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Survey of Gaming Materials: Ecuador Project Non-Formal Education

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**SURVEY OF GAMING MATERIALS
ECUADOR PROJECT
NON-FORMAL EDUCATION**

by

ALBERTO M. OCHOA

May, 1974

**PLEASE RETURN TO
NONFORMAL
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The Ecuador Non-Formal Education Project is administered by the Center for International Education at the University of Massachusetts and is funded under the auspices of the United States Agency for International Development.

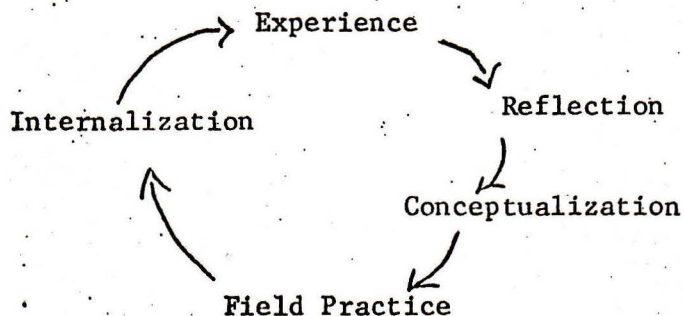
ECUADOR PROJECT
Gaming Materials Survey

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Introduction

In what is now over two years since the Non-Formal Education Project began its activities in Ecuador, the first question that was asked stated, "and now what?" Up to that point, we had developed a conceptual framework and a series of behavioral objectives that gave us the ideal perspective, and to a degree, imaginary, as to what we thought NFE should be; although we did not have a tool in our hands to convert this conceptual framework into a learning process.

Our first task, in response to this need, was to create learning environments where those theoretical processes could take place. The facilitator model discussed at some length in other project documents - was one of those environments to which participants (Sierra campesinos) and project staff (a heterogeneous group: two mestizos, an indian and a North American) attempted to attain self-esteem, a critical thinking process, and the ability to resolve conflicts. These variables, in the affective domain, were experienced through dialogue that provided a means to shape and develop an experiential process. A process that takes into consideration five different steps:



Although the steps do not necessarily need to follow a cyclical pattern, it is fundamental to the process to begin with an experience activity. It is at this stage that the project started to develop materials, simulations, fluency games fotonovelas, etc.

1MP
In the development of games our primary criteria was to develop games that were cheap, easily reproducible, motivating, of immediate relevance, self-explanatory, and self-generating. In so doing, the games were distributed to rural villages, the Ministry of Adult Education, and other institutional and non-institutional frameworks. The games were presented in a partially completed form and purposely produced in an unfinished way; this was done so that participants could adapt the games to their own social setting, relate them to their lives and experiences, be perceived by them as useful and entertaining, and be played according to their local style of play.

It is the purpose of this gaming material survey to assess the original intentions of the gaming materials in reference to the above mentioned criteria; in addition two more criteria were added to the assessment - games induce desirable human development and are culturally based. The survey provides for a comparative study of the games most frequently used by the project.

For this reason, the gaming materials survey and the comments of Alberto Ochoa, the investigator and writer of this document, provide valuable information into the gaming materials. The questions and comments of the writer will stimulate a process of reflection for those involved in educational gaming materials. The following gaming survey should be looked upon as a process for conceptualizing the first two years of the project and as a phase of the consolidation activities of the third year.

Patricio Barriga

Background of Gaming Materials Survey

During the Summer of 1973, Ted Ward from the University of Michigan visited the University of Massachusetts Project on "Non-Formal Education in Ecuador" for the purpose of advising USAID/Washington about the shape and form of an evaluation that could focus on the learning effectiveness of the institutional materials (games and simulations) developed within and for the project.

In his report to USAID/Ecuador, Dr. Ward points to the need for the project to develop guidelines for the development of effective materials (p. 3) and provides a series of questions for the project to evaluate.

What are the characteristics of effective instructional materials in reference to given learning outcomes among given sorts of learning? (p. 4) What sorts of instructional materials achieve what learning gains? for what sorts of people? under what sort of instructional conditions? (p. 5)

Under Section II, of his report he outlines seven options for evaluative emphasis; of these seven options David R. Evans, Principal Investigator of the project, committed the project to do option #6, a survey of gaming materials, during March 1974 (See Appendix I).

Goal of Gaming Materials Survey

The goal of the survey is to begin consolidating data based on the gaming materials developed and used by the project and to focus on the original intentions of the instructional materials (Ward, option 6).

Background Information on Gaming Materials

- A. Games in Rural Education: The project developed and produced thirty-three games during its first and second year (1972-1974), both in Umass and in Ecuador, with each game partially complete and in an unfinished format to provide the Ecuadorean campesino with the opportunity to adapt the game around his social and geographical ambiente and for him to determine the rules of the game. The games were designed for the illiterate and semi-literate campesinos in Ecuador, South America. The rationale being the high illiteracy rate among campesinos, the scarcity of trained teachers for the rural sectors, the reliance on passive educational methodologies, the need for self-confidence concerning one's ability to learn, etc. (See Technical Note #1, The Ecuador Project).
- B. Simulation and Fluency Games: Two of the three types of materials designed by the project to teach basic cognitive and affective skills are Simulation games and Fluency games (Skill Practice Games), these two types of games are the core of the survey of gaming materials; the third type of materials being Expressive Techniques, which are not dealt with in this survey. In reference as to why the project chose to develop and produce simulation games, the answer to the question lies in the rationale of the project and the following points:
1. Given the rural setting, one attractive aspect of games is that they combine learning with fun; they are, intended to be self-motivating.
 2. The scarcity of trained teachers forces a reliance on learning systems which require little training or expertise to administer.

*bit games are
in complete to allow
the computer to allow
wrap it with self to it.*

Games, through the use of verbal rules and clearly defined game boards, assist non-professionals in playing the role of instructor. Many game experts in the United States are skeptical about the use of colorful game boards, and chance mechanisms, and feel that such devices are fit only for "parlor" games. It is the conviction of the project that when working with rural adults these aspects are essential factors in the games' effectiveness and should not be discarded in favor of more rigorous, yet more complicated, simulation designs.

3. Because financial resources are so scarce, it is also important that the chosen educational methodologies be reproducible by local communities, and that they spread easily from one community to another without the need for an elaborate distribution system. Games provide both capabilities, they can be copied and transferred from one area to another by simple word of mouth.
4. Finally, and perhaps most important, games support an active pedagogy. They force students, all students, to become involved in the learning activity. They are an excellent vehicle not only for participation during the playing of the game but also for learner in-put into the content of the lesson itself. The simulation games have all been developed either by Ecuadorians or with their assistance. While it is possible to design a game in isolation from the target population, it is not advisable to do so.

img

Games are not the sole creation of game experts with years of training. Many such experts will try to insist that non-professionals had better leave game design to the experts. It is our experience that the best results are obtained from a mixture of design expertise and the practical experience of those who know and understand the situation being modeled.

In regard to the Fluency games (Skill Practice Games) the following are key reasons why the project chose to develop Fluency games in the area of literacy and numeracy skills:

1. Skill-practice games can take the role of drill instructor, and play that role in a very acceptable manner to the student. Like simulation-games, skill-practice games are fun and at the same time the students are actually increasing their facility with specific operations.
2. These games are also cheap; they can be produced at very low cost, copied by local communities, and spread by word of mouth.
3. They differ from simulation-games in that they offer more reinforcement to the learner in smaller doses. Usually during a period of an hour or so, there are many winners. Play is shorter, more concentrated, and closer to indigeneous-style games. They are completely modular in that they can be repeated over an extended period of time with little loss of interest or impact.
4. Once again, these games support an active rather than a passive pedagogy, they reinforce learner participation, and they involve physical as well as mental dexterity.

which is important to adults used to working with their hands.

C. Project Perspective on Gaming Materials: The Ecuador Project's perspective is represented in Dr. Evans' response to Professor Ward's report on "Evaluation Plans for the Umass Project." The following points are articulated:

1. The project is not conceived of as largely a materials \ development effort. We are in fact entertaining the hypothesis that the materials are incidental - what is crucial is the type of process which they stimulate, a human relationship horizontally based on respect, and the behavior of the users as a group of individuals. (p. 2)
2. The materials have grown organically out of the field \ experiences and from the demands of the learners as they work together. (p. 2)
3. Of the pool of 34 games developed by the project, only those materials currently in extensive use have had the most work and effort, and are not necessarily those which are most accepted. (p. 2)
4. There has simply not been time or manpower for extensive / testing and usage of all the materials. (p. 2)
5. In reference to selection of materials: depending on < the users, the materials will be different ones. The projects philosophy calls for user-oriented choice process; people are encouraged to take what interests them and make whatever modifications they wish. (p. 3)

6. The project takes the position that there is no "right" method or set of materials to meet the needs of the campesino; instead there are a variety of materials to be used by them as they find those which are most valuable for meeting their own needs. (p. 5)
7. The project is based on an alternative set of assumptions: that learners are the ones who ultimately know what content, what types of materials, what learning settings are best for them, that the outside experts are as often wrong as they are right, and a healthy scepticism for their recommendations is essential for survival; that there is no single correct material or approach but rather a variety from which learners should make their own choice; and that the goals of the project are not to create primary school equivalence in the countryside but rather to find ways to promote growth in personal community actions and skills which lead to a self-sustaining process of local development.)

D. Facilitators Trained to Use Materials: In order to be consistent with the overall purpose of non-formal education the project and the field project coordinators have emphasized in the training sessions for facilitators that // learning can be achieved through materials and people which are already present in the communities. Thus, the gaming materials are presented to the facilitators in the following way by the project:

1. The use of the games is demonstrated
2. Emphasis is placed on the fact that the rules of the games

are not complete and that the games allow the flexibility for the rules to be changed or adapted to the local situation.

3. Stress is placed on the right of the participant(s) to reject the game(s) if they do not wish to participate.
4. Discussion emphasizes the way in which the games permit the participant(s) to use them according to their own social setting and need.

Preparation Prior to Survey of Gaming Materials

- A. A memo was sent to the Ecuador field staff with regards to the survey of gaming materials by the writer of this report specifying the following information:

The trip is seen as lasting 3-4 weeks and having a two-fold purpose:

1. To focus on the evaluation of gaming materials based on the six criteria stated in Technical Note #1; and
2. To establish communication with the Ecuador staff and project roles for the third year of the project.

The goal of the first purpose is to begin consolidating gaming materials, a la Ward - Option 6 (see attached copy) and to provide the Ecuador staff with data that will facilitate the documentation of the following field tested games used by the project during the past two years:

Hacienda
Letter Dice
El Mercado
Syllable Dice

Letter Rummy
Roulette
Pin Ball
Coop

others less used

The gathering of information will be done by means of:

1. Visiting sites where gaming materials are being used;
2. discussions with Quito/Amherst staff
3. conversing with Ecuadoreans, e.g. facilitators, MOE personnel, etc.
4. if possible, conversing with the people using the materials;
5. independently working with the materials;
6. reviewing and checking records;
7. other

An evaluation form will be utilized to record the information for each of the materials to be evaluated. The form will attempt to document the following information:

1. six criteria - Technical Note #1
2. content of skills of games
3. mode of participation
4. learning outcomes

Criteria for each of the categories will be defined operationally in order to facilitate assessment of gaming materials.

B. The limitations of the survey should be noted:

- (1) Ward's Option 6, called for an eight month study evaluation and six staff persons to implement the option; the writer of

this survey spent three weeks in Ecuador during March 1974.

In the first week, the writer familiarized himself with the materials and in discussion with project staff regarding the games. The second was spent in the field visiting the Colonche area for three days, the Columbe area for two days, and the urban Adult Education schools of Quito for two days - in each case, each site utilized project materials. The third week was spent in Quito working with the project staff.

- (2) No laboratory testing of materials was done.
- (3) Survey data was gathered from existing documents, observations, visits to field sites, conversing with campesinos and working with the project staff in Quito.

Procedures of Gaming Materials Survey

The procedures undertaken in implementing the survey of the gaming materials are the following:

1. The first step was to develop a master list of all the gaming materials which the project had developed by using project records and an inventory of the games. The writer then asked the project staff in Quito to verify the list.
2. Given a master list of games a chart was developed in order to indicate:
 - whether the game was a fluency game, an expressive technique, or a simulation game.
 - whether each game had been pilot-tested in a local school in Quito

or in one project site and if it has been field-tested on a large scale in at least several communities.

-the degree of use of each game: whether it has never been used, has had some use, or is frequently used in field sites where the games have been introduced by the project.

-whether the game is used by facilitators and by adult education teachers in a number of field sites where the games have been introduced by the project or the Ecuadorian Department of Education.

The writer asked the project staff (Barriga, Tasiguano, Alcocer, Andrade, Smith) to provide the information desired, with differences subsequently negotiated to a consensus. The following Master List of Games represents the opinion of the Quito project staff:

MASTER LIST OF GAMES

SPANISH/ENGLISH TRANSLATION

1.	HACIENDA (two types) ¹	GAME OF LIFE
2.	COPERATIVA	COOPERATIVE
3.	EL ROBO	THEFT
4.	CONCENTRACION	CONCENTRATION
5.	NAIPES DE LETRAS	LETTER RUMMY
6.	NAIPES DE SÍLABAS	SYLLABLE RUMMY
7.	DADOS DE LETRAS	LETTER DICE
8.	DADOS DE NUMEROS	NUMBER DICE
	a) SUMA	ADDITION
	b) MULTIPLICACIÓN	MULTIPLICATION
	c) DIVISION	DIVISION
	d) RESTA	SUBTRACTION
9.	QUINA	MATH BINGO
	a) SUMA	ADDITION
	b) MULTIPLICACION	MULTIPLICATION
10.	PIN BALL	PIN BALL (Math)
11.	RULETA	ROULETTE
12.	ARGOLLAS	RING TOSS
13.	TRES EN CALLE	MATH TIC TAC TOE
14.	DOMINO	DOMINO (Math)
15.	EL BURRO	THE DONKEY (Multiplication card game)
16.	EL CHULO	(Reading and Math board game)

1. One made of card board and the other of wood. In addition, the game has been adapted to the Sierra and the Coastal regions of Ecuador.

17.	EL MERCADO	MARKET
18.	FERIA	FERIA
19.	BARRIO	GHETTO
20.	LA COMIDA	FOOD
21.	JUEGO DE LA EDUCACION	EDUCATION GAME
22.	JUEGO DE LA COMUNIDAD Y PLANIFICACION	PLANNING GAME
23.	40 DE LETRAS	40 OF LETTERS
24.	VEINTIUNA (21)	TWENTY-ONE
25.	CARTAS DE NUTRICION	NUTRITION CARD GAME
26.	FUTBOL SOCCER DE MATEMATICAS	MATH SOCCER
27.	PARQUET	PARQUET
28.	PALABRAS REVUELTAS	WORD SCRAMBLE
29.	QUINA DE PALABRAS	WORD BINGO
30.	LOTERIA	LOTTERY
31.	FLIP	FLIP
32.	OCHO'S	EIGHT'S
33.	JUEGO DE FRASES	PHRASE GAME
34.	TERRENOS	LAND

	TYPE: 1. Fluency 2. Expressive 3. Simulation	LABORATORY (Pilot-tested) Short-Term Testing Process	FIELD- TESTED Multi- Community	DEGREE OF USE: 1. ^a never used 2. ^b some 3. ^c frequently used	USED BY FACILI- TATOR	USED BY ADULT EDUCATION
1. HACIENDA (two types)	3	yes	yes	3	yes	yes
2. COPERATIVA	3	yes	no	2	no	no
3. EL ROBO	3	yes	no	2	yes	no
4. CONCENTRACION	1	yes	yes	2	yes	no
5. NAIPES DE SILABAS	1	yes	yes	3	yes	yes
6. NAIPES DE SILABAS	1	yes	yes	3	yes	yes
7. DADOS DE LETRAS	1	yes	yes	3	yes	yes
8. DADOS DE NUMEROS	1	yes	yes	3	yes	yes
a. SUMA						
b. MULTIPLICACION	1	yes	yes	2	yes	yes
c. DIVISION	1	yes	no	2	no	yes
d. RESTA	1	yes	yes	3	yes	yes
9. QUINA						
a. SUMA	1	yes	yes	3	yes	yes
b. MULTIPLICACION	1	yes	yes	3	yes	yes
10. PIN BALL	1	yes	yes	2	yes	no
11. RULETA	1	yes	no	2	yes	no
12. ARGOLLAS	1	yes	yes	2	yes	no
13. TRES EN CALLE	1	yes	no	2	no	no
14. DOMINO	1	yes	yes	2	yes	no
15. EL BURRO	1	no	yes	2	yes	no
16. EL CHULO	1	yes	no	2	yes	no
17. EL MERCADO	1	yes	yes	3	yes	yes

- 1.^a no community (Sierra/Costal) has used game
2.^b communities (Sierra/Costal) have used game three to six times in the last six months (Oct. '73-Mr. '74)
3.^c communities (SIERRA/Costal) have used game at least more than seven times in the last six months (Oct. '73-Mr. '74)

	1. Fluency 2. Expressive 3. Simulation	(Pilot-tested) Short-Term Testing Process	TESTED Multi- Community	1. never used 2. some 3. frequently used	BY FACILI- TATOR	BY ADULT EDUCATION
18. FERIA	3	yes	no	1	no	no
19. BARRIO	3	no	no	1	no	no
20. LA COMIDA	3	no	no	1	no	no
21. JUEGO DE LA EDUCACION	3	no	no	1	no	no
22. JUEGO DE LA COMUNIDAD Y PLANIFICACION	3	no	no	1	no	no
23. 4J DE LETRAS	1	yes	no	1	no	no
24. VEINTIUNA (21)	1	no	no	1	no	no
25. CARTAS DE NUTRICION	3	yes	no	1	no	no
26. FUTBOL SOCCER DE MATEMATICAS	1	no	no	1	no	no
27. PARQUET	1	yes	no	1	no	no
28. PALABRAS REVUELTAS	1	yes	no	1-2	no	no
29. QUINA DE PALABRAS	1	yes	yes	1	yes	no
30. LOTERIA	1	no	no	1	no	no
31. FLIP	1	no	no	1	no	no
32. OCHO'S	1	no	no	1	no	no
33. JUEGO DE FRASES	1	no	no	1	no	no
34. TERRENOS	1	yes	no	1	no	no

OTHER: EXPRESSIVE TECHNIQUES

Ashton-Warner Dialogue	2	yes	yes	3	yes	no
Cellos de Caucho (Rubber Stamps)	2	yes	no	2	no	no
Mini-Posters	2	yes	yes	2	no	yes

3. Given the information on the Master List of Games the writer spent a week in the field visiting sites where games were being used. The following schools and project sites were visited:

Quito: Colegio Oscus, Adult Education program 20 students (14 to 58 yrs.) observed students playing Dados de Silabas (Syllable Cards).

