

15

TRAINING AND DEVELOPMENT

Considerations in Design

LEARNING GOALS

By the end of this chapter, you will be able to do the following:

- 15.1 Identify key factors that are driving the demand for well-designed and well-executed programs of workplace learning
- 15.2 Explain what training and development activities are
- 15.3 Illustrate the fundamental requirements of sound training practice
- 15.4 Assess training needs and specify training objectives
- 15.5 Describe features of the learning environment that facilitate learning and transfer
- 15.6 Specify key elements of successful team training
- 15.7 Incorporate classic principles of learning into all training designs
- 15.8 Integrate key elements that will maximize positive transfer of training to the job

FACTORS DRIVING THE INCREASING DEMAND FOR WORKPLACE TRAINING

Change, growth, and development are facts of organizational life. Young people entering the workforce today typically change jobs at least seven times by their late 20s as they strive to figure out what they like, what they are good at, and where they can fit in and stand out (Hirsch, 2016). At the same time, as we noted in more detail in Chapter 1, the number as well as the mix of people available to work are changing rapidly. Globally, there will be many more older than younger people (“The first world is aging,” 2015; Qi, 2017), and in the United States, by 2040 the non-Hispanic white population will drop below 50% (Toossi, 2012).

These workforce dynamics have two major implications for employers. First, since products and services can be copied, the ability of a workforce to innovate, refine processes, solve problems, and form relationships becomes an organization's only sustainable advantage. Attracting, retaining, and developing people with critical competencies is vital for success. Second, the task of managing a culturally diverse workforce, of harnessing the motivation and efforts of a wide variety of workers, will present a continuing challenge. Ongoing training and development initiatives are critical to meeting the need for competent, well-functioning workforces. The following four trends are driving the demand for well-designed and well-executed programs of workplace learning (Cascio, 2017):

- *Growing demands for personal and professional development.* Among young adults, the most important feature they look for in a new job is the opportunity for continuous learning (Hirsch, 2016). From the perspective of organizations, surveys indicate a strong desire for employees who can “plug and play”—that is, perform with minimal on-the-job training. Unfortunately, only 11% of employers report that they have found such recruits (Abadzi, 2016; Coy, 2014; Weber, 2014). In addition to technical skills, employers are looking for people who can interact satisfactorily with customers and who demonstrate responsibility, flexibility, initiative, critical thinking, and a collaborative spirit. If most new recruits are not ready to “plug and play,” however, then the burden shifts to employers to develop the kinds of technical and interpersonal skills they need to compete and win in global markets. To be most effective, training needs to be aligned with management's operating goals, which may include improved productivity, quality, or customer satisfaction (Nathan, 2016).

- *The effects of digital technology on work.* In Chapter 1 we noted that technology, especially information and communication technology, is changing the manner in which businesses create and capture value, how and where we work, and how we interact and communicate. Technologies such as cloud and mobile computing, big data and machine learning, sensors and intelligent manufacturing, advanced robotics and drones, and clean-energy technologies are transforming the very foundations of global business and the organizations that drive it (Cascio & Montealegre, 2016; Friedman, 2016). Although technology is surely not the answer to all people-related business issues, it is critical to recognize how prevalent it is and the high expectations that employees, job candidates, suppliers, customers, and other stakeholders have that it will operate well. With respect to training, employees can take a course on nearly any subject online without leaving their desks, or couch, or coffee shop. Indeed, the trend toward consumer-centric learning puts employees, not training departments, in charge (Deloitte, Touche, Tohmatsu, Ltd., 2016).

- *Increased training opportunities for nonstandard workers.* Traditionally, employees received classroom instruction and on-the-job training opportunities as they moved through jobs and hierarchical levels in an organization. Today, more and more workers are operating outside the traditional confines of regular, full-time employment. These nonstandard workers may be “free agents” or “e-lancers” (that is, freelancers in the digital world) who work for themselves, or they may be employees of an organization with which a firm is allied, employees of an outsourcing or temporary-help firm, or even volunteers (Boudreau, Jesuthasan, & Creelman, 2015; Cascio & Boudreau, 2017). They may be employed for limited periods of time by many organizations as they work on tasks, micro-tasks, and projects. A “career” in the on-demand economy focuses more on accumulating project and task credits than on progressing through a series of positions in a hierarchy. Talent deployment may reflect long-term collaborations between an organization and a freelance platform or vendor. The objective is not only to perform the task at hand but also to ensure that the worker has opportunities to develop in order to be ready for the next task that the organization sends

his or her way. Ongoing opportunities for professional development are critical to continued employability.

- *Greater use of teams.* As more firms move to employee involvement and teams in the workplace, team members need to learn such behaviors as asking for ideas, offering help without being asked, listening and providing feedback, and recognizing and considering the ideas of others. Decades of research have revealed what effective team training looks like, as we shall see later in this chapter (Cannon-Bowers & Bowers, 2011; Salas, Burke, & Cannon-Bowers, 2002; Salas & Cannon-Bowers, 2001).

