 6: A Baker's Dozen—Basic Reference for Simulation and Gaming (William A. Anderson and S. Joseph Levine).....	40-42



Introduction

Why has this book been written?

The use of games and simulations is seen as a viable alternative mode of instruction that holds promise for numerous classroom applications. In fact, games and simulations hold tremendous promise for teaching about games and simulations! So why has this book been written? It is hoped that this book will provide a vehicle for reflection and synthesis of ideas that are stimulated through actual experiences. As a part of a college-level course for teachers, this book is designed to provide the underlying concepts and rationale for games and simulations. The actual experiences provided during the course will provide an understanding of the dynamics and impact of games and simulations. As an integrated approach, experiences and reading, it is felt that teachers will truly understand the potential of instructional games and simulations.

Exactly what are games and simulations?

A simulation is an abstraction of reality. It is an attempt to recreate a piece of the real world in a new setting. Instructional simulations are used to provide learners an opportunity to operate in a real world situation within the confines of the classroom. Through the use of instructional simulation it is hoped that the learner will learn about that aspect of the real world that is being simulated.

A role play is one form of simulation. It deals primarily with affective learning (feelings and emotions) through structured interactions. Fictitious situations are created in the classroom and learners are asked to step into a specified role and interact with each other. Through the use of role plays, learners can become aware of their own behaviors and the behaviors of others when faced with different situations.

Instructional Games can be considered as a very low-reality form of simulation. Their use is not dependent upon the level of reality for learning. Games have defined goals and there is always some aspect of competition incorporated in their design.

Simulations, role plays, and games all capitalize on the concept of interaction to stimulate learning. Through interaction, the learner becomes actively involved in the learning task. Many interactive learning activities, though not specifically designed as simulations or games, utilize some of their characteristics. Also, many simulations and games are not designed as “pure” forms, but instead integrate aspects of both.

How is this book organized?

In the chapters that follow, you will find the first three deal specifically with the design characteristics of games, role plays, and simulations. The fourth chapter describes the concerns and considerations that go into effectively using games and simulations in the classroom. Formative evaluation and strategies for examining the effectiveness of games and

simulations is the focus of the fifth chapter. The final chapter presents a selected annotated bibliography of some of the references that are currently available on the topic of instructional gaming and simulation.

We have attempted to keep verbiage to a minimum and to present ideas clearly and succinctly. We hope that this book will assist in the further clarification and understanding of the instructional potential of games and simulations.

S. Joseph Levine
April, 1975

Chapter 1

Teaching with Instructional Games

S. Joseph Levine

Games have been used for centuries as a form of recreation for the player. However, it is often forgotten that games have also been used for a long time for their *instructional* value. One of the oldest games, GO, was used within the oriental culture to examine the dynamics of strategy when applied to battlefield situations. By playing the game, the soldier would become better acquainted with various tactical maneuvers that could spell victory or defeat during war. Likewise, the game of chess clearly demonstrates the differential power of medieval characters. The king has the most power and consequently has the greatest freedom of movement. At the other extreme, the lowly pawn has limited power and is often sacrificed for the welfare of the more powerful.

For classroom use, instructional games have their primary value at the lower stages of cognition. Their use is most effective for the learning (knowledge) and basic understanding (comprehension) of information. The higher levels of cognition (application, analysis, synthesis evaluation) can also be accommodated through a game-like environment such as role playing or simulation. Both of these forms of instructional gaming will be discussed in later chapters.

When instructional games are considered for inclusion in the curriculum they are most often used because they are “fun” for the learner. This is certainly a viable reason (shouldn’t school be fun?), but it is a short-sighted view. Instructional games have both *play-related objectives* and *content-related objectives*. The *play-related objective* is the concept of “winning.” This may consist of collecting a certain amount of points, being the first to arrive at the FINISH box, collecting a set of cards, and so on. The play-related objective does not necessarily relate to the instructional value of the game. It does, however, create the reason why the player will play the game. If the play-related objective is very minor in a game, there is a possibility that no one will want to play the game!

The *content-related objective* is the learning that you would like the game to impart. Content-related objectives are often specified as instructional (behavioral) objectives and they specify exactly the abilities that are expected of the learner as a consequence of playing the game.

Standard instructional techniques have a content-related objective but not a play-related objective. Games have both. The challenge to the game designer is to create games where the two types of objectives are in balance. Certainly this will be dependent upon the specific learners that will be playing the game and their individual needs. If a game has an extremely high play-related objective (and a low content-related objective) the learner will leave the game thinking it was fun, but having learned very little. In a game where the content-related objective is extremely high (and a low play-related objective), the learner may not perceive the experience as a game and in fact may not want to

play! When these two types of objectives are in balance the learner will enjoy the experience and also learn something.

Games consist of four basic aspects:

Play This is the actual interaction that goes on during the game. Unlike a book that has the learner operating in a passive manner, an instructional game calls for active involvement.

Players These are the people that are playing the game. An instructional game may call for only a single player (solitaire game) or two or more players. Players may be operating independently, in groups or teams, or a combination of the two. The players for a particular game may be specified according to sex, age, interest area, experience, or other variable.

Rules These are the artificial constraints that structure the interaction. The rules set the level of skill (or chance) that is required; whether cooperation is necessary; the content that will be focused on; how complex the game will be, and the degree of reality of the game.

Goals This is the reason for the *player* to *play* according to the rules. Goals are usually defined according to the play of the game (who can get to the finish zone first) and the intended learning (the player will learn _____ by playing the game). Non-instructional games have only play-related goals. Instructional games have both play-related and learning-related goals. The play-related goals serve to motivate the learner in the achievement of the learning-related goals.

Instructional games are best used for drill and practice of previously presented information. Though they can be used for presentation of new information, such an experience can often be frustrating for the player. You will find that there are many topics where the learners have a basic understanding of the content but have not had ample opportunity or practice to really learn it. These are ideal situations for using instructional games.

If the information is completely new to the learners, or if you have doubts whether or not all of the learners have been introduced to the information at the same level, your best bet is to present the information in a direct (didactic) way (i.e. lecture, motion picture, tape/slide presentation, etc.) and then follow it with the instructional game. The game will serve to reinforce and support the information that is presented.

The basic format for most instructional games is that of *question* to *answer*. The player is presented with a question and then must answer it. If correct, the player receives some reward (gets some points, moves his marker ahead on the game board, receives some tokens, etc.) The question may ask for a simple factual response, a response with a supporting reason, or an elaborate decision based on the information that is presented to the player.

If designed well, the player will receive immediate feedback on his response *as an integral part of the game*. This may come from a game card, the game rules, or the other players. It is this aspect of gaming, feedback, that insures that the player is learning the appropriate content. Without feedback in an instructional game, there is no guarantee that the player will leave with the desired learning.

Care must be taken in the use and design of games to insure that the game model is one that is also appropriate for use with the intended learners. This is particularly important when it comes to the competition/cooperation component. True, games all consist of some level of competition. However, the level of competition can be altered. The level of competition should only be as strong as is needed to motivate the participants to become involved with the game and the content. Unnecessarily strong competition can often destroy the game and focus the players' attention on the play-related goals and thereby subvert the learning-related goals. A rule of thumb is to design instructional games that are too low in competition rather than too high.

Some players need a “strong dose” of competition to stay involved with the game. Other players need very little competition to succeed. A helpful design idea to keep competition in balance is to direct the players' competitive efforts toward a criteria rather than against each other. In other words, all of the players are united in the common goal of beating the *game* rather than beating each other. This strategy can be assisted by creating team games where the players are acting cooperatively in an attempt to win over the game rules.

The preceding discussion has provided a basic look at what goes into the design of an instructional game. Now, let's look at some actual instructional games. The following pages present three basic instructional game formats. **Game #1** is designed to provide learners an opportunity to organize information about a specified topic. You'll note that the topic for Game #1 is games! Try playing it—it should organize and reinforce the information presented in this chapter. **Game #2** is a simple drill and practice game for use when you would like learners to gain clarity on a topic through repetition. **Game #3**, a simple card game, is useful for categorizing information into sets or groups.

After you've had a chance to digest the information and games presented in this chapter, take a trip to your local game supplier (toy store, department store, etc.) and examine some of the available games. You'll probably notice that:

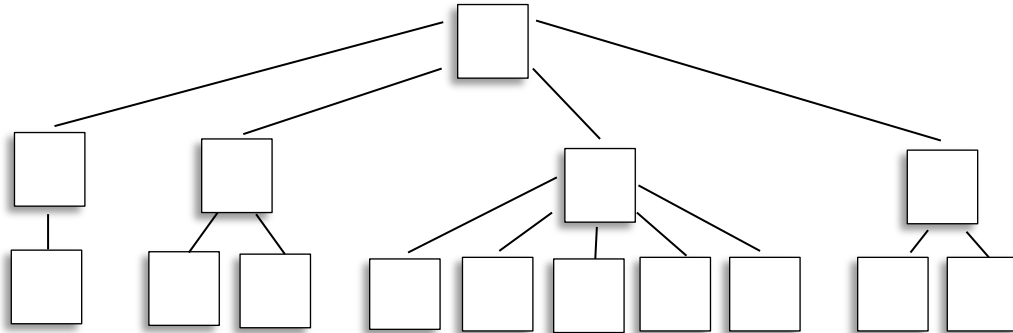
- There are dozens of games on the market.
- Though most of the games are not designed for instructional purposes, they can be easily modified to relate to different content areas.
- There are really only a few basic game formats. Most of what you see are merely variations on these basic formats.

Examples of Simple Instructional Games

Game #1

If you have some content that is organized in a defined fashion and it is necessary for the learners to understand the organization, create a game that is merely the reconstructing of the organizational chart.

Cut the boxes on the dotted lines. You will have 15 squares. Then, organize the squares so that they are logically arranged in the following sequence:



If you need some help, turn the page and read one of the hints. The correct answers are shown immediately following the hints.

1 Number Single Multiple	2 Competition or Competition/ Cooperation	3 Interaction	4 PLAY
5 Type Age, Sex, Ability, Experience, Grade	6 Degree of Complexity	7 GOAL	8 Chance Skill Chance/Skill
9 RULES	10 Play-Related (Type of payoff— money, points, etc.)	11 PLAYERS	12 CHARACTERISTICS OF GAMES
13 Degree of Structure	14 Learning-Related (Content, motivation, transfer)	15 Degree of Reality (Time, threat, involvement, etc.)	

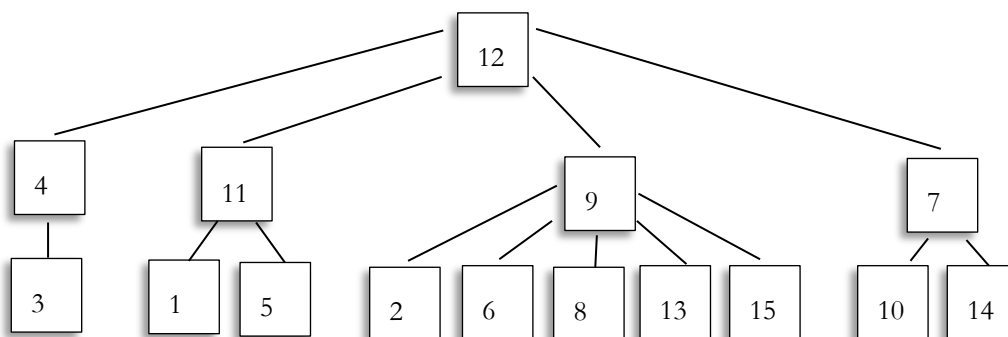
Hint #1—This game deals with the characteristics of games. What do you think the top card is?