Colegio 6 de Diciembre, Adult Education program, 16 students (12 to 48 yrs.), observed students playing Quina de Multiplicación (Bingo) and participating in a socio-drama based on the fotonovelas of the project.

Field

Sites: Colonche (Coastal area of Ecuador), visited the village of San Pedro with Enrique Tasiguano, a project field coordinator, who conducted a training workshop with the facilitators of the area; over 25 facilitators participated ranging in age from 15 years to over 40 years. During the two day workshop the writer observed Quina, Mercado, Naipes de Sílabas, Dados de Números (Number Dice) Dados de Letras, and Concentración played by the participants in groups of five or six.

Columbe (a Sierra area of Ecuador), visited the village of San Martin while the FERIA Educativa (Educational Fair, an experimental component of the project) was visiting the village under the coordination of Carlos Moreno, a project field coordinator; over 150 campesinos from the village participated in the fair. Observed

groups of campesinos playing Quina, Dados de Letras, Naipes de Silabas and Naipes de Letras for over two hours.

4. The fourth step after a week of visits in the field, the writer concentrated in operationalizing the six criteria (specified in Technical Note #1 of the project) as to what the gaming materials should have as desired attributes. In addition to the six criteria (1) cheap, (2) easily produced, (3) motivating, (4) self-explanatory, (5) immediately relevant, (6) self-generating, two more were added: the seventh proposed by Professor Ward in his report (7) induces desirable human development, and the eighth proposed by Alberto Ochoa, (8) materials are culturally based. The writer read the documents of the project that attempted to operationalize each of the first six criteria (Let Jorge Do It: An Approach to Rural Non-Formal Education by James Hoxeng and Technical Note #1) and proceeded to operationalize the meaning of each criteria with the assistance of the project staff. The eight criteria are operationalized as follows:

Desired Attributes for Gaming Materials Criteria

1. **CHEAP:** Material cost of game is within the economic reach of its participants; the cost should be:
 1. Within the budget of a campesino family
 2. Less than the cost of its commercial equivalent
 3. Less than 24 sucres (approx. \$1.00 U.S.)
2. **EASILY REPRODUCIBLE:** Game "material" should be accessible in the local communities of its participants and should be:
 1. Available to the participants
 2. Constructable by the participants themselves
 3. Durable and attractive to participants
3. **MOTIVATING*:** Game, in order to stimulate participant and provoke interaction, should:
 1. Be fun in order to provide interest and participation
 2. Be an active process
 3. Enable the participant to take risks
 4. Provide confidence in using skills taught by the game
 5. Be non-compulsory about its use
 6. Not depend on external rewards

*Concept proved to be ambiguous, and the term interaction has been used to mean motivation.
4. **IMMEDIATE RELEVANCE:** Game appeals to the participants by relating its activities to their everyday life endeavors, whether participants have had schooling or not, and by providing that:
 1. The rules of the game be flexible enabling the participant to redefine the rules.
 2. The game objectives (cognitive and affective) have a direct applicability to the problems of the participants.
 3. The game has a short term cognitive impact on the participant.
5. **SELF EXPLANATORY:** Game is able to be played with minimal explanation and provides the feasibility of:
 1. Being self directed
 2. Requiring little in the way of literacy skills
6. **SELF-GENERATING:** Game is not the final form, rather it provides the participants the input necessary for them to:

1. Redesign game to meet their needs
 2. Design their own rules
 3. Adapt game around their social environment
7. **CULTURALLY BASED:** To be related to the lives and experiences of rural people in Ecuador; games reflect (where appropriate) the:
1. Diet of the population (nutrition, health, foods,...)
 2. Dress of the population
 3. Language of the population (verbal, non-verbal, visual)
 4. Ethics (value structure) of the population
 5. Social network and relationships of the population
8. **INDUCES DESIRABLE HUMAN DEVELOPMENT:** Participants of the game through their involvement and interaction, develop skills that produce:
- Attitude change: increased**
- 1) Self esteem
 - 2) Belief in capability for learning
 - 3) Awareness of social contradictions
- Social Behavior: increased**
- 4) Verbal aggressiveness
 - 5) Peer confidence
 - 6) Group action
 - 7) Self dependence
- Skill Development: increased**
- 8) Literacy
 - 9) Numeracy
 - 10) Ability to negotiate with authorities (survival skill)
 - 11) Ability to assess information

The Spanish translations of the eight operationalized criteria is found in Appendix 2.

5. Based on the criteria of the Master List of Games, the writer and project staff selected the top 17 games for a close study. Only 17 games met the criteria of frequently used or somewhat used.
6. Having selected the top 17 games used by the project, the writer developed a chart in a grid format that includes the 17 games vertically and the eight criteria horizontally. The writer then asked each staff member (Barriga, Tasiguano, Alcocer, Smith, Andrade,

Borja, Pasmino, Moreno), to assess each of the 17 games according to each of the eight criteria through the use of the grid and the Desired Attributes for Gaming Materials Criteria; each project staff member indicated their perceptions as to the degree to which each game met each criteria. (See Appendix 3 for assessments.)

7. The writer then proceeded to collect information from cost-accounting records to derive a cost survey of the project gaming materials. The cost survey looked at the cost of producing each game individually (by-hand) and commercially (professionally produced). See Findings of Survey, Cost Survey Table.

8. Because of differences in staff opinion revealed by the individual assessment of games, the project staff recommended that the whole staff as a group discuss their assessment of the top 17 games and came to a consensus for each subcriteria within each of the eight criteria. In order for the staff to assess each subcriteria and come to a consensus a scale was developed:

0.....	1.....	2.....	3.....
Does not meet criteria/no satisface la criteria	Meets criteria very little/sat- isface la crit- eria muy poco	Meets criteria to some extent/ satisface la criteria	Meets criteria very much/sat- isface la crit- eria bastante

The staff proceeded to assess each game based on the Desired Attributes of the Gaming Materials in a period of two days. (See Findings of Survey for Table representing results of procedure 8.)

9. In order to do a more thorough survey of the materials, an evaluation

form was developed. The form takes into account the following areas for describing the games: type of material, descriptive characteristics, conditions for the use of the game, goal and major concepts taught by the game, learning outcomes (cognitive and affective levels), degree of use within the project, conditions of learning based on Gagne, instructional mode of materials, criteria of materials (desirable attributes), and comments and recommendations of the game. What follows is the format of the evaluation form and an operationalized description of each area:

Gaming Materials
Ecuador Project

Material: NAME OF GAME

Type: (1) Simulation, (2) Fluency, (3) Expressive

Descriptive Characteristics:

- (1) Description of game
- (2) Procedures to play game

Conditions for the use of the material:

- a. Setting: Facility specified (Indoor, Outdoor, or both)
- b. Region/Cultural Group: In Urban, Costal, or dual setting
- c. Age Group: Range of age group that can use the game
- *** d. How it has been used: (1) Didactic, (2) Heuristic, (3) Philetic [SEE APPENDIX 4]

Goal of Game:

Game was designed to do what?

Major Concepts of Game:

What are the major concepts "taught" by the game? To have the participants internalize what?

*** Learning Outcomes:

- a. Cognitive: What are the cognitive levels of the game:
Knowledge, Comprehension, Application, Analysis, Synthesis, Evaluation
[SEE APPENDIX 5 for tool to determine levels, as based on
Krathwohl, Bloom, Masia.]
- b. Affective: What are the affective levels of the game?
Receiving, Responding, Valueing, Organizing, Characterization
[SEE APPENDIX 5 for tool to determine levels.]

What is necessary for game to be:

- a. Introduced: How does the game get started?
- b. Played: How many participants are needed to play?
- c. Conditions(in order to be played): Environment, lighting conditions, etc.

Degree of Use:

(1) Never used, (2) Used somewhat, (3) Frequently used.

*** SEE APPENDIX for operationalized definition of each category.

*** Conditions of Learning:

- a. Signal learning
- b. Stimulus-Response learning
- c. Chaining
- d. Verbal Association
- e. Discrimination learning
- f. Concept learning
- g. Rule learning
- h. Problem Solving

Based on Gagne's eight types of learning. The purpose of this category is to find the types of learning that are emphasized by each game.
[SEE APPENDIX 6 for Gagne's definition of each of the eight types of learning.]

*** Facilitator/Teacher (F/T) Instructional Form/Mode: (under comments)

- 1. Predominance of F/T to Participant Instruction
- 2. Predominance of Material to Participant Instruction
- 3. Predominance of F/T and Participant Interaction and Dialogue
- 4. Predominance of Participant to Participant Interaction and Dialogue
- 5. Predominance of Participant to Material Interaction and Dialogue

Comments:

Based on the mode of instruction of the game.

The purpose of this heading is to determine the mode of instruction of each game.
[SEE APPENDIX 7 for an operational definition of each category.]

Criteria of Materials (Desired Attributes):

- 1. Cheap: Mode of production hand-made vs. commercial, and the cost of the game.
- 2. Easily Reproducible: What is required to produce the game?
- 3. Motivating: Type of interaction, degree of involvement, is it stimulating, fun, re-played, etc.
- 4. Self Explanatory: Is it self-directed, needs no introduction, etc.?
- 5. Self Generating: Can it be adapted to different settings and are the rules flexible to meet the style of play of the participants?
- 6. Immediate Relevance: Applicability in need, environment, skills.
- 7. Culturally Based: Does it take into consideration the life styles and experiences of the Ecuadorean campesino?
- 8. Induces Desirable Human Development: What growth (cognitive and affective) is due to the game, e.g., attitude, social behavior, skill development?

Comments:

Changes needed (possible variations):

Questions to be answered: In reference to the game: Skill level

Desired attributes

Instructional mode

Learning outcomes

Possible future (how the game might be used):

Cultural implications, etc.

Recommendations:

The writer then took the top eight games as determined by the project staff as the most frequently used (see Master List of Games) and proceeded to complete the evaluation form for each of the top eight games: Hacienda, Naipes de Letras, Quina de Suma y Multiplicacion, Concentracion, and Dados de Numeros. See Findings of Survey for the complete evaluation form of each of the eight games.

10. The last procedure consisted of interviewing staff members through informal discussions about the use of the games. (See Comments and Questions to be Answered).

FINDINGS OF SURVEY

The survey of the learning materials was based on field observations, project documents and reports, conversation with campesinos in the Sierra and on the Coast of Ecuador, and from extended discussions with the Ecuadorean staff.

A. Master List of Games

Based on step 1 and 2, (p. 11) the master list of games indicates the following facts about the games:

1. 7 of the 34 games have been widely and frequently used by the project: Hacienda, Naipes de Letras, Naipes de Silabas, Dados de Letras, Dados de Numeros, Quina, and Me Mercado.
2. An additional 10 of the 34 games have had some use by the project: Cooperativa, Robo, Concentration, Pinball, Ruleta, Argollas, Tres en Calle, Domino, El Burro, and El Chulo.
3. 7 of the 17 games not used by the project have been pilot-tested; and one was used by a facilitator in the Sierra.
4. 14 of the 17 games frequently used or having had some use, have been utilized by the facilitators of the project; while 7 of the same 17 games have been utilized by teachers of the Ministry of Adult Education. The games that have had large scale reproduction through Servicio Nacional de Recursos Didacticos (SENARED) are:

	<u>Number of Copies</u>	
	<u>1973</u>	<u>1974</u>
HACIENDA	200	500
NAIPES DE SILABAS	500	1000
NAIPES DE LETRAS	500	1000
DADOS DE LETRAS	500	1000
MERCADO	500	1000
QUINA DE SUMA Y MULTIPLICACION	500	1000

None of the games used and reproduced by the Ministry of Adult Education have been sold.

5. Within the top 17 games, 16 have been pilot tested; and 12 games field tested in a number of communities.
6. With the top 17 games 14 are fluency games and 3 simulation games.

B. Cost of Games Survey

A survey of the cost of the games was made from project production records and from the Ministry of Adult Education proposed cost to produce various games. The survey looks at all the 34 games developed by the project, with the top 17 games having a more accurate cost given for their production. Each game is considered in regard to its cost if produced individually (by-hand) and commercially. It should be taken into account that there has been a very substantial increase in cost of living in Ecuador since 1972 and that has influenced the production cost of materials. What follows is a cost survey of the game materials:

COST SURVEY OF THE ECUADOR GAMING MATERIALS**

Currency exchange: 24.75 sucres = \$1.00 dollar
(March 1974 base)

Individually Produced
(based on 1973 figures)

Commercially Produced
Order of 1000
(based on 1974 figures)

1. HACIENDA	160 Sucres (s/.)	200 s/. (wood)
2. COOPERATIVA	50 s/.	80 s/.
3. EL ROBO	30 s/.	10 s/.
4. CONCENTRACION	20 s/.	15 s/.
5. NAIPES DE LETRAS	15 s/.	15 s/.
6. NAIPES DE SILABAS	15 s/.	15 s/.
7. DADOS DE LETRAS	15 s/.	30 s/.
8. DADOS DE NUMEROS		
a. SUMA	30 s/.	30 s/.
b. MULTIPLICACION	30 s/.	30 s/.
c. DIVISION	30 s/.	30 s/.
d. RESTA	30 s/.	30 s/.
9. QUINA		
a. SUMA	30 s/.	30 s/.
b. MULTIPLICACION	30 s/.	30 s/.
10. PIN BALL	160S/.	100S/.
11. RULETA	60 s/.	50 s/.
12. ARGOLLAS	50 s/.	40 s/.
13. TRES EN CALLE	10 s/.	6 s/.
14. DOMINO	20 s/.	15 s/.
15. EL BURRO	15 s/.	10 s/.
16. EL CHULO	15 s/.	20 s/.
17. EL MERCADO	30 s/.	25 s/.

** Cost per game, individually or commercially produced, taken from project cost expenditures records and from the Ecuadorean Ministry of Education proposed budget to reproduce games commercially.

Individually Produced
(based on 1973 figures)

Commercially Produced
Order of 1000
(based on 1974 figures)

18. FERIA	50 S/. (estimate)	80 S/. (estimate)
19. BARRIO	30 S/. (estimate)	70 S/. (estimate)
20. LA COMIDA	50 S/.	80 S/.
21. JUEGO DE LA EDUCACION	10 S/.	15 S/.
22. JUEGO DE LA COMUNIDAD Y PLANIFICACION	150S/. (estimate)	100 S/. (estimate)
23. 40 DE LETRAS	15S/.	15 S/.
24. VEINTIUNA (21)	15S/.	15 S/.
25. CARTAS DE NUTRICION	30S/.	25 S/.
26. FUTBOL SOCCER DE MATEMATICAS	50S/. (estimate)	100 S/. (estimate)
27. PARQUET	30S/. (estimate)	50 S/. (estimate)
28. PALABRAS REVUELTAS	10 S/.	20 S/.
29. QUINA DE PALABRAS	20 S/.	30 S/.
30. LOTERIA	30 S/.	70 S/. (estimate)
31. FLIP	15 S/. (estimate)	15 S/. (estimate)
32. OCHO'S	10 S/. (estimate)	10 S/. (estimate)
33. JUEGO DE FRASES	25 S/. (estimate)	20 S/. (estimate)
34. TERRENOS	30 S/. (estimate)	50 S/. (estimate)

Based on the initial project criteria for the ideal cost of each material, which is less than 24 sucres, the following games met the criteria:

1. In the top 17 games, only 8 games meet the criteria if they are individually produced; with 9 meeting the criteria if commercially produced.
2. Overall, only 16 of the 34 meet the criteria if they are individually produced; with 17 meeting the criteria if commercially produced.
3. If one raises the criteria to 30 sucres for the ideal cost of each game, the project games have greater success in meeting the criteria:
 - a. 12 of the top 17 games meet the criteria if individually produced; with 12 of 17 games meeting the criteria if commercially produced.
 - b. 25 of 34 games meet the criteria if individually produced; with 26 of 34 games meeting the criteria if commercially produced.
4. A summary of the above is expressed in the following table:

PERCENTAGE OF GAMES MEETING IDEAL COST

GAMES PRODUCED	TOP 17 GAMES		OVERALL 34 GAMES	
	If Cost is 24/s	30/s	If Cost is 24/s	30/s
Individually	47%	71%	45%	68%
Commercially	53%	71%	50%	70%

Significant difference is seen if the ideal cost of the game is increased to 30/sucres for both individually and commercially produced games in the top 17 games and in the overall description for the 34 games.