Indeed, as the demands of the information age spread, companies are coming to regard training expenses as no less a part of their capital costs than plants and equipment. Organizations that provide superior opportunities for learning and growth have a distinct advantage when competing for talented employees (Loughery, 2016; Sparshott, 2017).

These trends suggest a dual responsibility: The organization is responsible for providing an atmosphere that will support and encourage change, and the individual is responsible for deriving maximum benefit from the learning opportunities provided. This may involve the acquisition of new information, skills, attitudes, or patterns of social behavior through training and development.

Change can, of course, be effected through a variety of other methods as well: replacement of poor performers; imposition of controls (e.g., budgets, sign-off procedures, or close supervision); reorganization of individual job assignments; use of participative decision making; bargaining; or outright coercion, either social or physical. In short, training is not necessarily the *only* alternative available for enhancing the person–job organization match, and it is narrow minded to view it as an elixir for all performance problems. Training and development are important managerial tools, but there are limits to what they can accomplish.

The good news is that studies show that well-designed training in general, and e-learning in particular, can be effective (Arthur, Bennett, Edens, & Bell, 2003; Cheng & Chen, 2015; Salas, Tannenbaum, Kraiger, & Smith-Jentsch, 2012). The average effect size, or *d*, equals .62—that is, it is .62 standard deviations better than performance without training—but the effectiveness of training varies, depending on the delivery method and the skill or task being trained.

In view of the considerable amount of time, money, and effort that organizations devote to these activities, we consider important issues in training and development in this chapter and in Chapter 16. Primarily we emphasize the *design* of training and development programs, the *measurement* of outcomes of these efforts, and the *interaction* of training outcomes with other organizational subsystems. We place substantially less emphasis on specific training methods and techniques.

TRAINING AND DEVELOPMENT ACTIVITIES: WHAT ARE THEY?

Both training and development entail the following general properties and characteristics (Goldstein & Ford, 2001; Kraiger, 2003; Noe, 2017):

- Training and development are learning experiences.
- They are planned by the organization.

- They occur after the individual has joined the organization.
- They are intended to further the organization's goals.

Training and development activities are, therefore, planned programs designed to improve performance at the individual, group, and/or organizational levels. Improved performance, in turn, implies that there have been measurable, relatively permanent changes in knowledge, skills, attitudes, and/or social behavior.

We include the phrase “relatively permanent” in the description of improved performance to distinguish learning from performance. The distinction is principally a temporal one. Learning is a relatively permanent change in behavior that occurs as a result of practice or experience (not simple maturation). Learning is the ability to perform; it is available over a long period of time. *Performance*, by contrast, refers to the demonstration of learning—it is observable, measurable behavior from which we infer learning. Performance is often a function of the individual's physical or mental state. For example, if an individual is fatigued, temporarily unmotivated, or distracted because of some environmental condition—noise, commotion, anxiety—he or she may not perform well in a given situation. The person is, therefore, unable to demonstrate all that he or she has learned. These conditions are more likely to affect short-run performance than long-term learning.

To be sure, a great deal of learning takes place in organizations—from peers, superiors, and subordinates. Some of this learning is planned and formally sanctioned by the organization, but much of it is serendipitous, unplanned, and informal (e.g., learning from a peer or from a more experienced employee). In fact, studies in the United States as well as in other Organisation for Economic Co-operation and Development (OECD) countries show that as much as 50 to 70% of workplace learning is informal (De Grip, 2015; McCall, 2004; Pfeffer & Sutton, 2000). The critical aspect of our definition of training and development is that it implies that training results must be defined in terms of measurable change either in individual states (knowledge, attitudes) or in individual performance (skills, social behavior). The definition is necessarily broad and includes simple programs of skill training, as well as complex, system-wide programs of organizational development.

TRAINING DESIGN

We begin this section by examining organizational and individual characteristics related to effective training. Then we consider fundamental requirements of sound training practice: defining what is to be learned and the interaction of training and development with the broader organizational environment, determining training needs, specifying training objectives, and creating an optimal environment for training.

Characteristics of Effective Training

If done well, training and development lead to sustained changes that can benefit individuals, teams, organizations, and society (Aguinis & Kraiger, 2009). Surveys of corporate training and development practices have consistently found that four characteristics seemed to distinguish companies with the most effective training practices (Colvin, 2009; Rifkin, 2011):

- Top management is committed to training and development; training is part of the corporate culture. This is especially true of leading companies, such as Google, Disney, GE, and Cisco.

- Training is tied to business strategy and objectives and is linked to bottom-line results.
- Organizational environments are “feedback rich.” They stress continuous improvement, promote risk taking, and afford opportunities to learn from the successes and failures of one’s decisions.
- There is commitment to invest the necessary resources, to provide sufficient time and money for training.

