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Increasing the Productivity of Public-Sector Training

Blue Wooldridge

Although training is often suggested as a strategy for improving productivity in public-sector organizations, insufficient attention has been paid to the question of how productive training is. This paper describes a model for the systematic design of training.

Training for public employees has long been considered a major strategy for improving the productivity of public organizations (Wooldridge, 1984). However, the investment of resources, direct costs, opportunity costs, and time in training is tremendous. It has been estimated (Havemann, 1987) that the U.S. government alone spends at least \$633 million a year training its work force. Increasingly, questions are being raised about the efficiency and effectiveness of training. Constance Horner, the director of the U.S. Office of Personnel Management, is quoted as saying, "We don't want to waste the federal employee's time with irrelevant, poor-quality training" (Havemann, 1987, p. 23A). This article identifies some questions that can be asked of public-sector training designs to improve the productivity of the resulting training effort. The article presents a contingency approach model for training design. This model links the instructional strategies used, the selection of trainers, and the training environment to learning objectives and the anticipated learning styles of trainees.

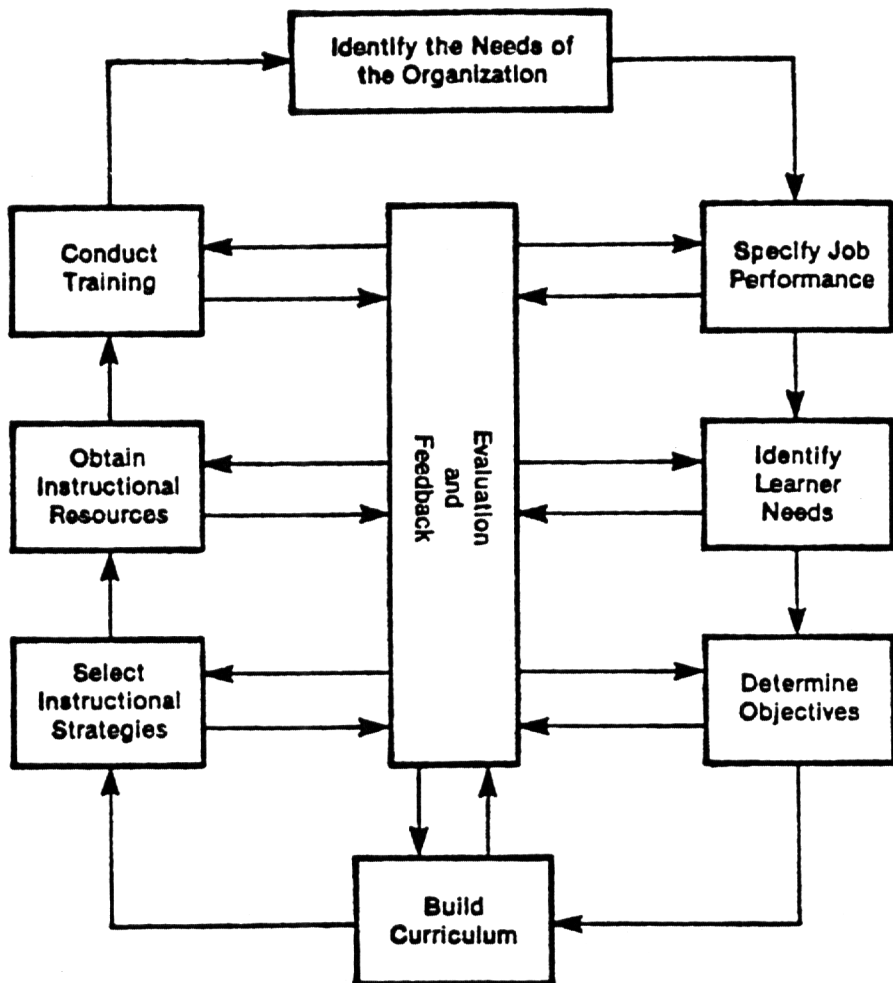
The first step in this analysis is to establish a working definition of training. This writer finds it useful to think of training as an organized learning experience designed to enhance the ability of an employee to achieve a desired level of performance in a specific job. This definition is useful because it emphasizes that the intermediate objective of a training effort is to achieve a specified level of performance in a given job. (The ultimate objective of training is to improve organizational performance.) Since training has this job-specific performance foundation, the critical event model of training design developed by Leonard Nadler (1982) of George Washington University is a very useful approach to the systematic design of training.

