

Evaluating CBT Evaluation

Before making that crucial (and costly) decision to install computer-based training, you'd better make sure proper evaluation practices are firmly in place.

What if CBT has effects that exist *outside* the carefully defined behavioral objectives?

By RICHARD A. McEWING and GENE L. ROTH

As shiny new systems shoulder their way into the training room, trainers must carefully measure the impact. Does computer-based training (CBT)—for all its innovation and, yes, charm—really beat the cost/benefit of traditional training ways?

A formal evaluation plan is essential. The first element to consider when structuring such a plan is timing. When should the evaluation take place? Process-oriented evaluation of CBT occurs during each implementation stage. This permits modification of CBT at the moment the need is identified. Product-oriented evaluation occurs at the conclusion of a portion of the training or at the end of the entire program. This evaluation determines whether the CBT worked as expected; it relates the CBT to the overall effectiveness of training.

Both types of evaluation are important and must be incorporated into the plan. Trainers must be able to make on-the-spot modifications to hardware, software or instructional design. Thus, the significance of process evaluation. Product evaluation is equally important. It may be used not only to refine a CBT

component, but also to help determine the nature and value of the total CBT program.

Another element to consider is who will conduct the evaluation. Will it be done by the trainers or by consultants? Internal evaluators possess greater familiarity with their programs than is possible for external evaluators. It is difficult for consultants to gain as full an understanding of the goals, objectives and intricate program workings. However, internal evaluators may possess biases which prevent them from being objective. The advantages and disadvantages must be weighed carefully before deciding between an internal or external approach.

A CBT evaluation is performed from either a goal-directed or goal-free perspective. A goal-directed evaluation establishes general and specific objectives, states the specific objectives in measurable terms, provides training to meet the objectives and measures the extent to which they are achieved. This approach seems so obvious that trainers might believe it to be the only legitimate one.

But what if CBT has effects that exist *outside* the carefully defined behavioral objectives? It is quite conceivable that the results of a CBT program may include consequences not anticipated in the planning stage. These byproducts can be assessed with a goal-free evaluation. The evaluator does not know the training program goals. Instead of looking in places already defined as key assessment areas, the evaluator may look in many places and consider many sources. He or she may

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discover that CBT is having the expected impact or another, perhaps more important, one. The focus of goal-free evaluation is on *actual*, rather than *purported*, effects.

Goal-free evaluation is linked most often with external evaluation. This combination may seem threatening to trainers; it appears to take control from them. However, trainers should keep the intent of the evaluation process foremost in their minds. Evaluation is a tool to gather information regarding the effectiveness and efficiency of CBT. The quality of the data gathered will have a tremendous impact on the trainers' ability to make informed decisions.

A final factor to determine is whether the evaluation will be comparative or non-comparative. Comparative evaluation identifies training programs with similar goals, expectations and objectives. Common evaluation approaches are used to determine how CBT compares on select measures to traditional training approaches. This information obtained on the product can be powerful. It tends to give exact direction to a decision on whether to go with computer-based training.

Such comparison studies can be problematic, too. It is often difficult to identify training programs with similar goals. Even if such programs are found, many times there are unique program- and company-specific constraints that color the comparisons. There seldom is a clear-cut conclusion on which program is better.

Once decisions have been made on which perspectives the evaluation will take, it's time to begin the program. Successful programs are characterized by the following elements:

■ **A clear-cut plan.** A good evaluation program for CBT must have a clear plan for its "when," "who," "what" and "how." The plan must specify the mix of evaluation features: process-oriented or product-oriented, internal or external, goal-directed or goal-free, comparative or non-comparative. These decisions will guide data collection.

It may be decided that three different combinations would provide the information needed. In one, perhaps, trainers would use objective tests geared to the program goals at predetermined checkpoints. In a second combination, outside evaluators would perform a goal-free evaluation to obtain an unbiased assessment of program results. In a third combination, trainers would meet with an instructor from a similar program to compare CBT strengths and weaknesses.

