



Evaluation: *Central to Educational Technology*¹

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Evaluation is one of the most crucial aspects involved in an educational technology utilizing instructional system regardless of whether that system is formal or nonformal. Evaluation for many educators in a formal, tradition-bound system is something that occurs last, if at all. In the technology utilizing system, evaluation plans are one of the first things designed. For the nonformal education sector, the area of evaluation is of crucial importance since those in that sector are asking important questions about educational technology utilization. So then, for those involved in the uses of educational technology in various countries and in various situations, evaluation is of great concern. In the following pages we will seek to provide answers to the following questions: Why evaluate? What is evaluation? Who should evaluate? How can one evaluate?

Why Evaluate?

Evaluation is the control mechanism by which one measures the fulfillment of instructional objective. Evaluation is the means of finding out the degree to which objectives or goals are being met. Evaluation can be viewed as the crucial element in all of the planning and operating stages of instruction. It provides the data for instructional objective planning, learning criteria, instructional design, and corrective feedback. It is thus arguably the single most important activity in educational technology.

Education is too important not to evaluate it. To ask how things are going or how things went in an educational setting is, for some, an embarrassing question or too much effort for learners. Boyle and Jahns (1970)² suggest several reasons for this: 1) There is nothing to evaluate because there were no particular purposes or objectives in mind other than to use some techniques or devices to cover some course material or subject matter. 2) The goals and objectives were too general or intangible to be measured. The result was that almost anything could be interpreted as related to the achievement of the goals. 3) Time was not available to spend on evaluation. Since leaders and administrators have so much else to do that is seemingly more immediate and since proper evaluation takes time, they often neglect it almost totally. 4) Some might fear that they or their program will be criticized if it is discovered to be ineffective. Hence they would rather continue in ignorance of the program's outcome than risk being criticized.

Programs must be evaluated if one is to know whether or not the results are what was intended. No country can afford to waste material and resources on unproductive or counter-productive activities.

A word of caution is appropriate at this point. Quite often the word "evaluation" stirs-up in the mind of the average person a whole array of scientific experiments with special controls on all parts of the experiment and all sorts of elaborate instruments and devices to provide the evaluation data and a large computer to analyze the data. We are committed to the position that the most scientific evaluation possible should be attempted under the limitation placed by time, costs, and personnel.

¹ Ted Ward. Evaluation: Central to Educational Technology. Unpublished monograph (draft), 1972

² P. G. Boyle and I. R. Jahns. Program Development and Evaluation. In R. M. Smith et al. (eds). *Handbook of Adult Education*. New York: Macmillan, 1970.

However, it is not necessary nor even suggested that all evaluation should be in the form of scientific experiments. Relatively uncomplicated, easily executed evaluation procedures can be used.

Evaluation's major purpose is to improve the educational program in all its stages of development for student mastery. Quite often the formal school system uses educational testing to determine student differences in order to attach a grade to each student's level of achievement. Unfortunately, this has been called evaluation. It lacks one necessary ingredient: there is no provision for improving either student or instructor or instructional material or curriculum performance. Evaluation should instead be used to provide feedback to instructor and student on their performance; and feedback on the instructional materials and overall curriculum. In this way corrections can be made in the instructing, material and/or curriculum so that the student will be able to master the material. Evaluation is *not for grading but for mastery*. Students may also use evaluation to facilitate their own self-evaluation in terms of their actual progress and mastery of the subject matter. Thus evaluation can be used throughout the educational program to improve its output through students themselves.

What is Evaluation?

So far we have been using the term "evaluation" without clearly defining its meaning. Evaluation is not a report of learning activities or opportunities provided. Nor is it testing of students by use of standardized tests nor giving them achievement scores. It is not such a simple thing as number of pupils enrolled or retained in educational programs. Nor is it the results of an opinion poll of student attitude and reactions to a given program—"happiness index" (Griffith, 1970). It is not a periodic, haphazard report of some supervisor's impression or observations of what is going on. Nor is evaluation merely the investigation of whether or not program objectives have been met. Evaluation has a greater and more important role to play in education and training than these items just mentioned provide.