C. Desired Attributes of the Gaming Materials Survey

The findings of the desired attributes of the gaming materials are based on steps 4, 5, 6, and 8 of the Procedures of Gaming Materials Survey. Step 4 provides the operationalized criteria for the desired attributes of: (1) cheap, (2) easily reproducible, (3) motivating, (4) immediate relevance, (5) self-explanatory, (6) self-generating, (7) culturally-based, and (8) induces desirable human developemnt. Step 5 is based on the Master List of Games which provided the top 17 games for the survey to focus on. Step 6 asked each Ecuadorian staff member familiar with the top 17 games to indicate the criteria not met by each game as based on the operationalized desired atributes criteria. The evaluation form for each of the eight staff member's assessment survey showed differences of opinion as to what criteria was not met by each game; step 6 served to acquaint the staff members with the criteria and allowed them to state their own personal opinion based on their knowledge and involvement with each game. Step 8 required the staff (six) to work as a group and to come to a consensus for each of the eight criteria for each game.

In order to be more precise, a value scale was constructed to serve as a means by which to assess each sub-criteria within each of the eight criteria (refer to step 4 of Procedures of Gaming Material Survey. The scale used was the following:

0.....	1.....	2.....	3
Does not meet criteria/no satisface la criteria	Meet criteria very little/ satisface la criteria muy poco	Meets criteria to some extent/ satisface la criteria	Meets criteria very much/sat- isface la crit- eria bastante

In a period of two days and based on the Operationalized Criteria of the Desired Attributes and scale the staff came to a consensus on the following 33 sub-criteria within the eight desirable attributes for the materials for the top 17 games. The following chart describes the results and should be read as follows, e.g. under cheap, the numbers 1,2, and 3 refer to the operationalized criteria for cheap; beginning with Hacienda, the staff concluded that it does not meet the criteria (1) that Hacienda is within the budget of a campesino family, that it meets the criteria (2) that it is less than the commercial cost of the game, and that it does not meet the criteria (3) that it is less than 24 sucres.

VALUE SCALE: 0.....1.....2.....3
 Does Not Meet Criteria Meets Criteria Very Little Meets Criteria to Some Extent Meets Criteria Very Much

Criteria	CHEAP			EASILY REPRODUCED				MOTIVATING						IMMEDIATE RELEVANCE		
	Sub-criteria	1	2	3	1	2	3 ¹	1	2	3	4	5 ²	6	1	2	3
CIENDA	0	2	0	1	1	2	3*	3*	3*	2-3*	2*	3*	3*	3*	2	2
OPERATIVA	0	2	0	1	1	2	1	2	2	1-2	1	2	2	2	1-2	1
ROBO	2	2	2	1	1	2	2	3*	2	2*	1	2	3	0	1-2	1
CONCENTRACION	3	2	3	2	3	2	3	3*	3*	0-3	1-2	3*	3	0-3	0-3	0-2
PAIPES DE LETRAS	3*	1	3*	2	2	1-2	3	3*	3*	2	2	3	3	2	2	3
PAIPES DE SILABAS	3*	1	3*	2	2	1-2	3	3*	3*	2	2	3	3	2	2	3
JUEGOS DE LETRAS	2	1	2	2	1-2	3*	3	3	3	1	2*	3	3	2	2*	3*
JUEGOS DE NUMEROS	2	1	2	2	1-2	3*	2	3	3	1	2	3	2	2	2	2*
QUINA	2	1	2	2	2	1-2	3	3	3	1	1-2	3	2	1	2	3
PIN BALL	0	1	0	1	1	2	3	2	1	1	1	3	2	1	1	1
RULETA	0	1	0	1	1	3	3	2-3	1	1	1	3	2	1	1	1
ARGOLLAS	1	1	1	1	1	2	2-3	2	2	2-3	2	3	2	1	1	1
TRES EN CALLE	3	0	3	3*	3*	2	1	2	2	2	1	3	2	1	1	1
DOMINO	2	1	2	1	1	3	2	2	2	1	1-2	3	2	1	2	2
EL BURRO	3	1	3	1	2	1-2	2	3*	2	1	1-2	3	2	1-2	1	2
EL CHULO	3*	1	3	1	1	2	3	1	0-1	0-1	0	3	2	1	1	1
EL MERCADO	2	1	2	1	1	2	2-3	2	2	1-2	2	3	2	2	2-3	3

1. divided into two categories: Durable / Attractive

2. after being introduced once

re-evaluation within each category

VALUE SCALE:

0 1 2 3
 Does Not Meet Meets Criteria Meets Criteria Meets Criteria
 Criteria Very Little to Some Extent Very Much

INDUCES DESIRABLE HUMAN DEVELOPMENT

SELF-EXPLANATORY		SELF-GENERATING			CULTURALLY BASED					ATTITUDE			SOCIAL BEHAVIOR				SKILL DEVELOPMENT			
1	2	1	2	3	1	2	3	4	5	1	2	3	4	5	6	7	8 ⁴	9	10	11
1	1	1	2*	3*	2	0	3*	3*	3*	2*	1	3*	3*	3*	3*	2*	1	2	3*	1*
0	1	0-1	2	2-3	2	1	2	1	2	1	1	2	2	2	3	2	1	2	2	1-2
0	2	0-1	1-2	2	0	0	1-2	1	2	0	1	0	2	2	2	1	1	0	0-1	0
2	3*	3*	2	0-3	0-3*	0-3*	3	0-3	0-3	0	1	0-3	1	0	1	0	2	0-3	1	0-3
2	3	0-1	1	0	0	0	written 3*	1-2	0-2	0	3*	0-1	1	0-1	1-2	1	3	0	1	0
2	3	0-1	1	0	0	0	3	1-2	0-2	0	3*	0-1	1	0-1	1-2	1	3	0	1	0
3*	3	0-1	1	0	0	0	3	1-2	0-2	0	3	0-1	1	0	1	1	3*	0	1	0
3*	3	0-1	1	0	0	0	0	NA	0-2	0	3	0-1	0-1	0-1	1	1	0	3	1	0
3*	3	0-1	1	0	0	0	0	NA	0-2	0	2	0-1	0-1	0-1	1	1	0	3*	1	0
2	3	0-1	1	0	0	0	0	NA	0-1	0	1	0-1	0-1	0-1	1	1	0	3	1	0
3	3	0-1	1	0	0	0	0	NA	0-1	0	1	0-1	0-1	0-1	1	1	0	3	1	0
3	3	0-1	1	0	0	0	0	NA	0-1	0	1	0-1	0-1	0-1	1	1	0	3	1	0
1-2	3	0-1	1	0	0	0	0	NA	0-1	0	1	0-1	0-1	0-1	1	1	0	3	1	0
1	3	0-1	1	0	0	0	0	NA	0-1	0	1	0-1	0-1	0-1	1	1	0	3	1	0
1-2	3	0-1	1	1	0	0	0	NA	0-2	0	1	0-1	0-1	0-1	1	1	0	3	1	0
1	3	0-1	1	1	0	0	0	NA	0	0	1	0-1	0-1	0-1	1	1	0	3	1	0
1	2	0	2	2	1	1	2	NA	0-2	0	2	0-1	0-1	0-1	1	1	0	3	1	0

3. Games 1 to 4 based on spoken language and games 5 to 16 based on written language

4. Literacy skills: 1 = in need of literacy skills

3 = agree with definition

NA Information not available

In order to summarize the degree to which each game meets the eight criteria, based on the information provided by the Survey Chart, the following procedure was used:

- I. a scale was constructed to average the scores of the subcriteria into a single score in each of the eight main criteria.
- II. by means of this scale it was determined which of the top 17 games best met the eight criteria of desired attributes for games.
- III. by means of interviews and discussions the Ecuador staff selected the game(s) that met the highest degree of each of the 33 subcriteria.

Procedures Operationalized:

- I. The following scale, derived from the value scale (0---3), was used to determine the degree to which each game met each criteria:

<u>Meets Criteria</u>	<u>Range of Value Scale</u>
Very Much	(2.5 - 3.0)
Some Extent	(1.5 - 2.4)
Very Little	(0 - 1.4)

e.g. Hacienda under Motivating, was given the following values: 3,3, 2-3, 2,3,3 a total of 16.5 points; with the 2-3 counted as 2.5 since it ranged between 2 and 3. The 16.5 points are divided by the number of subcriteria under motivating (6) for a score of 2.75; thus, in using the scale, Hacienda meets the criteria very much.

Using this scale, the following chart provides an overall general description as to the degree to which each game met each criteria:

SCALE: Meets Criteria

Range of Points

Value Scale: 0.....1.....2.....3

Very Much (2.5 - 3.0)
 Some Extent (1.5 - 2.4)
 Very Little (0 - 1.4)

Does Not Meet Criteria Very Little Some Extent Very Much

Criteria criteria	CHEAP EASILY REPRODUCIBLE		MOTIVATING	SELF EXPLANATORY	SELF GENERATING	IMMEDIATE RELEVANCE	CULTURALLY BASED	INDUCES DESIRABLE HUMAN DEVELOPMENT					
	1	2	3	4	5	6	7	Attitude	Social Behavior	8	Skill	9	10-1
TENDA	1.5	1.8	2.75	2.3	1	2	2.2	2	2.75	1	2	2	
ERATIVA	1.5	1.25	1.75	1.5	0.5	1.7	1.6	1.3	2.25	1	2	1.7	
ROBO	2	1.5	2.1	0.8	1	1.3	0.9	0.3	1.75	1	1.5	.25	
CENTRACION	2.7	2.5	2.5	1.3	2.5	2.2	1.8	0.8	0.5	2	0	1.2	
PES DE LETRAS	2.3	2.2	2.7	2.3	2.5	0.5	1.1	1.5	1	3	0	.5	
PES DE SILABAS	2.3	2.2	2.7	2.3	2.5	0.5	1.1	1.5	1	3	0	.5	
OS DE LETRAS	1.7	2.4	2.5	2.3	3	0.5	1.1	1.5	0.75	3	0	.5	
OS DE NUMEROS	1.7	2.2	2.3	2	3	0.5	0.2	.5	0.75	0	3	.5	
NA	1.7	2.2	2.25	2	3	0.5	0.2	0.8	0.75	0	3	.5	
BALL	0.3	1.75	1.7	1	2.5	0.5	0.1	0.5	0.75	0	3	.5	
ETA	0.3	2	1.75	1	3	0.5	0.1	0.5	0.75	0	3	.5	
OLLAS	1	1.6	2.35	1	3	0.5	0.1	0.5	0.75	0	3	.5	
ES EN CALLE	2	2	2	1	2.25	0.5	0.1	0.5	0.75	0	3	.5	
MINO	1.7	1.75	1.9	1.7	2	0.5	0.1	0.5	0.75	0	3	.5	
BURRO	2.3	1.6	2.1	1.5	2.25	0.8	0.2	0.8	0.75	0	3	.5	
CHULO	2.3	1.75	1.1	1	2	0.8	0	0.3	0.75	0	3	.5	
MERCADO	1.7	1.85	2.1	2.5	1.5	1.3	1	1	0.75	0	3	.5	

The following chart provides the percentage of games that met the various levels of the scale for each of the eight criteria. The eighth criteria is divided into 5 parts because of its content.

% OF THE TOP 7 GAMES THAT MET THE VARIOUS LEVELS OF THE SCALE

8

Scale Level	Criteria							Attitude	Social Behavior	Literacy	Numeracy	10-11
	1	2	3	4	5	6	7					
Meets Criteria												
Very Much (2.5-3.0)	0	0	57%	14%	14%	0	0	0	14	43	43	0
Some Extent (1.5-2.4)	100%	100%	43	86	72	14	14	72	86	0	14	0
Very Little (0-1.4)	0	0	0	0	14	86	28	0	0	57	43	100%

% OF THE TOP 17 GAMES THAT MET THE VARIOUS LEVELS OF THE SCALE

8

Scale Level	Criteria							Attitude	Social Behavior	Literacy	Numeracy	10-11	Skill Development
	1	2	3	4	5	6	7						
Meets Criteria													
Very Much (2.5-3.0)	*6 1	1 ⁶	4 ²³	1 ⁶	9 ⁵³	0 ⁰	0 ⁰	0 ⁰	1 ⁶	2 ¹²	10 ⁵⁹	0 ⁰	
Some Extent (1.5-2.4)	13 ⁷⁶	15 ⁸⁸	12 ⁷¹	9 ⁵³	5 ²⁹	3 ¹⁸	3 ¹⁸	5 ²⁹	2 ¹²	1 ⁶	3 ¹⁸	2 ¹²	
Very Little (0-1.4)	3 ¹⁸	1 ⁶	1 ⁶	7 ⁴¹	3 ¹⁸	14 ⁸²	14 ⁸²	12 ⁷¹	14 ⁸²	14 ⁸²	4 ²³	15 ⁸⁸	

*indicates the number of games

II. Using the Scale Chart, with 1.5 (Some Extent) to 3.0 (Very Much) as the value for considering that a game met the criteria, the number of criteria met by the top 17 games is as follows:

	Number of Criteria Met by Game	(#/8) %
1. HACIENDA	7	87.5
2. COPERATIVA	6	75
3. EL ROBO	3	37.5
4. CONCENTRACION	6	75
5. NAIPES DE LETRAS	5	62.5
6. NAIPES DE SILABAS	5	62.5
7. DADOS DE LETRAS	5	62.5
8. DADOS DE NUMEROS	5	62.5
9. QUINA	5	62.5
10. PIN BALL	3	37.5
11. RULETA	3	37.5
12. ARGOLLAS	3	37.5
13. TRES EN CALLE	4	50
14. DOMINO	5	62.5
15. EL BURRO	5	62.5
16. EL CHULO	3	37.5
17. EL MERCADO	5	62.5

III. Based on a two-day survey of the top 17 games, the Ecuador staff selected the game(s) that met the highest degree of each of the 33 subcriteria; the rationale being that under each subcriteria sometimes up to 15 games met the criteria at a level of (3) meets criteria very much. The following chart provides the selections of the staff in regard to the top game that met each of the 33 subcriteria the highest, in some cases more than one game was selected.

Games that met the highest criteria with the highest degree of application for of each of the 33 sub-criteria:

	CHEAP			EASILY REPRODUCIBLE			MOTIVATING SELF EXPLANATORY SELF					IMMEDIATE RELEVANCE			CULTURALLY BASED					INDUCES DESIRABLE HUMAN DEVELOPMENT											
	1	2	3	1	2	3*	1	2	3	4	5**	1	2	1	2	3	1	2	3	4	5	1	2	3	4	5	6	7	8	9	
1. HACIENDA						*	*	*	*	*	*			*	*	*				*	*	*	*	*	*	*	*	*	*	*	*
2. COPERATIVA																															
3. EL ROBO							*	*																							
4. CONCENTRACION	*	*					*	*				*	*						*	*											
5. NAIPES DE LETRAS	*	*					*	*											*	*							*				
6. NAIPES DE LETRAS	*	*					*	*											*	*							*				
7. DADOS DE LETRAS						*			*			*						*	*										*		
8. DADOS DE NUMEROS						*						*						*	*												
9. QUINA																													*		
10. PIN BALL																															
11. RULETA																															
12. ARGOLLAS								*																							
13. TRES EN CALLE				*	*																										
14. DOMINO																															
15. EL BURRO	*						*																								
16. EL CHULO	*																														
17. EL MERCADO																															

* Divided into two categories: DURABLE / ATTRACTIVE
 ** AFTER being introduced once

D. Sequence of Gaming Materials

Based on the project's experience and knowledge of the top 17 games used by the project and the Ecuadorean Ministry of Adult Education, the staff was asked which games could be used to introduce basic literacy and numeracy skills and follow-up reinforcement to provide higher levels of skill development, and what games could be recommended as prerequisites to others. The answer to these questions were:

Literacy Skills: Basic



Complex

Letter Rummy (Naipes de Letras)

Letter Dice (Dados de Letras)

Syllable Rummy (Naipes de Sílabas)

Letter Dice (Dados de Letras)

Numeracy Skills: Basic



Complex

Number Dice (Dados de Números)

Quina (+/-)

Pin Ball

Roulette

Argollas

Tres en Calle

Domino

Quina (X/%)

El Burro

Mercado

Attitude and Social Behavior:
(to provide belief in capability for learning; awareness, peer confidence, group cooperation, etc.)