Does top management commitment really matter? Absolutely. For example, meta-analysis indicates that, when management-by-objectives is implemented with high commitment from top management, productivity gains are five times higher than when commitment is low (Rodgers & Hunter, 1991). A subsequent meta-analysis found that job satisfaction increases about a third of a standard deviation when top management commitment is high—and little or not at all when top management commitment is low or moderate (Rodgers, Hunter, & Rogers, 1993).

Additional Determinants of Effective Training

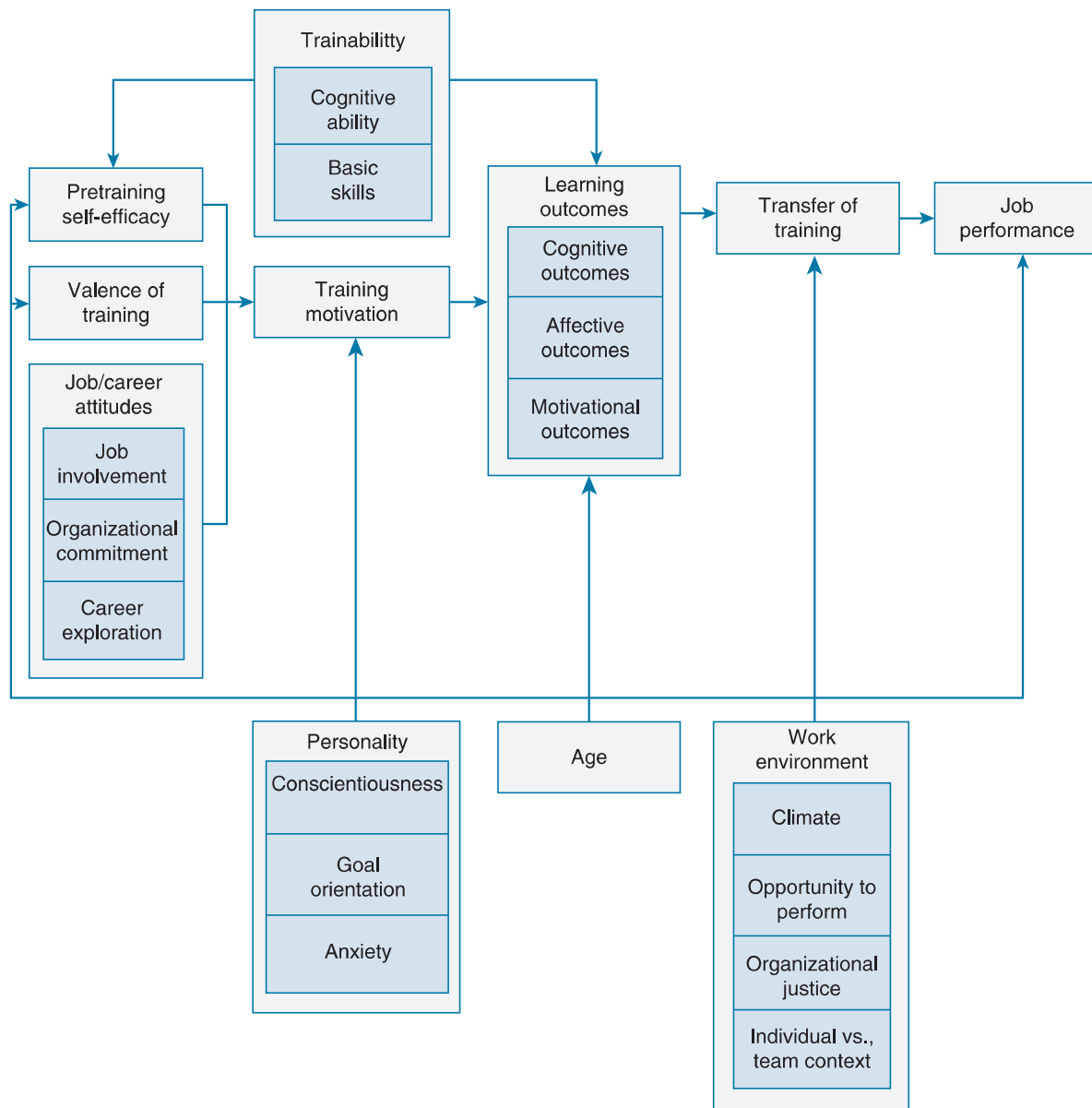
Evidence indicates that training success is determined not only by the quality of training but also by the interpersonal, social, and structural characteristics that reflect the relationship of the trainee and the training program to the broader organizational context. Variables such as organizational support, as well as an individual’s readiness for training, can enhance or detract from the direct impact of training itself (Colquitt, LePine, & Noe, 2000; Sitzmann & Weinhardt, 2015). Figure 15.1 shows a model of training effectiveness developed by Noe and Colquitt (2002).

