Snake Oil, Science, And Performance Products

by Jeanne Farrington and Richard E. Clark

Relevant performance improvement means actually helping individuals, organizations, and societies to meet their goals. Somewhere along the line, some performance technologists have lost sight of this and believe that the value they add is in designing and delivering training programs, or an organization structure, or a website that clients love. But it is not only client satisfaction that is important; it is *whether the solution we provide to clients actually works and whether it solves a real problem* that matters.

Many of our performance products do not work, and some are not the right answer to start with—not to the question being asked and sometimes not to any reasonable question that may be asked. In other words, there are a lot of solutions, beliefs, and practices that do not deliver the results that people hope they will (Farrington & Clark, 1999). The really sad part about this, and its salvation at the same time, is that the information about what actually works and what does not work is often available. But we have to invest the effort to learn how, commit to take the necessary time, and have the discipline to look for the answers.

Meeting Goals, Not Implementing Solutions

One clear message from our field of human performance technology (HPT) is that solutions are not generally useful as ends in themselves: they must be proceeded and in fact inspired by business or other relevant issues (Fuller & Farrington, 1999; Gilbert, 1996; Kaufman, Thiagarajan, & MacGillis, 1997; Stolovitch & Keeps, 1999). The determination to resolve an issue should come from the fact that the issue stands in the way of meeting important accomplishments or goals at the chosen level of focus: individual, organization, or society (Kaufman, 1997).

Providing solutions is the most visible thing we do, but they should not be our primary aim: Solutions
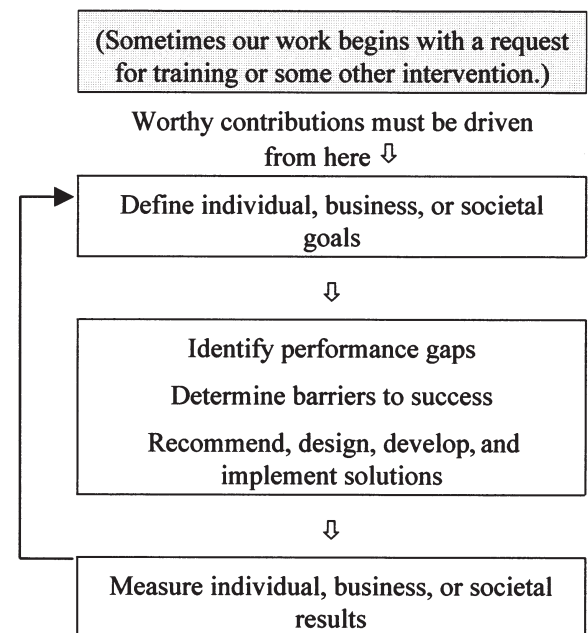

Figure 1. **Performance Improvement Contributions**.

are the wrong target (Fuller & Farrington, 1999). Achieving significant goals should be where we focus our attention (Gilbert, 1996). Solutions are the means we use to eliminate barriers to achieving worthy goals. When we do this, we have actually made a worthy contribution (see Figure 1).

If we were in the business, for example, of providing culture assessments, technical training, or compensation structures, then the measure of our success would be understanding, learning, or a feeling of fairness. And if this is all we offer, then it is no wonder the training, development, or performance functions in a company are often perceived as expendable (see Figure 2).

Activities usually start here ⇩

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          ┌─────────────────────────────┐
   ┌─────▶│   Request for training or other  │
   │      │         intervention             │
   │      └─────────────────────────────┘
   │                  ⇩
   │      ┌─────────────────────────────┐
   │      │  Identify knowledge or other gaps  │
   │      │                                    │
   │      │  Design, develop, and implement    │
   │      │            solutions               │
   │      └─────────────────────────────┘
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   │      ┌─────────────────────────────┐
   └──────│  Measure participant and client   │
          │   reactions to the intervention   │
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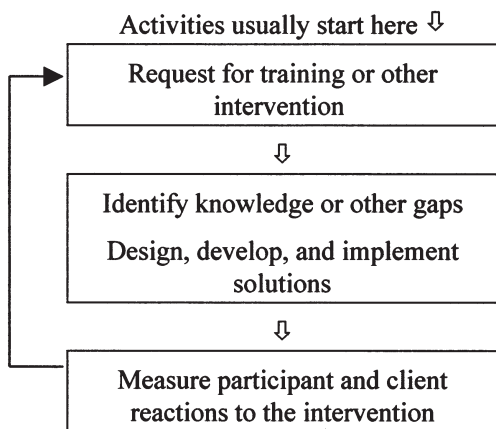
Figure 2. Performance Improvement Activities.

