HERE'S A FRAMEWORK DESIGNED TO HELP YOU IDENTIFY EVALUATION ALTERNATIVES . . .

EVALUATING TRAINING

BY KAREN S. BRETHOWER AND GEARY A. RUMMLER

Most discussions of training evaluation we hear are not very satisfying. Nothing is ever resolved because each discussant seems to be talking about evaluating a different dimension of the training. When people can't agree on *what* they are trying to evaluate and why, they actually won't agree on *how* to evaluate.

In this paper we would like to present a framework for viewing evaluation alternatives and deciding what evaluation is appropriate. Included also are some guidelines for conducting evaluation studies.

Evaluation and the General System Model

A number of aspects of training might be evaluated. The range of reasonable alternatives is suggested by a general systems view of training, which shows the relationship between the training function and the organization it supposedly services. Figure 1 (p. 16) illustrates the key components of an ideal training system, consisting of the receiving system (in this case, the jobs or organization) and the processing system (the training function). The specific systems components are:

1. The inputs into the system (students or trainees).

2. The processing system, which converts inputs into outputs. Depending on the system in question, the processing system might be an instructional lesson, a classroom, a course, or a training department.

3. The outputs of the processing system (trained, or educated, students or trainees).

4. The receiving system, which is the area or unit into which the outputs immediately go. For a company apprentice program, the receiving system is the job. The processing system and the receiving system are always subsystems of some larger system (e.g., the school, the agency manpower planning system).

5. The mission goal, or stated goal, of the receiving system. This might be "All claims honored within X days with Y errors" where the receiving system is the claims office of an insurance company and the processing system is the training course for claims representatives.

6. The evaluation of the accomplishment of the stated mission goal (e.g., percentage of claims paid correctly within the stated time). This evaluation consists of measuring the output of the receiving system and matching that output against the stated criteria for the mission.

7. The evaluation of the quality and quantity of the outputs of the processing system (e.g., degree of mastery at the conclusion of the Claims Representative course). This evaluation requires measurement of the processing system outputs and their comparison with the product criteria.

8. The feedback to the processing system on the outputs of the processing system and attainment of the mission goal. Based on this feedback, adjustments can be made in the processing system itself, in the criteria for product of the system, or in both. For example, feedback might indicate that even though Claims Representatives did exceptionally well in their class,

Claims Representatives were deficient in knowledge that they were thought to have acquired in that class. Based on more specific data, it might be necessary to alter the content of the course, to raise the performance standard, or to do both.

The training function has these systems characteristics:

1. Its output is the input to another part of the system. It does not function in isolation. It must contribute to the larger, total system. If it does not contribute, then it will cease to function. Also, any attempts to maximize its output or effectiveness will be neutralized by the need for the total system to optimize all the subsystems. (Specifically, this is done through budget allocations.)
2. It responds to data. It must be correct. It must adapt or die.
3. It is controlled by the evaluation *criteria*, as it adapts. If it is evaluated on the basis of headcount and popularity, all adjustments will be made accordingly. If it is evaluated on its performance and contribution to the organization, it will correct toward that goal.

System Sophistication

Figure 2 (p. 16) illustrates three degrees of system sophistication, which point up the relative effectiveness of training organizations. The simple input-output training systems are characterized by those training departments that do no evaluation and pride themselves on having unlimited budgets. These are the training organizations that disappear in strenuous economic times because they are unable to show any apparent value to the organization when asked. They always cry "foul," explaining that they were never required to justify their existence before.

A more sophisticated system, the guided system, is still deficient, though somewhat better off. It evaluates its output. If it evaluates according to performance criteria ("Can the trainees *do* what we set out to have them do?"), then it may very well be an effective training organization. But if it chooses to evaluate (or gets lulled into evaluating) according to the criteria of the amount of training activity (e.g., bodies trained per budget dollar) and its popularity (e.g., "Did you enjoy the training? Do you think you will find it useful?"), then it is a little better off than the less sophisticated ballistic system. That is, its own internal evaluations do not measure what the organization needs.

Karen Brethower

"Evaluation is frequently thought to be too difficult to do in the real world. Sometimes it is done in a way that undermines its utility."