Hint #2—Notice that 5 cards are printed using all capital letters. These cards go in the top two rows.

Hint #3—The “RULES” card has five cards modifying it.

Hint #4—There are two types of goals in a game.

Answers:



Discussion

This game is built on the premise that you have read the information previously presented in this chapter. If you have, the game served to review the information and allow you to try your hand at organizing it. You'll notice that some new information was added, but this was done in minor ways and “winning” was not dependent upon this new information.

The game is designed to have the player compete against criteria (the organization chart). Cooperation could be added to the game if you were instructed to play the game as a team with another person.

The game is entirely built around skill with no chance factors included. Feedback to the learner is provided by the “Hints” and also by the “Answers.” The complexity of the game is reduced by the chart that is presented, and if the game is still too complex, the “Hints” further reduce the complexity.

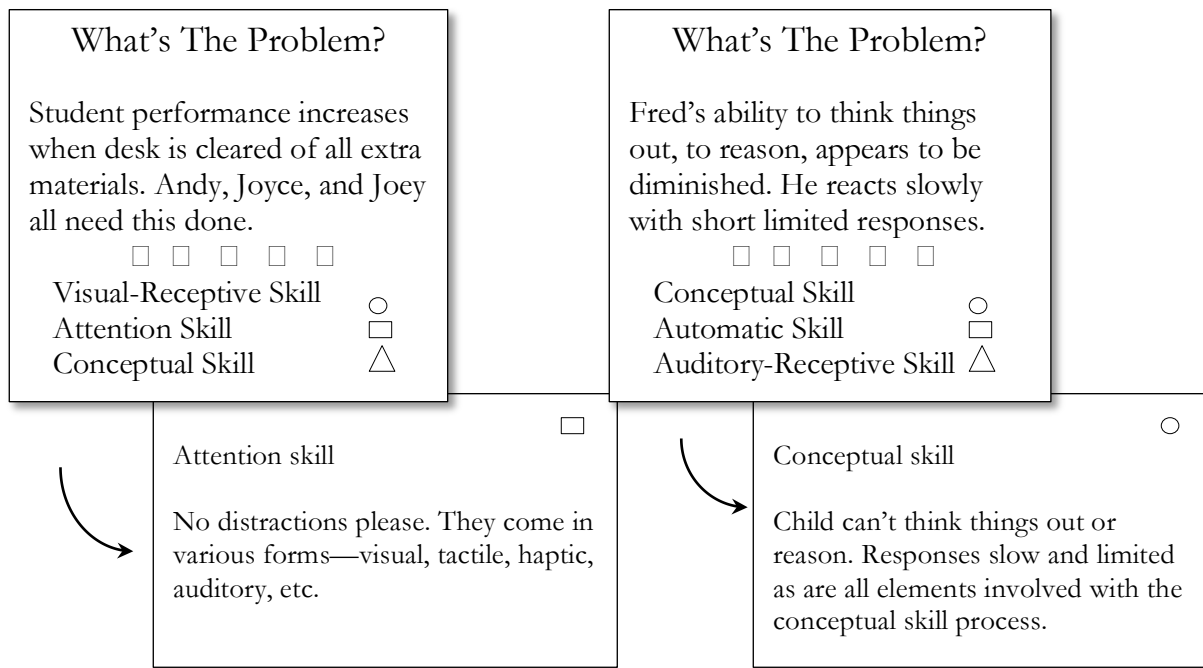
Game #2¹

This game consists of a game board and two sets of cards that are drawn by the players in a rotating order. One set of cards presents (on one side) a question and a set of possible answers. On the reverse of the card is the correct answer to the question and an explanation. The other set of cards are “chance” cards and are drawn if the player lands on a specified space on the game board. Each player reads the question on the card, moves his playing piece the appropriate number of spaces, and turns the card over for feedback. If correct, he leaves the playing piece where it is and the next

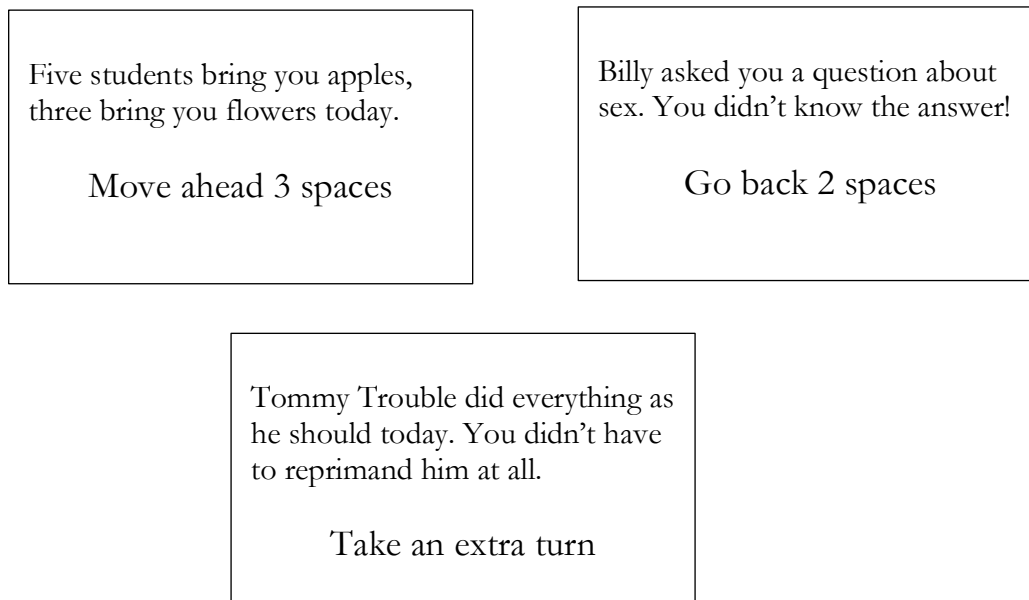
¹ Game #2 is actually *Teacher's Lounge*, a diagnostic teaching game for teachers. Permission to reprint parts of the game has been granted by the producer, Educational Design Association (PO Box 915, East Lansing, MI). *Teacher's Lounge* is copyright, 1972, by Educational Design Associates.

player draws a card. If incorrect, the player returns to his/her position prior to drawing the card. If he/she lands on a “chance” space, he/she draws a chance card and moves accordingly.

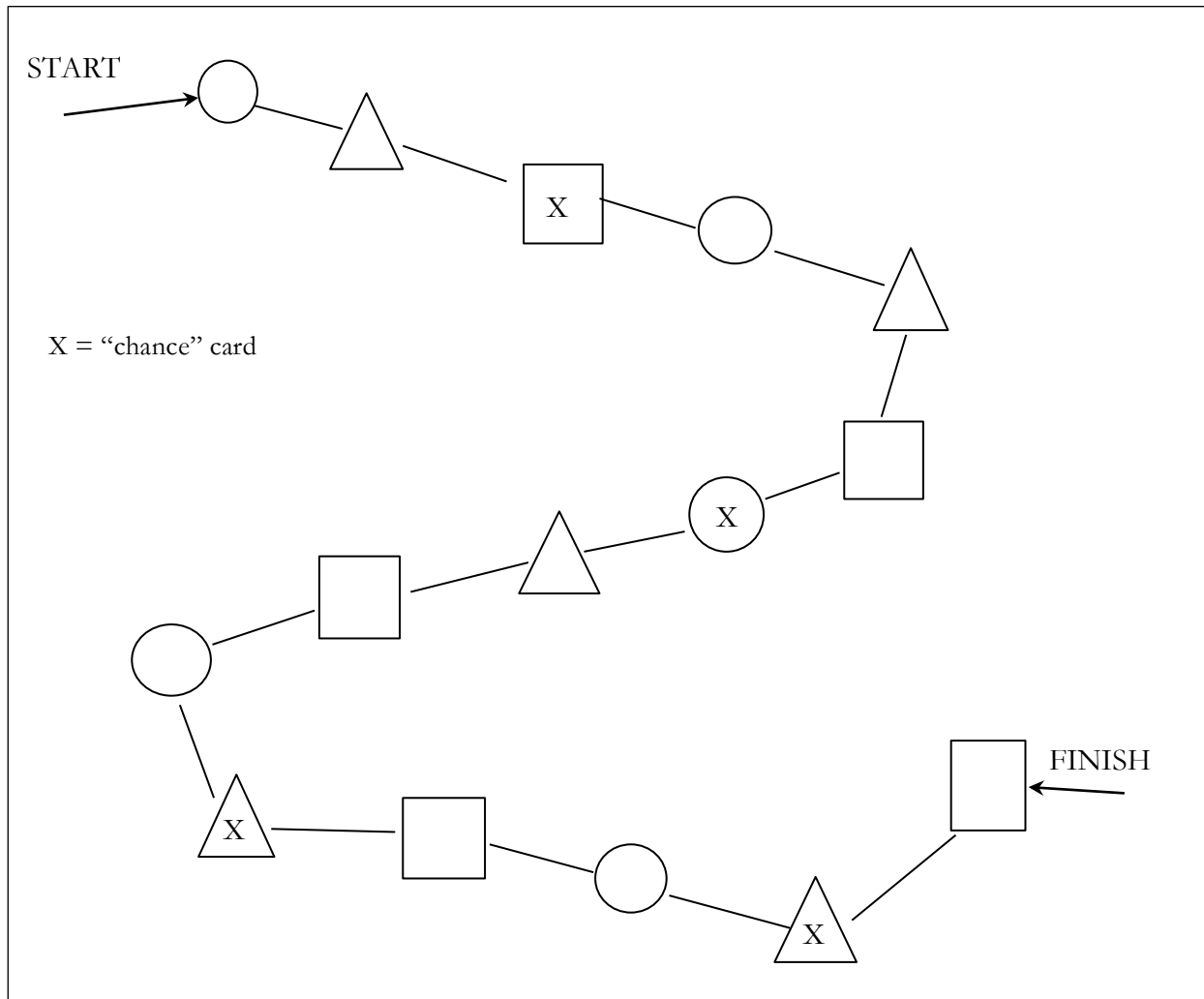
Samples of Game Cards



Samples of “chance” cards



Game Board



Discussion

This game consists primarily of a simple flashcard procedure with some gaming aspects added. By utilizing the game in a group mode, the players assist each other in solving the problems (answering the questions) and thereby learn from each other. Cards that present questions that are challenged by players are immediately brought up for group discussion. Since the playing of the game moves rapidly, it only takes a minute or so for each card to be answered, a number of question/answer sequences can be provided the participants.