Companies are generally in business to make a profit, and we also hope they will contribute to the larger good. As performance improvement professionals, we set our sights on contributing in measurable or at least obvious ways to achieve those aims. The issues or problems to tackle show up as a need to do something like the following:
• Increase sales
• Save time
• Reduce expenses
• Improve quality
• Comply with regulations
• Decrease unwanted turnover
• Reduce pollution

In business, every request for service from a performance improvement professional should have at the bottom of it an issue that is traceable to a fundamental business need. The request may not come to us in those words, but we need to figure out what important goals lie underneath that request (Mager, 1992).

Once we know what our goals are, then we can determine the gaps and barriers in the current system, determine their

root causes, and recommend solutions (Fuller & Farrington, 1999; Stolovitch & Keeps, 1999). Starting with a solution and figuring out if it might meet a business goal is generally backward thinking (Fuller & Farrington, 1999; Mager, 1992). This approach often results in the implementation of three-F programs: due to fun, fad, or fashion (Micklethwait & Wooldridge, 1996).

Even more insidious than the three F's is the unfortunate reality that many popular solutions *do not solve their targeted problems, in fact, they may make things worse.*

Popularity and Common Knowledge No Guarantee

What follows are some examples of popular practices and solutions that may not produce the intended results. We realize that these examples may elicit surprise or dismay. Some of them just seem to be common sense. However, obvious, intuitive truths sometimes aren't. Unfortunately, a lack of value is often obscured by other positive factors, such as positive reactions by participants (Clark, 1982; Fuller, 1997). For example, we recommend caution and careful investigation before attempting the following:
• Increasing a team's productivity by adding new members. In many situations, new members can actually reduce the productivity of a work team (Karau & Williams, 1993).
• Improving team results by rewarding team members equally rather than individually. Blanket rewards for teams often reduce their motivation to invest effort and decrease productivity (Fan & Gruenfeld, 1998).
• Motivating employees by instituting an employee-empowerment program. Though empowerment programs often increase motivation, there are documented instances where empowerment had the opposite effect (Clark, 1998).
• Providing different learning strategies for different learning styles. Some learning strategies can decrease learning from training (Clark, 1982).
• Providing maximum choices for learner control as a matter of good practice for all web-based training. Learner control decreases learning for a significant number of learners (Clark, 1989).
• Deciding that learning does not really transfer from one context to another and designing instruction only for situated learning. Transfer between contexts can occur under the right conditions (Anderson, Reder, & Simon, 1996; Farrington, 1997).
• Using Level 1 (reaction) questionnaires to determine whether learners can meet a training program's objectives. Level 1 assessment sometimes indicates the opposite of what actually happened (Clark, 1982; Fuller, 1997).

Case Studies

Following are three examples of popular practices, including their common use and what the research suggests about their efficacy.

Dysfunctional Team Behavior and the
Myers-Briggs Type Indicator

Although the Myers-Briggs Type Indicator (MBTI) is a favorite instrument of many organization development professionals and others, a comprehensive review of the research into its reliability and validity finds it wanting in both areas (Pittenger, 1993). The MBTI postulates that there are four binary personality traits (extroverted/introverted, intuitive/sensing, thinking/feeling, and judging/perceiving) that combine to describe 16 distinct personality types. Once subjects have answered questions on the MBTI, they are assigned their type, described in shorthand by initials based on their scores: ESTJ, ISTP, and so forth. Among other difficulties with this instrument, careful psychometric study shows that the MBTI is unreliable and invalid. There is no evidence that there are 16 distinct personality traits in the population at large. Although some of the traits do have supporting evidence—for example, introversion and extroversion are well-established personality traits—some key parts of the MBTI simply do not work. And, despite claims to the contrary, most people end up with different types if they take the instrument multiple times.