Thus, the only truly effective training system is one based on the adaptive system model. Without the receiving system in the loop, there is no way of assessing whether the products of this training function (however good they might be by behavior-change standards) are of any *value* to the organization.

Geary Rummler

"Most of the training evaluation today is classified as action *research. That is, the research occurs in a real situation with all the constraints imposed by the organization going about getting its work done."*

Thus, a general system view of the training function or of a particular training course or experience exposes a number of dimensions which might be evaluated. Figure 3 combines four of the possible evaluation alternatives with the general systems model of training.

An evaluator might evaluate at any one of these four levels to determine whether the training is having the desired effect. The training action in response to the evaluation can be of two major types. He/she can:

1. Decide to continue or discontinue the training (summative evaluation); or
2. Decide to continue the training as is, or to revise any aspect of the training system until it meets the criteria (formative evaluation).

If the evaluation information is to be used to revise the training it must be much more detailed as to specific aspects that worked or failed.

Evaluation Matrix

From the four levels of evaluation we have identified, we can form the evaluation matrix shown in Figure 4 (p. 16). For each level we can ask:

1. What question(s) do we want answered?
2. What might we measure to answer those questions?
3. What are the dimensions of learning or performance we are trying to measure?
4. What are the sources of the data to help measure?
5. What are alternative ways of gathering data for measurement?
6. What are the evaluation criteria we want to apply to each question?

Figure 5 (p. 16) is a partially complete matrix for one type of teaching activity, a management workshop. In the first column, alternative explanations of the "why not" have been made explicit

for the workshop, e.g., I — "unhappiness" might emanate from the concepts not being relevant, inapropriate workshop (WS) design, or pre-workshop setting of expectations. The entries in each cell would vary depending on the course and the situation.

There are several practical applications of the evaluation matrix. The first and most obvious one is as a guide to systematically determine *what* and *how* to evaluate training at the four levels.

However, a second application (which should be obvious to those readers who engage in performance analysis or front-end analysis) is a test for the existence of a real problem which can be corrected by training (or anything else). For example, if someone in your organization has approached you to develop a report writing course and you are reviewing how such a course might be evaluated prior to designing it, you might quickly see how you would evaluate at levels I and II. However, if you sat down with the party requesting the training to discuss how you might measure levels III and IV, chances are you would find them unable to help with IV because in fact there is no relationship between the perceived deficiencies of report writing and job performance. Or perhaps there is. The point is, thinking through the evaluation matrix prior to beginning the training effort is one method to approximate a front-end analysis.

Figure 1.

A MODEL OF A GENERAL SYSTEM APPLIED TO EDUCATION

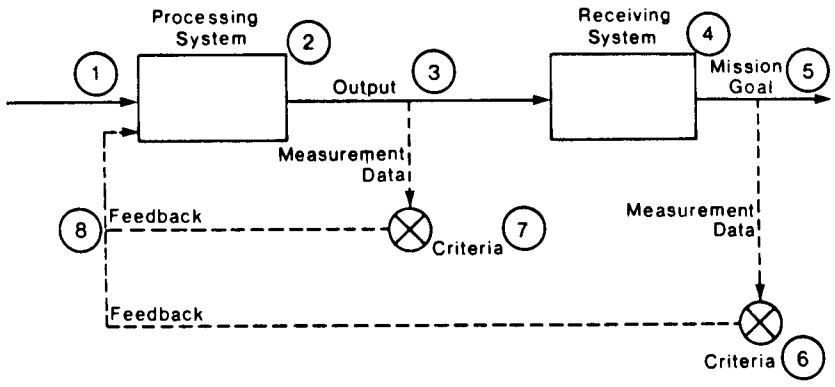
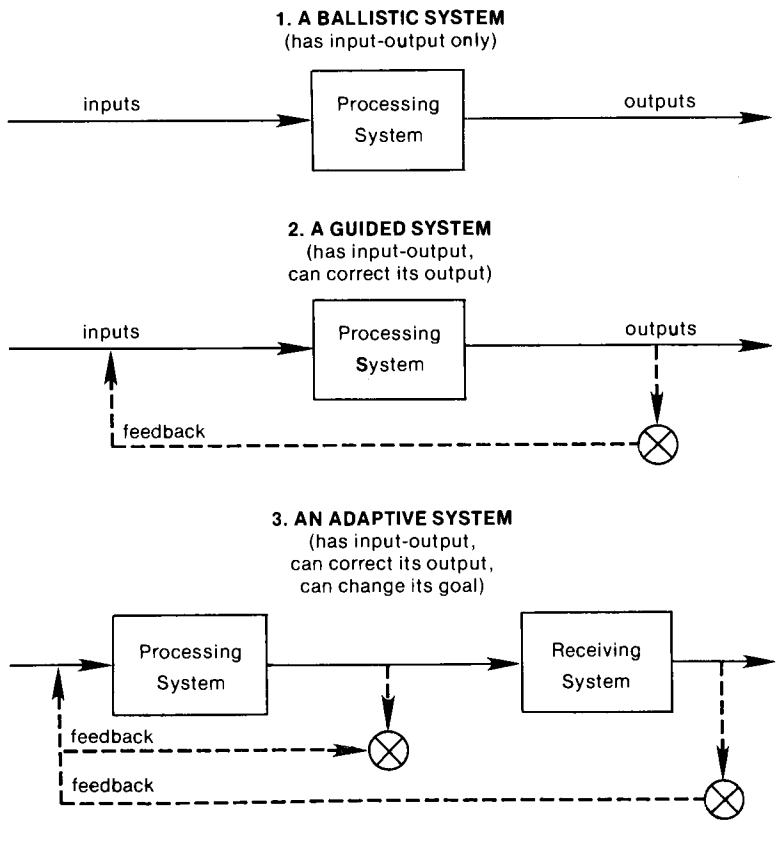