Unlike large group instruction where all participants must be dealt with at the same pace, the game provides an opportunity for participants to proceed through the learning experience at their own rate. Depending upon the desires of the players, the action can call for competition solely against the game (everyone is trying to beat the game), or a combination of competition against the game (answering the cards correctly) and against each other (getting to the finish square first).

As an introductory activity, the game complexity can be decreased by providing the players with a set of definitions to assist them in playing. For participants who already have a basic familiarity with the game, the use of the definitions can be optional.

The game is primarily skill-based with a minor amount of chance added through the “chance” cards. The chance factor can be increased by providing a larger number of answer choices on the cards or by including more “chance” places on the game board.

Game #3

Most of us have played dozens of card games. A card game usually consists of attempting to match sets of things. To create an instructional card game demands that you have a content area that is definable in terms of sets. If you have such a content area, the creation of a card game is rather easy.

This sample of a card game consists of two different types of cards—Example Cards and Term Cards. For each Term Card there are two Example Cards. The player, through successive draws and discards, attempts to “lay down” as many matches as possible (a match consists of a Term Card and the corresponding Example Cards). Points are awarded for each set and also for the person who “goes out” first.

8 EXAMPLE CARD Write comments on student papers. Try and make your comments positive.	27 EXAMPLE CARD Look for appropriate student behavior. When you find it, tell the student!	D TERM CARD <u>NOVELTY</u>
G TERM CARD <u>REINFORCEMENT</u>	P TERM CARD <u>DISTRIBUTED</u> <u>PRACTICE</u>	14 EXAMPLE CARD Provide time during each school day for students to work on a particular assignment.

Discussion

Feedback to the player in this card game can be incorporated in two ways: First, the cards are coded (notice the number or letter in the upper right corner). An “answer key” can be provided with the game that informs the players of the correct matches, (i.e., G, 8, 27—P, 14, 39—D, 11, 44). A second form of feedback is to define a system for challenging in the rules. If a player feels that an error has been made by another player, the match can be challenged. Both players must then support their views and the other players in the game would vote. A winning challenge would be given an extra point.

It is important in a game of this nature to make the statements on the cards very precise. Too much player confusion over what the game designer “meant” can detract the players from the game.

It is assumed that in a game of this nature, the players have received instruction in the content area prior to playing. It is also helpful to provide the players with a handout that deals with the content of the game. In this way, the participants can refresh their memory after the conclusion of the activity.

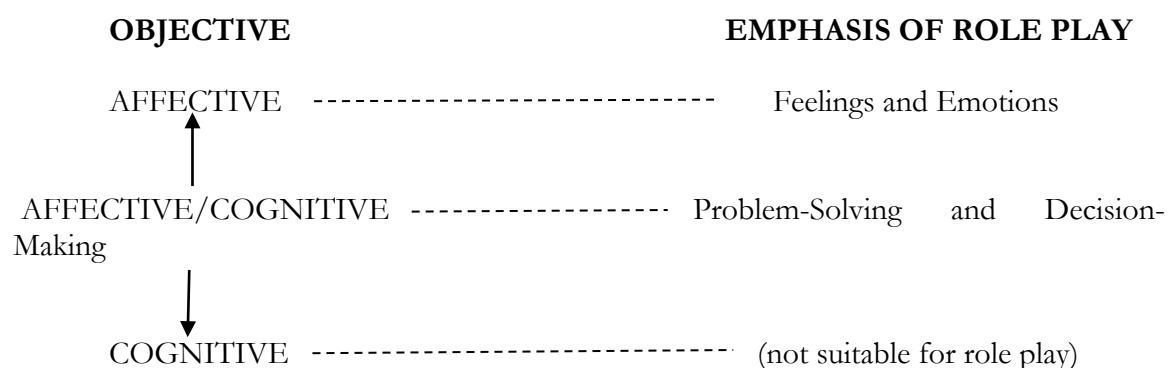
Chapter 2

Designing and Using Role Plays

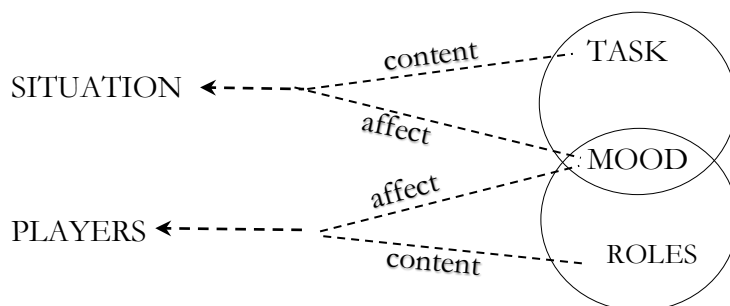
S. Joseph Levine

An effectively designed role playing activity can provide an ideal environment for learners to examine their perceptions of a particular topic or subject area. Role plays are simplistic in format (they don't call for elaborate props) yet they can be complex in design (to guarantee desired outcomes through human interactions). Obviously, one of the best ways to understand the dynamics behind effective role plays is to participate in one! Since you are reading this chapter (rather than participating in a role play), the various benefits of role playing will be described along with the concerns for developing role plays. This will be an attempt to get you through your first role play design—at which time you'll be able to experience one.

Role plays can be used (and designed) for a number of different objectives ranging from entirely affective to highly cognitive. They really aren't suitable for entirely cognitive objectives due to the interpersonal communication that is the key to the role play. When role players are involved in a spontaneous communication, their own behaviors and feelings will certainly emerge. These feelings can support cognitive objectives, but the feelings can't be pushed aside to make the learning experience devoid of any affective interaction. (For an example of an activity that is primarily cognitive yet utilizes verbal interaction, see the description of the Decision-Making Team in the next chapter).



A role play consists of two primary ingredients—a situation and a set of players. The players are provided with a description of the situation and the roles that they are expected to play in the situation. The description of the situation and the roles must accommodate both content and affect to the effective.



The content regarding the situation should provide the role player with an understanding of enough aspects of the situation to allow him/her to operate within the situation. Likewise, the content of the role should provide basic information about the role characteristics of the person that is being played.

Both the situation and the role should also carry some connotation of mood. This is easily accomplished in the player description (i.e. you're upset; this subject is very confusing; he's really annoying you; you've had a great day; etc.), but should also be included in the situation description (i.e. everyone in line keeps pushing you forward; this is the third person you've talked with and no one seems to be listening; the noise level in the store is almost unbearable; etc.)

Make the Description Brief!!

When you use a role play in class, you'll want to get the learners into action with a minimum of "dead" time. A long drawn out description of what they are to do in the role play tends to have the learners memorizing the description rather than trying to project themselves into it. Three quick readings of a concise description will go a lot further in creating an understanding of a role than a single reading of a lengthy description.

Describe the Overall Situation!!

Don't try and get detailed in your description. Too much detail will tend to create a stage play (complete with a script!) rather than a role play. The role play description should provide an overall view of the situation and the role. You can tell when you've got too much detail—the role players will be continually consulting their instructions throughout the role play.

Example: You're a milk truck driver. It's a dark and dreary day with a light rain falling. It's your last stop of the day and you'd like to get finished. You've just pushed the doorbell.

Non-Example: You're a 45 year-old milk truck driver. You have a wife and three children (two boys and a girl). You've been driving this same route for eight years. Most of the people on the route are quite nice but you seldom have much to say to anyone. It's a dark and dreary . . . , etc.

Focus on Behaviors!!

The best way to insure that a role play will work is to describe the roles with some behavioral specifications. Instead of purely descriptive specifications, ("You're wearing a blue tweed suit"), try and inform the participant how he should be *feeling* in the role, ("You've got a splitting headache and

really don't want to talk to anyone"). By defining the role with behavioral clarity you will allow the learner to get into the role because he can identify with behaviors. He can't always identify with physical descriptions. (Maybe he's never worn a blue tweed suit!)

Example: This has been one of your best days. You're really feeling good. The "troublemaker" in your classroom has done everything right today. The teacher next door has stopped you in the hall to ask your reaction to a memorandum from the principal.

Non-Example: You came to school early today. When you walked into your classroom you found that the desk chair had finally been fixed. You have been after the principal to fix it for weeks. The children all arrived on time and seemed to be very alert . . . , etc.

Select a Viable Situation!!

Few learners in your class have ever been a diesel mechanic on a submarine. So—you best not use this idea for a role play. The participants in the role play must be able to identify with the situation you have described. Their familiarity with a potential situation is guided by their direct experiences and also by their strong indirect or vicarious experiences. If you're dealing with teachers as your learners, you can be sure that they can identify with a school-related situation (i.e. classroom, teacher lounge, in-service workshop, etc.) You can also be fairly sure that they have had direct experience with a drug store, supermarket, traffic jam, being caught in the rain, etc. Strong vicarious experiences with which they may be familiar are often those found on television or in movies. They're more risky for use as role play situations since not everyone may have experienced them at the same level of intensity. Try and pick a situation for your role play that you are sure everyone can understand and one in which they need little prompting or clarification to stimulate their involvement.

Select a Viable Behavior!!

When selecting an appropriate behavior for a learner in a role play, it is important to know: a) what type of interaction you would like (conflict, argument, peaceful discussion, etc.), and b) the individual personality that the learner is bringing to the role play. If the learner is naturally aggressive, you may want to try a *role reversal* whereby she/he plays a passive role. Or, if a person is not aware of her/his behavior, you may want to try a *role identification* whereby she/he plays her/his normal role. If you want your role play to focus mainly on affect, define behaviors that will create a situation during the role play that will serve as a stimulus for a follow-up discussion/debriefing session. If you want your role play to lean more toward the cognitive side, create role behaviors which do not overshadow the situation or problem that is being dealt with. In other words, make the situation and not the role behavior the important aspect. Watch out for roles that are sexually defined, (You are a salesman; you are a waitress; you are a policeman). Careful role selection will allow anyone to become involved in the specified role, (You sell automobiles; you wait on tables at a restaurant; you are a police officer).

Watch your Level of Threat!!

Before running off and designing a role play where a student tears apart another one, you better think through the problems that may arise. Role plays, especially those that have high affective loadings can be very threatening to a participant who a) has never participated in a role play, or b) is insecure about the situation and/or behaviors that are specified. Take care in your design. You're

dealing with people who must return to their normal environment following the role play. By keeping a watchful eye on the level of threat in your role play design you will be able to stimulate communication. By letting the level of threat move beyond the tolerance of the learners you will be hindering future communication. If you use a high threat role play, *you* must be willing and able to follow through to the extent that is demanded of you. This may mean interceding during the role play, stopping the role play, or following up after the activity.

Try and Involve Everyone!!

Role plays can be simplistic in numbers (two players) or fantastically complex (twelve or more). However, it's no fun for a participant to just sit back and watch a role play. You've got two viable options for involving all of the learners: First, you may want to have enough materials available so that the same role play can be conducted simultaneously in a number of small groups around the room. A discussion at the conclusion can ask different groups to report on the dynamics, decisions, or results of their groups. The second option is to have a single group participate in the role play with the other students involved in an observation/analysis task. A simple set of questions can structure the observers to focus on specific aspects of the role play interaction (i.e., What behaviors hindered the interaction? Did the participants become truly involved? How do you know? Describe the learners' approach to problem-solving, and so on).