Given these difficulties with reliability and validity, what makes this instrument so popular? A principle from social psychology may explain it: People will often believe that they possess certain traits if you tell them they do (Aronson, 1995). And they will begin to act them out. Not only that, but others will treat them as if they do possess those traits. All this reinforcement easily becomes circular and self-sustaining. So people believe they have a particular type and their colleagues have particular types, and they make assumptions and treat each other accordingly. For example, one of us was recently doing an analysis at a high-tech company where engineers had their MBTI initials posted in large letters on top of their computers. Presumably this was so their colleagues could know how to approach them in an interaction. A manager there said of his vice-president, "Oh, So & So—he's a classic ISTJ." Then he nodded, as if that explained everything rather than providing little illumination. Even though there is compelling research evidence that there are problems with the MBTI, people like it! And they believe in it. Can good come from it? Have people used it for team building exercises, for example, to good effect?

People can use the MBTI to show that there are multiple ways of approaching the world of work and relationships or that no one way is always right or always wrong. Or, a trait that drives you nuts may really be a strength you have not recognized. Unfortunately, the unwitting effect of this enlightenment may also be to displace one stereotype—"So & So is indecisive"—with another, "He is a P." And with the backing of a scored instrument, the prejudice may be much stronger.

If working together more harmoniously (e.g., saving time, improving efficiency, and possibly reducing turnover) is the issue, we can find another solution that reflects more accurately and more respectfully the people with whom we work.

Increasing Learning and Retention by Putting
Training on the Computer

There are numbers of training developers and content providers who argue that computer-based training (CBT) and web-based training (WBT) improve learning. Despite ample evidence to the contrary, this claim persists. What CBT and WBT can do is provide broad access to information and learning activities. They can decrease the cost and improve the efficiency of implementation, and sometimes they increase the opportunities for practice. However, the delivery vehicles we choose—computers in this case—do not influence learning (Clark, 1983; 1994).

If increasing learning and retention are the problem, then making the objectives clear, providing good examples and ample opportunities for practice, and providing knowledge of results are critical elements in an effective solution to a knowledge problem. It is the learning method—how we construct learning activities, and not the delivery medium—that most affects learning.

Why does this distinction matter? It is hard enough to create a successful learning solution (Baldwin & Ford, 1988; Ford & Weissbein, 1997, Stolovitch, 1998) when we are paying attention to the active ingredients that affect learning processes. But the results can be dismal if we focus instead on the wrong things.

Figuring Out How the Experts Do It
by Interviewing the Experts

How many companies today are wildly excited about knowledge management? Many information technologists, corporate librarians, and training professionals are quickly filling up databases with information captured from internal and external experts. Unfortunately, research shows that only about half of what experts tell us about how they do some-

thing will be correct (Clark & Estes, 1996). This is true for a variety of reasons, including the fact that experts have automated processes to such an extent that they have forgotten much of what they do (Bargh & Chartrand, 1999; Glaser, Lesgold, & Gott, 1991).

Given that they forget, is it possible to find out how the experts do things? Yes, through a series of methods collectively termed "cognitive task analysis" (Glaser, Lesgold, & Gott, 1991). These methods require a lot more effort than just asking the experts and noting what they say. Unfortunately, only a few people have figured this out. Most people collecting knowledge for their companies are probably not aware how much of what they are carefully storing is not nearly as accurate or complete as they hope.

> *The real determinant of instructional effectiveness is the design of the instructional process.*

Some of these common practices seem to work sometimes. But they have become familiar and common misconceptions.

Bursting Our Own Bubbles

We all believe, sometimes without thinking about it, that particular theories, solutions, or principles are "just the way it is." Finding out that what we thought was obviously true may not be true is disappointing, even aggravating.

Following are some tips for when and how to check out a theory without researching an entire dissertation's worth of the literature on a given topic:

- Remember that even the solutions almost everyone believes are successful may not work or may have a negative impact on the problem at hand.
- Our understanding of the truth is subject to change. New facts and principles are being discovered constantly. (The Earth used to be flat.)
- Checking out a theory to see if it is supported by the research literature is a good idea.
- Look in refereed journals. The tougher it is to be published, the more rigor the authors have generally applied to their studies or reviews. For example, the *Review of Educational Research* and all the journals published by the American Psychological Association,

the National Academy of Sciences, and the American Psychological Society are refereed publications.