The Critical Event Model

Figure 1 depicts the critical event model of training design. Figure 1 shows not only that training is designed to achieve certain levels of job performance and certain behaviors that flow from the needs of the organization but that training evaluation should take place at every step of the training process. The questions developed in this paper are an important part of the resulting formative evaluation.

The first critical event in the critical event model is to specify the desired level of job performance and behavior as precisely as possible.

Figure 1. The Critical Event Model



The question to ask is, what must the person who fills the job do? Unfortunately, most traditional job descriptions and specifications fail to describe the desired job performance. Perhaps the results-oriented descriptions (RODs) advocated by Klingner and Nalbandian (1984) would improve the usefulness of job descriptions. The RODs state not only the expected performance but also the standards of performance under specific working conditions. Most training clients—program managers and supervisors—are very poor at describing the levels of performance desired of employees considered for training.

Therefore, the first question to ask in order to improve the productivity of a training effort is, Has the job performance or behavior been specified? If so, will achievement of the specified job behavior meet the organization's performance needs?

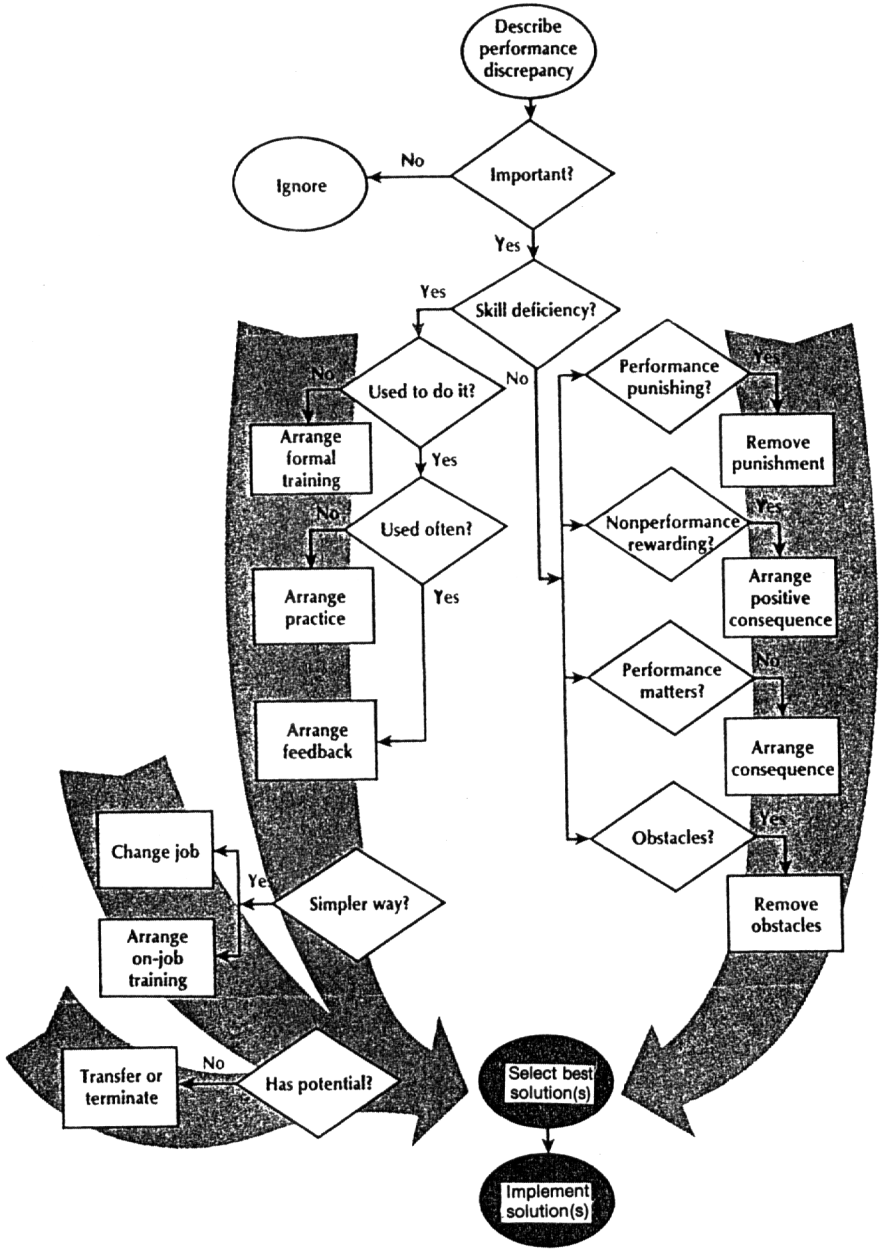
Training is usually proposed as a remedy when actual or anticipated job performance is below desired job performance. That is, there is a performance discrepancy. However, as Mager and Pipe (1974) have pointed out (Figure 2), low performance can have any of several causes. Formal training is a solution to only one of these causes. Therefore, the second question that must be asked is, Has it been determined that the cause of the performance discrepancy is a skill deficiency?