Set the Stage and Follow Through!!

A role play will have different value for different learners. To allow all participants to share the experiences that they had during the role play, it is important to hold a good discussion or debriefing immediately after the role play has concluded. If you're running short on time, it is often better to cut the actual role play short to allow for a full discussion. Don't get yourself into the bind where you don't have time to talk about what went on during the role play. The value of a role play is two-fold: First, it provides a viable experience for the individual role players to interact and learn through the interaction. Second, it sets the stage for a group discussion on what went on during the role play. Because of the role playing experience, all participants will have a common experiential base from which to discuss. Take advantage of this! Begin by posing general questions, (What were your feelings during the role play?) and gradually move to more specific questions, (Were you angry when _____ topic was introduced?). The major portion of your discussion should focus on the topic that is the subject of the role play. The discussion should clarify for the participants exactly what it is that you wanted the role play to teach.

Through your discussion you can move your role play in either an affective or cognitive direction. This will, of course, depend on your own objectives. To move the discussion in an affective direction, pose questions during the discussion that deal with the feelings, moods, emotions of the participants, (How were you feeling when . . . ? What attitudes did you perceive during the role play? How were these attitudes manifest?). Focus on the content of the role play to move the discussion in a cognitive direction, (e.g., What are the basic characteristics of strong leadership? How can communication in groups be enhanced? What other solutions to the problem did your group come up with? Why were these other solutions discarded?). A more detailed presentation on the topic of discussions can be found in the chapter entitled, "Conducting Simulation/Games in the Classroom."

Two Examples of Role Plays

A role play that focuses on affect is concerned with creating awareness in the learners of themselves and/or others. This awareness may be used to assist learners in seeing what behaviors they really

manifest (e.g., concern, frustration, empathy, cooperation) when interacting in a structured situation. The following role play is an example of one designed to focus on affect. You will note that the cognitive message is practically non-existent:

Example 1:

Situation

You are co-workers who have been contracted to paint the interior of a group of apartments. You've been on the job for ten days and it seems that it could go on forever. You are both in the middle of painting a wall.

Role A

This job has been really dragging. Your partner has got to be the slowest painter in the world! If you don't hurry up and get the rest of these apartments finished you'll end up losing money on this job. Try and have your partner speed up.

Role B

This job has been fun. There are no bosses and you'd had your fill of bosses on your last job. Your partner always seems to be in a hurry and because of this you seem to spend half of your time cleaning up his mess (paint splattered on windows, floors, etc.) Try and get your partner to be neater. Begin the conversation by saying, "I've noticed that you . . ."

Discussion of
Example 1

This role play is designed to stimulate a direct confrontation between the two participants. A subtle degree of mood is specified in the role descriptions. This subtlety, however, will become greatly exaggerated in the actual role play due to the direct conflict between the roles. According to the specifications, each has reason to be annoyed with each other (much like situations in real life).

A discussion following the role play would deal with the feelings of the two participants during the interaction. The discussion could also examine the perceptions that the players have of each other, the ability to stay within their defined roles, or whether the players allowed their true feelings to emerge.

The following role play (Example 2) shows a combination affective/cognitive design. The cognitive message will come across to the participants due to the affective interactions of their roles:

Example 2:

Situation

You are members of a community action committee. The purpose of your committee is to develop the working for a newspaper ad that will be used locally to get people involved in recycling paper.

Role A

You have been a strong advocate of recycling for many years (long before it became vogue!) You fear that this committee will waste a lot of time and eventually come up with a newspaper ad that is not worth very much (not strong enough). The time for action is now!

Role B

There are many problems in the community that deserve greater attention than recycling paper. You'd like to see the newspaper ad taken care of quickly so that the committee might be able to deal with a more substantive problem—procedures for dealing with juvenile delinquency.

Role C

You haven't really thought too much about paper recycling. It seems like a good idea. Whatever the committee comes up with is all right with you. Any idea brought up by committee members is better than no idea at all. Try and help committee members see each other's point of view.

Role D

Many newspaper ads have been written on the spur of the moment without a great deal of thought about what the ad "really" says. You feel that this committee must carefully examine the content of the ad to be sure it doesn't offend anyone in the community, really says something, and truly represents the feelings of the committee. "Haste makes waste" and you certainly don't want the committee to agree on an ad before thinking it over carefully.

Discussion of Example 2 You'll note that in this role play there are two different levels of interactions that will be taking place: One level of interaction is cognitive (why people should be concerned with recycling paper), and the other is affective (how fast the committee should act on their problem).

Roles have been purposely defined to create conflict at both levels. Cognitive conflict comes between Role A and Role B:

Role A—I'm an expert and it's time to act.

Role B—Recycling isn't really that important.

The other players will probably get into the cognitive conflict though they have no defined stance.

Affective conflict comes between Role A, Role B, and Role D:

Role A—Let's get moving.

Role B—Let's get moving.

Role D—Let's not move too quickly.

Role C is a mediating role at both levels. This person really has little input to provide to the group, but is primarily concerned with being a pleasant person and assisting the interaction. Due to this type of role, there is a good chance that a lot of the aggression from the other players will end up being directed at Role C.

A discussion following the role play should focus on both levels of the interaction. Questions that could be used for examining cognitive learning include:

“What are the major problems associated with paper recycling?”

“What strategies can be employed to get people involved in paper recycling?”

“Does a newspaper ad hold much promise for stimulating people to become involved in paper recycling?”

Questions that could be used for examining affective learning include:

“Which role helped the group the most?” “Why?”

“Which role hindered the group the most?” “Why?”

“What problems did you have staying in your defined role?”

“Have you ever seen this type of interaction occur in other groups in which you have participated?” “What happened?”

Chapter 3

Communicating Concepts Through Simulations

S. Joseph Levine

The two preceding chapters have presented two species of interactive activities that are based on the use of gaming techniques. This chapter will present a third game-based technique—simulations. The simple *game*, though often low in terms of reality, can be high in motivation. The *role play* is high in reality (very much like the real world) and confines itself mainly to the affective domain. In this chapter we will deal with a defined form of *simulation* that is high in reality and primarily concerned with cognitive learning.

	Degree of Reality	Level of Motivation	Primary Focus	Primary Use
Game	Low	High	Cognitive	Drill & Practice
Role Play	High	High	Affective	Awareness
Simulation	High	High	Cognitive	Problem-Solving/ Decision-Making

A simulation is an abstraction of reality. In other words, a piece of reality (the real world) is removed from context and brought into the workshop for interaction with the participants. A simulation usually presents a *situation* to the learner who must then *act* on it. Following the learner's action, a *consequence* is provided.

SITUATION → ACTION → CONSEQUENCE

In a well-designed simulation, the situation, action, and consequence are very much like the real world. However, they have been transported to the classroom and the learner encounters the simulation in a controlled environment.

Why Use Simulations?

Simulations are used for one or more of the following reasons:

Reality: The learner has an opportunity to react to a “real” situation.

<i>Transfer:</i>	Practice with a “real” situation has a high probability of transferring to the learner’s own situation. When the situation turns up after class (at home, on the playground, etc.) learning from the simulation will be put to use.
<i>Low Threat:</i>	The simulation can be altered to reduce high threat aspects that may be standing in the learner’s way for effective learning. Some of the real world threat can be reduced in the simulation to allow the learner the opportunity to deal with the situation with a higher degree of psychological and/or physical security.
<i>Scheduling of Events:</i>	In the real world events often occur at random and unscheduled times. The simulation allows the scheduling of these events so that they can be dealt with by the learner. The learner will be able to deal with the event whenever it may occur in the real world.
<i>Simplification of Reality:</i>	In the real world events often occur in extremely complex patterns. The simulation can allow for the presentation of events in a simplified manner by reducing the number of intervening aspects surrounding the event.
<i>Repetition:</i>	In the real world events often occur in such a fashion that little opportunity is provided for practicing alternative responses (actions). Through the use of a simulation it is possible to repeat a simulation a number of times to allow the learner practice in alternative actions.
<i>Reflection:</i>	In the real world there is seldom opportunity for the learner to discuss the appropriateness of actions. The simulation provides an opportunity to discuss with others the actions that were made and their relative value. Learners can see how others have responded to the same situation and the consequences of their actions.
<i>Introduction of New Situations:</i>	A simulation can be used to introduce to the learners new situations that they have not yet encountered. The simulation can provide an opportunity to practice actions so that when the situation occurs in the real world the learner will already have experienced it. Actions will have been practiced within the simulation and be ready for the real world situation when it occurs.

What Simulations Are We Familiar With?

Probably the most familiar simulation is that of driving a car. Most schools have a “driving simulator” that allows a student an opportunity to practice driving without actually getting into a car. The interior of the driving simulator looks very much like a real car (reality). However, not all of the real car problems (i.e., a loud radio, a poorly adjusted rear view mirror, an angry policeman, etc.) are present (simplification of reality).

The student has many opportunities to try the same driving maneuver over and over again (repetition) and following a session in the simulator the student can discuss his problems with the instructor or other students (reflection). Many situations can be encountered on the simulator that may never be faced in a real car (introduction of new situations) and there is no danger that the student will get hurt in a simulated accident (low threat). When the student gets into a real car he will

already be familiar with the function of the various controls and know what is expected of him as a driver when he enters traffic (transfer).

We have all seen public service announcements on late night television that are aimed at better driving. The commercial usually presents a driving situation where you, as the viewer, are behind the wheel of an automobile in trouble. This is also a simulation. However, unlike the driving simulator, this simulation is greatly reduced in reality. It does provide low threat for the viewer, along with opportunities for repetition. The reflection is usually provided by the announcer. It is certainly less expensive than the driving simulator but it is also less effective!

Other simulations that we are familiar with are the grocery store that is set up in the back of the elementary school classroom, the mathematics problem that asks you to solve a “real” problem, (“If you give the cashier two quarters and a nickel for ten . . .”), the reduced-size model of the voting booth that allows you to become familiar with the equipment, or the parachute ride at the amusement park. Each of these simulations, and the dozens of others that we have encountered, allow us an opportunity to experiment with reality. Each of these simulations is used for one or more of the reasons that have been presented. Now let’s look at some simulations that can be used in the classroom:

In-Basket

An in-basket simulation exercise thrusts the learner into the role of someone sitting at a desk, first thing in the morning, with a number of items awaiting decision. The items awaiting decision are ones which could be found in a person’s desktop in-basket. Obviously, the items needing decision are carefully selected and designed to focus on a particular content area that is the topic of the class.

For instance, an in-basket simulation can be built around the topic of educational planning. The items in the in-basket might consist of the following:

- A note from a student’s mother asking for an explanation of why he or she was kept after school.
- A request from the principal that a student be transferred to another school (subject to your approval!)
- A memorandum from the school psychologist asking what specific tests (from a list that is included) you would recommend be administered to a student.
- A note from the school social worker requesting a meeting to discuss a student and a request for who you feel should also attend the meeting.
- A directive from the purchasing department asking that you list supportive statements regarding the instructional materials that you ordered for use with a student (or else they won’t order them!)—the list of materials is attached.
- A homework assignment that has just completed. You must correct it and write a short note to the student.