Figure 2.

GENERAL SYSTEMS MODELS



The third practical application of the matrix is as a vehicle to gain organization support of a training effort. For example, you are approached to develop a training course on a "quality control" matter. Again, levels I and II should offer you no trouble. A discussion of evaluating III and IV with the management requesting the training will point up the need for management support of the trainees using the new skills or concepts on the job. The matrix makes it clear that all the training in the world around quality will be to no avail unless management takes the necessary steps to assure that use of these concepts will be supported on the job. In fact evaluation results that show passing grades at level I and II and failing grades at III and IV are an indictment of management, not the trainees or the trainers.

And that leads to application four — the use of the matrix to negotiate the degree of evaluation required. Frequently there is a mismatch between the expected or desired degree of evaluation by the requesting party and the training group. The matrix can help clarify how much (to what degree) evaluation is necessary or worth investing in.

Thus far, we have presented a model for training evaluation and some propositions related to that model. The propositions are:

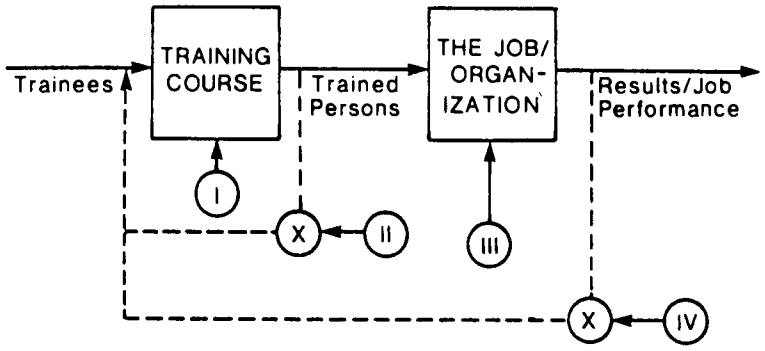
1. The training system be viewed as a subsystem of the total organization.

2. There are four potential levels of evaluation.

I. Do trainees like the train-

Figure 3.

FOUR LEVELS OF EVALUATION



I. Are the trainees happy with the course?
II. Does the training course teach the concepts?
III. Are the concepts used on the job?
IV. Does the application of the concepts positively affect the organization?

ing?

II. Do trainees learn from the training?

III. Do trainees use what they learn?

IV. Does the organization benefit from the newly learned performance?

3. For each of these degrees of evaluation, there are basic considerations that need to be made for evaluation. These are listed in the EVALUATION MATRIX presented in Figure 5 (p. 18).

While a model is very important, it provides no benefit unless it is used in some way. The rest of this article will deal with issues in actually conducting evaluations.

