

Was it the

Training?

● THIS IS THE SECOND ARTICLE (SEE T&D, FEBRUARY 1996) IN A THREE-PART SERIES ON MEASURING TRAINING ROI, BASED ON CASE STUDIES COLLECTED BY THE AMERICAN SOCIETY FOR TRAINING AND DEVELOPMENT. ● EVALUATION EXPERT JACK PHILLIPS DESCRIBES 10 WAYS TO ISOLATE THE EFFECT OF TRAINING SO THAT IT'S CREDITED OVER OTHER VARIABLES AS THE REASON FOR PERFORMANCE IMPROVEMENTS.

BY
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IT'S A COMMON SCENARIO. After a major training program, there's a boost in trainees' work performance. Clearly, the two events are linked. But then a manager asks the dreaded question: "How much of the improvement was caused by the training?"

This familiar inquiry is rarely answered with much accuracy or credibility. Performance improvements may be linked to training, but usually nontraining factors have also contributed. As most HR practitioners know, it can be difficult to show a cause-and-effect relationship between training and performance. Up-front planning is essential. This article recommends several approaches for isolating the effect of training, a crucial step

in calculating training's return on investment in terms of dollars and cents.

But first, it's important to explain the "chain of effect" implied in the five-level evaluation model shown in Figure 1. To start, it's essential to derive the measurable results of training from participants' application of new skills or knowledge on the job over a specific period of time after training is completed, a level 3 evaluation. Logically, successful on-the-job application of training content should stem from participants having learned new skills or acquired new knowledge, a level 2 evaluation. Consequently, for a business-results improvement (a level 4 evaluation), the chain of effect implies that measurable on-the-job applications (level 3)