Mercado

Basic

Robo

Coperativa

Hacienda

Complex

Ashton-Warner (Literacy Method - allows learner to approach written culture on his own terms):

Basic:

Argollas

Mercado

El Robo

Coperativa

Hacienda.

Burro

Dados de Letras

Concentración

Naipes de Letras

Naipes de Sílabas

Complex:

The sequence of the above gaming materials provide only a project opinion as to how the 17 top games can be used to facilitate, reinforce, and enhance literacy, numeracy and social skills.

E. Evaluation Form Survey of the Top 8 Games

The following eight games were surveyed using the evaluation form for the gaming materials:

Material: HACIENDA (JUEGO DE LA VIDA)

Type: Simulation

Descriptive Characteristics:

The Hacienda simulation has two variations: (1) a prototype of a monopoly board; (2) containing the elements of the monopoly board, but taking a form that is identifiable with the Sierra. Hacienda is a board game, modeled on Monopoly, which seeks to reflect many of the situations and institutions in the life of campesinos in rural Ecuador. Its intent is to clarify the life situation of its participants through discussion of problems and their possible solutions. The simulation offers the participant a chance to portray the officials of his community. The Hacendado is chosen by a roll of the dice. At the beginning a lawyer is chosen--the only player who knows the rules; other players seek his advice on "legal questions". (See Technical Note #3 for a comprehensive description of Hacienda.)

Conditions for the use of the material:

- a. Setting: Indoor and Outdoor
- b. Region/Cultural Group: Sierra
- c. Age Group: Designed for rural adults (12 to 60+ years).
- d. How it has been used: Heuristic and Philetic (Facilitates learning and is experienced based)

Goal of Game:

To simulate the economic and social realities of the Ecuadorian Sierra and to involve the participants in dialogue as to the problems presented by the simulation.

Major Concepts of Game:

- Simulates life's social controls and social-institutional (Hacienda) power.
- Community economic life style varies according to social positions.
- Authority and power are determined by those who control the means of production & wealth
- Individual attitude towards himself can either perpetuate being taken advantage of or take action against being.
- The agrarian reform and improvement of land.

Learning Outcomes:

- a. Cognitive: Knowledge, Comprehension, Application, Analysis, Synthesis: recognizes community roles, acquires information, represents life roles, gives own opinion, distinguishes roles and game activities, explains actions, dialogues regarding life problems, chooses situations, analyzes choices and decisions, discriminates among choices, deducts game actions & activities, compares choices & decisions made, plans strategy, modifies game, organizes participants.
- b. Affective: Receiving, Responding, Valuing: volunteers to participate, discusses game, spends time participating, supports others in game decisions & choices, argues in negotiations, expresses his decisions and viewpoint discusses life discrepancies--what is and should be.

What is necessary for game to be:

- a. Introduced: A participant to assume the role of lawyer (the only person who knows the rules of the game)
- b. Played: 5 to 15 participants, game board and cards
- c. Conditions (in order to be played): adequate facility and light, 2 to 10 hours of time, and a relaxed environment

Degree of Use:

Very frequently (3)

Conditions of Learning:

- a. Signal learning
- b. Stimulus-Response learning
- c. Chaining
- d. Verbal Association
- e. Discrimination learning
- f. Concept learning
- g. Rule learning
- h. Problem Solving

Facilitator/Teacher (F/T) Instructional Form/Mode:

- 1. Predominance of F/T to Participant Instruction
- 2. Predominance of Material to Participant Instruction
- 3. Predominance of F/T and Participant Interaction and Dialogue
- 4. Predominance of Participant to Participant Interaction and Dialogue
- 5. Predominance of Participant to Material Interaction and Dialogue

Comments:

"With this game they react to their own lives, and when they play, they say this is what happens to us in life." (Tech. Note #3, p. 13-14)

Criteria of Materials (Desired Attributes):

- 1. Cheap: Estimated cost 150 sucres (office production), commercially (wooden) at 200 sucres, more durable.
- 2. Easily Reproducible: Paper materials (game board, paper money) difficult to construct, given the necessary materials.
- 3. Motivating: Participants determine "way the game is played." "The players, even the lawyer, are entertained and find things to think about. It promotes cooperation because the players loan money to each other."
- 4. Self-Explanatory: Self-directed, simulation provides the participant the direct input for the implementation of the simulation; only requires one person to read rules.

5. **Self-Generating:** simulation with 30 cards, taking three styles: (1) traditional or reality-reflecting; (2) modernization oriented; and (3) role playing (see tech. note #3) modifications.
6. **Immediate Relevance:** Have adapted Hacienda to meet their own community version, adapting activities to reflect their social reality, e.g., to reflect incidents which have occurred in their communities.
7. **Culturally Based:** Translated into Quechua and adapted by facilitators to reflect cultural values of their community and social institutions (Church, Teniente Político, etc.).
8. **Induces Desirable Human Development:** It provides entertainment, a forum where issues of concern are discussed, a chance to experience the connecting links between various actions and the outcomes which follow from them. Village conflicts can be discussed without confrontation; a setting in which new and unfamiliar actions can be tried without risk, e.g. borrowing from the bank.

Comments:

Changes needed (possible variations): To be adapted to Costa setting and field-tested in Costa.

Questions to be answered: Are the values incorporated into the game applicable to Ecuadorean society: Is Hacienda adaptable in a different setting, e.g., Costa? After continuous participation, is there an observable behavioral change in the participants? Is the simulation a means towards inculcating in the participants' self-awareness?

Possible future (how the game might be used): Can be utilized as a means to train facilitators and teachers in: (1) group dynamics, (2) developing simulations in other areas of process learning, (3) development of games as a vehicle for dialogue, conceptual learning, negotiations, etc.

Recommendations:

Based on field testing observations and dialogue with participants a second variation has been developed and is in the process of being field tested (Apr.-Sept., '74). Recommendations from participants have modified: game board reflecting Sierra setting, properties have been reduced, church squares added, community institutions increased, educational alternative squares added, cooperative square made mandatory, a "¿Qué Quiere Usted?" square added, reforma agraria cards now include positive and negative decisions, mercado has been simplified--changes benefit the participants' chances of winning.

GAMING MATERIALS
ECUADOR PROJECT

Material: SYLLABLE RUMMY (NAIPES DE SILABAS)

Type: Fluency Game

Descriptive Characteristics:

The game consists of 66 cards and up to 6 players can participate.

1. Each player is dealt 7 cards. Remaining cards are placed face down in center of table, with one card face up beside them.
2. Players see if they can make words with all 7 cards and lay them face up on the table before game begins. This is called a "golpe" (coup) and other players have 1 point counted against them for any cards they can not use in making words or adding to other players' words.
3. If no one scores a golpe, game begins with player at dealer's left drawing a card, attempting to form words and discarding. Other players must check words laid on the table to assure their validity.
4. Player first making words with all his cards wins. Other players have 1 point against them for each card left in their hands.*

Conditions for the use of the material:

- a. Setting: Indoor and Outdoor
- b. Region/Cultural Group: Urban, Rural, Costal
- c. Age Group: 10 to 60+ years
- d. How it has been used: Heuristic and didactic (facilitates learning and imparts knowledge to participant)

Goal of Game:

To enable the participant to conceptualize word building through a game activity.

Major Concepts of Game:

1. Development of words (vocabulary)
2. The formation of words (syntax and spelling)
3. To generate ideas and themes implied by the formation of vocabulary words

Learning Outcomes:

- a. Cognitive: Knowledge and Comprehension: distinguishes, identifies, provides own words, rearranges syllables into words; explains words.
- b. Affective: Receiving and Responding: involvement in a recreational activity, social interaction with other participants, utilization of words in their social environment.

*Three variations are: (1) forming only words, (2) taking words' numerical equivalence to add to a certain figure, e.g., 30 points, (3) adding total

What is necessary for game to be:

- a. Introduced: Any participant to read the basic rules of the game.
- b. Played: 2 or more participants to generate peer learning.
- c. Conditions (in order to be played): a relaxed environment where the participant is encouraged to take risk in the formation of words and an adequate physical facility, good lighting, no wind.

Degree of Use:

Used with frequency (3)

Conditions of Learning:

- a. Signal learning
- b. Stimulus-Response learning
- c. Chaining
- d. Verbal Association
- e. Discrimination learning
- f. Concept learning
- g. Rule learning
- h. Problem Solving

Facilitator/Teacher (F/T) Instructional Form/Mode:

1. Predominance of F/T to Participant Instruction
- ② Predominance of Material to Participant Instruction
3. Predominance of F/T and Participant Interaction and Dialogue
4. Predominance of Participant to Participant Interaction and Dialogue
5. Predominance of Participant to Material Interaction and Dialogue

Comments:

"Game is fun and helps me to learn how to read and write while I play."
(16 year old girl, Colegio Oscus)

Criteria of Materials (Desired Attributes):

1. Cheap: 15 sucres per set (office and commercial production)
2. Easily Reproducible: Paper (cards) provides the necessary material to develop game.
3. Motivating: Participants interact in dialogue while striving to complete words before other participants.
4. Self-Explanatory: Game is self-directed and provides flexibility to change after minimal explanations .

5. Self-Generating: Has been self-generated (Sierra, Urban settings), provoking discussion of the vocabulary words.

6. Immediate Relevance: Vocabulary of the participant is generated through his participation.

7. Culturally Based: Words derived from the vocabulary and social environment of the participant.

8. Induces Desirable Human Development: Syllable Rummy increases word building ability in a brief exposure period.

Comments:

Changes needed (possible variations): Game needs to include more complex operations, e.g. taking words and forming sentences.

Questions to be answered:

1. What are its limitations?
2. To what degree can vocabulary be related to Freire's alphabetization approach?
3. How many times should game be played before participants begin to increase their vocab.
4. What type of reinforcement is necessary to apply words & vocab. learned?
5. Is the best reader always able to form more words?

Possible future (how the game might be used):

As a process in the development of vocabulary, formation of words, and as a means towards learning to read.

Recommendations:

(1) A more complex follow-up game or activity would provide a next level of (cognitive) learning; taking the words learned, through the process and involvement of the game, into a level of application (in their conversational vocabulary, life situations, and reading material).

(2) The rules of the game should be changed every so often by the participants in order to provide more interest.

ECUADOR PROJECT

Material: EL MERCADO (THE MARKET)

Type: Fluency

Descriptive Characteristics:

El Mercado is designed to provide practice in market computational skills. The game can be played almost anywhere, and teaches the existence of a range of alternatives in market negotiations in buying and selling. The game consists of two decks of cards: one consisting of money cards (65), the other representing commodities typically found in the market (62) and purchased by campesino families. The commodity cards contain the name of the commodity, a picture of the product, the unit price, and a number of units which the particular card is worth. Each player is given three cards from each deck which he places face up on the table in front of him and the top card of each deck is then placed face up beside it, as in rummy. Players attempt to match money and product cards. (For example, bills of S/.50 & S/.1 can be combined with 5 aguacates @S/2.20 and 4 meters of rope at S/.10). Players choose cards in rotation, and are not required to discard. Cards matched are placed face up on table for inspection by the other players. Player who goes out first wins. (In Tech. Note #4, p. 11-13, 3 versions of the game are explained.)

Conditions for the use of the material:

- a. Setting: Indoor and Outdoor
- b. Region/Cultural Group: Sierra, Costa, and MOE
- c. Age Group: 8 years to 60+ years
- d. How it has been used: Didactic, Heuristic and Philetic (facilitates learning, impartation of knowledge to participant, and is experienced based).

Goal of Game:

To enable participants to see the relationship between products and money and the cost per unit value of given commodities; and to increase the ability to negotiate with sellers of needed goods.

Major Concepts of Game:

- Given "x" amount of money, "y" number of buys are possible.
- Unit measure and exchange of currency.
- Computational skills: addition, subtraction, multiplication, and division
- Develop ability of many variations of money and product cost and exchange

Learning Outcomes:

- a. Cognitive: Knowledge, Comprehension, Application: participant distinguishes unit price, value of commodities; recognizes market values, represents unit price with currency; explains computations, categorizes and classifies money value with product value; analyzes & discusses mathematical implications of the game; analyzes market values and unit price.
- b. Affective: Receiving, Responding, Values: shares market experiences, participates and responds to game activities, approves of participant interaction, volunteers to play, spends time in game exercises, assists others, supports participants' viewpoints.

What is necessary for game to be:

- a. Introduced: A participant to read the rules of the game.
- b. Played: 2 to 8 people, a card set, and participants having some basic math skills.
- c. Conditions (in order to be played): adequate facility and lighting, no wind.

Degree of Use:

Used frequently (3)

Conditions of Learning:

- a. Signal learning
- b. Stimulus-Response learning
- c. Chaining
- d. Verbal Association
- e. Discrimination learning
- f. Concept learning
- g. Rule learning
- h. Problem Solving

Facilitator/Teacher (F/T) Instructional Form/Mode:

1. Predominance of F/T to Participant Instruction
- ② Predominance of Material to Participant Instruction
3. Predominance of F/T and Participant Interaction and Dialogue
4. Predominance of Participant to Participant Interaction and Dialogue
5. Predominance of Participant to Material Interaction and Dialogue

Comments:

The game was interesting and fun and was played for 40 minutes; the participants stated that it was hard but at the same time entertaining (San Pedro, in the Costa).

Criteria of Materials (Desired Attributes):

1. Cheap: 30 sucres (office production), 25 sucres (commercial production for 1000).
2. Easily Reproducible: Easily made and requires paper materials.
3. Motivating: Fun, entertaining, interesting, recreational.
4. Self-Explanatory: Minimal explanation and literacy skills; self-directed.

5. **Self-Generating:** The game has various variations and provides the flexibility to change values of products and cost to reflect their social setting.
6. **Immediate Relevance:** Game takes the market setting and provides participants with the opportunity to simulate the buying of regional products and quickly compute their cost.
7. **Culturally Based:** The game takes on the life reality of the campesino market place.
8. **Induces Desirable Human Development:** Has been used in formal and informal settings; campesinos have used the game to teach their families, e.g., how to be a storekeeper; it provides a conceptual picture of market price interaction (buyer-seller); reinforces basic mathematical skills, unit price, and problem solving exercises.

Comments:

Changes needed (possible variations): Game might include product cards, showing cost per unit but not the units.

Questions to be answered:

1. Can Market Rummy provide the initial computational skills necessary for its participation?
2. Over a long period of playing the game will the operations become routinized and memorized?
3. Does the game develop an unreal attitude of market transactions?
Possible future (how the game might be used):

The design implementation of more difficult versions of the game: value of the commodity determined by participants and money available reflecting their real income (see Tech. Note #4).

Recommendations:

Market Rummy should be used with Math Bingo (addition & multiplication) and Number Dice--both should be prerequisites to Market Rummy. The game is an over-simplified market simulation in that there are fixed prices in the game and not in the market and no way to make change. Participants should at one point in the game reflect upon the real cost of the products and discuss the value of commodities and their price fluctuation in the market. The game should be designed at higher levels of activities to include bargaining for better prices, price differences due to quality or quantity and price market fluctuation.

ECUADOR PROJECT

Material: LETTER DICE (DADOS DE LETRAS)

Type: Fluency

Descriptive Characteristics:

The game consists of 11 wooden dice (66 letters) , approximately 1 1/2" on the side. The dice contain handwritten letters on each face. The players toss the dice and form words from the letters showing. Additional blank dice are often provided to permit amplification, modification or copying of the game. The game has three versions: finding a word, building a word, and word listing competition. The most utilized version is as follows: Each player throws the 11 dice, and has three minutes to construct all the words he can with the letters on the top faces of the dice. Letters may be re-used. A companion keeps score, writing down all words which emerge. The easiest is to record them in columns according to the number of letters in the words. At the end of the time, a player's score consists of 20 points for each two-letter word, 30 points for each three-letter word, and so on.

Conditions for the use of the material:

- a. Setting: Indoor and Outdoor
- b. Region/Cultural Group: Sierra, Costa, and Formal Institutions, e.g., MOE, Vocational Schools, Primary reading classes. . . .
- c. Age Group: 5 to 60+ years
- d. How it has been used: Heuristic and Didactic (facilitates learning and impartation of knowledge to participants.

Goal of Game:

To enable participants to learn functional literacy skills: to recall letters and words, composition, deciphering of words and word building.

Major Concepts of Game:

- The morphology and syntax of words
- Written culture of words
- Reading and spelling new words
- Combining letters to form words
- The use of active and passive vocabulary

Learning Outcomes:

- a. Cognitive: Knowledge, Comprehension, Application, Analysis: distinguishes syllables, recalls combination of syllables and words, acquires skill in forming words, provides own vocabulary words, differentiates between syllables and words, explains meaning of words, demonstrates combination of syllables to form words, develops and organizes word formation, compares words, analyzes meaning, deduces nonsense words and word meaning, develops vocabulary.
- b. Affective: Receiving, Responding, Valuing: shares words, selects words from his own vocabulary, approves the participation of others, practices forming words, participates actively, increases vocabulary and applies words in conversations, assists others, supports the participation of others.