■ **A well-defined training program.** It is important that the training program being evaluated be clearly described. The description can be drawn from the goal setting done in the early phases of integrating CBT, but the description must be more than just the goal statements. The description is especially important if outside evaluation is being considered. It is also of critical importance when the final report is submitted to other audiences.

Consider this problem: A training director decides on a goal-free, outside evaluation and contracts a computer specialist. The evaluator arrives and begins the program examination. At the end of the visit, trainers discover that the program was criticized because students were not learning programming skills. The training staff is furious because the intent of the program had nothing to do with programming skill instruction. This type of result can be avoided if the evaluation plan provides a clear, concise description of the CBT program.

■ **Identified clients.** Evaluation efforts should consider input from people who have a legitimate stake in CBT. For train-

ing and development purposes, this group includes trainers, trainees, former CBT trainees, supervisors of CBT trainees, personnel officers and job analysis experts. Mechanisms which allow for this type of input also keep the program up to date based on information from current job trends. With continued advances in computer technology, this input is particularly critical.

■ **Sensitivity to potential political problems.** It's important to know who is going to use the evaluation data and for what purposes. It is good evaluation procedure to specify at the outset who has control over the data generated. Many people view evaluation with suspicion and fear. A clear statement of procedure and purpose will help reduce or eliminate needless concerns.

It is wise to create a training department review process and indicate how the evaluation information can be reviewed by affected personnel prior to the final report. This way, factual mis-statements and er-

roneous data can be eliminated at the lower, rather than the higher, levels. CBT evaluations must be sensitive to the corporation's political climate. An insensitive evaluation, no matter how well done, is worse than no evaluation at all. Suppose, for example, corporate leaders believe there are many managers who refuse to keep current in their fields. An evaluation of the CBT program indicates a lack of support by several senior managers. The corporate executives read the evaluation results and, sensitized to this "fact" in another context, demand to know who those managers are—the executives are determined to solve the problem "confirmed" by the CBT evaluation. Other factors in the evaluation are disregarded completely.

Being politically aware helps guide the evaluation so that the information is presented most usefully.

■ **Specified information needs and sources.** A good evaluation plan delineates clearly what information will be examined by who, when and where. The first step is to identify information sources. Take, for example, information needs concerning

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how well trainees using CBT meet industrial standards, as opposed to trainees not using CBT. Data can be generated by student achievement scores on unit examinations, scores of trainees on job entry examinations, on-the-job performance reports from supervisors, reports from outside evaluators and comparison studies with similar training programs. Any special permission or access required to examine sources must be attained and verified in the plan. Also, if certain information is sensitive, adequate safeguards must be built in.

■ **Comprehensive data collection.** Most pieces of information give insight into just a small segment of a larger picture. Therefore, it is necessary to collect a lot of data. A major problem exists when trainers expect a single definitive test or assessment procedure to provide all the information needed to evaluate CBT.

The following scenario amplifies the need to gather evaluation data from more

than one source. It is discovered that test scores are higher for a CBT class than for the non-CBT. Because this is the only data source included in the evaluation study, CBT seems an expensive innovation which did not outproduce conventional training approaches, and CBT is scrapped. Yet if student questionnaires and follow-ups with supervisors had been included in the data collection, the training department might have discovered that former CBT students felt more confident about their job skills and had favorable things to say about the CBT. In addition, supervisors might have reported performance or attitude improvements attributable to CBT.

There is danger in being too data-rich. A briefcase full of randomly collected data ends up telling a training director little. Data deemed relevant should be specified in advance.

■ *Technically adequate data.* Is the instrumentation adequate? Is the sampling plan reasonable? Is the planned analysis appropriate? Is the obtained information valid, reliable and objective? These ques-

tions should be answered by evaluators who are familiar with the measurable, statistical and analytical roots of the evaluation process. A technical advisor expert in these areas might be necessary. It would be a terrible blow to have the final report destroyed by suggestions that the sample was biased, the goal-free evaluator was not objective or a technique that was used violated the statistical assumptions behind the design.