- Avoid relying solely on articles published in journals or magazines that make it really easy for people to publish. The microfiche records in ERIC, for example, have about a zero percent reject rate. In other words, they will publish just about any manuscript they receive. That does not mean there is nothing of value there; it just means there was no screening process, so proceed with caution. Rely instead on journals that require peer review (look at the authors' guidelines section to get this information).
- See what you can do to find out who the research leaders are in a particular area. Check out their abstracts in various search engines: PsychLit or journal articles listed in ERIC, for example. Look to see whose names appear repeatedly. Pick the top two or three and read what they have written. Check names in the Social Science Citation Index (SSCI). The most respected experts are cited more frequently by their peers, and the SSCI lists the number of citations for each expert who publishes in peer-reviewed journals.
- Just because someone writes many articles or books does not guarantee that his or her positions are correct. Search for balance by finding divergent views.
- Ask experts to talk against an idea. Take on the role of investigative reporter: What is the negative view? Who doesn't like this? Call a critic.
- Sometimes journals devote an entire issue to a particular topic. They invite the leaders in that area to write articles. These are great sources of information from different points of view in these issues. You can follow up by reading a few of the particularly salient references cited in these articles.

In your search for what's known about your area of inquiry, once you begin to find redundant information from a variety of viewpoints, then you have probably made a reasonable effort.

Staying Out of Trouble

Once you have discovered that a favorite solution, theory, or principle is not supported by the literature, you probably need to tell someone. You may be in the unenviable position of telling your manager, employees, team, or clients that the direction they have been wanting to travel has some minefields in it. Following are tips for discussing opposing views without triggering an explosion:

- First, it is important not to be too persuaded by a particular view just because it reflects our own beliefs. The powerful contribution of science is that it suggests counterintuitive facts. For example, we will not fall off the

end of the world if we walk or sail too far. But this was once commonly believed because it fit people's perceptual experience. Remember that today's unquestionable beliefs will quite possibly be modified tomorrow.

- Often, when there are diametrically opposed viewpoints in research, academics and others line up on one side of an issue to argue their points. Eventually, someone comes along who makes a compelling point that both sides are right to some degree. This in turn offers a new viewpoint, and a new argument begins. How measured or heated the argument becomes is up to the participants.
- If we remember to respect what we do not know, our conversations about areas of conceptual contention can become a learning experience rather than a fight.
- Approaching disagreements from a position of inquiry (Bohm, 1996) can help. "Here is what I know about X; what have you found?"
- Recognizing that our mental models of the universe are necessarily incomplete (that is, we don't know *everything* there is to know) helps to keep us from getting too stuck on being right (Senge, 1990).

Practicing, at least internally, respectful debate on all sides of an issue can help make another point of view more clear.

Remember…

We are trying to implement HPT. Often in the past we were in the business of selling solutions. We now need to become a profession that sets out instead to meet clients' goals. Therefore, we should not start with a solution and then go looking for a problem it might solve. We should figure out the underlying problem first. Ask yourself what problem you are trying to solve. Then ask what solutions have been suggested for this problem. For the solutions that sound like they might solve the problem, ask what the downside is, and who says it doesn't work and why. Then determine what positive evidence exists.

One way to avoid making mistakes is to keep in mind that the solution that works in one setting for one problem will often not work in another setting with a different problem. We must make sure that we understand the active ingredients as well as the context for the issues and solutions we encounter and propose (Clark, 1998; Clark & Estes, 1998, 1999, 2000; Farrington, 1997).

Some of our favorite solutions may not actually provide useful results. There is a whole body of literature in the social sciences that we can use to make sure that we are offering legitimate solutions. As professionals, we need to invest enough effort so that we know and make good use of the difference (Kaufman & Clark, 1999).

Reference

Anderson, J.R., Reder, L.M., & Simon, H.A. (1996). "Situated learning and education." *Educational Researcher*, 5-11.

Aronson, E. (1995). *The social animal.* New York: Freeman.

Baldwin, T.T., & Ford, J.K. (1988). "Transfer of training: A review and directions for future research." *Personnel Psychology, 41*, 63-105.

Bargh, J.A., & Chartrand, T.L. (1999). "The unbearable automaticity of being." *American Psychologist, 54*(7), 462-479.

Bohm, D. (1996). *On dialogue.* New York: Routledge.

Clark, R.E. (1982). "Antagonism between achievement and enjoyment in ATI studies." *Educational Psychologist, 17*(2).

Clark, R.E. (1983). "Reconsidering research on learning from media." *Review of Educational Research, 53,* 445-459.

Clark, R.E. (1989). When teaching kills learning: Research on mathemathantics. In H.N. Mandl, N. Bennett, E. de

Corte, & H.F. Freidrich (Eds.), *Learning and instruction. European research in an international context. Vol. 2.* London: Pergamon Press.