Evaluation is frequently thought to be too difficult to do in the real world. Sometimes it is done in a way that undermines its utility. We, therefore, offer some suggestions for making evaluation easier and more useful.

Suggestion 1: Be sure to describe all crucial elements in your training activity, not just program content.

Suggestion 2: Choose an evaluation design that fits your situation.

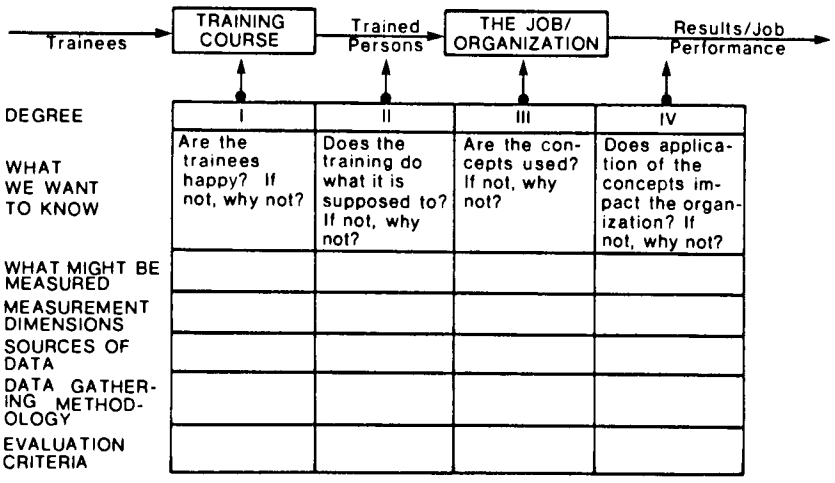
Suggestion 3: Seek out naturally occurring opportunities for evaluation.

What follows is a discussion of each of these suggestions.

Documentation of Conditions Surrounding Training

Needless to say, when evaluating job performance application and organizational impact, it is critical to specify *what* is being

Figure 4.



DEGREE	I	II	III	IV
WHAT WE WANT TO KNOW	Are the trainees happy? If not, why not?	Does the training do what it is supposed to? If not, why not?	Are the concepts used? If not, why not?	Does application of the concepts impact the organization? If not, why not?
WHAT MIGHT BE MEASURED				
MEASUREMENT DIMENSIONS				
SOURCES OF DATA				
DATA GATHERING METHODOLOGY				
EVALUATION CRITERIA				

evaluated. If not, it makes both evaluation and transfer very difficult.

Example: A training program is tried out on a pilot basis and proves to be very effective as measured by desired changes in job performance measures. The program is then adopted organization-wide, but does not yield nearly as positive results. Why? In many cases, some crucially important aspect of the pilot situation was overlooked, and therefore not replicated in the other parts of the organization. The content and format of the training program itself are almost always described in great detail. However, some equally important aspects are often underrated. Each of the following conditions might have been critical to the process of the pilot but not specified as a necessary condition.

Before and During Training:

Support

1. The program was introduced and supported by top management of the organization.

Perceived Need

2. The organization came to its own conclusion that it needed the training.

Group Make-up

3. Group make-up within training sessions is a special family group. For instance, X level manager and his or her direct or indirect reports experience training at the same time (and thereby share the vocabulary and opportunity to apply and provide mutual support to one another).

Scheduling

4. The program ran for 10 days — but the 10 days were spread over 10 weeks with extensive on-the-job application in between.

Location

5. It may be important that the program take place off-site (away from interruptions) or on-site (where work materials are easily accessible).

After Training:

Measurement

6. On-the-job application of learned behavior was measured.

Tools

7. Tools for on-the-job application were provided.

Opportunity

8. Trainees were placed in situations allowing for on-the-job application of learned behavior immediately posttraining.

Ongoing Training

9. Personnel who entered the organization after the initial training are trained.

Communication of Success

10. Successful application of trained behavior is communicated throughout organization.

A good guide to what needs to be in the description of the training

Figure 5.