The model shows that individual characteristics (including trainability—that is, the ability to learn the content of the training—personality, age, and attitudes) influence motivation, learning, transfer of training back to the job, and job performance. The motivation to learn is a critical consideration. Motivation is a force that energizes, directs, and maintains behavior (Steers & Porter, 1975). In the context of training, this force influences enthusiasm for the training (*energizer*), keeps attention focused on training per se (*director*), and reinforces what is learned in training, even in the face of pressure back on the job to discard what has just been learned (*maintainer*). Indeed, meta-analytic and causal modeling evidence indicates that motivation to learn explains significant variance in learning outcomes, over and above cognitive ability per se (Colquitt et al., 2000; Noe & Colquitt, 2002).

Features of the work environment (climate, opportunity to perform trained tasks, organizational justice, and individual versus team context) also affect each stage of the training process. The model, therefore, illustrates that characteristics of the individual, as well as of the work environment, are critical factors before training (by affecting motivation), during training (by affecting learning), and after training (by influencing transfer and job performance).

Admittedly, some of the individual characteristics, such as trainability and personality, are difficult, if not impossible, for organizations to influence through policies and practices. The organization clearly can influence others, however. These include, for example, job or career attitudes, pretraining self-efficacy (a person’s belief that he or she can learn the content of the training successfully), the valence of training (the attractiveness of training outcomes), and the work environment itself (Brown & Sitzmann, 2011; Quiñones, 1997; Switzer, Nagy, & Mullins, 2005).

FIGURE 15.1 ■ A Model of Individual and Work Environment Characteristics Influencing Learning and Transfer of Training



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Fundamental Requirements of Sound Training Practice

As an instrument for change, the potential of the training and development enterprise is awesome. To reach that potential, however, it is important to resist the temptation to emphasize technology and techniques; instead, define first what is to be learned and what the substantive content of training and development should be (Campbell, 1971, 1988). One way to do this is to view training and development as a network of interrelated components. After all, training

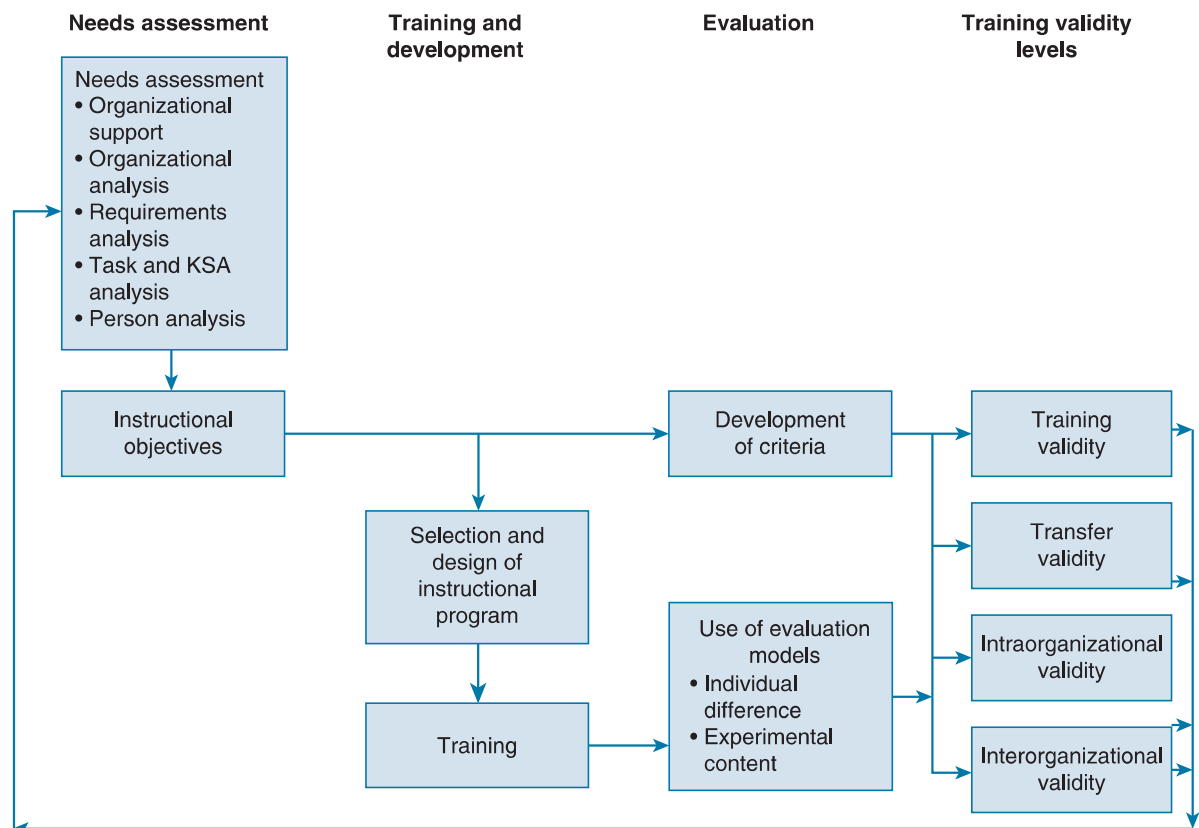
is an activity that is embedded within a larger organizational context (Aguinis & Kraiger, 2009; Brown & Sitzmann, 2011; Quiñones, 1995, 1997). Figure 15.2 shows such a model.