*Evaluation is the "... collection and use of information to make decisions about an educational program"*³ More particularly, *evaluation has been defined as feedback for program improvement*. An example of the lack of proper use of evaluation occurred in New York City and was brought to the attention of a committee of the U.S. Government:

We ask for amendments to render the required evaluations of Title I projects meaningful. The Act states that evaluations must be made, not that they be utilized in future planning. In New York City this year, projects were recycled before last year's evaluations were submitted. To be made more useful, evaluations should have built into them alternatives and the recommendations of the evaluator. What is now an expensive exercise should be made a function to provide service to local school boards having the responsibility for making policy based on experience. American business would not survive if its consultants did not supply management with alternatives after reviewing the efficiency of programs.⁴ (Stufflebeam, p. 47, quoted from *Citizens' Committee for Children of New York, Inc., Newsletter*. Statement of Mrs. Nathan W. Levin, Chairman of the Educational Services Section

³ J. Lee Cronbach. Validation of Educational Measures, Proceedings of the 1969 Invitational Conference on Testing Problems: Toward a Theory of Achievement Measurement. Princeton, NJ: Educational Testing Service, 1969: pp. 35-52. Emphasis added.

⁴ Daniel Stufflebeam. Evaluation as Enlightenment for Decision-Making. Ohio State University Evaluation Center. Quoted from *Citizens' Committee for Children of New York, Inc., Newsletter*. Statement of Mrs. Nathan W. Levin, Chairman of the Educational Services Section before the Subcommittee on the Elementary and Secondary Education Act of the Education and Labor Committee of the House of Representatives, March 18, 1967, p. 47.

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When we view evaluation as feedback we can see how it permeates the whole warp and woof of an educational program. If the evaluation is of great enough scope and depth it will affect every aspect of program planning and execution from beginning to end. *The real test of evaluation is whether or not it delivers the necessary feedback at the appropriate time, to the appropriate people in an appropriate form for use in decision-making.*

Kinds of Evaluation. There are several types or kinds of evaluation which are dependent upon the decisions being made. In order to know which kind is being used, one must have some knowledge of the decision that is to be made. Stufflebeam identified seven areas of knowledge needed relevant to the decision situation to be served. Though he suggests these in terms of a nationally-sponsored educational program, they are germane to relatively small evaluation-decision situations, too:

1. The *locus* of the decision-making: Who is the decision-maker?
2. The *focus* of the decision: For what goal is the decision being made? Is it for developing a new material, for improving a program, for diffusing an innovation for training, etc.?
3. The *substance* of the decision: What is the subject matter involved, and what are the alternative choices regarding that subject?
4. The *function* of this decision: What is the purpose for making the decision? Is it for assessing needs, program planning, implementation, improvement, reading, or find certification of the program?
5. The *object* of the decision: What people, place, events, and things are involved?
6. The *timing* of the decision: What is the time sequence and the amount of time available to evaluate and decide?
7. The *criticality* of the decision: Just how important is the decision?

Four kinds or functions of evaluation have been identified by Alkin, 1969⁵ and Stufflebeam, 1971⁶ dependent on the decisions involved:

1. *Context evaluation.* An evaluation of the needs and problems of the learner in their environment. The product of this evaluation is a list of instructional objectives based on the context evaluation. The evaluation environment should assess the needs of the student in the total social and cultural milieu in which the students live including their peers, community, and larger society, in relation to the educational or training system.
2. *Program planning evaluation.* The design of a program or choice among several alternative program designs to meet the objectives decided upon in *context* evaluation. The evaluation provides information as to the likelihood of achieving the educational objectives decided upon by the use of one of the alternative program designs suggested. The decision-makers must decide if they can produce a program to meet the assessed needs and if the larger social, educational, and economic system can support such a program. The result of this kind of evaluation is the choice of one program to meet the stated objectives.
3. *Program process evaluation.* Formative evaluation or evaluation that occurs while the program is in progress determines how well the program is doing in relation to the objective (context evaluation) and programs (program planning evaluation.) At this time, the program can be more easily modified to insure that objectives are being met. During the program, formative

⁵ M.C. Alkin. Evaluation Theory Development. Evaluation Comment. (2) pp. 2-7.