- The student's cumulative records with a note from the reading teacher asking your opinion of last year's test results.

For an in-basket simulation exercise to work well demands a design that calls for definite commitment on the part of the learner. It is not sufficient to have the learner read through the items included and merely talk about what he/she might do in response. Instead, the learner should actually make the response. This might mean composing letters or memorandum, checking options on a form, or completing a report. Another useful technique is to have the learner respond to a series of questions at the conclusion of the in-basket simulation but prior to a discussion period:

Which items were the hardest to deal with?

Which item did you do first?

What kind of person is the principal?

If you can force definite commitment on the part of the learner you will find the discussion part of the activity will move beyond the typical "that was fun" type of remarks and into substantive discussion.

To assist in making the in-basket simulation more realistic, try creating the various items on fictitious letterhead stationery or memorandum forms. With the help of a typewriter and some lettering available at a stationery store, you will be able to create items that look authentic. By adding the element of authenticity you will assist the learner in moving beyond the task as merely an academic exercise and into an identification with the role of the respondent. This is why you're using a simulation! When the learner identifies with the role of the respondent he/she will be acting in a manner truly consistent with existing behaviors. Attempts at disguising real behavior in favor of the "right" behavior will be discarded in light of the reality of the task. Once the learner has demonstrated true behavior it can then be dealt with.

Decision-Making Team

The creation of a decision-making team as a simulation exercise can provide the learners: a) an opportunity to identify with new roles, b) a chance to deal with new problems, or c) a chance to seek out new answers to old problems *through a cooperative group effort*. To utilize this technique you must first identify a problem that can be dealt with (and usually *is* dealt with) through a team effort. Then, identify the members of the team and the particular expertise that each brings to the problem.

The focus of the decision-making team is different from that of role playing. In a role play activity the primary focus is on the interaction of the roles according to affective concerns. The discussion following a role play usually deals with the feelings and emotions that surrounded the interaction. In the decision-making team, the focus is on the solutions(s) that the team has evolved for solving the particular problem. This is primarily a cognitive orientation with team member descriptions concerned with defining their individual expertise in terms of the problem.

A decision-making team approach should allow the learners to better understand through their interaction the complexity of a particular problem, the types of secondary decisions that must be made prior to reaching the primary decision, the alternative solutions that are available, the types of

information needed to effectively deal with a problem, or biases that are brought to bear on a particular problem by certain types of team roles. A decision-making team task should have a clearly defined goal with exact specification of what the team will produce during the activity. This may be a report, a recommendation, an evaluation, a completed form, and so on. It often helps to assign one member of the team as a recorder to document the discussions/findings of the team. It may also help to assign a team member with a role of keeping the team task-oriented. As so often happens in any group effort, there is a tremendous pull to move the team in directions other than those specified by the activity leader. The clear specification of the goal, team recorder, and task-orientation member will help to keep the team moving positively toward a conclusion that can be discussed following the activity.

Example of a Decision-Making Team Task

Topic: Recommendation for integrating values education in content-related curriculum (i.e., math, science, etc.)

Goal: A written description of classroom activities that can be integrated in content classes.

Instructions: You are a member of a team that has been given the responsibility to recommend actual procedures and methods to the superintendent of your school district for integrating values education in the existing course offerings. At the conclusion of your meeting, your team should have at least four procedures or methods defined that can be implemented by classroom teachers. Your role as a member of the team is specified below. Try and represent this role as your team deals with this topic.

Team Members:

Clergyman: You represent a local church. You are very aware of the lack of values in today's children. Hopefully, ideas developed by this team will be useful within your own religious school program.

Teacher: You teach elementary school. Your concern in the team is to make sure that the suggestions that are finally developed can be implemented with elementary school children.

Teacher: You teach secondary school. Your concern in the team is to make sure that the suggestions that are finally developed can be implemented at the secondary school level.

Parent: Your concern in the team is to make sure that the team recommendations will not impinge upon the role of the parent or be considered by parents as inappropriate for exploration within the school.

Principal: Your concern in the team is to make sure that the team deals with the problem in a manner that will benefit *all* students.

Recorder: Your role in the team is to record the major concerns brought out during the team discussions. Try and be objective in your task. Remind team members of inconsistencies in their statements and try to assist them in moving toward closure.

A Final Word

This group of three chapters (Teaching with Instructional Games, Designing and Using Role Plays, and Communicating Concepts Through Simulations) has attempted to present some viable alternatives for creating interaction in classrooms. Though all three chapters deal with game-like activities, each has specific attributes that can be capitalized on in the classroom.

A guide such as this which has a strong focus on the technology (e.g., methods, materials, techniques) that is necessary in creating effective instruction often assumes that the reader will add the one missing ingredient—the specification of the instructional objective! This omission is not meant to suggest that objectives are not important. Instead, the mission of this guide is to suggest alternative strategies for the accomplishment of the teacher's own objectives. Objectives are the key to the effective design of any game-like procedure. Before a teacher can jump in and design an effective simulation, it is absolutely essential that the instructional objective be clearly in mind. Once the objectives are known and have been validated (i.e., the learners really need this topic) it is up to the teacher to carefully examine the alternative activities that can be developed that might best fulfill the objective. Just because a teacher likes to design role plays does not mean that role plays are the most appropriate type of activity to fulfill a particular objective! Hopefully, through the careful examination of the game-related strategies presented in these three chapters, you will have a number of alternative strategies that can be examined in light of your instructional objective. Then, select that strategy which holds the most promise for achieving your objective.

Chapter 4

Conducting Simulation/Games in the Classroom

William A. Anderson

Whether you have personally designed a simulation/game² for use in the classroom or have chosen one “off the shelf,” an important component in the success of a simulation/game as a learning strategy is how well you as the game director prepare, conduct, and debrief the simulation/game. This chapter will introduce some considerations to assist you in conducting simulation/games in the classroom. Specifically, we will present:

1. Considerations in *preparing* the simulation/game for classroom use.
2. Considerations in *conducting* the simulation/game in the classroom.
3. Considerations in *debriefing* participants at the end of the simulation/game.
4. Considerations in *preparing a leader's guide* for the simulation/game.

Preparing for Classroom Use

As with every other teaching strategy or material, a simulation/game requires a certain amount of preparation time. Your success in using simulation/games in the classroom will be enhanced if you take time to prepare: (1) yourself, (2) the simulation/game itself, and (3) the student participants.

In preparing yourself for using the simulation/game, be sure that you are completely familiar with the exercise. If you have personally designed the simulation/game, this is no problem. But if you have selected a simulation/game designed by someone else, be sure you understand the purpose of the exercise—what it is designed to teach (and more importantly, what it is *not* designed to teach). If you are using a simulation/game for the first time, it is a good idea to actually play a round of the exercise yourself. (A good strategy might be to corner some of your fellow faculty members in the teacher's lounge for an hour.) By playing the simulation/game, its rules, procedures, strategies, and components will hopefully “mesh” to provide you with a good idea of how the exercise will operate in the classroom. Short of actually playing the simulation/game with others, you might sit down and “jog through” the exercise by yourself. Simply lay out all the materials and simulate a playing session by following the rules.

² The form “Simulation/game” is used throughout this chapter in its broadest sense to include simple games, role plays, simulations, and simulation/games.

After you feel you understand the purpose, procedures, rules, and strategies for the simulation/game (and can explain them to someone else), you are ready to start preparing the simulation/game itself for classroom use. If you are lucky or ambitious, you should have a leader's guide to help you with the preparation tasks. (The last section of this chapter will provide some suggestions for creating such a guide for either a simulation/game you have designed or for a commercial simulation/game without such a guide). With or without a leader's guide, the following items should be considered in preparing the simulation/game for use in the classroom:

1. *Playing Time*
Either by your experience or by the author's statement, determine how long the simulation/game will take.
2. *Number of Players*
Most simulation/games have a minimum and/or maximum number of players. If you have fewer players than the number required, review the exercise to see if certain roles or activities can be eliminated *without* damaging the playing of the exercise. If you have *more* players than the exercise can accommodate, consider duplicating the materials (if legally possible) and running two or more groups, or assign a *few* observers to watch the others play the exercise and have them report the dynamics and strategies they saw in the debriefing session.
3. *Simulation/Game Materials*
Most exercises contain a variety of materials (e.g., cards, tokens, money, charts, role sheets) which must be duplicated, cut out, assembled, or otherwise prepared. Be sure this is completed ahead of time with quantities sufficient for the players involved.
4. *Simulation/Game Environment*
If the simulation/game activity is to be in your classroom, try to determine the kinds of space, seating and other environmental factors that are required or will enhance the playing of the exercise. For example, if a game board is used, is there a flat surface (table to lay out the game board and tokens)? Or, can the chairs or desks be arranged so that competing groups cannot be overheard? Consider this: sometimes it may be a good idea *not* to use your classroom. Some simulation/games are best played in other areas such as the outdoors, an empty cafeteria, gymnasium, or legislative chamber. In general, review the purpose of the simulation/game you are using and consider all the ways you can arrange the playing environment to facilitate the action and affect of the exercise.

Now that you have completed preparations of the simulation/game itself, consider the different ways you can prepare your students for the exercise so that they maximize the time spent on the activity. One advisable strategy is to let them know ahead of time what they will be participating in a simulation/game activity. Otherwise, they may be slightly overwhelmed at playing with dice, game cards, paper money, or playing-out an assigned role. If they are not keyed to the distinction of playing to learn vs. playing to play, the best simulation/game around may flop.

If the simulation/game activity is designed to demonstrate a particular scientific, economic, or historical point, it may be advisable to prepare students with appropriate reading or discussion experiences to provide them with some introductory knowledge about the subject matter area presented in the simulation/game. Also, a simulation/game may present only one point of view

about a particular subject. Reading or discussions ahead of time may help students correct this imbalance.

Another way you may prepare students for a simulation/game is to provide them with a copy of the activity's rules ahead of time. This will allow them sometimes to "digest" the materials and prevent lengthy explanations of the rules at the time of play. This technique is especially helpful with role play activities. Allowing students time to remember crucial traits of the role they are playing will help create a much more dynamic activity.

In summary, this section has attempted to identify some of the considerations necessary for preparing simulation/games for the classroom. A number of suggestions were given for preparing you as the game leader, the simulation/game itself, and the student participants. There is really no substitute for advance preparation. Doing your homework will allow you to do a better job of conducting the activity in class. Some hints for conducting a simulation/game in the classroom are presented next.

Conducting the Simulation/Game in the Classroom

As teacher and game director, there are two major activities you perform during the playing of a simulation/game: First, you get the playing of the exercise underway, and secondly, you manage the play and interaction of the simulation/game to its completion. This section of the chapter will present some considerations to assist you in conducting a simulation/game in the classroom.