Program development comprises three major phrases, each of which is essential for success: a needs assessment or *planning* phase, a training and development or *implementation* phase, and an *evaluation* phase. In brief, the needs-assessment phase serves as the foundation for the entire program, for, as Figure 15.2 shows, subsequent phases depend on inputs from it. If needs assessment is incomplete, the training that is implemented may be far out of tune with what an organization really needs.

Having specified instructional objectives, the next task is to design the training environment in order to achieve the objectives. This is the purpose of the training and development phase—“a delicate process that requires a blend of learning principles and media selection, based on the tasks that the trainee is eventually expected to perform” (Goldstein & Ford, 2001, p. 28). We examine this topic in more detail later in the chapter. If assessment and implementation have been done carefully, the evaluation should be straightforward. Evaluation (see Chapter 16) is a twofold process that involves establishing measures of training and job performance success (criteria) and using experimental and quasi-experimental designs to determine what changes have occurred during the training and transfer process.

A number of different designs can be used to assess the outcomes of training programs. To some extent, the choice of design(s) depends on the questions to be asked and the constraints

FIGURE 15.2 ■ A General Systems Model of the Training and Development Process



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operating in any given situation. The last column of Figure 15.2 lists a number of possible training goals:

- *Training validity*: Did trainees learn anything during training?
- *Transfer validity*: To what extent did the knowledge, skills, or abilities (KSAs) learned in training lead to improved performance on the job?
- *Intraorganizational validity*: Is the performance of a new group of trainees in the same organization that developed the training program similar to the performance of the original training group?
- *Interorganizational validity*: Can a training program that “works” in one organization be used successfully in another organization?

These questions often result in different evaluation models or, at the very least, different forms of the same evaluation model (Kraiger, 2002; Mattson, 2003; Noe, 2017; Wang & Wilcox, 2006). Evaluation, therefore, should provide continuous closed-loop feedback that can be used to reassess instructional needs, thereby creating input for the next stage of development. The purpose of Figure 15.2 is to provide a model that can help to organize the material in this chapter and Chapter 16. Let’s begin by defining what is to be learned.

Defining What Is to Be Learned

There are six steps in defining what is to be learned and what the substantive content of training and development should be:

1. Analyze the interaction of training and development with other HR systems, such as recruitment, staffing, performance management, and incentive programs.
2. Determine training needs.
3. Specify training objectives.
4. Decompose the learning task into its structural components.
5. Determine an optimal sequencing of the components.
6. Consider alternative ways of learning.

Our overall goal—and we must never lose sight of it—is to link training content to desired job behaviors. This is consistent with the modern view of the trainer’s role, which represents a change from focusing on training per se to focusing on improving performance, guided by the overall competitive strategy of an organization (Nathan, 2016; Tyler, 2008).

Interactions of Training and Development With Other Systems

Training and development operate in a complex organizational milieu. Failure to consider the broader organizational environment often contributes to programs that either result in no observable changes in attitudes or behavior or, worse yet, produce negative results that do more harm than good. As an example, consider what appears at first glance to be a simple question—namely, “Whom do we train?”

Traditionally, the pool of potential trainees was composed of an organization’s own employees. Today, however, organizational boundaries are blurring, such that the border

between customers, suppliers, employees, non-employees, and even competitors is becoming fuzzier (Cascio & Boudreau, 2017). As a result, *any* individual or group that has a need to acquire specific capabilities to ensure an organization's success is a potential candidate for training (Cascio, 2010).

Unfortunately, training does not always lead to effective behaviors and enhanced organizational results. One reason for this is lack of alignment between training and an organization's strategic direction (Nathan, 2016; Noe, 2017). To enhance that alignment, it is important to identify what new talent capabilities will be needed, how they compare to current capabilities, and what steps are necessary to bridge the gap. That kind of analysis may also have implications for recruitment, staffing, performance management, incentives, and other organizational processes as well and it is important to anticipate them.

In practice, three other conditions also must be present: The individual must be capable of learning new material ("can do"), he or she must be motivated to learn it ("will do"), and those individuals who exert influence over him or her must support the development effort. A key element of any such effort is the careful identification of training needs.