Clark, R.E. (1994). "Media will never influence learning." *Educational Technology Research and Development, 42*(3), 21-29.

Clark, R.E. (1998). "Motivating performance: Part 1—Diagnosing and solving motivation problems." *Performance Improvement, 37*(8), 39-46.

Clark, R.E., & Estes, F.D. (1996). "Cognitive task analysis." *International Journal of Educational Research, 25,* 403-417.

Clark, R.E., & Estes, F.D. (1998). "Technology or craft: What are we doing?" *Educational Technology* (September-October) 5-11.

Clark, R.E., & Estes, F.D. (1999). "The development of authentic technologies." *Educational Technology* (March-April) 5-16.

Clark, R.E., & Estes, F.D. (2000). "A proposal for the collaborative development of authentic performance technology." *Performance Improvement* (April) 48-53.

Fan, E.T., & Gruenfeld, D.H. (1998). "When needs outweigh desires: The effects of resource interdependence and reward interdependence on group problem solving." *Basic & Applied Social Psychology, 20* (1), 45-56.

Farrington, J. (1997). *The impact of structural features and context on improving transfer in concept acquisition.* Unpublished doctoral dissertation, University of Southern California, Los Angeles (University Microfilm No. 9733051).

Farrington, J., & Clark, R.E. (1999, March). *Performance improvement snake oil.* Presentation at the annual meeting of the International Society for Performance Improvement, Long Beach, CA.

Ford, J.K., & Weissbein, D.A. (1997). "Transfer of training: An updated review and analysis." *Performance Improvement Quarterly, 10*(2), 22-41.

Fuller, J. (1997, April). *Avoiding evaluation pitfalls.* Presentation at the annual meeting of the International Society for Performance Improvement, Anaheim, CA.

Fuller, J., & Farrington, J. (1999). *From training to performance improvement: Navigating the transition.* San Francisco: Jossey-Bass/Pfeiffer.

Gilbert, T.F. (1996). *Human competence: Engineering worthy performance* (Tribute Edition). Washington, D.C.: International Society for Performance Improvement, and Amherst, MA: HRD Press.

Glaser, R., Lesgold, A., & Gott, S. (1991). Implications of cognitive psychology for measuring job performance. In A. Wigdor, A. Green, & B. Green (Eds.), *Performance assessment for the workplace: Vol. 2. Technical issues.* Washington, D.C.: National Academy Press.

Karau, S.J., & Williams, K.D. (1993). "Social loafing: A meta-analytic review and theoretical integration." *Journal of Personality and Social Psychology, 65*(4), 681-706.

Kaufman, R. (1997). A strategic-planning framework: Mega planning. In R. Kaufman, S. Thiagarajan, & P. MacGillis (Eds.), *The guidebook for performance improvement: Working with individuals and organizations.* San Francisco: Pfeiffer.

Kaufman, R., & Clark, R.E. (1999). "Re-establishing performance improvement as a legitimate area of inquiry, activity, and contribution: Rules of the road." *Performance Improvement, 38*(9), 13-18.

Kaufman, R., Thiagarajan, S., & MacGillis, P. (Eds.). (1997). *The guidebook for performance improvement: Working with individuals and organizations.* San Francisco: Pfeiffer.

Mager, R.F. (1992). *What every manager should know about training.* Atlanta, GA: Center for Effective Performance.

Micklethwait, J., & Wooldridge, A. (1996). *The witch doctors: Making sense of the management gurus.* New York: Times Books.

Pittenger, D.J. (1993) "The utility of the Myers-Briggs type indicator." *Review of Educational Research, 63*(4) 467-488.

Senge, P.M. (1990). *The fifth discipline: The art and practice of the learning organization.* New York: Doubleday.

Stolovitch, H.E. (1998, March). Presentation at the annual meeting of the International Society for Performance Improvement, Chicago, IL.

Stolovitch, H.E., & Keeps, E.J. (Eds.). (1999). *Handbook of human performance technology: Improving individual and organizational performance worldwide.* San Francisco: Jossey-Bass/Pfeiffer.

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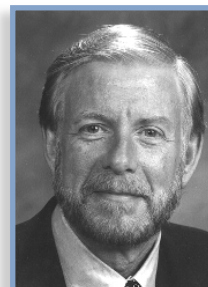
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