If you have followed the steps outlined in the previous section, getting a simulation/game underway becomes a relatively easy task. Before beginning play, students should know: (a) the purpose of the exercise, (b) the problems or issues posed to the students, (c) the functions or roles of other students (especially in role play activities), (d) the time allotted for play, (e) the significance of the room environment, (f) a review of the rules, and (g) how to begin the action of the activity.

As suggested earlier, some of these activities can be shortened by providing students with copies of rules and roles ahead of time. Thus, instead of overwhelming them with a great deal of information all at once, the session before beginning play can serve as a procedural clarification session. There is a general tendency for game directors to "over-explain" the action of the simulation/game at this point. They attempt to tell students too much too soon, rather than allowing the students the excitement of discovery. Try to keep the pre-play sessions as brief as possible. Provide just enough information to the students to allow them to get the simulation/game underway. Specific questions can be answered as they arise in the course of game play.

The importance of conducting a good pre-play session should be stressed. How well you introduce the simulation/game affects the students' predisposition towards the activity. If you hurry through the session and omit vital background or procedural information, the activity may end in frustration. Or, if you drag out the session to include a 45-minute lecture, students may lose their desire and enthusiasm to participate. A well-arranged pre-play session can be used to promote a positive attitude toward the game activity.

Once the simulation/game has begun, the role of the teacher as game director will vary. Some activities will be designed so that students can participate with little or no interaction with the game director, while others require the game director to be an active (perhaps the *most* active) participant.

Again, careful preparation will assist you in identifying your role during the simulation/game. If it appears you do not have an active role, it is always a good idea to “float” around the room preparing notes for the debriefing session. Try to observe the emergence of playing strategies or dynamics as well as those students who appear to be “lost” in the action of the activity. For those students provide enough, but *just* enough assistance to get them back into the action.

If your role is an active one, you must really try to do two things at once: provide the necessary information and resources to the players at the appropriate times, *and* try to prepare notes for the debriefing session. This is a difficult if not impossible task. One way to get around this dilemma is to assign students to either provide the information and resources or have students serve as group observers to prepare notes for debriefing.

While your role as game director will vary for different types of simulation/games, here are Ten Considerations for Game Directors³ which can be applied to all circumstances:

Ten Considerations for Game Directors

1. Resist the temptation to correct minor errors.
2. Resist the temptation to offer a better strategy that the student does not perceive.
3. Resist the temptation to test or review, in minute detail, students’ understanding of the rules or roles of the game.
4. Resist the temptation to correct any elaboration or alteration of the rules of the game.
5. Resist the temptation to keep perfect order. The noise level produced by thirty students talking at the same time need not exceed human tolerance.
6. Resist the temptation to stymie any points that seem to be irrelevant to the discussion. They often prove to be relevant to the discussion. They often prove to be relevant; at worst, they will be brief digressions.
7. Resist the temptation to constrain the moderate physical movement a game may require.
8. Resist the temptation to answer students’ questions about the game with “That’s not in the rules.”
9. Resist the temptation to avoid admitting lack of knowledge about a point of the game’s operation or an aspect of the process under study.
10. Resist the temptation to consider a game a less serious form of education than a textbook.

³ Adapted from Alice Kaplan Gordon. *Games for Growth: Educational Games in the Classroom*. Science Research Associates, 1970, p. 31

To conclude, this section of the chapter has identified a number of considerations to assist you in actually conducting simulation/games in the classroom. Specifically, suggestions were presented on how to get the simulation/game underway, and how to manage a simulation/game to its completion. The next section of this chapter will suggest ways to conduct the very important debriefing session once the play of the simulation/game has been completed.

Debriefing the Simulation/Game

One of the most important components of conducting a simulation/game in the classroom is *debriefing*, or discussing what the students experienced and learned as a result of participating in the activity. Unfortunately, this is a component that is frequently neglected by inexperienced game directors. They assume that learning takes place in any simulation/game experience and that the student will understand what took place. This may or may not happen. This section of the chapter will present suggestions to assist you in conducting effective debriefings for simulation/gaming activities.

An easy-to-remember method for conducting debriefing sessions is the “EIAG” model (E-experience, I-identify, A-analyze, G-generalize).⁴ It can be applied to most simulation games used in the classroom:

1. *Experience*
This comes before debriefing, of course, but there are questions for the teacher: Why did you choose the game experience for this class for this particular learning? Are you doing your own thing? Teaching decision-making? Simulating a life experience through a simulation game? Helping students cope with their environment? Trying to achieve a specific learning objective?
2. *Identify*
Specifically, what are you trying to do in the debriefing process? Look for the facts? Explain the symbolism in the game? Surface feelings and reactions? Generate data? (Questions for students which can be used in this step: What do you think this represents in real life? What made you feel good or bad during the game? What did you feel was the most significant thing that happened? What are the factors that explain your low score—or high score? How did you feel when . . . ? What did you say when . . . ? What did he/she do when you . . . ?)
3. *Analyze*
What are you, the teacher, asking the students to analyze? Outcomes from the game? Cause and effect relationships? Alternative decisions and strategies? (Questions which can be used to stimulate student analysis: What problems did you face and how did you attempt to meet them? How were you affected by this event? What relationships do you see in these data? Why did events, actions, or strategies result in . . . ? Why did these feelings or attitudes develop?)

⁴ From Ron Stadslev. *Handbook of Simulation Gaming in Social Education*, 1974, p 31. [Go to <http://ron.stadslev.info/handbook-of-simulation-games-in-social-education-constitution-today/> for 2013 version.]

4. *Generalize*

What are you, the teacher, hoping the students have learned? Check back with the goals or objectives you listed in No. 1. These steps for the students are useful in the generalizing process:

- a) Review specific roles, events, and interaction in the game experience that led to a conclusion. Specificity is necessary.
- b) Compare that conclusion to what the student thinks real life is.
- c) Search for “real life” data that support or disprove the conclusion (or conclusions).

The above model is only one possible way to conduct a debriefing. The exact nature of your debriefing will depend upon the type of simulation/game activity you use and your learning purposes and objectives. The important point to remember is the importance of debriefing. It is the process by which the simulation/game activity is integrated into the course of study, by making students aware of the connections between the activity and their other classroom work.

In summary, this section of the chapter has presented suggestions for conducting a simulation/game debriefing. The “EIAG” model was presented as an easy-to-remember structure for designing debriefings. In the final section of this chapter, you will learn how to integrate the previous three sections into designing a leader’s guide to assist you and others in using simulation/games in the classroom.

Preparing a Leader’s Manual

If you have used a simulation/game in the classroom and have followed the procedures suggested in the previous three sections of this chapter, you have for all practical purposes designed your own leader’s manual for using the activity. This final section of the chapter will provide you with an outline to assist you in developing a *written* leader’s manual for a simulation/game you have either designed or used in your classroom. The value of such a guide is that it will assist you or another teacher in using the simulation/game at a future date. Your leader’s guide should include information about the following:

I. Overview of the Simulation/Game

A. Introduction:

1. Specific content area of the activity
2. Purpose of the activity
3. Numbers of players and age or grade levels
4. Prerequisites (knowledge or skills)

B. Learning Objectives:

1. Cognitive objectives
2. Affective objectives

C. Scope:

1. Elements of the real-life situation *included* in the activity
2. Elements excluded

D. Scenario of Activity:

1. Goals of the players
2. Roles of the players (if any)
3. Resources of players
4. Sequence of events
5. Setting of the game:
 - a) Location
 - b) Time

E. Materials for the Game:

All materials should be described as to appearance, quantities, and function

II. **Preparing for the Simulation/Game**

A. Time Necessary:

1. Total time necessary
2. Preparation of game materials and set-up time
3. Time to introduce game to players
4. Time required for each session of game
5. Post-game discussion time

B. Number of Players:

1. Minimum/maximum numbers
2. Suggestions for fewer or more players

C. Preparing Materials:

1. What materials must be prepared
2. How to prepare materials
3. When to prepare materials

D. Setting-up the Simulation/Game:

1. Where game can be played
2. What equipment is necessary (desks, tables, AV equipment)
3. Arrangement of room

III. **The Simulation/Game Session**

A. Introducing the Game to the Players

What players should be told about the activity

B. Playing the Game:

1. The rules
2. Scoring
3. Determining the end of the game.

IV. **Debriefing the Simulation/Game**

- A. Experience questions
- B. Identify questions
- C. Analyze questions
- D. Generalize questions

V. **Suggestions for Repeating or Modifying the Simulation/Game**

A. Repeating

B. Modifying

VI. **Appendix**

Copies of all game materials

To conclude, this final section of the chapter has presented an outline to assist you in preparing a leader's guide for a simulation/game you have designed or used. Such a guide will benefit you or another teacher by saving preparation time and providing a "map" for the systematic use of the simulation/game as a learning strategy.

For Further Reading

Chartier, Myron R. *How to Teach With Simulation Games*. Pasadena, California: Associates in Human Communication, 1974.

Fennessey, Gail M. *Guidelines for Writing the Director's Manual for a Simulation Game*. Baltimore: Johns Hopkins University Center for the Study of Social Organization of Schools, 1973. (ERIC: ED084 314)

Gordon, Alice Kaplan, *Games for Growth*. Chicago: Science Research Associates, Inc. 1972.

Lauffer, Armand, *Aim of the Game*. New York: Gamed Simulations, Inc., 1973.

Stadskev, Ronald, *Handbook of Simulation Gaming in Social Education*. University of Alabama: Institute of Higher Education Research and Services, 1974.

Chapter 5

Formative Evaluation for Games and Simulations

George F. Sargeant

Evaluation may be classified in several ways. One useful way is whether it is formative or summative evaluation. The term “summative evaluation” indicates the type of evaluation used at the end of a term, course, or program for purposes of grading, evaluation of progress, or research on the effectiveness of a curriculum, etc. Perhaps the essential characteristic of summative evaluation is that a judgment is made about the student, teacher, or curriculum with regard to their effectiveness, *after* the learning or instruction has taken place. As such, summative evaluation is not the tool to use for the purpose of revising instructional materials, rather it is used to report on their successfulness.

The other term, “formative evaluation” refers to evaluation conducted *during* the time when the materials and methods are being developed. (It may happen in a regular classroom setting as long as the developmental process is still active). The purpose of formative evaluation is to detect deficiencies in prototype instructional materials, and identify appropriate revisions of the instructional materials. Scriven, (1967), who first used the term formative evaluation, points out that once a curriculum has been put in final form, everyone connected with it resists evidence which would make for major alterations. Therefore, every effort should be made to conduct formative evaluation during the early stages while the people concerned are still willing to make meaningful revisions in the materials or methods.