Assessing Training Needs

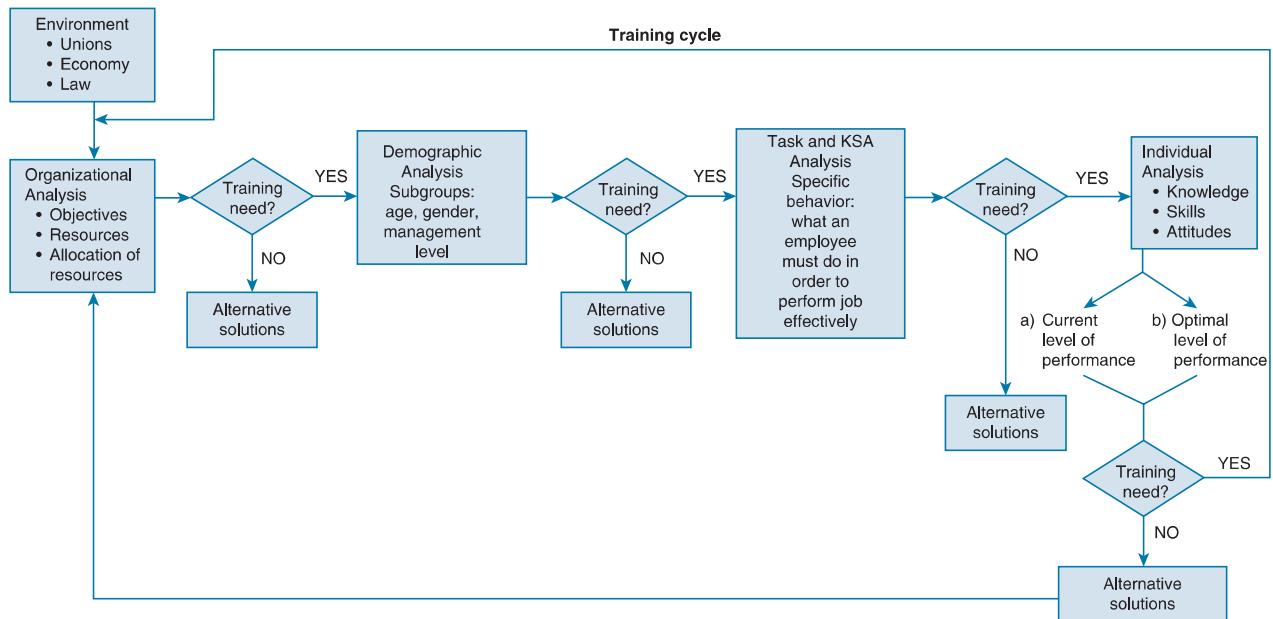
It has been said often that, if you don't know where you are going, any road will get you there; *but*, if you do know where you are going, you will get there sooner. This is especially true of training and development efforts. The purpose of needs assessment is to determine if training is necessary *before* expending resources on it.

Kraiger (2003) noted three important points about needs assessment. First, across multiple disciplines, it is perceived as an essential starting point in virtually all instructional-design models. Second, despite its assumed importance, in practice, many training programs do not use it. A large-scale meta-analysis of training effectiveness found that only 6% of the studies analyzed reported any needs assessment prior to training implementation (Arthur et al., 2003). Third, in contrast to other areas of training, there is very little ongoing research or theory with respect to needs assessment.

Earlier we noted that pretraining motivation is an important determinant of training success. Motivation increases as adults perceive the training as relevant to their daily activities, and a thorough needs assessment that includes experienced subject matter experts should be able to demonstrate the value of training before it begins, lower trainees' anxiety about training, and enhance organizational support for transfer of training back to the job (Goldstein & Ford, 2001; Klein, Noe, & Wang, 2006; Noe, 2017).

Many methods have been proposed for uncovering specific training needs—that is, the components of job performance that are relevant to the organization's goals and the enhancement of which through training would benefit the organization (Campbell, 1988; Goldstein & Ford, 2001). In general, they may be subsumed under the three-facet approach described in McGehee and Thayer's (1961) classic text on training. These are *organization analysis* (identification of where training is needed within the organization), *operations analysis* (identification of the content of the training), and *individual analysis* (identification of who needs training and of what kind is needed). Each of these facets contributes *something*, but, to be most fruitful, all three must be conducted in a continuing, ongoing manner and at all three levels: at the organization level, with managers who set its goals; at the operations level, with managers who specify how the organization's goals are going to be achieved; and at the individual level, with managers and workers who do the work and achieve those goals.

These three managerial levels are but three possible populations of individuals. In fact, needs analysis done at the policy level based on different populations is called *demographic analysis* (Latham, 1988), and it should be added to the traditional trichotomy of organization,

FIGURE 15.3 ■ Training Needs-Assessment Model

operations, and individual analyses. This broader schema is shown in Figure 15.3. We now describe various portions of Figure 15.3 in greater detail.

As Figure 15.3 demonstrates, an important consideration in the needs-assessment process is the external environment. Judicial decisions, civil rights laws, union activity, productivity, accidents, turnover, absenteeism, and employee behavior in the workplace will provide relevant information at this level. The next step is organization analysis.