⁶ Daniel L. Stufflebeam, et al. *Educational Evaluation and Decision Making*. Ithaca, IL: F.E. Peacock, 1971.

evaluation is used to determine if the assessed needs of the students and the program choices were accurately decided and producing the desired outcome. If (through monitoring the program) it is found that students' needs were incorrectly assessed then some sort of correction must be made in the program. For instance, suppose a community decided to sponsor a community-wide project in which the program materials were written in rather academic language. At the time of assessment the community liked the idea, but at the program implementation stage they were rather unenthusiastic. A monitoring of the actual on-going program found that the academic language was almost unintelligible to the majority of the people who had little education. Then in order to accomplish the objective of the program, some mid-course correction using the formative or program implementation evaluation feedback is necessary.

4. *Outcome product evaluation.* Summative evaluation of the program occurs at the very end. It seeks to ascertain whether the program actually did what it set out to do—i.e., to meet the educational objectives by use of the program with its correctives. Outcome product evaluation is the last step of evaluation that occurs when the program has run its course. It is no longer possible to modify that program with those particular people. All that can be stated is that the program had a certain amount of success in achieving its stated goals using certain procedures. However this evaluation provides information on whether to repeat the program, drop it totally, or make certain modifications in it at various points.

Criteria for Evaluation. In order for information to be useful in the above kinds of evaluation it must meet certain criteria:

1. It must be accurate. Obviously erroneous information would lead to errors in decisions. Thus it is absolutely necessary not to allow guesses or informal judgments to enter into the decisions. Trustworthy sources of information must be found or developed or the whole program could result in failure.
2. Evaluation during and at the end of the program (program process and outcome product evaluations) must involve the learner as an important part of the evaluation process. This is especially the case in nonformal education where learners are usually more responsible for their education than in the formal, traditional system. The ultimate decision as to the worthwhileness of the program will be whether or not it met the students' learning objectives.
3. Evaluation must be used for decision-making. Information must be obtained, but it must be used.
4. Evaluation data must be in a form to be used. It is one thing to have a pile of papers describing the outcome of a program. It is quite another thing to have the information in such a form to allow it to be used easily by decision-makers.
5. Evaluation information must be relevant to the decision to be made. The four areas of decision, as outlined above, require different types of information. Information for one area is not always totally relevant to all other decision areas.

Who should Evaluate?

Everyone involved in judging of the education program should be involved to a degree with the evaluation. Numerous leaders as well as individual learners are involved in the judgment of a program. Thus, each brings a certain distinct viewpoint and information base to bear on the program. When evaluation of the program is made it should involve these same people.

Students. Students are usually the last group considered for input in evaluation in formal education. They are evaluated, or at least they are tested and graded frequently, but they are not frequently considered to be part of the evaluation process *per se*. On the other hand, students should be on the forefront of evaluation. They must be involved in all facets of evaluation from need assessment through the final stage of evaluating the program.

Instructors. This group of people are usually the major evaluators in formal education. In nonformal education they play an important role of facilitating learning *and* evaluation. Their role is to aid the students to evaluate for themselves the achievement of their objectives and the objectives of the program. Instructors also must work with their superiors to evaluate the program from the viewpoint of the objectives of the sponsoring agency.

Sponsors. Sponsors are the public and private agencies that sponsor and supervise various educational programs. Evaluation for the sponsors, be they local, regional or national in scope is two-fold: 1) Closeness of fit between student needs and program objectives, and 2) The relative cost-effectiveness to meet the program objectives.