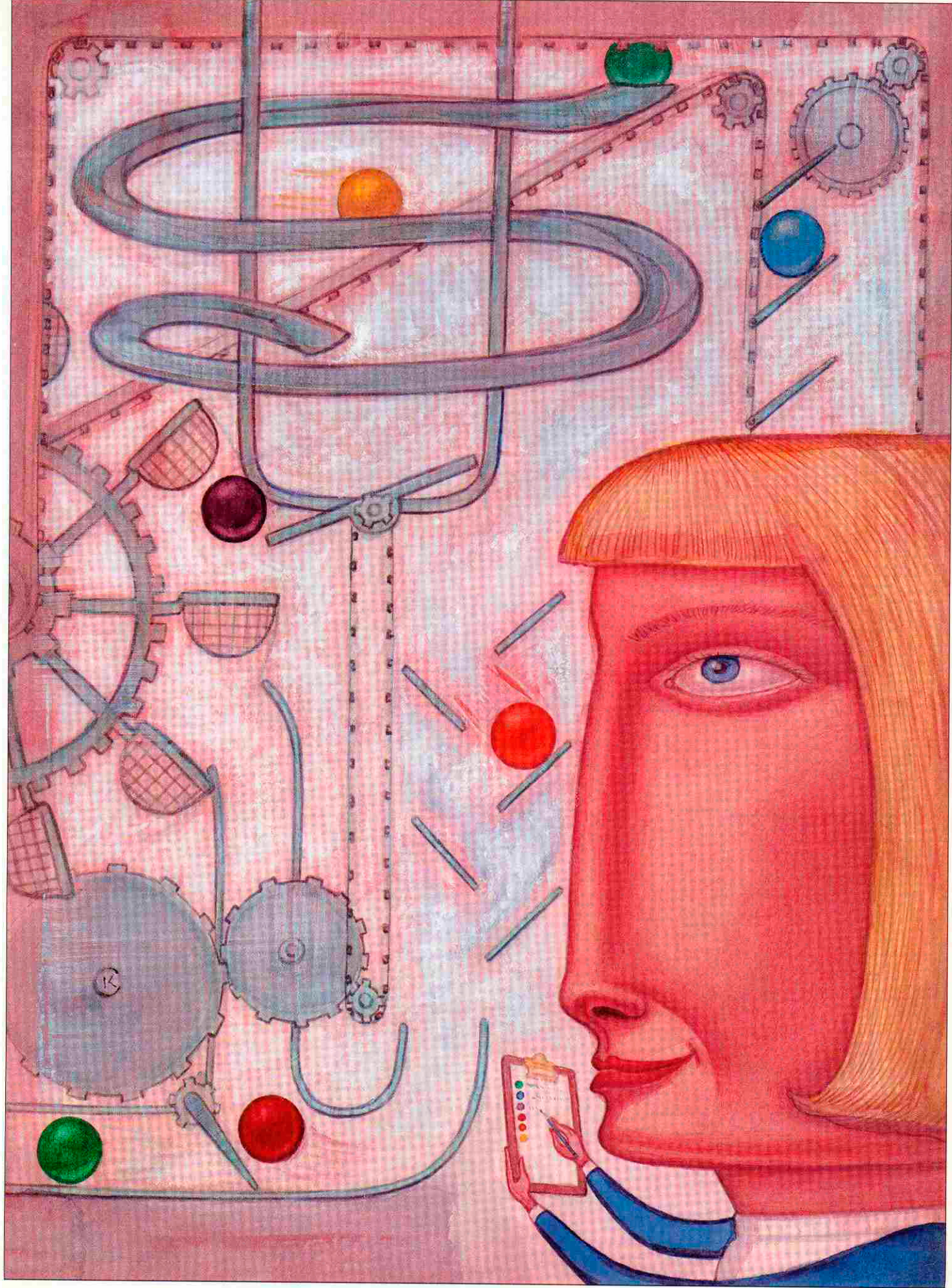


FIGURE 1: FIVE-LEVEL ROI EVALUATION

Here's a slightly modified version of Kirkpatrick's four-level evaluation model, adapted to include measuring for return on investment.

Level	Questions
1. reaction and planned action	What are participants' reactions to the training? What do they plan to do with the material?
2. learning	What skills, knowledge, or attitudes have changed? By how much?
3. on-the-job application	Did participants apply on the job what they learned in training?
4. business results	Did the on-the-job applications produce measurable results?
5. return on investment	Did the monetary value of the results exceed the cost of training?

and improvement in learning (level 2) are achieved. Without this preliminary evidence, it's difficult to isolate the effect of training or to conclude that training is responsible for any performance improvements. Practically speaking, if data is collected on business results (level 4), data should also be collected at the other three levels of evaluation.

Specific approaches

Here are several ways to isolate training's effect on performance.

Use of control groups. A highly credible approach for isolating the effect of training is the use of control groups in an experimental training design. The experimental group receives training; the control group does not. Participants in both groups should be similar demographically, selected at random, and subjected to the same environmental influences.

It isn't necessary to take pre-program measurements of the two groups. Rather, measurements taken after training show the difference in performance between the two groups that can be attributed directly to training.

For example, Federal Express gave 20 new employees training in driving company vans. Their post-training performance was compared with a control group of 20 new employees who

hadn't received the special training. The two groups' performance was tracked for 90 days in 10 performance categories, including accidents, injuries, and errors. Experts from engineering, finance, and other groups assigned dollar values to the performance categories. The ultimate outcome was that the training showed a 24 percent return on investment.

A disadvantage of the use of control groups is a misperception that the training staff is turning the workplace into a lab. To avoid this negative image, some organizations conduct a pilot of the training program using pilot participants as the experimental group and nonparticipants as a control group. In fact, the nonparticipants aren't even informed of their status as "the control group."

Sometimes, management may not want to take the time to experiment; it may just want to make sure employees get the training. But using control groups is worthwhile when training programs are costly and linked with organizational objectives.

Trend-line analysis. In this approach, a line is drawn from current performance to future performance, assuming that the current trend will continue even without training. After employees receive training, their post-training performance is com-

pared to their performance predicted on the trend line. It's reasonable to attribute any improvement over the trend-line prediction to training. It's not an exact process, but it does provide a reasonable estimation of training's effect. (See Figure 2.)

In Figure 2, the reject rate for defective components at an electronics manufacturing firm is shown before and after training, with a pre-training downward trend. The training apparently reduced the number of rejects dramatically, though the trend line shows that reject-rate reduction would have continued anyway.

It's tempting to measure the improvement by comparing the average six-month reject rate prior to training (1.85 percent) to the average six-month rate after training (0.7 percent). But a more accurate comparison is to compare the six-month average after training with the trend-line value at the same point (1.45 percent). In this instance, the difference is 0.75 percent. Sometimes, it behooves the training department to use more modest measures to demonstrate the effect of training rather than to make claims that can't be proved.

The main disadvantage of this approach is its potential inaccuracy. A trend-line analysis assumes that the events that influenced performance prior to training still exist after training. It also assumes that no new influences entered the situation. On the positive side, the approach is relatively simple, inexpensive, and effortless.

Forecasting. This approach is more analytical and mathematical than the trend line. Instead of drawing a straight line, a linear equation is used to calculate a value of the anticipated performance improvement. A linear model (such as $y = ax + b$) is appropriate when only one variable influences the results. When several variables intervene, it's necessary to use sophisticated statistical models. Without them, forecasting is difficult to implement. Still, it can be an accurate predictor of performance variables without training, if the appropriate data and models are available.

Participant estimation. This approach involves asking participants to determine how much performance improvement is due to training. Their ac-

tions have produced the improvements, so they should have some idea of how much improvement is because they applied what they learned in training. Management tends to find such reports credible because participants are at the center of the improvement.