What is necessary for game to be:

- a. Introduced: A participant to provide the basic rules of the game.
- b. Played: 1 to 20 participants, set of blocks.
- c. Conditions (in order to be played): adequate facilities and lighting, several minutes to hours of participation time.

Degree of Use:

Used frequently (3)

- Conditions of Learning:
- a. Signal learning
 - b. Stimulus-Response learning
 - c. Chaining
 - (d) Verbal Association
 - (e) Discrimination learning
 - (f) Concept learning
 - (g) Rule learning
 - h. Problem Solving

Facilitator/Teacher (F/T) Instructional Form/Mode:

- 1. Predominance of F/T to Participant Instruction
- (2) Predominance of Material to Participant Instruction
- 3. Predominance of F/T and Participant Interaction and Dialogue
- 4. Predominance of Participant to Participant Interaction and Dialogue
- 5. Predominance of Participant to Material Interaction and Dialogue

Comments:

"In a vocational school in Quito the dice are popular. . . interest is so high that lessons cannot be reviewed once play begins."

"Participants become excited and seem to enjoy the game."

"A useful activity for motivating and working with difficult students." (teacher)

Criteria of Materials (Desired Attributes):

- 1. Cheap: 30 sucres (office made); 30 sucres (commercially per set - professional)
- 2. Easily Reproducible: Small pieces of wood (1" X 2") and pen and saw; easily produced.
- 3. Motivating: Participants try to discover word before the player does, active participation, fun-active activity, cooperation is seen.
- 4. Self-Explanatory: Self directed with minimal directions.

5. **Self-Generating:** Has been adapted in various forms by Ecuadorian formal and non-formal institutions and by facilitators in village communities. In one community the game was modified into a concentration game of word building.
6. **Immediate Relevance:** Provides for a means to see spoken words in a written form and to build an active and passive vocabulary.
7. **Culturally Based:** Organic words are generated from the vocabulary of the participants' social environment.
8. **Induces Desirable Human Development:** Enables participants to build words at higher speed and enhance their self-confidence and their willingness to participate in reading and writing activities. The ability to spell is also enhanced.

Comments:

Changes needed (possible variations): Reduction of competitive atmosphere would probably enhance risk taking and in the process greater participation would develop in the game.

Questions to be answered: Can this game be adapted into Quechua?

1. Is the frequency of letters in the dice (vowels & consonants) adequate for basic word building?
2. Is the number of dice too many or too few?
3. Does the game in long-term use enhance participants' word building ability?
4. Is a competitive situation in using materials dysfunctional?

Possible future (how the game might be used):

This game is an enabler activity for the Ashton-Warner method of instruction and self-expression.

Recommendations:

Letter Rummy should be used with Syllable Rummy, once participants demonstrate their ability to build words.

GAMING MATERIALS
ECUADOR PROJECT

Material: LETTER RUMMY (NAIPES DE LETRAS)

Type: Fluency

Descriptive Characteristics:

Letter Rummy is a simpler version of Syllable Rummy, the difference being that each of the 66 cards contain single letters. The game is designed to provide literacy skills. Twenty-four of the cards consist of vowels, the rest are consonants. The players are dealt 5 to 7 cards, the other cards are placed face down in a pile; first player draws from the deck and discards a card from his hand, second player follows. When a player forms a word, he places it face down and takes another turn; a player wins when all cards are gone. Players total their score; scoring can be by the number of words each player made; or by the number of letters used or the number of cards used; or a point system on the card--vowels having a value of 2 points, consonants, 1 point.

Conditions for the use of the material:

- a. Setting: Indoor and Outdoor
- b. Region/Cultural Group: Sierra and Costa
- c. Age Group: 5 to 60+ years
- d. How it has been used: Heuristic and Didactic (facilitates learning and impartation of knowledge to participant.

Goal of Game:

To enable the participants to develop an ability to use a combination of letters to make words and enhance their word building ability.

Major Concepts of Game:

- Development of word building
- Compositional structure of words (morphology and syntax)
- Phonological structure of words (pronunciation)
- Meaning of words

Learning Outcomes:

- a. Cognitive: Knowledge, Comprehension, Application: participant distinguishes letters and words, recognizes words, identifies word composition, gives his own words, reorders words, explains meaning of words, chooses words, restructures his/her vocabulary, develops a combination of letters.
- b. Affective: Receiving, Responding, Valuing: shares thoughts, accepts the participation of others, volunteers participation, increases participation, assists others.

What is necessary for game to be:

- a. Introduced: A participant to explain game rules and process.
- b. Played: 2 to 10 participants, set of cards.
- c. Conditions (in order to be played): adequate light and physical facility.

Degree of Use:

Used frequently (3)

Conditions of Learning:

- a. Signal learning
- b. Stimulus-Response learning
- c. Chaining
- (d) Verbal Association
- (e) Discrimination learning
- (f) Concept learning
- (g) Rule learning
- h. Problem Solving

Facilitator/Teacher (F/T) Instructional Form/Mode:

1. Predominance of F/T to Participant Instruction
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5. Predominance of Participant to Material Interaction and Dialogue

Comments:

"The cards make it a happy way to form words that we know and to learn new ones from our friends as we play." (15 year old girl, San Pedro, Costa)

Criteria of Materials (Desired Attributes):

1. Cheap: 15 sucres per set (commercial or hand made).
2. Easily Reproducible: Easy to reproduce or be made by anyone--needing minimal materials (cards, pen or crayon).
3. Motivating: Provides interest and group participation and interaction; participants take risks.
4. Self-Explanatory: With introduction and minimal directions the game becomes self-directed.

to be played.

6. **Immediate Relevance:** The game has direct applicability to participants' life situation by providing a new vocabulary and short term cognitive learning experiences.
7. **Culturally Based:** The vocabulary of the participants is generated from their life experiences.
8. **Induces Desirable Human Development:** One of the most used game in the project--in the MOE, Sierra and Costa. It provides for the discovery of words and the conceptualization of their chemistry (composition). Based on laboratory evaluation--in a 30 minute period--Letter Rummy improves word building ability in a brief exposure period.

Comments:

Changes needed (possible variations): Rules can be changed to meet the learning ability of the participants, e.g., number of minimum letters in a word or number of cards used.

Questions to be answered:

1. What is the long-term carry-over of what is learned?
2. To what degree do campesinos or costeños gain an increased ability in manipulating letters and words?
3. Are the words learned applied in their life situation (conversations, discussions, etc)?

Possible future (how the game might be used):

As a part of "learning to read" exercises, enrichment, and reinforcement.

Recommendations:

The game is designed for pre-literates and new literates; this game should be used before using Syllable Rummy. This game should vary as skills change (cognitive growth).

Material: MATH BINGO (ADDITION & MULTIPLICATION)
QUINA DE MATEMATICAS (SUMA Y MULTIPLICACION)
Type: Fluency

Descriptive Characteristics:

The game consists of two variations: (1) Addition - consisting of addition problems from $1 + 0$ to $12 + 12$; and (2) Multiplication - consisting of multiplication problems from 1×1 to 9×9 . The number of players who can participate is determined by the number of playing cards available (each card containing a different combination of answers. The basic rules for both games are: (1) a participant calls out the problem; (2) the participants find the answer in their card; if found they place a seed, paper, etc. on the number--not all cards contain the answer; however, an answer can often be repeated, e.g., 6×4 and 8×3 , etc.; (3) depending on the variation of the game: a full card, L shape, one line, or diagonal lines--once completed the player calls out QUINA! (4) in order to win the player needs to call out QUINA, game stops; winner assumes the "caller of problems" role.

Conditions for the use of the material:

- a. Setting: Indoor and Outdoor
- b. Region/Cultural Group: Sierra/Costa (Urban, Campo, Costa)
- c. Age Group: 5 years to 60+ years
- d. How it has been used: Heuristic (facilitates learning)

Goal of Game:

To enable participants to develop fluency with numbers and adeptness with basic arithmetic operations.

Major Concepts of Game:

- Ability to manipulate basic addition and multiplication figures.
- Compute cost of purchases without resorting to pencil calculations or dependence on others.
- Compare prices of consumption goods,
- Recognize the numbers on the bills and coins used to buy goods and to make change.
- Application of arithmetic operations in the market place.

Learning Outcomes:

- a. Cognitive: Knowledge, Comprehension, Application: identifies operations, recalls operations, recognizes symbols, demonstrates operations, reorders operations, differentiates between operations, transfers and classifies operations.
- b. Affective: Receiving, Responding, Valuing: responds to activity, accepts activity, participates, spends time on game activity, applies game in a social environment and activity, assists others in game activities.

What is necessary for game to be:

- a. Introduced: Participant to introduce game.
- b. Played: 1 to 15 participants and a set of cards (25 to 30)
- c. Conditions (in order to be played): adequate facilities and lighting, and a few minutes to an hour.

Degree of Use:

Used to some degree of frequency (2).

Conditions of Learning:

- a. Signal learning
- b. Stimulus-Response learning
- c. Chaining
- d. Verbal Association
- e. Discrimination learning
- f. Concept learning
- g. Rule learning
- h. Problem Solving

Facilitator/Teacher (F/T) Instructional Form/Mode:

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5. Predominance of Participant to Material Interaction and Dialogue

Comments:

"This game provides a way to entertain oneself and practice memory and visual skills."

Criteria of Materials (Desired Attributes):

1. Cheap: 20 sucres (office made/set); 15 sucres/set (commercially made in an order of 1000 sets)
2. Easily Reproducible: Cards can be easily reproduced to reflect the words and symbols of participants.
3. Motivating: Competitive setting, provides visual and mental challenge, fun, easy to play, high risk taking.
4. Self-Explanatory: Little explanation is required.

5. **Self-Generating:** The game has been adapted in various forms: competitive, betting to raise money.

6. **Immediate Relevance:** Communities in the Sierra have used the game in diverse ways adapting the game to meet the needs, e.g., raffles, gambling, recreation while drinking; while using skills in the market place.

7. **Culturally Based:** The game provokes a competitive setting--a cultural value that traditionally is not part of the Latin American Indian culture.

8. **Induces Desirable Human Development:** Based on laboratory evaluation, numeracy skills increase when there is a personal investment in the game.

Comments:

Changes needed (possible variations): More difficult board cards and problems; participants who become competent in basic addition or multiplication skills become bored. An additional incentive than just winning would also enhance participation.

- Questions to be answered:**
1. Is competition an imposed "White" value?
 2. Is personal investment in the game (betting) necessary to provide participants' incentive?
 3. Does the game reinforce the skills (numeracy) of those who already are competent in basic skills?
 4. Do the onlookers learn while being passive participants?
- Possible future (how the game might be used):**

Game can be utilized to introduce fractions and other higher levels of math skills and to reinforce basic mathematical skills.

Recommendations:

This game should be used for only four to five rounds, and then followed with a another activity.

READING MATERIALS
ECUADOR PROJECT

Material: CONCENTRATION (CONCENTRACION)

Type: Fluency

Descriptive Characteristics:

Concentration is designed as a skill-practice game to provide pre-literates with practice in word recognition. Players are asked to match words with pictures placed on cards and arranged randomly on a flat playing surface. The game consists of a set of cards with pictures on them and a matching set of cards with words (at least 10 sets are used). All cards are dealt out face down in rows until all are used and an array is formed. At first, player turns one card and tries to find its match by turning another card--if he succeeds he continues, if not the next player proceeds to find a match. Players continue until all cards are matched.

Conditions for the use of the material:

- a. Setting: Indoor and Outdoor
- b. Region/Cultural Group: Sierra, Costa
- c. Age Group: Preliterates - Children and Adults
- d. How it has been used: Heuristic (facilitates learning).

Goal of Game:

To enable participants to recognize and conceptualize words and pictures and enhance his/her vocabulary through the use of pictures and words.

Major Concepts of Game:

- Correlation of words and symbols
- Meaning of pictures and words as a symbolic language
- A visual and written vocabulary
- A process to introduce visual and written vocabulary

Learning Outcomes:

- a. **Cognitive:** Knowledge, Comprehension, Application: differentiates between words and pictures, recognizes correlations, identifies names and pictures, reorders and arranges symbols and words, relates correlations, organizes processes, classifies words and pictures, applies visual and memory skills, employs generalizations.
- b. **Affective:** Receiving, Responding: participates in game activities, responds to the participation of others, follows game process, plays and interacts with others, practices memory and correlation skills.

What is necessary for game to be:

- a. Introduced: Any participant to read basic rules.
- b. Played: 3 or more participants.
- c. Conditions (in order to be played): adequate space, lighting, no wind (outdoors)

Degree of Use:

Used with frequency (3): Sierra, Costa and within the Ecuadorian MOE

Conditions of Learning:

- a. Signal learning
- b. Stimulus-Response learning
- c. Chaining
- (d) Verbal Association
- e. Discrimination learning
- f. Concept learning
- (g) Rule learning
- (h) Problem Solving

Facilitator/Teacher (F/T) Instructional Form/Mode:

1. Predominance of F/T to Participant Instruction
- (2) Predominance of Material to Participant Instruction
3. Predominance of F/T and Participant Interaction and Dialogue
4. Predominance of Participant to Participant Interaction and Dialogue
5. Predominance of Participant to Material Interaction and Dialogue

Comments:

"All the participants can take the leadership role in this activity if they win; if this was only true in life." (37 year old man, San Pedro, Costa)

Criteria of Materials (Desired Attributes):

1. Cheap: 15 sucres per set.
2. Easily Reproducible: With cardboard sheets, problem cards (paper), seeds or stones - materials available in Sierra and Costa.
3. Motivating: The game is often taken home by the participants.
4. Self-Explanatory: Peer-learning and teaching, self-directed.

5. Self-Generating: Participants can make their own words and reproduce their own set of cards.
6. Immediate Relevance: Provides for a visual conceptual approach to viewing words.
7. Culturally Based: Words and symbols can be generated from within participants.
8. Induces Desirable Human Development: Provides for a conceptualization of words and symbols and a visual and mental process for correlating visual and mental skills. It also provides for group interaction.

Comments:

Changes needed (possible variations): Sentence fragments may be introduced, picture cards and word cards around a specific topic or theme, plural and singular words and pictures, synonyms and antonyms, words and pictures to make a sentence.

Questions to be answered:

1. Does the game increase the number of words a participant is able to recognize?
2. Does it provide pre-reading skills?
3. Does participant apply visual and written vocabulary of game?

Possible future (how the game might be used): As a process for conceptualizing words and an initial step in preparing pre-literates to read.

Recommendations:

Should be used to introduce the concepts of Sylvia-Ashton Warner's methodology of learning to read (building organic words from their vocabulary and adapting words into a set of cards).

GAME MATERIALS
ECUADOR PROJECT

Material: NUMBER DICE (DADOS DE NUMEROS)

Type: Fluency

Descriptive Characteristics:

Number dice is used to teach basic mathematics; incorporating into it the adaptation to the skill level of the participants. There is one set of eleven dice; each participant has his own set and competes with others. Teams can be used where two play against time together. The team approach provides for peer learning. There are several kinds of games possible: (1) Getting the solution - a number is set up as the desired solution, a player must make arithmetic combinations (+, -, X, ÷) in order to obtain the desired solution; (2) Spending the Money - a figure of money is stated and the player must find ways to spend the money, a player throws the dice and tries to find the arithmetic combination that will give him the solution, e.g., 6 lbs. of beans at 70¢/lb. equals \$4.20; (3) Making an Equation; (4) Series of Solutions; (5) Making the Correct Problem; (6) Approaching a Solution - played like "21", etc.

Conditions for the use of the material:

- a. Setting: Indoor and Outdoor
- b. Region/Cultural Group: Sierra, Costa, Urban
- c. Age Group: Children to Adults (5 years to 60+ years)
- d. How it has been used: Heuristic (facilitates learning).

Goal of Game:

To enable the participant to practice basic mathematics skills (+, -, X, ÷) and to develop comprehension in doing mathematical operations while changing the base of numbers.

Major Concepts of Game:

- Number system
- Combinations of numbers and operations (+, -, X, ÷)
- Application of numbers as a language
- Application of numbers as a market-exchange skill
- Cost per unit value
- Relationship between symbols, numbers, and spoken language
- Relationship between mathematical operations

Learning Outcomes:

- a. Cognitive: Knowledge, Comprehension, Application, Analysis: identifies arithmetic operations, recognizes various operations and solutions to operations, prepares problems, rearranges combinations of operations, explains operations, demonstrates solutions to operations, develops own problems, transfers operations and solutions that undo one another, compares operations, analyzes the process of operations.
- b. Affective: Receiving, Responding, Valuing: shares solutions to operations with others, accepts the process of the game, approves of game interaction, plays and discusses games, increases his/her skills through participation, assists and helps others, spends time in participating.

What is necessary for game to be:

- a. Introduced: Participant to introduce game.
- b. Played: 2 to 10 participants, a set of dice.
- c. Conditions (in order to be played): adequate facilities and light, and a period of time consisting of several minutes to several hours.