Others. Sometimes an outside expert in certain areas is asked to evaluate a program in terms of his or her expertise. This type of person usually evaluates a program in terms of the subject matter. Sometimes government officials who control the money make themselves evaluators. These are usually interested in benefits to the students and especially cost-effectiveness.

Regardless of the evaluators, the one group of people that must be involved is the participants. Throughout all these categories of evaluators the presence of the participants must be prominent. The result will be a better evaluation of the program and a better understanding for the participants as to where they are in mastery of the subject matter.

How Does One Evaluate?

Frequently informal evaluation is used to judge the effectiveness of a program. Informal evaluation is a judgment by an instructor or sponsor or even participant based on personal values, experiences, and information. These decisions are based on “casual observation, implicit goals, intuitive norms, and subject judgment.”⁷ The problem with this type of evaluation is that it is unsystematic; and it is open to all sorts of personal biases and prejudices thus rendering it almost totally subjective and hence unreliable for objective facts.

Formal evaluation requires “. . . explicit statements and objective measures as the base of the evaluations.”⁸ The problem with formal evaluation is that it costs more than informal evaluation, and it takes more time to do it adequately. However, if a program is to be adequately evaluated, it must be done through some objective, systematic way in order to have reliable results.

Experiments? *Experimental design is an unprofitable method for evaluation.* Formal evaluation for many people suggests some sort of experiment. Experimental evaluation requires the following conditions: 1) All units in the experiment must be randomly assigned to a treatment group or a control group; 2) “. . . treatment and control conditions must be applied and held constant throughout the experiment

⁷ Stake, 1967

⁸ M. C. Wittrock. The Evaluation of Instruction. *Evaluation Comment*. Vol. 1 (4) 1969: pp. 1-7

...,” 3) “All the students must receive the same amount of treatment . . .,” 4) One treatment group must be kept from contaminating another group with a different treatment; and 5) “. . . an instrument which is valid and reliable for the specified criterion variable must be administered after a certain [predetermined] period of time . . .” to all subjects in all the groups.⁹

The above conditions necessary for an experiment make the use of experimental evaluation almost a hopeless cause. Stufflebeam (1969) lists four distinct problems involved in trying to do experimental evaluation. They are (italicized in the original) as follows:

1. Experimental design “. . . conflicts with the principle that evaluation should facilitate the continued improvement of a program.” In an experiment one is not able to make mid-course corrections and changes. The major purpose of evaluation is for such corrections which experimentation rules out.
2. Experimental design is fine for use in final evaluation, i.e., for certification of the course, but it is useless for decision-making during planning and implementation *stages* of the program. All that an experimental design can do is tell if a program supports or does not support the experimental hypotheses. It cannot offer reasons for success or failure nor point to strengths or weaknesses of the program.
3. Experimental evaluation requires tight controls which are most easily cared for in the “pure” condition of an experimental laboratory. The numerous . . . “confounding variables must be either controlled or eliminated through randomization . . .” In most educational settings such controls and randomization is impossible thus providing very questionable internal validity to the study.
4. Assuming that the confounding variable can either be controlled or eliminated through randomization, the results would have high internal validity but would lack generalizability. In the real world those extraneous variables could not and would not be controlled and hence would be actively involved in the educational setting.

Standardized Tests? The use of *standardized tests is unwarranted in evaluation*. Often evaluators are tempted to look for some sort of standardized test to use as a major source of information for evaluation. Skager (1971)¹⁰ provides several reasons why their use is inadequate for evaluation: 1) These kinds of *tests* usually have “. . . a low degree of overlap to the actual objectives of instruction at any given time or place.” Standardized tests are constructed to measure generalizable skills not specific ones. 2) “Standardized tests are not useful as aids in the planning of instruction, particularly the specification of instructional objectives.” These tests do not provide specifics for developing objectives for either the instructor or the participants. 3) “Standardized *tests* often require skills or aptitudes that may be influenced to only a limited degree by experience in the classroom.” Rarely do such tests reflect the capacities related directly to particular classroom instruction. They are made to be insensitive to short-range instruction and even long-range, too. Finally, 4) “Standardized tests do not indicate the extent to which individuals or groups of students have mastered the spectrum of instructional objectives.” The use of standardized tests is inadequate to provide the kinds of information needed for proper evaluation.