EVALUATION MATRIX*

What We Want to Know	What Might Be Measured	Measurement Dimensions	What To Look At (Sources of Data)	Alternative Data Gathering Method	Evaluation Criteria
I. ARE THE TRAINEES HAPPY? IF NOT, WHY? a. Concepts Not Relevant b. WS Design c. Trainees Not Properly Positioned	Trainee reaction during workshop	Relevance Threat Ease of learning	Comments between trainees Comments to instructor Questions about exercises "Approach Behavior" to exercises	Observation Interview Questionnaire	
	Trainee reaction after workshop	Perceived "Worth" V - Relevance; or C - Learning Energy	"Approach Behavior" to project Questions about project, concepts	Observation Interview Questionnaire	
II. DO THE MATERIALS TEACH THE CONCEPTS? IF NOT, WHY NOT? a. WS Structure b. Lessons —Presentation —Examples —Exercises	Trainee performance during workshop	Understanding Application	Learning time Performance on exercises Presentations	Observation Document review	
	Trainee performance at end of workshop	Understanding Application Facility Articulation	Action plan for project Use of tools on exercises Presentations	Observation Document review Interview Questionnaire	
III. ARE THE CONCEPTS USED? IF NOT, WHY NOT? a. Concepts: —Not relevant —Too complex —Too sophisticated b. Inadequate Tools c. Environment Not Supportive	Performance Improvement projects*	Analysis Action plan Results	Discussions Documentation Results	Observation Interview Document review Questionnaire (critical incid.)	
	Problem solving technique*	Questions asked Action proposed Action taken	Discussions Documentation Results	Observation Interview Document review Questionnaire (critical incid.)	
	On-going management approach*	Dissemination effort Language People management process	Discussions Meetings Documentation	Observation Interview Document review Questionnaire (critical incid.)	
IV. DOES APPLICATION OF CONCEPTS POSITIVELY AFFECT THE ORGANIZATION? IF NOT, WHY NOT?	Problem solving*	Problem identification Analysis Action Results	Discussions Documentation Results	Interview Document Review Questionnaire (critical incid.)	
	Problem prediction and prevention*	Potential problem identification Analysis Action	Discussions Documentation Results	Interview Document Review Questionnaire (critical incid.)	
	Performance measures* *Specific to a particular workshop	Output measures Interim or diagnostic measures	Performance data	Document review	

Figure 6.
UTILITY OF RESEARCH DESIGNS IN THE "REAL" WORLD

Designs	Applicability to Training Evaluation	When to Use
CONTROL GROUP	Low	Very high cost program with support from high enough in the organization to hold *organization-controlled* factors constant in both groups.
REVERSAL (ABA)	Medium	As circumstances lead to stopping a critical element of the program (strike, workload influx, new manager, etc.)
MULTIPLE BASELINE	High	Any time you can get agreement on implementing the program area-by-area throughout the organization, rather than all at one time.
"BEFORE AND AFTER" MEASUREMENT	It Depends	When there are no other possible factors influencing performance and/or it is impossible to use one of the other designs.

and situation is a document called "Request for Development of Training."

From Concept to Practice:

To this point, we have presented several concepts important to evaluation:

1. The General Systems Model of training.
2. The Evaluation Model with its four degrees of evaluation.
3. The Evaluation Matrix.

Assuming that the decision has been made as to what questions to ask, some decisions still face the evaluator. How formal does the evaluation have to be? Will the organization allow evaluation activity? As with any other question, common sense is a large part of the answer to this one — the evaluation need be as extensive as necessary to convince whoever is the decision-maker. That will differ in each case, and one tries to do only as much as is necessary to make an informed decision.

In addition to common sense, there are several practical tactics that may help you in evaluation. There is one historical pitfall of training evaluation. That is, if a perfect laboratory type evaluation can't be done, then the organization falls all the way back to happiness index. In fact, there are a number of possible research designs for Degree III and IV evaluation which fit the dynamic nature of organizations and can often be used. In addition to the designs, some guides to converting *barriers* to evaluation into *opportunities* for evaluation will be suggested.

Some general suggestions for doing evaluation in the "Real" world:

1. Accept the fact that the evaluation will probably not be as clear-cut as laboratory research.
2. For purposes of formative evaluation research (in order to improve the training), limit yourself to a relatively small pilot group over which it is easier to gain control and get detailed information.
3. Conduct the simplest evaluation possible to answer the questions that the organization needs to have answered.
4. Take advantage of naturally occurring research opportunities.