The next critical event is to identify the learner's needs. Once there is agreement on the desired job behaviors, it is possible to develop a list for competencies needed for the job. The list should spell out the necessary skills, attitudes, and knowledge (SKAs) that the employee should have if he or she is to perform the job at the standard expected by the organization (Nadler, 1982). Using these competencies as a benchmark, we can determine which of the needed SKAs the employee already has. The difference between the SKAs required for expected performance in the job and the SKAs that the learner already possesses are the learner's needs. Thus, the third question is, Have the SKAs that the employee needs been clearly identified?

After the employee's training needs have been specified, trainee-oriented behavioral learning objectives (TOBLOs) can be developed. Mager (1962, p. 3) describes an objective as "an intent communicated by a statement describing a proposed change in a learner—a statement of what the learner is to be like when he has successfully completed a learning experience." Otto and Glaser (1970, p. 123) have suggested that the writing of objectives can be accomplished in three steps: First identify the desired terminal behavior. Second, further define the conditions under which this terminal behavior will occur. Third, state the criteria of acceptable performance.

The next question that needs to be asked to improve the effectiveness and efficiency of public-sector training is, Have trainee-oriented behavior learning objectives been identified? If so, will the achievement of these

Figure 2. Diagnosing Performance Problems



Source: This figure is reproduced with permission from *Analyzing Performance Problems* by Robert F. Mager and Peter Pipe, © 1984 by David S. Lake Publishers, 500 Harbor Blvd., Belmont, Calif. 94002, \$11.95.

objectives result in the employee's having the necessary skills, knowledge, and attitudes that will enable her or him to achieve the desired level of job performance?

Now that appropriate trainee-oriented behavioral learning objectives have been established, the trainer can use the contingency approach to training design to ascertain how appropriate the instructional strategies that have been selected are.

Selection and Sequencing of Instruction Strategies and Methods

The contingency approach to instruction design can be useful in developing learning experiences. This approach suggests that the specific design and delivery of a learning experience—that is, the selection of trainers, the choice of instructional strategy, and class exercises—should all be contingent on the specific learning objectives to be achieved and the anticipated learning styles of the audience (Wooldridge, 1978).

Within the past few years, some excellent work has related the effectiveness of various instructional methods (for example, lectures, films, case studies, role playing) to specific learning objectives. McCleary and McIntyre (1972) assessed the effectiveness of fifteen methods of instruction. They measured the extent to which the methods tended to be practical and effective in reaching the objective (which could be technical, conceptual, or human relational) at a specific level of learning (familiarity, understanding, or application) (Figure 3). Newstrom (1980), Olivas and Newstrom (1981), and Carroll, Paine, and Ivancevich (1972) have reported similar relationships.

This literature can provide the public administration training community with some general guidelines that can help to select an instructional methodology that will be suited to achieving certain broad categories of learning objectives. As Newstrom (1975, p. 12) points out, "Tradition often locks educators into suboptimal behavior patterns . . . Whenever training techniques are selected on the basis of illogical or irrelevant criteria, we have committed an injustice to our trainees. . . . Why might trainers knowingly use methods that are either inadequate or inappropriate for the objectives they hope to accomplish? Some possible reasons include . . . lack of knowledge about the competitive effectiveness of various approaches or even the perception that the trainees like a certain method best."