⁹ Daniel L. Stufflebeam. Evaluation as Enlightenment for Decision Making. In A. Walcott (ed). *Improving Educational Assessment and An Inventory of Measures of Affective Behavior*. Washington, DC: Association for Supervision and Curriculum Development, 1969.

¹⁰ R. W. Skager. The System for Objectives Based Evaluation. *Evaluation Comment*. Vol. 3 (1) 1971: pp. 6-11

Design for Evaluation

Stufflebeam's (1969) general design for developing an educational evaluation program is quite clear in its steps. The logical structure of evaluation design is the same for all types of evaluation. The parts, briefly, are as follows:

Focusing the Evaluation:

1. Identify the major level(s) of decision-making to be served, i.e., local, state, and/or national.
2. For each level of decision-making, project the decision situations to be served and describe each one in terms of its locus, focus, criticality, timing, and composition of alternatives.
3. Define criteria for each decision situation by specifying variables for measurement and standards for use in the judgment of alternatives.
4. Define policies within which the evaluation must operate.

Collection of Information:

1. Specify the source of the information to be collected.
2. Specify the instruments and methods for collecting the needed information.
3. Specify the sampling procedure to be employed.
4. Specify the conditions and schedule for information collection.

Organization of Information:

1. Provide a format for the information which is to be collected.
2. Designate a means for coding, organizing, storing, and retrieving information.

Analysis of Information:

1. Select the analytical procedures to be employed.
2. Designate a means for performing the analysis.

Reporting of Information:

1. Define the audiences for the evaluation reports.
2. Specify means for providing information to the audiences.
3. Specify the format for evaluation reports and/or reporting sessions.
4. Schedule the reporting of information.

Administration of the Evaluation:

1. Summarize the evaluation schedule.
2. Define staff and resource requirements and plans for meeting these requirements.
3. Specify means for meeting policy requirements for conduct of the evaluation.
4. Evaluate the potential of the evaluation design for providing information which is valid, reliable, credible, timely, and pervasive.
5. Specify and schedule means for periodic updating of the evaluation design.
6. Provide a budget for the total evaluation program.

All of the steps outlined in the design for evaluation, Figure 2, are important. The one that is perhaps the most crucial also seems to be the one that gives the most trouble for the evaluation to know what to do. This is the collection of information step. If this one is done inadequately probably nothing can save the evaluation from being inadequate, too. Earlier we stated that experimental methodology and standardized tests were not adequate ways to collect information for evaluation, especially for those in nonformal education. What follows is a relatively simple but effective method to allow nonformal evaluators to obtain information more readily and in a manner

that they can understand. We have adapted an evaluation model developed by Stake (1967)¹¹ and added to it questions taken from Knowles (1970).¹²

Description, Standards, and Judgments

Descriptive information is required before we can make a judgment in educational evaluation. However, description of an educational experience apart from a judgment regarding its value, merit, or effectiveness is not evaluation.

Description, Standards, and Judgment are all necessary in order to have adequate evaluation. By description we mean the detailing of the elements in an educational experience and their interrelationship. These elements are very broad, but they include a description of the student before, during, and after the educational encounter, a description of the instructor, a description of the relationship between students and instructor experiences. Standards are the criteria used in making judgments of the educational experience. In order to make judgments, the standards or measures to be used in the judging need to be explicitly stated. For example, if a program on tractor repair was to be evaluated, the standards stated at the planning stage of the program might be that all students are to be able to fix a certain specified number of malfunctioning parts on a given tractor so that the tractor can function without breakdown for five minutes. The idea is to make as explicit as possible the standards used.