Models

Information about the Game or Simulation (henceforth written G/S) may be collected by several models, of which this chapter discusses the following three types:

1. Tutorial.
2. Large group.
3. Small group with debriefing.

Tutorial

The tutorial model requires the prototype designer, or a surrogate, to observe one student (or the minimum number required) using the new treatment and provide tutorial instruction whenever needed. The tutorial instruction may then be incorporated into a revised version and the process repeated as the experimenter deems necessary. Advantages of the tutorial approach are that it: (1) requires no formalized evaluation instruments or techniques, and (2) is logistically simple. The disadvantages of the tutorial model are that: (1) multiple repetitions can be time-consuming, and (2) it is sensitive to the idiosyncratic responses of individual learners and tutors. There is the constant

threat that revisions based on data from a single learner may be unnecessary or even counter-productive. This gives the motivation for the group models, although, even when the designer chooses a group model for formative evaluation, he probably uses the tutorial model when developing the prototype before he tries it out on the group.

It has been found that developers are quite often unwilling to revise prototypes unless a large amount of data corroborates the existence of several major problems. The group models (especially the small group with face-to-face debriefing) provide this data.

Large Group

In the large group model, the prototype materials are tried out on a larger group representative of the intended target group. Using this technique, the entire group interacts with the prototype materials and revisions are based on post-hoc analysis of errors on post-tests, intermediate quizzes, or data from a questionnaire. No discussion between the group and the developer is planned. While the large group model reduces the problem of idiosyncratic revisions, the lack of face-to-face interaction between the learner and author can make it difficult to get at the heart of deficiencies that may exist. For example, if the developer's objective is not clear to the group, they may provide inappropriate, or at least different, feedback than they would have had they understood his reasoning for doing as he did.

A key to the success of the large group technique is in developing or choosing appropriate questionnaires with which to collect the data. Means for developing appropriate questionnaires are discussed in the Instrumentation section.

Small Group

The small group model may be split into two separate modes of operation: an informal discussion versus a more pre-planned or formal discussion. Distinguishing characteristics between the informal and more formal small groups are the usage of questionnaires and advance organizers for the follow-up debriefing.

Informal Small Group

The informal small group model is really the tutorial model applied in a group setting. Here, a group small enough in size to be a single discussion group experiences the prototype materials. This is followed up by a discussion led by the designer, or his surrogate, on the various merits and weaknesses of the materials. The informal small group represents the normal mode of operation which one might use with a small group whether or not he ever heard of formative evaluation.

Given a group of people, it is usually not practical to observe and tutor individuals as they use the prototype materials because the actions of other members of the group may be effected. Therefore, the interaction between the group members and developer largely takes place during the follow-up discussion. The informal small group shares the tutorial model's advantage in that pre-planning, preparations for evaluation, and data analysis are minimized. However, it loses the opportunities that these additional preparations provide. These extra preparations form the basis of the distinction between the informal and formal small group models.

Formal Small Group

The more formal version of the small group model uses evaluation instruments to collect pre/post data about the G/S which is used to help focus the agenda of the following debriefing/problem-solving session. This is essentially a combination of the data collection techniques of the large group model combined with the group discussion methods of the small group model. The steps in implementing this model are:

1. Select Group.
2. Pre-Test—Run G/S—Post-Test.
3. Analyze Data—Develop Debriefing Agenda.
4. Debriefing/Problem-Solving.

Procedures

Since the procedures for the Formal Small Group model contains the essential procedures for all four models, this model is used as the basis for outlining the general procedures:

1. *Selecting the Group*

The objective here is to get a group of subjects to go through the prototype G/S that is both representative of the intended audience for the G/S and is also of appropriate size for discussion and group problem-solving. When selecting the group, if possible, select people that represent as nearly as possible the spectrum of abilities in the target population, if you expect ability differences to effect performance in the G/S. This will help insure that the criticisms and suggested revisions are appropriate for a group of mixed abilities.

The size of the group should be large enough to have “critical mass.” This will help insure that revisions are not made on the basis of idiosyncratic behavior, and the group has enough different people to have a lively debriefing discussion of deficiencies in the prototype and develop suggestions to remedy the deficiencies. Of course, the group should not be so large that the group debriefing process is encumbered. When the subjects individually (independently) experience the prototype, a debriefing group size from 6 to 10, including the leader, is suggested. However, a G/S may be for a fixed or restricted number of participants, for example, four people usually play card games. In these kinds of cases, judgment and circumstances will prevail in selecting both individual group compositions and the number of groups (i.e. perhaps two games of four people each) to include in the debriefing session.

2. *Pre-Test—Run G/S—Post-Test*

The developer's purpose here is three-fold: First, a pre-test time, the subjects may be oriented to the purposes and objectives of this formative evaluation. Second, stand-alone data about the prototype (to be analyzed but not necessarily discussed) is collected. And third, data is collected to help in choosing the topics of the debriefing session.

Pre-tests are useful for establishing the entry-level knowledge of prospective participants to select amongst them, or so that pre/post changes in knowledge or attitudes be verified. Pre-tests are not always necessary or even desirable. If you have no need for entry-level knowledge or attitudes, eliminate the pre-test. This does not mean that other preliminary activities, such as an orientation to what will be expected of the participants, should be eliminated.

When the participants are involved in the G/S, the developer should give whatever tutorial help that is necessary and consistent with making the G/S work properly.

Normally, a post-test follows the G/S, otherwise the greatest distinctions between the formal and not so formal small group models vanishes. Again, the purpose of the post-test is to collect data to assist in finding and correcting prototype deficiencies. Questionnaires may be constructed as explained in the Instrumentation section below. Also, tests of cognitive knowledge may be constructed and used in the normal way, of course. However, a discussion of the construction of cognitive tests is not within the intended scope of this paper.

3. *Analyze Data—Develop Debriefing Agenda*

Once the data is collected, it needs to be tallied to determine the major problems in the prototype. It is suggested here that simple tallies are usually the most appropriate means of data reduction (i.e. counting up the number of people who indicated that they would “recommend extensive modifications to the G/S before using it again,” etc.) Tally the fixed choice (Likert scale) item responses, and group together the open-ended item responses that are similar. This will give you a feeling for the overall attitude of the evaluation group.

Having tallied and grouped the responses, the major hang-ups should be clearly identified. These become the tentative agenda for the debriefing session to follow.

4. *Formative Evaluation Debriefing and Problem-Solving*

Debriefing, as used here, refers to the follow-up session for the purpose of *evaluating* the instructional materials. This should not be confused with a debriefing session that may be an integral part of *using* the instructional materials. If the instructional materials are designed to be used with a follow-up debriefing session, the formative evaluation debriefing is a separate session that follows the “using” debriefing session.

The intent of the debriefing session is two-fold: First, major problem areas are identified or verified, and their severity is discussed. Second, solutions to those problems are sought. It should be noted that students are capable of not only identifying deficient instructional sequences, but of providing insightful and practical design information to remediate the deficiencies. This, after all, is the basis for using students in the formative evaluation process. The students can sometimes provide unique and insightful solutions to their own learning problems which the developers cannot because of their more sophisticated understanding of the subject matter.

The group debriefing is usually led by the developer of the G/S. It is very important for the developer to communicate his commitment to the principle of “no reprisals” for frank and/or derogatory comments. The G/S is on trial, not the students. Needless to say, it is very important for the group leader to have this commitment himself.

The goal of the group leader is to work with the group to solve the problems found in the prototype. It is not, and should not be, to be defensive of the prototype when it comes under attack. For the process to have maximum effect, it is necessary for the leader to try and understand why the students encountered their problems rather than defend the prototype.

However, face-to-face feedback from students can be threatening, even devastating to developers; therefore, formative evaluation using a face-to-face debriefing process is most effective with developers who have a high tolerance for criticism. Also, it should be noted that the amount of criticism of the G/S is directly related to its quality. Consequently, the amount of threat is inversely related to the quality of the G/S. In other words, get as many bugs as possible out before undergoing the group debriefing process.

Although face-to-face feedback may be threatening, it can be an effective tool to convince reluctant developers that revisions really are necessary. When a single student says something like, “The main objective of the G/S was not clear,”—the developer may find this uncomfortable. Then, as additional students corroborate the point being made, the cumulative effect begins to make an enormous impact on the developer, and he begins to “really believe.” One could not argue with the students or somehow ignore the discrepancies which were discussed. These discrepancies are very real to the students and they become, through the interaction, very real to the developers.

Assuming the debriefing process has identified a component that may need revision, it is important to obtain student consensus on: (1) whether it really warrants revision, and (2) what specific revision alternatives should be implemented. In their role of providing feedback to the lesson designer, students often disagree as to whether a particular instructional component warrants revision, and/or how to review a deficient component. Students may state a concern with some segment of a prototype or point out some specific problem which could easily be the result of an idiosyncratic response to the G/S. To maximize the probability that a given sequence does, in fact, warrant revision, or that a particular suggestion for revision will be effective, a student consensus decision model should be used. Thus, for example, when a particular discrepancy is under discussion, the group leader can quickly determine student agreement on the seriousness of the problem by asking “How many agree that ‘X’ should be revised?” After a consensus is reached on whether to revise “X” then consensus can again be used to select the best revision alternative from among those which emerge during the discussion.

The following ground rules will facilitate interaction between students and developers during the debriefing and problem-solving session:

- a) The tone of the debriefing must be kept open, positive, and factual.
- b) The debriefing must be non-threatening and non-intimidating for the students.
- c) All students must be encouraged to make a contribution.
- d) The debriefing should be organized around objective data. (While debriefing that is an integral part of “using” instructional materials often is subjective in nature—debriefing for formative evaluation purposes should be based upon objective determinations of the particular deficiencies of the instructional materials being evaluated).

The next section of the paper discusses the measurement and evaluation of data to provide insights into the prototype materials, and delimit the topics of the group debriefing process.

Measurement and Evaluation

This section discusses three parts of the measurement and evaluation problem. That is, it discusses two kinds of instruments: how to administer one of those kinds of instruments, and what to do with the data when you get it.

Kinds of Instruments

There are two general kinds of measuring instruments: (1) those which measure achievement, and (2) those which measure attitude. Instruments which measure achievement are generally called tests, while those which measure attitude are usually called questionnaires.

Tests

The purpose of tests is to measure how well the student has learned the instructional material, not how well the instructional materials has contributed to student learning. Remember, the purpose of formative evaluation is to evaluate the materials, not the students. But, how well the students learn is related to the quality of the instructional materials (otherwise, why improve them), and tests can often be quite helpful in pinpointing deficient portions of the instructional materials.

Everyone is at least familiar with the taking of tests, and most of us are probably familiar with the construction of tests. It should be noted that the construction of cognitive tests is very dependent on the particular subject matter being taught, and therefore, no examples of generally applicable tests can be provided. Further discussion of tests is not part of the scope of this paper. However, see Ebel, (1965), as one helpful source on test construction.

Questionnaires

This paper will, however, touch on the use of questionnaires since: (1) questionnaires may be developed expressly to evaluate student response to the instructional materials, and (2) a single questionnaire may be appropriate in many settings. Beyond what is offered here, Oppenheim, (1966), is a good source on questionnaire construction.

Basically, there are two types of questionnaire items: closed and open items. The distinction is made because their data is analyzed differently.

Closed Items

Items that require the respondent to choose from a list of alternate replies are closed. True/False and multiple choice items are familiar examples of closed items, and the first 12 items of the G/S questionnaire in the Appendix are also closed items.