Degree of Use:

Frequently Used (3)

Conditions of Learning:

- a. Signal learning
- b. Stimulus-Response learning
- c. Chaining
- ④ Verbal Association
- e. Discrimination learning
- ⑥ Concept learning
- ⑦ Rule learning
- ⑧ Problem Solving

Facilitator/Teacher (F/T) Instructional Form/Mode:

1. Predominance of F/T to Participant Instruction
- ② Predominance of Material to Participant Instruction
3. Predominance of F/T and Participant Interaction and Dialogue
4. Predominance of Participant to Participant Interaction and Dialogue
5. Predominance of Participant to Material Interaction and Dialogue

Comments:

"Participants create their own problems and not those given arbitrarily by a teacher."

Criteria of Materials (Desired Attributes):

1. Cheap: 30 sucres (office made/set); 30 sucres (commercially made/set).
2. Easily Reproducible: Can be reproduced with small blocks of wood (2" X 2" X 2") and a colored pen.
3. Motivating: Fun, interesting, enthusiastic, provides competition; when played with some external reward interest increases.
4. Self-Explanatory: Requires little explanation, but needs to be introduced.

5. Self-Generating: Provides participants with a large repertoire of possible games and for participant input.
6. Immediate Relevance: Provides basic skills that are applied in everyday activities, e.g., the market.
7. Culturally Based: Participants relate operations to their life situation and market negotiations and transactions..
8. Induces Desirable Human Development: Laboratory testing showed an increase of speed and accuracy in basic arithmetic calculations; skills in arithmetical computation and solution to problems are practiced and applied; mathematical processes and language are learned and a vocabulary enhanced.

Comments:

Changes needed (possible variations): Addition - high participation; Multiplication - some; Division - none; Subtraction - high. The application of multiplication and division should be emphasized on higher levels of mathematical skills.

Questions to be answered:

1. Do participants of the game apply skills learned in life situations?
2. Is importance placed on the process of getting an answer or the correct answer?
3. Is a competitive setting desirable in providing motivation and enhancement of ability to solve basic operations?

Possible future (how the game might be used): As an applied and experience based activity to introduce, conceptualize and reinforce basic mathematical operations.

Recommendations:

It is important to adapt the game to the skill of the player and for him/her to choose from a variety of sets at various levels of complexity (+ & - to X & \div).

Summary

It should be emphasized that of the 34 games developed by the project, only 50% (17) have been used by the project. Thus, only 17 games have had the most work and effort.

The survey of the gaming materials provides the following information about the desired attributes of the game materials; the limitations of the survey should be kept in mind:

A. The Master List of Games

1. The project has developed 34 games; 9 simulations, and 25 fluency games (numeracy and literacy). Three expressive techniques have also been developed in addition to the 34 games.
2. The project has used and field-tested 17 of the 34 games; the 17 games have been used in communities (Sierra and Costal) at least 3 times in the last six months - October '73 to March '74.
3. Of the 17 games, 3 are simulation games and 14 fluency games.
4. Of the 17 games, seven have been frequently used (at least seven times - see 2) and are: Hacienda, Naipes de Letras, Naipes de Silabas, Dados de Letras, Dados de Numeros, Quina (+/-), and Mercado.

B. Cost Survey of Games: Ideal cost per game, less than 24 sucres (\$1.00 U.S. dollar).

1. Of the 17 games used by the project, only 8 games cost less than 24 sucres if individually produced as compared to 9 games if commercially produced.
2. Overall, 16 of the 34 games cost less than 24 sucres if individually produced as compared to 17 if commercially produced.

3. If criteria of 24 sucres is increased to 30 sucres as the ideal cost per game: overall, 9 more games meet criteria if individually produced; as compared to 8 if commercially produced.

C. Desired Attributes of Games: Based on the eight operationalized criteria for the desired attributes of each game and value scale:

1. Of the seven most frequently used games, the following percentage met criteria:

Scale Level	Criteria							8				
	1	2	3	4	5	6	7	Attitude	Social Behavior	Literacy	Numeracy	10-11
Meets Criteria												
Very Much (1.5-3.0) to Some Extent	100%	100%	100%	100%	86%	14%	14%	72%	100%	43%	57%	0%
Very Little (0-1.4)	0	0	0	0	14%	86%	86%	28%	0%	57%	43%	100%

2. Of the top 17 games used and field tested by the project, the following percentage met criteria:

Scale Level	Criteria							8				
	1	2	3	4	5	6	7	Attitude	Social Behavior	Literacy	Numeracy	10-11
Meets Criteria												
Very Much (1.5-3.0) to Some Extent	14* ⁸²	16 ⁹⁴	16 ⁹⁴	10 ⁵⁹	14 ⁸²	3 ¹⁸	3 ¹⁸	5 ²⁹	3 ¹⁸	3 ¹⁸	13 ⁷⁷	2 ¹²
Very Little (0-1.4)	3 ¹⁸	1 ⁶	1 ⁶	7 ⁴¹	3 ¹⁸	14 ⁸²	14 ⁸²	12 ⁷¹	14 ⁸²	14 ⁸²	4 ²³	15 ⁸⁸

*indicates number of games

3. The following chart provides the answer to the question: Is game X cheap? Is it easily reproducible? Is it motivating? etc.

Is the game of X

cheap
 easily reproducible
 motivating
 self explanatory
 self generating
 immediately relevant
 culturally based
 a game that induces desirable human development.

?¹

Criteria Sub-criteria	CHEAP EASILY REPRODUCIBLE		MOTIVATING	SELF EXPLANATORY	SELF GENERATING	IMMEDIATE RELEVANCE	CULTURALLY BASED	INDUCES DESIRABLE HUMAN DEVELOPMENT				
	1	2	3	4	5	6	7	Att.	Soc. Beh.	Lit.	Num.	10-11
HACIENDA	yes	yes	yes	yes	no	yes	yes	yes	yes	no	yes	yes
COOPERATIVA	yes	no	yes	yes	no	yes	yes	no	yes	no	yes	yes
EL ROBO	yes	yes	yes	no	no	no	no	no	yes	no	yes	no
CONCENTRACION	yes	yes	yes	no	yes	yes	yes	no	no	yes	no	no
NAIPES DE LETRAS	yes	yes	yes	yes	yes	no	no	yes	no	yes	no	no
NAIPES DE SILABAS	yes	yes	yes	yes	yes	no	no	yes	no	yes	no	no
DADOS DE LETRAS	yes	yes	yes	yes	yes	no	no	yes	no	yes	no	no
DADOS DE NUMEROS	yes	yes	yes	yes	yes	no	no	yes	no	no	yes	no
QUINA	yes	yes	yes	yes	yes	no	no	no	no	no	yes	no
PIN BALL	no	yes	yes	no	yes	no	no	no	no	no	yes	no
RULETA	no	yes	yes	no	yes	no	no	no	no	no	yes	no
ARGOLLAS	no	yes	yes	no	yes	no	no	no	no	no	yes	no
TRES EN CALLE	yes	yes	yes	no	yes	no	no	no	no	no	yes	no
DOMINO	yes	yes	yes	yes	yes	no	no	no	no	no	yes	no
EL BURRO	yes	yes	yes	yes	yes	no	no	no	no	no	yes	no
EL CHULO	yes	yes	no	no	yes	no	no	no	no	no	yes	no
EL MADO	yes	yes	yes	yes	yes	no	no	no	no	no	yes	no

¹ In connection to the question is indicated from the chart in page 26 that provides information...

4. Of the 17 games used by the project the following number met criteria:

<u>Number of Games (0)</u>	<u>Game</u>	<u>Met how many of 8 criteria (8)</u>	<u>Percentage (100%)</u>
1	Hacienda	7	87.5%
2	Coperativa, Concentration	6	75%
8	Naipes de Letras, Naipes de Silabsas, Dados de Letras, Dados de Namerro, Quina, Domino, El Burro, Mercado	5	62.5%
1	Tres en Calle	4	50%
5	El Robo, Pin Ball, Ruleta Argollas, El Chulo	3	37%

5. Of the eight criteria, the following criteria was met at 100%, 75% or greater, 50% or greater, and less than 49% respectively by the top 7 and 17 games; based upon summary chart 1 and 2:

<u>Criteria</u>	TOP 7 Games				17 Games			
	100%	<75%	<50%	49%	100%	<75%	<50%	49%
1. Cheap	X					X		
2. Easily Reproducible	X					X		
3. Motivating	X					X		
4. Self Explanatory	X						X	
5. Self Generating		X				X		
6. Immediate Relevance			X					X
7. Culturally Based			X					X
8. Induces Desirable Human Development:								
Attitudinal		X						X
Social Behavior	X							X
Literacy				X				X
Numeracy			X		X			
Negotiations/ Information				X				X

6. The games that met the most criteria, with the highest degree of application for each of the 33 subcriteria, are:

Hacienda	-	21 subcriteria
Concentracion	-	9
Naipes de Silabas	-	6
Naipes de Letras	-	6
Dados de Letras	-	6
Dados de Numeros	-	3
El Burro	-	2
El Robo	-	2
Tres en Calle	-	2
Quina	-	1

D. Sequence of Gaming Materials: The project staff, based on the question, which of the 17 games could be used to introduce basic literacy, numeracy, and provide belief in the capability for learning? answered the question by suggesting the games that could be used to introduce and facilitate skill development. Refer to page 40.

E. Evaluation Survey of the Top 8 Games: Based on an evaluation form for the gaming materials, that provides twelve categories of information, the top eight games were surveyed. Refer to page 26 for the evaluation form format and page 42 for the survey of the top eight games.

COMMENTS

The following comments are the opinion of the writer, based on his observations and the results of the game survey. It should be kept in mind that the project worked mostly with mestizo communities in its initial phases.

A. The games developed by the project have been used as tools to enable the facilitators of the project (community leaders) to: initiate communication and dialogue among community members; to get people to interact and know one another; as a process to set the environment in a community gathering for people to feel relaxed; as a means to motivate community members to take an active part in community functions; to transfer cognitive and affective skills in the process of participating in the activities of the games; to assess numeracy and literacy skills; to provide a means to acquire basic cognitive skills and enable participants to enjoy the process; and to build self-confidence in their ability to learn.

B. In the process of designing, implementing, and evaluating the games the project staff has deliberately left the games unfinished to enable users to re-design them and adapt the rules and playing styles of games to the local situation. In doing so, the project needs to assess and constantly focus upon the following factors in its overall gaming activities:

- Cultural factors (language of the community; social values, mores, traditions, social relationships of the community; the dress; the diet, nutrition, foods) vary from village to village and more predominantly in contrast to the urban centers, to the Sierra setting, to the Coastal areas of Ecuador.
- The degree of participation and motivation in game activities are related to the amount of time since the game has been introduced; the support and reinforcement provided by the peers

- of the participant; the attitude of the facilitator towards games; the degree of use of game.
- The degree of game utilization in any one community or village is perhaps due to the fact that games are not a priority, a concern or need to the community where games have been introduced.
 - The games designed are more culturally mestizo based and may be socially disruptive in Indian communities. The reward system, social values, attitude toward's games, and the reflection or assessment of game activities reflect more the social thought of mestizo culture than Indian culture.
 - The success of the games in Indian communities and their use is probably dependent upon their use in a small social setting rather than in a large social setting given that the games are not part of the Indian culture; games are indirectly forced upon the community by the presence of the project; and the attitudinal incompatibility that exists as to how the Indian is seen at a national and provincial level by the decision makers and mestizos of Ecuador.
 - Games need more follow-up of other materials or activities otherwise they become boring and iterative and tend to provide repetitive reflection.
 - Games need to provide greater cultural and social relevance as e.g., Mercado, that has been changed through its use and has enabled participants in various communities to adapt it to their own social setting.

- Greater effort needs to be made in using the games of the people, within/of their own communities, rather than introducing "outsiders" games..

QUESTIONS TO BE ANSWERED:

1. Each of the statements in heading "B" can be stated in a question format for investigating purposes and to determine the applicability of gaming materials in various cultural settings and within the context of Nonformal education.
2. Does the "learning" in simulation games take place in the process of the game or in the dialogue and interaction after the game?
3. What is the process in adapting an "outsider's" game to a given cultural group or setting? for what purpose?
4. Is the competition present in the games a cultural factor absent in the Indian culture? Introduced into the Indian culture? What are the implications?
5. What is the role of the Church in the success of the games? Of other institutions?
6. Is it a critical factor for the success of the games to have charismatic leaders or persons introduce the games? For their continuous use and success? Is the investment of personal contact necessary?
7. Is the function of the games solely to transfer information? To enable participants to attain basic cognitive skills in literacy and numeracy?
8. In evaluating the impact, value, goals, etc. of gaming materials, does one use formal schooling tools and methodology? What are the

- implications of such evaluation? Of intervening in the project communities? The social and cultural effect of using people as sources of information for the knowledge of gaming materials?
9. To what degree do the games reflect the formal and traditional schooling system? Can the games alone be a NFE project?
 10. Within the first generation facilitators, what games are being played? if not, why not?
 11. To what degree and influence do the games have success?

RECOMMENDATIONS

1. The survey of gaming materials should be re-implemented during February of 1975 and results compared to those of May, 1974.
2. Based on the tools used in the survey the project staff should focus on:
 - a. operationalizing to a greater level of degree the desired attributes for gaming materials.
 - b. the evaluation form for the gaming materials and each of the eight games assessed.
 - c. the cost survey should be re-examined in February, 1975 and results compared.
 - d. the staff should re-evaluate each of the top 17 games used by the project using the desired attributes for gaming materials criteria.
 - e. the staff should evaluate each of the materials in regard to criteria met and not met.
3. A critical evaluation on the role of the gaming materials within the framework of the project should be done before March, 1975, in order to assess their function, impact and future particularly in relationship to the role of the facilitators.

OPTION 6: Focus the evaluation on the original intentions about the instructional materials. Following is a figure showing the six criteria stated in Technical Note #1 (1/73), clustered in terms of the sorts of data that would be required to determine if a given material meets the criteria.

Sources

Source of data	1. <u>development and production records</u>	2. <u>laboratory or field observations</u>	3. <u>field observations</u>
Criteria	cheap easily produced	motivating self-explanatory	immediately relevant self-generating*

It would be appropriate to add one more criterion to this series of six (it is implied in the logic of the project): induces desirable, appropriate, or necessary behavior in terms of human development.

Major questions:

Since these seven criteria are, in effect, a set of claims or standards to which the materials are expected to measure up, it would seem reasonable to assess each of the important materials against them. The questions, then, are these seven: Is material X cheap? Is it easily produced? Is it motivating? etc.

Locus of investigation:

The study would be conducted: 1) in the project office, 2) in a laboratory situation to be developed in a location not to interfere with on-going programs and 3) in a sample of the on-going programs.

Procedures of data gathering:

1. Drawing from cost-accounting data and recall of the project staff, cost and production facility would be described
2. Pre and post testing in the laboratory, augmented by observation and interviewing.
3. Observation and interviewing in selected sample sites the field

* Referring to the capability of the material to launch the learner into worthy operations and activities that go beyond the specific activities of the material in self-directing sorts of ways.

Value Positions (Criteria)

The criteria would need to be defined operationally.

Operational meaning would be assigned as realistic but arbitrary standards for each of the criteria. For example, "cheap" has already been defined in the project as \$1 U.S. or less.

Discrepancies to be assessed:

Each material would be assessed against each of the seven criteria, using arbitrary standards of excellence such as .8 or .7 of achievement of the standard.

Each material would also be assessed against the norms of achievement for the whole set of materials, thus providing for comparative study of the materials.

This comparative study would be a useful basis for the development of guidelines for subsequent materials.

Staff requirements:

- 1 consultant 8 months full time (in Ecuador 6 months)
- 1 evaluation coordinator (Ecuadorian, M.A. level)
- 3 observer-evaluators, part time (trainable collegians)
- 1 experienced facilitator (4 months)

Time required:

eight months

Product:

Monograph on the whole set of materials that have been developed in the project, detailing each one in terms of each of the seven criteria, and giving attention to such factors of effective use as sequencing, appropriate environment, teacher style, etc.

A derived set of guidelines for the development of subsequent instructional games/simulations.

ATRIBUTOS DESEADOS PARA LOS JUEGOS

1. Costo (Barato)

El costo de los materiales para los juegos están dentro de las posibilidades económicas de los participantes; el costo debe:

1. estar dentro de los ingresos económicos de una familia campesina
2. ser menos costoso que su equivalente comercial
3. costar menos de 24 sucres

2. Reproducido con Facilidad:

Las comunidades locales deben tener acceso a los materiales de los juegos y estos deben:

1. estar disponibles para sus participantes
2. poder ser hechos (construïdos) por los mismos participantes
3. ser atractivos y durables para los participantes

3. Estimulante: *

Para que el juego estimule a los participantes y provoque interacción este debe:

1. ser divertido para crear interés y participación
2. ser un proceso activo
3. permitir al participante a que tome riesgos
4. dar confianza a los participantes en el uso de destrezas que el juego enseña
5. ser usado no forzosamente
6. ser jugado sin recompensas o premios

* Este concepto es algo ambiguo y por lo tanto estamos usando la palabra interacción.