Rationale. Part of every educational program should be some statement of rationale. The rationale is a general purpose statement of how a particular program fits into the overall educational program for a certain community and country. It provides a general check on the evaluation of the entire program. If a program's rationale is to develop national unity by teaching literacy, then it would be wise to teach a language that would help to achieve that.

Judgments are the decisions regarding the educational experience in terms of value, merit, and effectiveness. The judgments are based upon the objective descriptive data. All those involved in the evaluation as listed previously should be involved in making the judgment. In the final analysis, however, persons directly responsible for the evaluation must come to a decision regarding the educational program. They cannot escape the decision if they are to do a thorough evaluation.

Methodology for Collecting Information. In order to evaluate adequately, the evaluator must have readily available the descriptive information in which to make his or her judgment. The evaluator and those who will make final decisions will have to have the necessary information in a form they can use, which means as concise as possible. To determine that information we suggest the model outlined by Stake that includes rationale, and then intents and observations, standards, and judgments linked by antecedents, transactions, and outcomes.

Intents are those elements which are planned for in terms of student characteristics, student behavior, environmental conditions, demonstrations, and coverage of certain subject matter in certain specified ways. All the intended goals, effects, and plans for, anticipated, and/or feared go in the Intents column, including the students own impact in all those areas.

¹¹ Robert Stake. The Countenance of Educational Evaluation. *Teachers College Record*. (68) 1967, p. 530

¹² Malcolm Knowles. *The Modern Practice of Adult Education: Andragogy vs Pedagogy*. New York: Association Press, 1970.

Observations are the characteristics of the educational experiences that actually occur and are recorded by those involved in the evaluation. Anything that will provide accurate measurements at reasonable cost could be used to obtain the observations. Various performance tests, interviews, attitude surveys, and projects as well as unobtrusive measures are all possible ways to observe. Unobtrusive measures are quite important in observation activities since the students do not realize they are being tested or observed for evaluation and sometimes even the instructor doesn't know. The result is less contamination of the data by those being observed.¹³ The idea is to make the observation so natural that it is not detected by those being evaluated.

Antecedents are any condition “. . . existing prior to teaching and learning which may relate to outcome.”¹⁴ They are factors such as the students' and teachers' social and economic status, previous experience, students' motivation and intents, community resources, peer attitudes, and so on. In sum, antecedent is all the physical, social, and psychological elements that students, instructors, and sponsors bring to the educational event.

Transactions are the various ways in which students and instructors and students and student interact with the educational setting. They are the dynamic interactive encounters and relationships of people with people and with things in the educational environment.

Outcomes are the actual effects on the student, the rest of the educational system including instructors, administrators, and society.

In brief, we have described the particular kinds of information for each of Stake's elements. How one gathers that information is an important step. One must ask the right questions or one will not have the proper information. If the correct questions are asked in the Intention column they can be used throughout the other three columns: Observations, Standards, Judgments with only slight modification. (The following questions are adapted from Knowles, 1970).

Rationale Questions:

1. Has the present statement of purpose been reviewed within a reasonable period of time? Does it delineate the role of adult education in the institution clearly? Does it specify the long-run goals and constituency clearly? Does it express a philosophy of education that is congruent with modern knowledge about adults as learners? Are the purposes significant and relevant in the light of contemporary conditions?
2. Does it define purposes relevant to contemporary needs and conditions?

Intended Antecedents:

1. Have surveys of these needs and interests of individuals, organizations, and communities been made within a reasonable period? Is some individual or group taking responsibility for sensing changing needs and interests from contacts with community leaders, the mass media, and professional literature? Are the techniques we are using for the collection and analysis of data about needs and interests keeping up with advancing survey technology? Do the assessed needs include predicted future needs as well as identified present needs?

¹³ See Eugene Webb, Donald Campbell, Richard Schwartz, and Lee Sechrest. *Unobtrusive Measures: Non-reactive Research in the Social Sciences*. Chicago: Rand McNally, 1966.