Organization Analysis

The purpose of organization analysis is to link strategic-workforce-planning considerations (see Chapter 10) with training needs-assessment results. Another objective is to pinpoint inefficient organizational units to determine whether training is the appropriate antidote to performance problems. The important question is “Will training produce changes in employee behavior that will contribute to our organization’s goals?” If that connection cannot be made, then the training is probably not necessary. A final objective is to estimate the extent of managerial and organizational support for the application of what is learned in training to performance on the job—that is, transfer of training.

Demographic Analysis

Demographic analysis can be helpful in determining the special needs of a particular group, such as older workers, women on expatriate assignments, or managers at different levels. Those needs may be specified at the organizational level, at the business-unit level, or at the individual level (Goldstein & Ford, 2001). With respect to managers, for example, level, function, and attitudes toward the usefulness of training have small, but significant, effects on their self-reported training needs (Ford & Noe, 1987).

Demographic analysis deserves treatment in its own right because the information it provides may transcend particular jobs, work roles, and even divisions of an organization (e.g., safety or sexual harassment training for everyone, regardless of level). Taking this information into account lends additional perspective to the operations and individual analyses to follow.

Operations Analysis

Operations analysis requires a careful examination of the work to be performed after training. It involves (a) a systematic collection of information that describes how work is done, (b) determination of standards of performance for that work, (c) how tasks are to be performed to meet the standards, and (d) the competencies necessary for effective task performance. To ensure the collection of valid data, seek the opinions of managers and subordinates close to the scene of operations (Aguinis & Kraiger, 2009; Nathan, 2016). After all, they know the jobs best. In addition, their involvement helps build *commitment* to the training effort. It is important to ensure, however, that all raters have the experience and self-confidence needed to provide meaningful data (Ford, Smith, Segó, & Quiñones, 1993).

For work that is complex, is dynamic, and has high-stakes outcomes (e.g., pilots, surgeons, accident investigation teams), cognitive task analysis (CTA) may be appropriate (Brannick, Pearlman, & Sanchez, 2017; see also Chapter 9). CTA differs from traditional task analysis in that it focuses explicitly on identifying the mental aspects of performance—activities such as decision making, problem solving, pattern recognition, and situational assessment—that are not directly observable. Conventional task analysis seeks to identify what gets done, whereas CTA focuses on the details of how it gets done—cues, decisions, strategies, and goals. CTA can be a useful supplement to traditional methods to identify cognitive tasks and knowledge requirements that are difficult to describe using standard procedures.

An emerging trend is the use of competency models to drive training curricula. A *competency* is a cluster of interrelated knowledge, skills, values, attitudes, or personal characteristics that are presumed to be important for successful performance on the job (Noe, 2008, 2017). Once validated, an organization-specific competency model may be used for a variety of purposes: to design training programs or personal development plans, 360-degree performance reviews, long-term staffing plans, or as tools for staffing, including promotions (see, e.g., the example of 3M in Chapter 10).

Individual Analysis

Having identified the kinds of characteristics required to perform effectively in a work role, emphasis shifts to assessing how well each employee performs his or her role, relative to standards required. This is the purpose of individual analysis (Goldstein & Ford, 2001). In the rapidly changing environments that many organizations face today, along with demands for “better, cheaper, faster” products and services, performance standards also change. An important aspect of individual analysis, therefore, is to determine whether training can fill that gap or whether other interventions, such as new hiring strategies, work redesign, or some combination of strategies, should be used.

One especially fruitful approach to the identification of individual training needs is to combine behaviorally based performance-management systems with *individual development plans (IDPs)* derived from self-analysis. IDPs provide a road map for self-development and should include the following

- *Statements of aims:* desired changes in knowledge, skills, attitudes, values, or relationships with others
- *Definitions:* descriptions of areas of study, search, reflection, or testing, including lists of activities, experiences, or questions that can help achieve these aims
- *Ideas about priorities:* feelings of preference or urgency about what should be learned first

Individuals often construct their own IDPs, with assistance, in career-planning workshops, through structured exercises, in the practice of management-by-objectives, or in assessment centers. They provide a blueprint for self-development.

As a result of needs assessment, it should be possible to determine what workers do, what behaviors are essential to do what they do effectively, what type of learning is necessary to acquire those behaviors, and what type of instructional content is most likely to accomplish that type of learning (Blanchard & Thacker, 2013; Goldstein & Ford, 2001). This kind of information should guide all future choices about training methods and evaluation strategies.

Rapid Prototyping

Needs assessment remains important (Nathan, 2016), although the overall process can be somewhat ponderous. As an alternative, some instructional designers are incorporating “rapid prototyping” of training programs based on process models used in software development (Brown & Sitzmann, 2011; Welbourne, 2011). It’s a three-phase approach.

The first phase involves the assessment of needs and the determination of training objectives. The second phase involves constructing prototypes and testing them with users. The third phase involves implementing and refining the training. This approach relies on parallel work efforts, minimal commitments, and extensive user testing. Designers are expected to create and test training before the needs assessment is complete, and to modify it based on the results of user tests. If instruction can be created, tested, and modified quickly, then rapid prototyping might be appropriate. It is less practical in settings where instruction is costly to develop or when user testing is not feasible.