Evaluation Designs For the "Real" World

Most of the training evaluation today is classified as *action* research. That is, the research occurs in a real situation with all the constraints imposed by the organizations going about getting its work done. This is particularly relevant to levels III and IV of the evaluation in which job performance and organizational value of job performance are the foci of the evaluation. It is crucial that levels III and IV be evaluated in the reality of the organization rather than in the laboratory. However, it is difficult to engineer and enforce all of the conditions necessary to the proper use of laboratory research design in the field setting. Some of the problems encountered in level III and IV evaluation and some suggestions for dealing with these problems are offered here.

A summary of several research designs and their applicability to level III and IV evaluation are presented in Figure 6.

Control Group Research Design:

While one group receives training a *comparable* group does not receive the training. Each group is measured to see what the effect of the training has been.

Difficulties encountered in the

"Real" World:

It is difficult to find two *naturally* occurring groups that just happen to be comparable on the relevant dimensions. A group may be able to be selected in such a way as to provide comparability. Even when two such groups can be identified and used as the experimental and control group, the probability is very low that there will be identical environments and experiences for each group, so that training is the *only* variable that changes. One of the groups is very likely to have some important change occur — a local economic change, a local weather influence or an unpredicted influx of business.

Suggestions:

Use a control group to evaluate the on-the-job application and organizational impact of training only when the evaluation is seen as important enough to take extraordinary measures to ensure the continuing comparability of the groups. (Even then, factors outside your control may undermine the comparability.) Otherwise, seek other alternatives for evaluation.

Reversal, or ABA Research Design:

In a reversal or ABA design one evaluates by:

1. Taking a baseline measurement (how do things look now).
2. Implementing the training and measuring its impact (how do things look after training).
3. Return to the original condition by removing the training and measure (how do things look without the training).

The ABA design is intended to guard against the erroneous assumption that because two events occur at the same time one of the events *caused* the other. In other words, the fact that sales increased at the same time that a sales training program was conducted does not necessarily mean that the training *caused* the increase in sales — it might have been due to any number of other factors, such as the major competitor going on strike. If training caused the improved performance, then ceasing to train people should lead to deterioration of performance.

Difficulties encountered in the "Real" world:

If any action is implemented and there is an improvement in measured performance that can *logically* be tied to the action, it is very difficult to find a management group that is willing to stop doing what they think has caused the improved performance.

Suggestions:

Seek out opportunities to use an ABA design due to naturally occurring changes that lead to removing the training or other practice being evaluated.

Multiple Baseline:

In a multiple baseline design, the same program is used with different groups at different times. The design is an attempt to determine whether the change in performance is *caused* by the training or just concomitant (occurs at the same time) with the training:

Example: A training program is begun January 1st in Region A,

and yields a 17 per cent performance improvement. The same program is started February 1st in Region B and yields a similar performance improvement. This pattern is repeated March 1st in Region C, and April 1st in Region D. By starting the programs at different times, rather than all at once, factors such as changes in the marketplace, workload, quarterly business cycle, and personnel intake are spread. If, in each of four regions, the introduction of the training program leads to improved job performance, then one can attribute the change in performance to the training program with more certainty than if only one region had shown such an improvement.

Difficulties encountered in the "Real" World:

Organization may not be willing to spread out the introduction of something that has been proven successful in the pilot setting.

Suggestions:

The decision to introduce progressively by area, rather than introducing the program everywhere at once, may be necessitated by the lack of staff to do it all at once. Or, one may be able to make the argument that careful high quality introduction more than compensates for the loss incurred by not installing the program all at one time.

"Before and After" Measurement:

Performance is measured *in the relevant job setting* before the training and again after the training. Note that this differs from a pretest-posttest design in that the performance is being measured *on-the-job* rather than in the classroom.

Difficulties encountered in the "Real" World:

The major difficulty is a limitation in interpreting the results. A change in performance might be attributed to training. It could equally well be attributed to any other change occurring during that same time.

Suggestions:

Use this design only as a last resort, but if you do use it, try to have a detailed log of any changes which might be tied to the measured performance.

In summary, different situations lend themselves to different designs. Choose the one that is best suited to the current circumstances; and then try to build in the necessary conditions for the design to yield valid data.