4. Relevancia Inmediata:

A los participantes les gusta el juego porque refleja las actividades de su vida cotidiana y aunque el participante haya o no asistido a la escuela, el juego permite:

1. que sus reglas sean flexibles, pudiendo los participantes redefinirlas.
2. Que los objetivos (cognoscitivos y afectivos) tengan una aplicabilidad directa en los problemas de la vida social de los participantes.
3. Que el juego tenga cuando menos un corto desarrollo o crecimiento cognoscitivo para los participantes.

5. Se Explica por Sí Mismo:

El juego puede ser jugado con una explicación mínima y por lo tanto este puede:

1. Ser jugado sin tener dirección
2. Ser jugado por personas que tengan un poco de conocimientos de alfabetización.

6. Se Facilita por Sí Mismo:

El juego no está hecho de manera rígida, sino que permite que el participante ponga el "input" necesario para que este pueda ser:

1. rediseñado para que refleje sus necesidades
2. diseñado con sus propias reglas
3. adaptado alrededor de su ambiente social

7. Basado en la Cultura:

El juego debe reflejar las vidas y experiencias de la gente rural del Ecuador; este debe reflejar (en los casos donde sea apropiado) la:

1. Dieta de la población
2. El vestuario de la población
3. El idioma de la población (ya sea verbal, no-verbal o visual)
4. La ética (valores estructurados) de la población
5. Estructura social y sistemas de comportamiento de las poblaciones

8. Produce (Desarrolla) un Crecimiento Humano:

Los participantes dentro de su interacción y involucramiento en el juego, desarrollan destrezas que les permite:

Un Cambio de Actitud: un aumento en cuanto a:

1. Su auto-estimación
2. Creer en su capacidad de aprender
3. Darse cuenta de las contradicciones sociales

Un Cambio en su Comportamiento Social en relación a:

4. Agresividad verbal (defendiéndose)
5. Tener confianza en sus compañeros
6. Su participación en grupos
7. Su dependencia en sí mismo

Un Cambio en su Desarrollo Cognoscitivo en relación a:

8. Un aumento en sus conocimientos de alfabetización
9. Un aumento en sus conocimientos de numeración
10. Negociaciones con autoridades (destrezas de supervivencia)
11. Su habilidad para tener acceso a información

CRITERIA NOT MET BY THE FOLLOWING 16 GAMES (as based on CRITERIA GUIDE)

	CHEAP EASILY REPRODUCIBLE	MOTIVATING	SELF EXPLANATORY	SELF GENERATING	IMMEDIATE RELEVANCE	CULTURALLY BASED	INDUCES DESIRABLE HUMAN DEVELOPMENT
HACIENDA	1,3	2	5,6	1		1,2	1
COOPERATIVA	1,3		5,6	1	3	1,2,3	1,4,5,8,9,10,11
EL ROBO			4,5,6	1,2	3	1,2,3	1,4,10,11
CONCENTRACION	1,3		4,5,6,7	1	1,3	1,2,3	1,3,4,5,6,7,8,9,10,11
NAIPES DE LETRAS y DE SILABAS			3,5,6	1	1,3	1,2,3	1,3,5,7,9,10,11
DADOS DE LETRAS			3,5,6	1	1,3	2,3	1,3,5,7,9,10,11
DADOS DE NUMEROS			3,5,6	1	1,3	1,2,3	1,3,4,5,7,8,10,11
QUINA			3,5,6	1	1,3	1,2,3	1,3,4,5,7,8,10,11
PIN BALL	1,3	2	2,5,6,7	1	1,3	1,2,3	1,3,4,5,6,7,8,10,11
RULETA	1,3		3,6	1	1,3	1,2,3	1,3,4,5,6,7,9,10,11
ARGOLLAS	1		5,6,7	1	1,3	1,2,3	1,3,4,5,7,8,10,11
TRES EN CALLE	1	1,2,3	5,6,7	1	1,3	1,2,3	1,3,4,5,6,7,8,9,10,11
DOMINO	1,3	1,3	1,2,5,6,7	1	1,3	1,2,3	1,2,3,4,5,6,7,8,9,10,11
EL BURRO			5,6	1	1,3	1,2,3	1,3,5,7,8,10,11
EL CHULO	1,3	2,3	3,4,5,6,7	1	1,3	1,2,3	1,3,4,5,6,7,8,9,10,11
EL MERCADO	1,3	2	3,5,6	1,2	1,3	2,3	1,3,4,5,6,7,8,10,11

CRITERIA NOT MET BY THE FOLLOWING 16 GAMES (as based on CRITERIA GUIDE)

	CHEAP EASILY REPRODUCIBLE		MOTIVATING	SELF EXPLANATORY	SELF GENERATING	IMMEDIATE RELEVANCE	CULTURALLY BASED	INDUCES DESIRABLE HUMAN DEVELOPMENT
HACIENDA	1, 3	2		1			1, 2	
OPERATIVA	3	2		1			1, 2	
EL ROBO	3		3	1	2		1, 2, 4, 5	3, 10
CONCENTRACION	2					2	1, 2, 4, 5	3, 5, 6, 9, 10, 11
NAIPES DE LETRAS y DE SILABAS			3			2	1, 2, 4, 5	3, 9, 10
DADOS DE LETRAS			6			2	1, 2, 4, 5	3, 9, 11
DADOS DE NUMEROS						2	1, 2, 4, 5	3, 10, 11
QUINA						2	1, 2, 4, 5	3, 10, 11
PIN BALL	1, 3	2	2, 3			2	1, 2, 4, 5	3, 4, 5, 6, 8, 10, 11
0. RULETA	3					2	1, 2, 4, 5	3, 6, 8, 10, 11
1. ARGOLLAS	3		3			2	1, 2, 4, 5	3, 4, 6, 10, 11
2. TRES EN CALLE						2	1, 2, 4, 5	3, 6, 8, 10, 11
3. DOMINO			3	1		2	1, 2, 4, 5	3, 6, 8, 10, 11
4. EL BURRO			1, 2, 3			2	1, 2, 4, 5	1, 3, 4, 5, 6, 8, 9, 11
5. EL CHULO	3		3, 4	1		2	1, 2, 4, 5	3, 4, 6, 10, 11
16. EL MERCADO		2		1			5	3

CRITERIA NOT MET BY THE FOLLOWING 16 GAMES (as based on CRITERIA GUIDE)

	CHEAP	EASILY REPRODUCIBLE	MOTIVATING	SELF EXPLANATORY	SELF GENERATING	IMMEDIATE RELEVANCE	CULTURALLY BASED	INDUCES DESIRABLE HUMAN DEVELOPMENT
HACIENDA	1, 3	1, 2		1, 2	1, 3		2	5, 7
COOPERATIVA	1, 2	1, 2		1, 2	1, 2	1	1, 2, 3, 4, 5	
EL ROBO		1, 2		1, 2	1, 2, 3	1	1, 2, 3, 4, 5	2, 3, 4, 5, 6, 7, 8, 9, 10, 11
CONCENTRACION		1	3	1, 2		1	2, 3, 4, 5	3, 6, 9, 10, 11
NAIPES DE LETRAS y DE SILABAS		1, 2	3		1		1, 2, 3, 4, 5	3, 6, 9, 10
DADOS DE LETRAS		1	3		1		1, 2, 3, 4, 5	3, 6, 9, 11
DADOS DE NUMEROS		1	3		1		1, 2, 3, 4, 5	3, 6, 10, 11
QUINA		1	2, 3	1	1	1	1, 2, 3, 4, 5	3, 6, 10, 11
PIN BALL	1, 3	1, 2	1, 2, 3		1, 3	2	1, 2, 3, 4, 5	3, 4, 5, 6, 8, 10, 11
RULETA	1, 2, 3	1, 2	1, 2, 3		1, 2, 3	1	1, 2, 3, 4, 5	3, 6, 8, 10, 11
ARGOLLAS	1, 2, 3	1, 2			1, 2, 3	1	1, 2, 3, 4, 5	3, 4, 6, 10, 11
2. TRES EN CALLE		1	3	1, 2	2		1, 2, 3, 4, 5	3, 6, 8, 10, 11
3. DOMINO		1	2, 3		1, 3		1, 2, 3, 4, 5	3, 6, 8, 10, 11
4. EL BURRO	1, 2, 3	1, 2	3	1	1, 3	2	1, 2, 3, 4, 5	1, 3, 4, 5, 6, 8, 10, 11
5. EL CHULO	1, 2, 3	1, 2		1, 2	1, 2, 3	1	1, 2, 3, 4, 5	3, 4, 6, 10, 11
6. EL MERCADO		1, 2	3		1		2, 4, 5	3, 6

CRITERIA NOT MET BY THE FOLLOWING 16 GAMES (as based on CRITERIA GUIDE)

	CHEAP EASILY REPRODUCIBLE		MOTIVATING	SELF EXPLANATORY	SELF GENERATING	IMMEDIATE RELEVANCE	CULTURALLY BASED	INDUCES DESIRABLE HUMAN DEVELOPMENT
HACIENDA	1,2	1,2	4,5			3		
COOPERATIVA	1,2		4,5			3		
EL ROBO	1,2	2	4,5			2,3	1,5	8
CONCENTRACION		1,2	4			2,3	1,2	
NAIPES DE LETRAS y DE SILABAS	1,3				1,2	2,3	1,2	3,4,5,6,7,9,10,11
DADOS DE LETRAS					1,2	2,3	1,2	3,4,5,6,7,9,10,11
DADOS DE NUMEROS					1,2		1,2	3,8,10,11
QUINA					1,2		1,2	3,8,10,11
PIN BALL	1,3	1,2			1,2		1,2	3,8,10,11
0. RULETA	1	1			1,2		1,2	3,8,10,11
1. ARGOLLAS	1,3						1,2	3,8,10,11
2. TRES EN CALLE							1,2	3,8,10,11
3. DOMINO	1				1,2		1,2	3,8,10,11
4. EL BURRO	Not observed							
5. EL CHULO	Not observed							
16. EL MERCADO	1,3	1,2			1,2			8

CRITERIA NOT MET BY THE FOLLOWING 16 GAMES (as based on CRITERIA GUIDE)

	CHEAP EASILY REPRODUCIBLE	MOTIVATING	SELF EXPLANATORY	SELF GENERATING	IMMEDIATE RELEVANCE	CULTURALLY BASED	INDUCES DESIRABLE HUMAN DEVELOPMENT
1. HACIENDA	1,2	5,6		1,2	1,3	1,2,4	5,7
2. COPERATIVA	1,3	1,5,6,7	1,2	1,2,3	1	1,2,3,5	3,7,10,11
3. EL ROBO	1,3	1,5,6	1,2	1,2,3	1,2,3	1,2,3,4,5	3,4,5,6,7,9,10,11
4. CONCENTRACION		5,6	1,2	1,2,3	1,2,3	1,2,4,5	3,4,5,6,7,9,10,11
5. NAIPES DE LETRAS y DE SILABAS		1,2,3,5, 6,7	1,2		2	1,2,3,5	3,4,5,6,7,9,10,11
6. DADOS DE LETRAS		1,2,3,5,6,7			2	1,2,3,4,5	3,4,5,6,7,9,10,11
7. DADOS DE NUMEROS		1,2,3,5,6,7			2	1,2,3,4,5	3,4,5,6,7,9,10,11
8. QUINA		1,2,3,5,6,7	1,2	1,2,3	1,2	1,2,3,4,5	3,4,5,6,7,8,10,11
9. PIN BALL	1,3	3,5,6,7	1,2	1,2,3		1,2,3,4,5	3,4,5,6,7,9,10,11
10. RULETA	1,3	3,5,6,7	1,2	1,2,3	1,2	1,2,3,4,5	3,4,5,6,7,8,10,11
11. ARGOLLAS	1,3	5,6	1,2	1,2,3	1,2	1,2,3,4,5	3,4,5,6,7,8,10,11
12. TRES EN CALLE		3,5,6	1,2	1,2,3	1,2	1,2,3,4,5	3,4,5,6,7,9,10,11
13. DOMINO		3,5,6	2	1,2,3	1,2	1,2,3,4,5	3,4,5,6,7,9,10,11
14. EL BURRO		3,4,5,6,7	1,2	1,2,3	1,2	1,2,3,4,5	3,4,5,6,7,9,10,11
15. EL CHULO		3,4,5,6,7	1,2	1,2,3	1,2	1,2,3,4,5	3,4,5,6,7,9,10,11
16. EL MERCADO	1,3	1,2,3,5,6,7	1,2		1	1,2,3,4,5	3,4,5,6,7,9,10,11

CRITERIA NOT MET BY THE FOLLOWING 16 GAMES (as based on CRITERIA GUIDE)

	CHEAP EASILY REPRODUCIBLE		MOTIVATING	SELF EXPLANATORY	SELF GENERATING	IMMEDIATE RELEVANCE	CULTURALLY BASED	INDUCES DESIRABLE HUMAN DEVELOPMENT
HACIENDA	1, 3	2	6	1			1, 2	7
COPERATIVA	1, 3	2					1, 2, 4	1, 3, 4, 8, 10, 11
EL ROBO	1, 3						1, 2, 4	1, 2, 3, 4, 8, 9, 10, 11
CONCENTRACION	1	3		2		1, 2	1, 2, 4, 5	1, 3, 4, 8, 10, 11
NAIPES DE LETRAS y DE SILABAS		3				1, 2	1, 2, 4, 5	1, 3, 4, 7, 9, 10, 11
DADOS DE LETRAS						2	1, 2, 4, 5	1, 3, 4, 7, 9, 10, 11
DADOS DE NUMEROS						1, 2	1, 2, 4, 5	1, 3, 4, 7, 8, 10, 11
QUINA		3		2		1, 2	1, 2, 4, 5	1, 3, 4, 7, 8, 10, 11
PIN BALL	1		3		1	1, 2	1, 2, 4, 5	1, 2, 3, 4, 5, 6, 8, 10, 11
3. RULETA	1		3			2	1, 2, 4, 5	1, 2, 3, 4, 8, 9, 10, 11
4. ARGOLLAS		1		2	1	2	1, 2, 4, 5	1, 3, 4, 5, 8, 10, 11
5. TRES EN CALLE			3, 6		1	2	1, 2, 4, 5	1, 3, 4, 5, 8, 10, 11
6. DOMINO	1, 3	3	2		1, 2	2	1, 2, 4, 5	1, 2, 3, 4, 5, 6, 8, 10, 11
7. EL BURRO		3	3, 6	2	1	1	1, 2, 4, 5	1, 3, 4, 5, 8, 10, 11
8. EL CHULO	1		3, 6	3	1	1, 2	1, 2, 4, 5	1, 2, 3, 4, 5, 7, 8, 9, 10, 11
9. EL MERCADO	1, 3	2, 3	6				2, 4	1, 3, 4, 8, 10, 11

CRITERIA NOT MET BY THE FOLLOWING 16 GAMES (as based on CRITERIA GUIDE)

	CHEAP EASILY REPRODUCIBLE		MOTIVATING	SELF EXPLANATORY	SELF GENERATING	IMMEDIATE RELEVANCE	CULTURALLY BASED	INDUCES DESIRABLE HUMAN DEVELOPMENT
1. HACIENDA	1, 3	2, 3		1		2	1, 2	2, 7
2. COPERATIVA	1, 3	1, 2				3	3, 5	4, 10, 11
3. EL ROBO	1, 3	2		2	2	2, 3	1, 2, 3, 5	4, 9, 10, 11
4. CONCENTRACION				2		2, 3	4, 5	3, 4, 5, 9, 10, 11
5. NAIPES DE LETRAS y DE SILABAS	2		4	2	3	3	1, 2, 5	3, 5, 9, 10, 11
6. DADOS DE LETRAS				2	3	3		3, 4, 6, 10, 11
7. DADOS DE NUMEROS				2		3	1, 2, 3, 5	3, 7, 8, 10, 11
8. QUINA	1	2	4, 6	2	1, 3	2, 3	1, 2, 3, 5	3, 4, 5, 7, 8, 10, 11
9. PIN BALL	1, 3	2	4, 6	2	1	2, 3	1, 2, 3, 5	3, 4, 7, 8, 10, 11
10. RULETA	1, 3		4, 6	2		3, 3	1, 2, 3, 5	3, 5, 8, 10, 11
11. ARGOLLAS	1, 3			2		2, 3	1, 2, 3, 5	3, 7, 8, 10, 11
12. TRES EN CALLE	1, 3		4	2	1, 3	2, 3	1, 2, 3, 5	3, 7, 8, 10, 11
13. DOMINO	3		3, 4		2	3	1, 2, 3, 5	3, 3, 4, 7, 8, 10, 11
14. EL BURRO	3	3	4	2	1, 2	2, 3	1, 2, 3	3, 7, 8, 10, 11
15. EL CHULO		2	4	2	1	2, 3	3, 4, 5	3, 4, 9, 10, 11
16. EL MERCADO	2	2	3	2	3	3	3, 4, 5	4, 8, 10

Operationalize definitions* of Didactic, Heuristic, and Philetic for conditions for the use of the materials, subpoint (d) how it has been used:

Didactic: refers to the impartation of knowledge by the Facilitator/Teacher to the participant; in order for the participant to acquire a mastery of a repertoire of explicitly formulated knowledge and skills.