Participants' input can be obtained by asking the following questions:

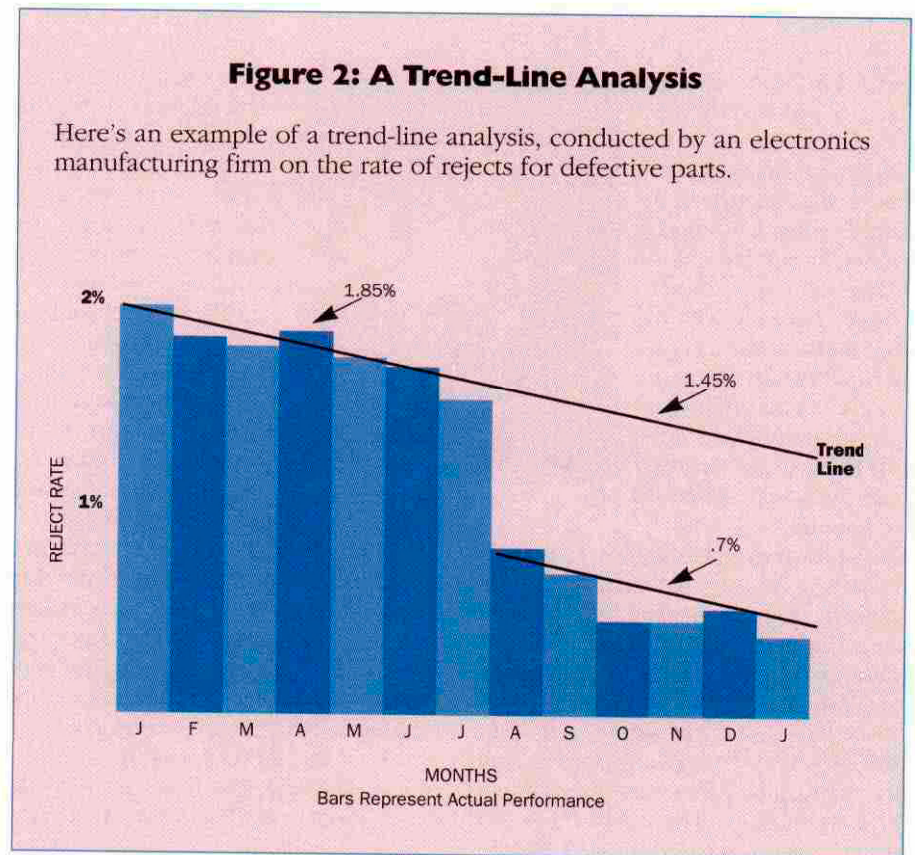
- ▶ What percent of the improvement can be attributed to the application of skills, techniques, or knowledge gained in the training?
- ▶ What is the basis for your estimation?
- ▶ What degree of confidence do you have in your estimation?
- ▶ What other individuals or groups could make an estimation?
- ▶ What other factors do you think contributed to the improvement?

To be conservative, it's recommended to factor in a confidence level. For example, if a participant estimates that 50 percent of an improvement is due to training but is only 70 percent confident about that estimate, multiply the confidence percentage by the improvement percentage and divide by 100, for a confidence level of 35 percent. Then multiply that figure by the amount of the improvement in order to isolate the portion attributable to training. To calculate ROI, convert that portion to a monetary value.

To enhance this approach, management can approve participants' estimations. For example, in performance-management training at Yellow Freight Systems, participants estimated the amount of savings that could be attributed to the program. Managers reviewed and approved the estimates, confirming participants' estimations.

One disadvantage to this approach is obvious: It's just an estimate. The input data may be unreliable. Some participants aren't comfortable providing estimates; some may not be able to estimate improvements because they don't know which factors contributed. The advantages are that it's inexpensive, time-saving, and easily understood by most participants and others who review evaluation data. And the estimates do originate from a credible source—the people who actually produced the improvement.

Supervisor estimation. Participants' supervisors may provide input in lieu



of, or in addition to, participants' estimations. In some settings, participants' supervisors may be more familiar with other factors that could have produced the improvements. It's recommended to ask supervisors the same questions asked of participants.

Supervisor estimation should be treated the same way as participant estimation in summarizing and analyzing the data. The evaluator may not know which estimates to use. A conservative approach is to use the lowest value and include an appropriate explanation. Or, the evaluator can recognize that each source has its own perspective and average the two, placing equal weight on each group's input.