¹⁴ Stake, 1967

2. Have the objectives been reviewed within a reasonable period of time? Are they clearly related to assessed needs?
3. Is the desired clientele clearly defined? Is the present promotion program recruiting this clientele? Is the promotion campaign adequately planned and efficiently carried out? Do the promotion materials accurately reflect the quality and spirit of the program? Do they help to set the proper expectations and climate for learning? Are the various media being used appropriately and effectively? Are the results of the various elements of promotion evaluated adequately? Is the program being adequately interpreted to the public?
4. Is the staff personnel adequate in number to the needs of the program? Are all necessary staff services performed? Is there adequate differentiation and yet flexibility in role definitions? Is there a spirit of teamwork? Are staff members involving participants and committee members in sharing responsibilities and rewards imaginatively? Are there good working conditions, adequate salaries, and sound personnel policies and practices? Are staff members paying adequate attention to their own continuing self-development? Are they good role models for continuing learners?
5. Are the criteria of selection clear, adequate, and in keeping with principles of andragogy? Are they applied? Is compensation on a professional basis? Is it competitive with other institutions? Are new instructors and leaders given adequate orientation and individual coaching? Is adequate in-service training and supervision given the entire faculty? Do they perceive it as a program of continuing self-directed self-development? Is the performance of faculty members periodically assessed?
6. Are the meeting rooms adequate in number, size, flexibility, comfort, and attractiveness? Are leaders and instructors helped to arrange rooms for maximum informality and interaction? Are the lighting, ventilation, and storage facilities adequate? Are the physical facilities maintained in good condition? Is there adequate instructional equipment? Is it properly safeguarded and maintained in good condition? Is the faculty given sufficient help in using it well? Is provision made for the replacement or renewal of physical facilities before they deteriorate? Are the space and equipment used as close to the capacity as is practicable? Are the office facilities adequate, attractive, and efficient?

Intended Transactions:

7. Are participants treated with warmth, dignity, and respect at all points of contact? Is the rich experience of participants being made use of to the full extent possible in policy-making, planning, management, learning, and evaluation? Do we know in what ways the participants feel they are being treated as more and less adult in their experience with us?
8. Is a sense of line provided by a dynamic theme, activity sequences, and time schedule? Does an interesting space pattern emerge from the rhythm of activities, varying depth of activities, control of size of activities, etc? Is the tone of the program one of warmth, varying emphases, and personalization? Is the color of the program bright and warm, as conveyed by publicity materials, the arrangement and decoration of physical facilities, and the personnel? Is the texture of the program interesting, rich, and functional? Does the design make use of a variety of formats for learning appropriately? Does the program design have a sense of unity, balance, and integration?

Intended Outcomes:

9. What will the students be expected to *do* when they finish?

10. What will the students be expected to *be* when they finish?
11. What will the students be expected to *know* when they finish?

Processing the Information

The information in Stake's model is still unwieldy to handle easily. There are two ways to make the task of analysis easier. Both need to be used to do a complete job of evaluation:

The first way is to find the contingencies or links between antecedents. "The evaluator's task is one of identifying outcomes that are contingent upon particular antecedent conditions and instructional transaction."¹⁵ The evaluator asks whether or not it is logical that the intended antecedents would allow the intended interactions to occur to produce the intended outcomes. After the educational experience has been completed, the observed antecedent transactions and outcomes are also examined to see if what seemed logical in the planning stages actually (or empirically) occurred. Evaluation of *intents* focuses on the logic of the relationships; evaluation of observations focuses on the empirical relationships.

The second way to find the congruence between intents and observations. The data are *congruent* if what was intended actually happened. To be fully congruent the intended antecedents, transactions, and outcomes would have to come to pass.¹⁶

Factors Affecting the Quality of Description

The following factors or criteria are important to the quality and usefulness of the descriptive data. Note that all factors are relative, in that no absolute is achievable. The effectiveness of the subsequent evaluation is apt to be increased as these criteria are increased:

Explicitness
Thoroughness
Representativeness
Objectivity

¹⁵ Stake, 1967, p. 512.

¹⁶ Ibid.