Paige and Martin (1983) have taken the instructional strategy objective one step further. Many instructional strategies confront trainees with the possibility of revealing things about themselves to others that they would prefer to leave unknown, and with the risk of failure. Moreover, the instructional methods that are selected must be properly sequenced in

Figure 3. Assessment of Levels of Instruction

<i>Instructional Method</i>	<i>Levels of Learning</i>			<i>Competencies to Be Learned</i>		
	<i>Familiarity</i>	<i>Understanding</i>	<i>Application</i>	<i>Technical</i>	<i>Conceptual</i>	<i>Human</i>
Reading	high	medium	low	low	medium	low
Lecture	medium	medium	low	low	medium	low
Discussion	medium	medium	low	low	medium	low
Field Trip	medium	low	low	low	medium	low
Case	low	high	low	low	high	low
Scenario	low	high	low	low	high	low
Individualized Instructional Package	low	high	low	low	high	low
Computer-Assisted Instruction	low	high	low	low	high	low
Student Research	low	medium	low	low	medium	low
Laboratory Approach	low	high	medium	medium	high	medium
Simulation	low	high	high	high	high	medium
Human Relations Training	low	high	high	high	high	high
Clinical Study	low	high	high	high	high	medium
Team Research	low	high	high	high	medium	low
Internship	low	medium	high	high	medium	medium

Note: High, medium, low = Extent to which the method, when competently employed, tends to be practical and effective in achieving the designated skills at the levels desired.

Source: McCleary and McIntyre, 1972.

order to achieve the aims of the overall educational experience. Thus, the fifth question that public-sector trainers and managers eager to improve the productivity of public-sector training should ask is, Have the instructional strategies to be used proved effective in achieving the learning objectives that have been identified? If so, have the strategies been sequenced so as to have a positive impact on trainees?

Trainees Learning Styles

The second independent variable in the contingency approach to instructional design is the anticipated learning style of trainees. Learning styles are characteristic cognitive, affective, and physiological behaviors that indicate how learners perceive, interact with, and respond to the learning environment. Cognitive styles are "information-processing habits representing the learner's typical mode of perceiving, thinking, problem solving, and remembering" (Keefe, 1979, p. 8). The term *affective style* refers to those motivational processes viewed as the learner's typical mode of arousing, directing, and sustaining behavior, while physiological styles are biologically based modes of response that are founded on sex-related differences, personal nutrition and health, and accustomed reaction to the physical environment (Keefe, 1979).

One of the most researched polarities of learning style is the polarity between field dependence and field independence. In a field-dependent mode of perceiving, perception is strongly dominated by the overall organization of the surrounding field, and the individual parts of the field are experienced as fused. In a field-independent mode of perceiving, parts of the field are experienced as discrete from the organized ground.

As the name implies, field-dependent individuals, sometimes called *global learners*, rely on the environment of the learning situation for structure. These individuals are sensitive to social cues. They are interpersonally oriented, and they rely heavily on external stimuli. They tend to have a short attention span, they are easily distracted, and they like informal learning situations. People with this learning style view the teacher as just another individual. They are less achievement oriented and less competitive than analytic learners. Global learners respond best to a learning environment that invokes their feelings and experiences. For them, learning is a social experience.

The field-independent or analytic learner does not rely on the learning environment. Field-independent learners have an internal structure that enables them to analyze information and solve problems without outside assistance. They are not as sensitive to socially oriented communication, and they do not pay as much attention to those around them. They appear to be more active, more autonomous, more self-motivated, and more task oriented in their approach to life. These individuals have the

ability to analyze information from the learning situation and solve problems independently. Analytical learners resist distractions and have a longer attention span and greater reflectivity than global learners. They tend to be more sedentary and prefer formal learning situations; they view the instructor as a source of information. They are competitive, achievement oriented, and impersonal.