Open Items

Open items are those which do not restrict the respondent to a limited set of responses. Here he must generate his own answer. Essay questions and fill-in-the-blank items are open, and the last three items of the G/S questionnaire in the Appendix are open.

Administering Questionnaires and Data Analysis

Once a questionnaire is produced it needs to be given, usually after (and sometimes before, too) the G/S. usually the forms are individually distributed to be truthful and frank in their replies. Thus, if there are 20 students, one distributes 20 copies of the questionnaire and later tallies the results of the *closed* items to achieve an overall aggregate measure of the responses.

Closed Items

To tally the closed items means to count the number of times each foil (Yes, Neutral, No) was chosen for a particular item. For example, the tally of item number 9 for 15 people may result in 7 Yes's, 4 Neutral's, and 4 No's.

This tally can be tedious, and sometimes the alternate chosen is either to not analyze all of the data collected, or to not collect the data in the first place. When doing formative evaluating using a small group model, there are two alternatives to doing no data analysis at all. Both alternatives are more desirable than no analysis at all, and both are less work than having one person tally all the responses without help. These two alternative ways to produce the tally are: (1) after the respondents answer individual questionnaires, exchange papers, and have a show of hands to get the tally for each item, and (2) have many respondents share a few copies of the questionnaire (perhaps 10 respondents per questionnaire). Each respondent marks his choices alongside of those already on the questionnaire from earlier respondents. The example questionnaire in the Appendix has been constructed with large boxes in which to mark so that there is room for many people to answer each item.

Although statisticians may consider alternative number two outrageous because it violates the very important assumption of statistical independence amongst the respondents, it will serve the needs of formative evaluation very well. First of all, the people involved in the G/S do not operate independently of each other anyway, nor will they be independent of one another in the follow-up discussion. Dependent interactions are really the normal mode of operating in real life. Secondly, in small group formative evaluation, the questionnaire data is not the basis for final judgments. A group discussion and group consensus model to determine needed changes was suggested for this. Finally, the data is (probably) not going to be statistically analyzed to test hypothesis (and in fact should not be whenever statistical independence has been violated).

Open Items

These are represented by items 13-15 in the Appendix questionnaire. Here the student generates an answer rather than choosing one from a list. Thus, before the answers can be tallied up, they need to be examined and then categorized into similar groups. This can be facilitated by cutting the items apart to sort each item separately.

The open-ended questions should provide rather precise but not comprehensive information on the strengths and deficiencies of the material being evaluated. Using the questionnaire then provides a broad base of data via the closed items, and more sharply focused data through the open items.

In the small group model, the group debriefing is used to build on the base information from the questionnaires, and perhaps tests as well, to evaluate the quality of the prototype materials and make needed revisions.

Summary

This chapter has presented: (1) a description of Formative Evaluation, (2) three models for conducting formative evaluation and procedures for implementing the models, and finally, (3)

measurement and evaluation instrumentation that may be used in formative evaluation. These three topics are summarized here:

First, formative evaluation has been identified as evaluation that is conducted during the time when instructional materials and methods are being developed for the purpose of detecting deficiencies in the prototype instructional materials, and identifying appropriate revisions to those materials.

Second, three practical models of conducting formative evaluation were outlined. These were the: (1) Tutorial, (2) Large Group, and (3) Small Group with Debriefing Models. When using the Tutorial model, the prototype designer observes one student as he uses the prototype materials and provides tutorial instructions whenever needed. This approach has the advantage of simplicity and the disadvantage of providing erratic feedback to the developer. The Large Group model relies on using group tests and attitude evaluation instruments. Revisions are based on post-hoc evaluation of the findings from the group test results. It provides more stable data than does the Tutorial model, but suffers from the lack of personal interaction between the designer and the subjects.

The third and last formative evaluation model was the Small Group approach. Here a group of subjects small enough to have a single group discussion, uses the prototype materials. This is followed-up by a debriefing discussion led by the designer on the various merits and weaknesses of the materials.

The Small Group with debriefing model is generally superior to either the Tutorial or Large Group models. This is because it combines the interaction of the Tutorial model with much of the data stability of the Large Group model. The group interaction is a powerful means of identifying problems, their solutions, and convincing the designer that the problems are real. Data instability, i.e. the idiosyncratic behavior of the Tutorial model, can lead to inappropriate revisions of the instructional materials.

Third, and finally, the paper presented a discussion of appropriate measurement and evaluation instrumentation. This included the uses of both tests and, in particular, questionnaires. These are used to obtain the objective data upon which the Small Group debriefing session is based. Questionnaires may be administered to each respondent individually, or several respondents may sequentially answer the same copy of the questionnaire to ease the burden of tallying the results. A general formative evaluation questionnaire is in the Appendix.

For Further Reading

Abedor, Allan J. "*Development and Validation of a Model Explicating the Formative Evaluation Process for Multimedia Self-Instructional Learning Systems.*" Ph.D. Dissertation, Michigan State University, 1971.

Abedor, Allan J. "*Development and Empirical Test of a Model for Formative Evaluation of Self-Instructional Multimedia Learning Systems.*" Prepared for: 1972 Annual Meeting of the Association for Educational Communications and Technology; Research and Theory Division, April 19, 1972.

Bloom, Benjamin S.; Hastings, J. Thomas; Madans, George F. *Handbook on Formative and*

- Summative Evaluation of Student Learning*. New York: McGraw-Hill Book Company, 1971.
- Ebel, Robert L. *Measuring Educational Achievement*. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1965.
- Oppenheim, A.N. *Questionnaire Design and Attitude Measurement*. New York: Basic Books, Inc., 1966.
- Scriven, Michael, Ralph Tyler, and Robert Gagne. *Perspectives of Curriculum Evaluation*, Vol. I. Chicago, IL: Rand McNally, 1967

Chapter 6

A Baker's Dozen: Basic References for Simulation and Gaming

William A. Anderson and S. Joseph Levine

Abt, Clark C. *Serious Games*. New York: Viking Press, 1970.

Concentrating on “serious” games of educational and classroom value. Abt presents a comprehensive yet readable introduction to the theory of educational games and simulations. Many examples whereof he speaks.

Boocock, Sarane S. and E. O. Schild (eds). *Simulation Games in Learning*. Beverly Hills, Calif.: Sage Publications, Inc., 1968.

This was probably the first book devoted solely to the topic of games and simulations in education. (The copyright date will give you some idea regarding how much has been written!). Chapters are included by a number of the individuals currently developing games and simulations. It should be noted that the editors have had their primary experience in social studies simulations. Consequently, the procedures discussed most thoroughly are those built around structured role playing. (The players act out different leadership roles of foreign countries which are attempting to resolve strategic issues). Two appendices are very helpful—a selective bibliography of available games, and a listing of major agencies involved in developing games with simulated environments.

Bower, Eli M., Kendra Bersamin, Amy Fine, Joy Carlson, and others. *Learning to Play, Playing to Learn*. Berkeley, CA: School of Education, 1974.

Several people have combined their thoughts and experiences in gaming in education to produce a readable introduction to the field. The book can be easily divided into two sections: theory and application. The first section clarifies terminology and presents a rationale for utilizing the various formats of simulation/gaming in the classroom. The second section presents information to assist one in selecting and evaluating a simulation/game in a classroom. Several examples are provided.

Carlson, Elliot. *Learning Through Games*. Washington, DC: Public Affairs Press, 1970.

This book is written for the layman to provide a survey of simulation/gaming from the participant's point of view. Nowhere else is the essence of the technique more vitally described. An excellent starting place for those interested in business, political, and social simulation/games to get the “feel” of the technique.

Glazier, Jr., Raymond E. *How to Design Educational Games*. Cambridge, MA: Abt Associates, 1970.

Especially fine on preparation of game materials and game boards, by the author of many simulations and games used in industry, government, and the schools.

Gordon, A.K. *Games for Growth*. Palo Alto: Science Research Associates, 1970.

Designed for use by classroom teachers, this book presents a good introduction to the theory of game design and game use. An extensive bibliography is included.

Nesbitt, William A. *Simulation Games for the Social Studies Classroom*. 2nd edition. New York: Foreign Policy Association, 1970.

This easily read little booklet is aimed at the classroom teacher and presents precisely the “what” and “why” of simulation gaming. Included are useful descriptions of some representative classroom games and discussion of the values and limitations of games. Bibliography lists resource persons, organizations, games, reports, books, and films on simulation.

Pfeiffer, J. William and John E. Jones. *A Handbook of Structured Experiences for Human Relations Training*. Vol. I, II, III, and IV. Iowa City: University Associates Press, 1969, 1970, 1971, 1974.

All volumes are well organized cookbooks of actual games and procedures that can be used for a variety of purposes. (Observation training, problem-solving, nonverbal techniques, etc.) The authors utilize a clear format which provides step-by-step instructions on how to run the game, copies of all handout materials that are needed, plus a concise statement of the goals of the procedure. This book is handy if you’re just getting started (it’s all spelled out in detail) or quite sophisticated in game design (each game can be modified and redesigned in a myriad of ways).

Pfeiffer, J. William and John E. Jones. *Simulation/Gaming/News*. Moscow, Idaho: Simulation Gaming News, Inc. 1974.

A one-stop shopping center for anyone interested in the field of simulation/gaming. Published in the field of simulation/gaming. Published six times a year, S/G/N contains articles on game design, use, evaluation, research, new publications, and much more. Especially helpful is the ERIC listing of new documents on simulation/gaming. The subscription price (\$6.) has gone up (but what hasn’t) and is still well worth the money.

Stadsklev, Ron. *Handbook of Simulation Gaming in Social Education, Part 1: Textbook*. University Alabama: Institute of Higher Education Research and Service, The University of Alabama, 1974.

One of the few books available with a very practical orientation. Twenty-two different articles are organized into three sections—What?, Why?, and How? Particularly good aspects include a step-by-step look at how to debrief a game/simulation activity, concerns of evaluation, and procedures for evaluating.

Stoll, Clarice and Michael Inbar. *Simulation and Gaming in Social Science*. New York: Free Press, 1972.

This book is written for a general audience as an introduction to various simulation techniques (teaching or research, computer or non-computer). It includes six “textbook chapters” written by Inbar and Stoll, and twelve chapters by contributors. Included is a discussion of the history of simulation, and several examples of simulations.

Twelker, Paul A. *Instructional Simulation: A Research Development and Dissemination Activity*.

Monmouth, Oregon: Teaching Research Division, Oregon State System of Higher Education, 1969.

A broad examination of theoretical issues of instructional simulation. Among the chapters, “Simulation: An Overview” furnishes the reader with a broad look at the field of simulation, provides a rationale and conceptual framework for subsequent discussions, and discusses many of the more important issues in the design and use of simulation. A 13-step design model is presented.

Zuckerman, D.W. and R. E. Horn. *The Guide to Simulations/Games for Education and Training*.
Lexington, MA: Information Resources, Inc., 1974.

In addition to over 600 simulation/games described in detail, authors have included articles introducing simulation/gaming, its place in the classroom, and game design. Articles are good, and game compendium serves as an idea springboard for game design.