■ *Cost considerations.* There are two financial concerns: the cost of the CBT program and the cost of the evaluation. Operational costs for CBT should be precisely delineated. What are the hardware and software costs? What are the projected costs related to hiring, training and retraining personnel? What are the structuring costs (e.g., purchasing CBT instructional materials, maintaining microcomputer security, improving access)? And what is the end payoff? Are workers able to qualify for advanced jobs because of the training, and does promoting them save the company money?

The cost of the evaluation process

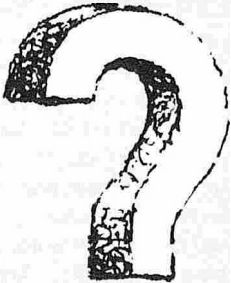
should be included in the initial CBT program cost projections. A CBT program is doomed for failure if all of its resources are placed in the training process and only minimal time, personnel and money are set aside for evaluation. A successful evaluation is not achieved on a small budget. The necessary instrumentation, consultation, travel, research and report generation all require money.

■ *Explicit standards for the training.* This is the "so what" portion of the evaluation plan. For example, assume it is decided that trainers should assess the time-on-task of students during CBT instruction. The trainers report that the average student spends 30 out of every 45 minutes engaged in CBT. So what? Is this too much? Too little? About right? What's missing is a standard by which to judge the data.

Trainers must set standards within the evaluation plan. Without standards, no one is exactly sure what the data mean.

Many training standards already exist. The first place to look is in the original training objectives. They are likely to

THE DILEMMA OF THE PARTICIPATIVE MANAGER

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- ? What do they do with their urge to "take charge" that has traditionally been so valued in the U.S. organizational life?
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specify competency levels to be achieved. Also, job and task analyses provide information for establishing training standards. Other sources are military and industrial standards.

■ *Recommendations for the training.* After the data are compared to the standards, trainers have a good deal of insight as to whether or not the CBT program achieved the expected results. It would seem that the evaluation is complete, but it is not. The final step of the evaluation is to make general and specific judgments and recommendations. Certain aspects of CBT may be judged as not working; recommendations should be made to abandon them. Others may need a few patches here and there to increase efficiency. Other parts of the training program may be achieving outside expectations and actually should be drawn back. These judgments and recommendations are what most program directors, managers and board executives turn to first when considering action on a given training emphasis. Reports which lack this important dimension allow data to be selected out

of context. Select components may be highlighted at the expense of others. To avoid this, a final report should provide readers with an overall perspective of the CBT efforts and its respective outcomes.

■ *Appropriate evaluation report for each audience.* Some decisions related to report delivery were mentioned earlier—particular audiences should be identified and individuals receiving reports should be specified. Costs also are related to delivery. Up to 30 percent of monies allocated to CBT evaluation should be spent on dissemination.

In addition to these factors, the look of the final report must be considered. It should be tailored to the audience who will read it. The face validity of the report will have a significant impact on how it is received. A too technical report will not work well with a review board of non-technicians. Fellow trainers, on the other hand, will be interested in details beyond the generalities of cost effectiveness. Evaluation outcomes may consist of multiple reports that address particular audiences with specific interests, all grow-

ing out of a larger volume containing the data tables and statistics. An executive summary highlighting those areas of most interest to decision makers is useful.

The worst error trainers can make is to cram all the evaluation information into one general document for all potential audiences. The overload on details may turn certain audiences sour on CBT simply because it seems too complicated.

Evaluation's the key

The future is bright for merging computer technology and human resource development, but only when the two are truly right for each other. Proof of CBT/HRD compatibility lies with a well planned, well executed program evaluation—one specific to an organization's particular training needs.



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