There are many ways of relating the field-dependent and field-independent styles of learning to the instructional methodologies described earlier in this paper. One approach is to categorize the instructional methodologies by learning environments on a continuum ranging from formal and unambiguous to informal and ambiguous. The dichotomy is important, because research has shown that field-dependent and field-independent learners react differently to these two learning situations (Mezoff, 1982). Field-dependent students prefer discussion or discovery modalities in which they can interact with others, while field-independent students like lecture formats in which they can take in the information autonomously. In view of these descriptions, the reader may suspect that the informal training environment is most effective for global learners, while the formal environment is most effective for analytical learners. However, research indicates that this conventional wisdom needs to be nuanced. Witkin and others (1977) suggest that there is no difference between the amount of material that global or analytical learners learn in a structured learning environment. However, when the material has no clear inherent structure and the learner must organize it in order to learn it, field-dependent persons are likely to have more difficulty than field-independent students. The need that field-dependent learners seem to have for structure leads to several strategies for effective instruction. For example, in a session that features discussion, field-dependent trainees may require questions or a list of suggested topics. If case studies are being used as the teaching method, the instructor should provide field-dependent learners with questions that can focus their discussion (Murphy, 1982). Likewise, the learning style of field-independent trainees requires attention from an astute trainer. Field-independent individuals do not seek external feedback. Thus, a field-independent trainee who works alone on a project and starts on the wrong track may not recognize this until he or she has completed the assignment. In an ongoing class project, the trainer can require progress reports and monitor them to ensure that field-independent trainees have perceived the correct method for responding to the assignment (Murphy, 1982).

Since field-dependent people are particularly interested in the social aspects of their surroundings, it is obvious that such persons are better at learning material with social content (Witkin and others, 1977). Thus, if a course activity requires the learning of social-related material, the instructor can assume that field-independent trainees will learn the mate-

rial quite readily. It has also been shown that while field-independent students are not particularly sensitive to social material, they are just as able as field-dependent students to learn such material once they have been alerted to look out for certain social-related facets of the learning experience (Mezoff, 1982). Thus, the observant trainer sees that sufficient clues are provided in a socially oriented learning situation to assist field-independent trainees in the learning process.

The motivation for learning also seems to affect the degree to which field-dependent and field-independent persons learn. Some evidence suggests that field-independent persons tend to learn more than field-dependent individuals do when the motivation is completely intrinsic. However, when there are external rewards for learning, whether the rewards are material or nonmaterial in nature, there is no difference between the amount of learning that takes place (Mezoff, 1982). Recognizing this difference, the instructor might want to make sure that extrinsic rewards are made available to stimulate field-dependent learners.

However, the field dependence-field independence dichotomy is not the only factor that appears to have implications for improving the learning process (Keefe, 1979). Another cognitive style has been termed *perceptual modality preference*. This term refers to the individual's preference for one of the three sensory modes of understanding experience: kinescope or psychomotor, visual or spatial, and auditory or verbal. In adults, all three modes function cooperatively; a preference for one mode can usually be discerned (Keefe, 1979).

There are also several affective learning styles that should interest the instructor. These include conceptual level and persistence or perseverance. The term *conceptual level* refers to a broad development trait characterizing the amount of structure that a student requires in order to learn best. Closely related are responsibility—the capacity to follow through on a task without direct or frequent supervision—and need for structure—the amount and kind of structure that an individual requires (Keefe, 1979). The term *persistence* is defined as “variations in learners' willingness to labor beyond the required time” (Keefe, 1979, p. 12).

Physiological styles include time rhythms—variations in optimum learning patterns that depend on the time of day; need for mobility—differences in learners' needs to change posture and location; and environmental elements—individual preferences for varying levels of light, sound, and temperature (Keefe, 1979).

This writer used the Productivity Environmental Preference Survey (PEPS) (Price, Dunn, and Dunn, 1979) to measure learning styles not related to the field dependence-field independence dichotomy. This instrument claims to be the first comprehensive approach to the diagnosis of an adult's individual productivity and learning style. Further, the instrument helps to prescribe the type of environment, working conditions,

activities, and motivating factors that maximize individual output. The PEPS analyzes an individual adult's personal preferences for each of twenty-one different elements:

- | | | |
|------------------------------|------------------------------------|----------------------------|
| 1. Sound | 2. Light | 3. Warmth |
| 4. Formal design | 5. Motivated/
unmotivated | 6. Persistent |
| 7. Responsible | 8. Structure | 9. Learning alone |
| 10. Peer-oriented
learner | 11. Authority-
oriented learner | 12. Several ways |
| 13. Auditory
preferences | 14. Visual preferences | 15. Tactile
preferences |
| 16. Kinesthetic | 17. Requires intake | |
| 18. Evening-morning | 19. Late morning | 20. Afternoon |
| 21. Needs mobility | | |

The standard score scale ranges from 20 to 80, with a mean of 50 and a standard deviation of 10. The standard score is calculated from the scores of adults who have taken the PEPS. Individuals having a standard score of 60 or more on a particular element strongly prefer that element as a factor when they study or work. Individuals having a standard score of 40 or less do not prefer the element when they study or work.

Price, Dunn, and Dunn (1979) suggest some instructional strategies for students whose standard scores are greater than one standard deviation from the mean. For example, for students who receive a standard score of 60 or more on the sound element, provide soft music, earphones, conversation areas, or an open work environment. For students who receive a standard score of 40 or less, establish silent areas, provide individual alcoves with sound proofing, or provide ear plugs to block out sound.

For students with a standard score of 60 or more on the light element, place the student near a window or under bright illumination, and add table or desk lamps. For students with a standard score of 40 or less, create work spaces under indirect or subdued light, away from windows and use dividers or plants to block or diffuse light.

It is vital for the trainer to be aware of the wide variety of trainees' learning styles. The trainer must be cognizant of the implications of individual learning styles and integrate appropriate responses into the training design and environment. In light of the importance of learning styles to learning, it is natural to ask, Do the training, design, delivery, and facilities take the variety of learning styles of the anticipated audience into account?

The final focus of inquiry that will improve the productivity of public-sector training is that of summative evaluation. Kirkpatrick (1976) describes four levels of summative evaluation for training: reaction, learn-

ing, behavior, and results. Evaluation of reaction gathers data on how well the participants liked the training program and on how they perceived the trainer, the program, and the training facilities. Reaction evaluation is the most common (and sometimes the only) form of training evaluation. Evaluation of learning determines what principles, facts, and techniques were learned. Evaluation of behavior attempts to ascertain the changes in job behavior or performance that resulted from the program, whereas evaluation of results asks what were the tangible effects of the training in terms of such things as reduced cost, improved quality, improved quantity, and so on. Klingner and Nalbandian (1984) add cost-effectiveness as a fifth level of evaluation. On this level of evaluation, the trainer determines whether the cost of the total training activity was less than the cost of the skill deficiency, and if so, whether the training activity cost less than other possible solutions.

Obviously, the questions that managers and trainers must ask at this stage of the training design and delivery are, Has summative training evaluation been carried out? If so, was it carried out at the level that will provide the information necessary for adequate program assessment? Recognizing that this paper has defined training as an organized learning experience designed to enhance the ability of an employee to achieve a desired level of performance in a specific job, the minimum level of evaluation for training is the level of behavior. Both the manager and the trainer may also want the insight that can be obtained from evaluation of cost-effectiveness.

Summary

In conclusion, training can be a very important strategy for improving the efficiency and effectiveness of the public-sector work force. For it to achieve this noble goal, it must first be the correct medicine for the "sickness" that the organization is experiencing. To be sure that the fit between the performance discrepancy observed and the training effort is correct, the following steps must be observed:

1. Be sure that the job performance and behaviors that will meet the performance needs of the organization have been specified.
2. Ascertain whether the cause of the observed performance discrepancy is a skill deficiency.
3. Identify the skills, knowledge, and attitudes that trainees need in order to achieve the desired job performance.
4. Establish trainee-oriented behavioral learning objectives that will enable trainees to develop the competencies needed to achieve the desired level of job performance.
5. Select and sequence instructional strategies that have proved effective in achieving the learning objectives that have been identified.

6. Integrate the variety of learning styles of the anticipated trainees into the training design, delivery, and facilities.
7. Select the level of summative evaluation that will provide the information necessary for program assessment.

Elevating training to its rightful place as an instrument for improving the effectiveness of public organizations will require a careful examination of training design, delivery, evaluation, and environment. Each phase of the training process must be analyzed. The issues raised in this paper will help astute managers and trainers to increase the productivity of public-sector training.

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