Naturally Occurring Research Opportunities

In addition to an evaluation design — conceived in the purity of an office atmosphere — there are often changes during a project which lend themselves to evaluation. Since the chance to conduct evaluation is limited, it is important that we learn to recognize these opportunities. Naturally occurring research opportunities present themselves very frequently. Unfortunately, these opportunities are often doing an excellent job of masquerading as barriers. It is the wise evaluator who can demask the barrier to find the subtle opportunity that lies beneath. The barriers/opportunities are situational, so no cookbook of hard-and-fast decision rules for conversion can be provided; but some examples are included as thought-starters.

Situation: Loss of Support

The person who was in charge of a group when training first was implemented gets promoted out of the area.

Barrier Interpretation

The support generated has been lost, and thus there is no point in continuing evaluation activities.

Opportunity Interpretation

Whereas previously the opportunity was to evaluate the program with a manager who followed the program through, there is now an opportunity to:

1. Evaluate the transferability of the program across managers.
2. Determine what different types of support building mechanisms are necessary when the manager inherits an ongoing program (than when

he/she is there during start-up).

3. Determine if the program is applicable to the promoted manager's new area, whether it will be implemented and if so, what different kind of support (if any) is necessary.

Situation: Modification

People running the program have deviated from the original design in some way (changed the format; an example: the time frame, etc.).

Barrier Interpretation

They're not using the program as designed, so there's no point in conducting an evaluation.

Opportunity Interpretation

1. There is an opportunity to evaluate the program *with* the modification.
2. Whether or not the modification "works," it would be very important to the interpretation and use of evaluation results to find out *why* the modification was made. If the original design was felt to be unsatisfactory by this group, it might be unsatisfactory to other users for the same reason.

Situation: Interruption

The program is interrupted for some reason (vacations, illness, personnel change, temporary crisis, etc.).

Barrier Interpretation

This try-out of the program has been rendered useless since it has been interrupted.

Opportunity Interpretation

This is a naturally occurring opportunity for an ABA design.

1. Continue to measure during the interruption to see if performance is maintained or drops off.
2. One would also want to check to see what new activities or priorities would logically be interfering with use of measured performance at this time.
3. Likewise, one would need to check to see what new or unusual support was being given to the measured performance at this time.

You will undoubtedly run into barriers/opportunities that are different from those presented here. The important thing is to constantly be on the lookout for conditions that allow for a type of evaluation that you feel is needed. Secondly, be alert whenever you curse a barrier that impedes evaluation (according to the original plan). It just may be an opportunity to do a different and equally useful evaluation.

Summary

We have proposed a model for evaluation and suggested some ways of increasing the ease and opportunity to do evaluation.

If these ideas are used, it should lead to:

1. More clarity about *why* a given evaluation is being conducted.
2. More flexibility in evaluation design.
3. More evaluations that examine whether anything was learned, whether anything was used and whether that produced an organizational impact.

The better impact is measured, the easier it is to discuss the contributions of training to the critical results of the organization.

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Special Professional Development Issue

Increasing Your Effectiveness as a Training and Development Professional — Page 3

THE PROFESSIONAL ORGANIZATION AS A LEARNING COMMUNITY
MALCOLM KNOWLES PROVIDES THIS MONTH'S GUEST COMMENTARY . . .
PAGE 36

RESEARCH: AN HRD ACTIVITY AREA
"THE CORE OF THE HRD FIELD IS IN LEARNING" — LEN NADLER
PAGE 60

DEVELOPING PROFESSIONAL SKILLS AND EXPERTISE
"THE KEY IS A MIXED BACKGROUND OF INTERDISCIPLINARY EDUCATION AND EXPERIENCE" — GORDON LIPPITT
PAGE 66

TRAINING PROFESSIONAL ACTIVITIES INVENTORY — PAGE 6

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MAY 1979
VOL. 33, NO. 5
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TRAINING AND DEVELOPMENT JOURNAL

FEATURES AND ARTICLES:

PAGE 41

PAGE 87

ASTD PROFESSIONAL DEVELOPMENT COMMITTEE – "THE PAST AND THE FUTURE"

PAGE 89

1978 ASTD Award Winners

PAGE 97