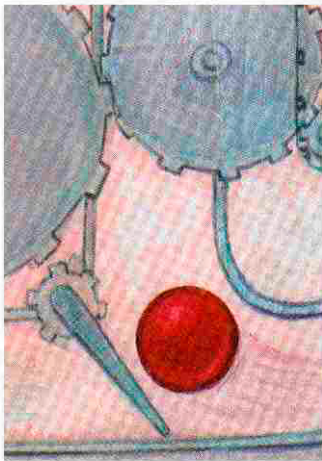
This approach has the same disadvantages as participant estimation. Because it's subjective, it may be viewed skeptically by management. Supervisors may be reluctant to participate. Or, they may be incapable of providing accurate estimates. The advantages are also the same: It's simple, inexpensive, and fairly credible because the information comes from the "horse's mouth"—in this case, the supervisors of people who received

the training. Credibility rises when supervisors' estimates are combined with participants' estimates and when a confidence level is factored in.

A restaurant chain implemented a training program on performance management for manager-trainees. Trainees learned how to establish measurable goals for staff, how to provide performance feedback, how to measure progress toward goals, and how to take action for ensuring that goals are met. Trainees developed action plans for improvement, using the skills taught in the training. The top managers learned how to convert measurable improvements into economic values. They decided employees could focus on any improvement areas (such as inventory, food spoilage, or employee turnover) on the conditions that they use the new skills taught in training and that improvements be converted to either cost savings or profits.

As part of a follow-up evaluation, trainees' action plans were documented to show results in quantitative terms converted to monetary values. Trainees were asked to estimate (con-

servatively) the percent of improvement that resulted from the application of skills either acquired or enhanced in training. Each improvement was calculated using an annual monetary value. To implement the improvements, trainees worked closely with the restaurant managers, who estimated for the trainees the percent of improvement (outlined on their action plans) that could be attributed to training.



Management estimation. Top-level managers can provide estimates on the percent of improvement they attribute to training. At Litton Guidance and Control Systems, management applied a subjective figure (60 percent) to improvements due to training, after considering other contributing factors such as changes in processes, procedures, and technology. The upshot was that training received credit for 60 percent of the improvements in quality and productivity.

Clearly, this approach can be highly subjective. But then, the input is from people who provide the training funds.

Customer input. Why not elicit input directly from customers? Ask them why they chose a particular product or service. Ask them to explain how their reactions to a product or service were influenced by employees who were using the knowledge and skills taught in training. This approach focuses directly on what training programs are designed to improve.

For example, following a bank's teller-training program, customers indicated in market-research data a 5 percent reduction in customer dissatisfaction with teller knowledge.

Expert estimation. Experts—such as independent consultants and industry sources—must be carefully selected regarding their knowledge of a particular process, program, or situation. For example, an expert in quality can provide fairly reliable estimates of how much quality improvement can be attributed to training—and how much can be attributed to other fac-

tors associated with a TQM effort.

This approach can be inaccurate, unless the new training program and setting are similar to the current program and setting, and the approach may lack credibility because the estimates come from external sources. Still, it's a quick source of input from a reputable source. Right or wrong, management can sometimes place more confidence

in external experts than internal staff.

Subordinate input. In some situations, participants' subordinates can provide input on training given to supervisors and other managers on implementing work-unit changes or developing new skills in dealing with employees. Subordinates usually can't estimate how much of an improvement is attributable to training, but they can provide input about specific changes that have occurred since the supervisor received training. And they also can help determine the extent to which other factors have changed.

Subordinate input is usually obtained through surveys or interviews. When the survey responses show significant changes in supervisors' behavior after training and no significant change in the general work climate, improvements in work performance can be attributed to changes in supervisors' behavior.

Typically, subordinates are aware of the factors that have caused changes at work, and they can provide reliable input about the magnitude of such changes. When combined with other approaches, subordinate input is even more credible.

Other factors. In some situations, it's feasible to calculate the effect of factors other than training that may have contributed to some improvement and then to conclude that training accounts for the rest.

For example, a consumer-lending program for a large bank experienced a significant increase in the number of loans after training was provided to loan officers. In addition to the effect of training, other factors included

falling interest rates and loan officers' growing confidence in their knowledge and expertise.

This approach is appropriate when other factors are easily identified and when the necessary mechanisms for calculating their effect are in place. In some cases, it's just as difficult to estimate the effect of factors other than training. This approach is highly credible when the methods used to isolate the effect of other factors is credible.

But which one?

With 10 approaches available, it can be difficult to select the most appropriate one. It's important to consider the following criteria:

- ▶ feasibility
- ▶ accuracy
- ▶ credibility
- ▶ costs
- ▶ time—including that of participants, managers, and others.

Generally, two approaches are better than one. In using multiple sources, it's recommended to combine the inputs. This conservative approach builds acceptance. The target audience should receive explanations of the approach and the subjective factors.

It's not unusual for the ROI in training to be an extremely large figure. Even when a portion of the improvement is attributed to other factors, the numbers can still be impressive. But it should be understood that ROI figures aren't precise, though every effort is made to isolate training's effect. An ROI figure represents the best estimate given the conditions, time, and resources the organization was willing to commit. Chances are, it's more accurate than other types of data in the organization. ■

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