Heuristic: refers to the effort to facilitate the participant to discover for himself either the contents of a body of knowledge or the methods of arriving at such knowledge and assessing it.

Philetic: refers to the use of the game(s) to secure rapport with the participants, in order to relate to them as individuals and to their own life style and self-perspective.

*adapted from Harry S. Browdy, Professor of Philosophy of Education, University of Illinois, A Critique of PBTE, p. 5-7.

A Condensed Version of the Taxonomy Categories
of the Cognitive and Affective Domains and their Relationship

Taken from

Taxonomy of Educational Objectives

The Classification of Educational Goals

Handbook I : Cognitive Domain (1956)

by

Benjamin S. Bloom

Handbook II: Affective Domain (1964)

by

David R. Krathwohl
Benjamin S. Bloom
Bertram B. Masia

Prepared by

Alberto M. Ochoa

RELATIONSHIPS BETWEEN THE TAXONOMY CATEGORIES
OF THE COGNITIVE AND AFFECTIVE DOMAINS

COGNITIVE

(Thinking tone)

1. KNOWLEDGE

Recognition and recall of information, terms, classes, procedures, theories, and structures.

(Information which one wants to receive)

2. COMPREHENSION

Interpretation of what has been learned

(Willingness to understand information)

3. APPLICATION

Use of knowledge in new situations

(Appreciates information that is relevant and useful)

4a. ANALYSIS

Breaking whole units into related parts (deduction)

(Forms a value system by integrating bits of information into new and unique combination)

4b. SYNTHESIS

Combining elements into new roles (induction)

(Forms a value system by integrating bits of information into new and unique combination.)

5. EVALUATION

Judging materials and methods using standards and criteria.

(Judging by how this fits into a way of one's life)

AFFECTIVE

(Feeling tone)

1. RECEIVING

Passive attention to stimuli (i.e., sensory inputs).

2. RESPONDING

Reacting to stimuli (i.e., sensory inputs)

3. VALUING

Actions consistent with a belief or value.

4. ORGANIZATION

(Conceptualizes; Commitment to a set of values (discussion) formulating values)

5. CHARACTERIZATION

(Internalized) Total behavior conforming to internalized values (i.e., philosophy)

TAXONOMY CLASSIFICATION
COGNITIVE

	<u>KEY WORDS</u>	<u>EXAMPLES OF DIRECT OBJECTS</u>	<u>INSTRUCTIONAL ACTIVITY</u>
KNOWLEDGE			
1.1 Of Specifics			
1.11 Terminology	to define, to distinguish, to acquire, to identify, to recall, to recognize	Vocabulary Terms, meanings, miniology, referents elements	
1.12 Specific Facts	to acquire, to identify, to recall, to recognize	Facts: Sources, names, dates, events, persons, places, time periods, properties, examples phenomena.	
1.2 Of Ways and Means of Dealing with Specifics			
1.21 Conventions	to recall, to recognize, to acquire, to identify	Actions, processes, movements, trends, sequence, causes, forces, relationships, influences	
1.23 Classifications	to recall, to recognize, to acquire, to identify	Area(s), type(s), feature(s), class(es), set(s), division(s), arrangement(s), classification(s), category/categories	
1.24 Criteria	to recall, to recognize, to acquire, to identify	Criteria basics, elements, principles, opinions.	
1.25 Methodology	to recall, to recognize, to acquire, to identify	Methods, techniques, approaches, uses, procedures, treatments	
1.3 Universals and Abstractions in a Field			
1.31 Principles and Generalizations	to recall, to recognize, to acquire, to identify	Principles, generalizations, propositions, fundamentals, laws, implications.	
1.32 Theories and Structure	to recall, to recognize, to acquire, to identify	Theories, bases, interrelations, structure(s), organization(s), formulation(s)	

COMPREHENSION

2.10 Translation

to translate, to transform, to give in own words, to illustrate, to prepare, to read, to represent, to change, to rephrase, to restate.

Meaning(s), sample(s), definition(s), abstractions, representations, words.

2.20 Interpretation

to interpret, to reorder, to rearrange, to differentiate, to distinguish, to make, to draw, to explain, to demonstrate.

Relevancies, relationships, essential aspects, new view(s), qualifications, conclusions, methods, theories, abstractions.

2.30 Extrapolation

to estimate, to infer, to conclude, to predict, to differentiate, to determine, to extend, to interpolate, to fill in, to draw.

Consequences, implications, conclusions, factors, ramifications, meanings, corollaries, effects, probabilities.

APPLICATION

to apply, to generalize, to relate, to choose, to develop, to organize, to use, to employ, to transfer, to restructure, to classify

Principles, laws, conclusions, effects, methods, theories, abstractions, situations, generalizations, processes, phenomena, procedures.

ANALYSIS

4.10 Elements

To distinguish, to detect, to identify, to classify, to discriminate, to recognize, to categorize, to deduce.

Elements, hypothesis, hypotheses, conclusions, assumptions, statements, (of fact)/(of intent), arguments, particulars

4.20 Relationships

To analyze, to contrast, to compare, to distinguish, to deduce.

Relationships, inter-relationships, relevance, relevancies, themes, evidence, fallacies, arguments, cause-effect(s), consistency, consistencies, parts, ideas, assumptions.

4.30 Organizational Principles

To analyze, to disguise, to detect, to deduce

Form(s), pattern(s), purpose(s), point(s), of view(s), techniques, bias(es), structure(s), theme(s), arrangements, organization(s).

SYNTHESIS

5.10 Production of Unique Communication

To write, to tell, to relate; to produce, to constitute, to transmit, to originate, to modify, to document

Structure(s), pattern(s), products, performance(s), design(s), work(s), communication, effort(s), specifics, composition(s)

5.20 Production of a Plan or Proposed Set of Operations

To propose, to plan, to produce, to design, to modify, to specify

Plan(s), objectives, specifications, schematic(s) operations; way(s), solution(s) means.

5.30 Derivation of a Set or Abstract-Relations

To produce, to derive, to develop, to combine, or organize, to synthesize, to classify, to deduce, to develop, to formulate, to modify.

Phenomena, taxonomies, concept(s), scheme(s), theories, relationships, abstractions, generalizations, hypothesis, hypotheses, perception, ways, discoveries.

EVALUATION

6.10 Judgement in Terms of Internal Evidence

To judge, to argue, to validate, to assess, to decide.

Logical-accuracy/accuracies, consistency/consistencies, fallacies, reliability, flaws, errors, precision, exactness.

6.20 Judgement in Terms of External Criteria

To judge, to argue, to consider, to compare, to contrast, to standardize, to appraise

Ends, means, efficiency, economy, economics, utility, alternatives, courses of action, standards, theories, generalizations

TAXONOMY CLASSIFICATION

AFFECTIVE

	<u>KEY WORDS</u>	<u>EXAMPLES OF DIRECT OBJECTS</u>	<u>INSTRUCTIONAL ACTIVITY</u>
D RECEIVING			
1.1.	Awareness	To differentiate, to separate, to set apart, to share.	Sights, sounds, events, designs, arrangements.
1.2	Willingness to receive	To accumulate, to select, to combine, to accept.	Models, sizes, meters, shapes, examples, cadences
1.3	Controlled or Selected Attention	To select, to posturally respond to, to listen(for) to control.	Alternatives, Answers, rythems, nuances.
D RESPONDING			
2.1	Acquiescence in Responding	To comply (with), to follow, to commend, to approve.	Directions, instructions, laws, policies, demonstrations
2.2	Willingness to Respond	To volunteer, to discuss, to practice, to play	Instruments, games, dramatic works, charades, burlesques.
2.3	Satisfaction	To applaud, to acclaim, to spend leisure time in, to augment.	Speeches, plays, presentations, writings.
D VALUING			
3.1	Acceptance of a Value	To increase measured proficiency in, to increase numbers of, to relinquish, to specify.	Group membership(s) artistic production(s), musical production(s) personal friendships.
3.2	Preference for a Value	To assist, to subsidize, to help, to support	Artistis, projects, viewpoints, arguments.

3.3 Commitment

To deny, to protest, to debate, to argue.

Deceptions, irrelevancies, abductions, irrationalities.

ORGANIZATION

4.1 Conceptualization of a Value

To discuss, to theorize on, to abstract, to compare

Parameters, codes, standards, goals.

4.2 Organization of a Value System

To balance, to organize, to define, to formulate

Systems, approaches, criteria limits.

CHARACTERIZATION BY VALUE

5.1 Generalized Set

To revise, to change, to complete, to require.

Plans, behavior, method(s), efforts.

5.2 Characterization

To be rated high by peers in, to be rated high by superiors, to be rated high by - subordinates in and to avoid, to manage, to resolve, to resist.

Extravagance(s), excesses, conflicts, exorbitancy/exorbitancies.

- 1.1 -----3.2 Interest
- 1.3 -----3.2 Appreciation
- 2.2 -----4.1 Attitudes
- 2.2 -----4.1 Value
- 2.2 -----5.2 Adjustment

: The range of meaning typical of commonly used affective terms measured against the Taxonomy continuum.

LEARNING TYPES AND LEARNING THEORY

Eight different classes of situation in which human beings learn have been distinguished, that is, eight sets of conditions under which changes in capabilities of the human learner are brought about. The implication is that there are eight corresponding kinds of changes in the nervous system which need to be identified and ultimately accounted for. Each of these may involve different initial states or different structures, or both. From the standpoint of the outside of the human organism, however, they seem to be clearly distinguishable from one another in terms of the conditions that must prevail for each to occur. Might there actually be seven, nine, or ten rather than eight? It is quite possible

that as research is continued it will become necessary to make new formulations of these conditions, to separate some or—what appears less likely—to collapse some. The distinctions made here are simply those that appear to be consistent with present evidence, much of it based on simple observation.

In brief, the varieties of learning that can currently be distinguished are as follows:

Type 1: Signal Learning. The individual learns to make a general, diffuse response to a signal. This is the classical conditioned response of Pavlov (1927).

Type 2: Stimulus-Response Learning. The learner acquires a precise response to a discriminated stimulus. What is learned is a connection (Thorndike, 1898) or a discriminated operant (Skinner, 1938), sometimes called an instrumental response (Kimble, 1961).

Type 3: Chaining. What is acquired is a chain of two or more stimulus-response connections. The conditions for such learning have been described by Skinner (1938) and others, notably Gilbert (1962).

Type 4: Verbal Association. Verbal association is the learning of chains that are verbal. Basically, the conditions resemble those for other (motor) chains. However, the presence of language in the human being makes this a special type because internal links may be selected from the individual's previously learned repertoire of language (see Underwood, 1964b).

Type 5: Discrimination Learning. The individual learns to make n different identifying responses to as many different stimuli, which may resemble each other in physical appearance to a greater or lesser degree. Although the learning of each stimulus-response connection is a simple type 2 occurrence, the connections tend to interfere with each other's retention (Postman, 1961).

Type 6: Concept Learning. The learner acquires a capability of making a common response to a class of stimuli that may differ from each other widely in physical appear-

ance. He is able to make a response that identifies an entire class of objects or events (see Kendler, 1964). Other concepts are acquired *by definition*, and consequently have the formal characteristics of rules.

Type 7: Rule Learning. In simplest terms, a rule is a chain of two or more concepts. It functions to control behavior in the manner suggested by a verbalized rule of the form, "If A, then B," where A and B are previously learned concepts. However, it must be carefully distinguished from the mere verbal sequence, "If A, then B," which, of course, may also be learned as type 4.

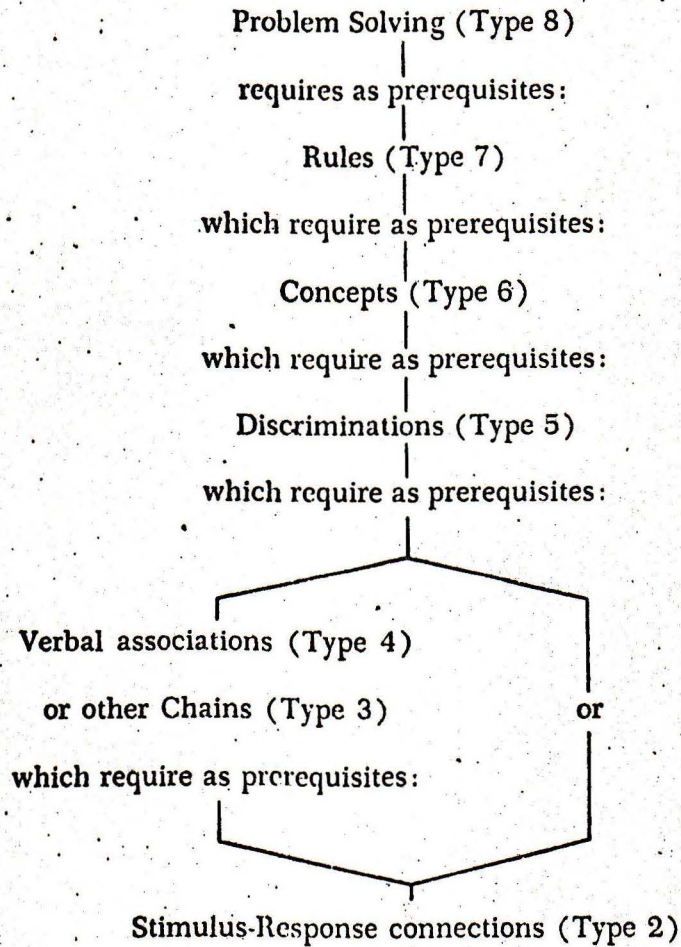
Type 8: Problem Solving. Problem solving is a kind of learning that requires the internal events usually called thinking. Two or more previously acquired rules are somehow combined to produce a new capability that can be shown to depend on a "higher-order" rule.

Prerequisites to Learning

Throughout many years of experimental investigation of learning, there have been those who have contended that *all learning is basically the same*. Thorndike (1931, p. 160), for example, says essentially this, and there have been many others who have espoused this view, explicitly or implicitly. It should be perfectly clear from the present chapter that it is this viewpoint about learning which is categorically rejected. The attempt is made to show that each variety of learning described here begins with a *different state of the organism* and ends with a *different capability for performance*. It is believed, therefore, that the differences among these varieties of learning far outweigh their similarities. Furthermore, great confusion can arise—and has arisen—through believing that these varieties are somehow alike. To equate the responding of an animal to a warning signal with the learning of a child asking for a doll, or the learning of a student to identify a chromosome or the learning to predict inheritance with the laws of genetics is considered to be a matter of gross disregard for some obvious and simple observations.

The most important class of conditions that distinguishes one form of learning from another is the initial state of the learning—in other words, its *prerequisites*. The conditions for chaining, for example, require that the individual have previously learned stimulus-response connections available to him, so that they *can* be chained. If this condition is not met, one finds oneself dealing with conditions for establishing these prerequisite *Ss* → *R*'s, and thus one is likely to draw incorrect conclusions about chaining itself. This gen-

eralization, applied to the varieties of learning we have discussed, may be briefly stated as follows:



It is tempting to agree with Mowrer (1960a) that $Ss \rightarrow R$ connections (type 2) require signal learning (type 1) as a prerequisite. This may be true, but it does not seem possible to draw this conclusion with complete confidence from presently available evidence; it remains as a proposition to be further illuminated by experimental research.

M O D E S of Instruction

1. Vertical Relationship

Predominance of Teacher/Facilitator (T/F) to Participant (P)

Instruction:

The T/F introduces ideas by relating stories of the community found in newspapers, oral communication, and other places likely to be familiar to the participants. Learning is cognitive depending on verbal interaction.

2. Written Instruction Relationship

Predominance of Material (M) to P Instruction:

Participant becomes familiar with material (by reading instructions, through questions, observations, trial and error, etc.); participant is encouraged to involve himself in the activities of the material, keeping in mind that he/she is expected to follow a pre-established game procedure.

3. Horizontal Relationship (One-Way)

Predominance of T/F \longrightarrow P Interaction:

The T/F and P interaction is directed through discussion in which T/F has in mind most of the considerations that can be brought to bear on the issues at hand and seeks to draw these out of the participants. An attitude of "let's inquire together" is the approach to Instruction.

4. Horizontal Relationship (Two-Way)

Predominance of P \longleftrightarrow P Interaction:

Participants through a mutual encouraged discussion and participation in activities such as role playing and simulations will derive questions and processes (community based, legal rights, etc.) to achieve their ends (as defined by the participants) and will increase their level of awareness (concientización) and will not

withdraw or be apathetic to his/her concerns.

5. Dual (P and M) Interactional Relationship

Predominance of P \leftrightarrow M Interaction:

Material activities are designed to put the P into an active position of decision making. The participant performs roles of influence that affect social policy, e.g. he/she may be asked to write a set of laws for his/her community. The activities have no right or wrong answers and the chance of participating in the activities is high - exploring various answers to activities without pressure of always being correct.