Specifying Training Objectives

Specification of training objectives (i.e., what is to be learned) becomes possible once training and development needs have been identified. This is *the* fundamental step in training design (Blanchard & Thacker, 2013; Campbell, 1988). Such objectives define what the learner should be able to do after finishing the program that he or she could not do before it. Objectives are stated either in behavioral or in operational terms. Behavioral objectives refer to actions, movements, or behaviors that are observable and measurable. Each objective should describe (a) the desired behavior, (b) the conditions under which the behavior should occur, and (c) the standards by which the trainee’s behavior is to be judged (Mager, 1984). For example, consider a behavioral objective for a training program for civil engineering students:

In a two-hour test following the last week of training [conditions under which behavior should occur], the student will be able to list the sequence of steps involved in building an on-ramp to a highway, specifying the standards for completion of each step [desired behavior]. All steps must be included in the correct order, and the standards for completion must match those in the textbook [success criteria].

Objectives also may be stated in operational or end-result terms. For example, it is one thing to have an objective to “lower production costs.” It is quite another thing to have an objective to “lower the costs of producing Model 600 lawn sprinklers 15% by April 30, by having one operator execute all operations using computer-controlled machinery.” The latter is a much more specific statement of what the objective actually is and how it will be reached. In addition, the more precise the statement is, the easier it is to assess its contribution to successful operations. “To lower costs 15%” makes it possible to determine what changes in price or increases in profits can be anticipated as a result of the introduction of computer-controlled machinery. The end result of training, of course, is the successful execution of all operations by a single operator.

It is important to understand the “action” component of objectives, and what it implies. Many of the crucial mediating factors of management performance are attitudes, yet it is difficult to demonstrate the link between attitudes and job performance (Cascio, Boudreau, & Fink, in press). Operationally, we are interested in the characteristics of the end results or behaviors that permit us to *infer* the type of mental activity that produced them. Hence, we emphasize observable actions. If trainers were not concerned with bringing about changes in individuals or groups, they would not have to bother looking at behavior—but they do bear that responsibility, and cannot shirk it.

Creating an Optimal Environment for Training and Learning

Having specified training objectives, the next task is to design the training environment in order to achieve the objectives. Summarizing existing research, Noe and Colquitt (2002) identified seven features of the learning environment that facilitate learning and transfer:

1. Trainees understand the objectives of the training program—the purpose and outcomes expected.
2. Training content is meaningful. Examples, exercises, assignments, concepts, and terms used in training are relevant.
3. Trainees are given cues that help them learn and recall training content, such as diagrams, models, key behaviors, and advanced organizers.
4. Trainees have opportunities to practice.
5. Trainees receive feedback on their learning from trainers, observers, video, or the task itself.
6. Trainees have the opportunity to observe and interact with other trainees.
7. The training program is properly coordinated and arranged.

In terms of coordination, a classic paper by Gagné (1962) offered three psychological principles that are useful in training design:

1. Any human task may be analyzed into a set of component tasks that are quite distinct from each other in terms of the operations needed to produce them.
2. These task components are mediators of the final task performance; that is, their presence ensures positive transfer to a final performance, and their absence reduces such transfer to near zero.
3. The basic principles of training design consist of (a) identifying the component tasks of a final performance, (b) ensuring that each of these component tasks is fully achieved, and (c) arranging the total learning situation in a sequence that will ensure optimal mediational effect from one component to another. (p. 88)

In this framework, “what is to be learned” is of signal importance. Successful final performance on a task depends on first attaining competence on the various subtasks that compose it. In short, it appears that there is a *more efficient* and a *less efficient* sequence that can be arranged for the learning of a procedural task (i.e., a task composed of at least two component tasks), and this sequence involves learning each subtask before undertaking the total task. Gagné’s ideas were based on a great deal of research on skill learning in the military. Subsequent reviews

of the empirical evidence lend considerable support to the validity of these principles (Gagné, 1967, 1977; Gagné & Briggs, 1979; Gagné & Rohwer, 1969). A similar approach may be used to design training programs that attempt to change knowledge or attitudes.

These principles are necessary, but not sufficient, conditions for learning. As noted earlier, a variety of individual and work-environment characteristics affect learning and transfer (Noe & Colquitt, 2002). Here is an illustration. Tracey, Hinkin, Tannenbaum, and Mathieu (2001) collected data from 420 hotel managers who attended a two-and-a-half-day managerial knowledge and skills training program. Results showed that managers' job involvement, organizational commitment, and perceptions of the work environment (i.e., perceived support and recognition) predicted pretraining self-efficacy, which, in turn, was related to pretraining motivation. Pretraining motivation was related to posttraining measures of utility reactions, affective reactions, declarative-knowledge scores, and procedural-knowledge scores.

Computer-based training offers another opportunity to illustrate the effects of individual differences. Based on a study of 78 employees taking a training course delivered by an intranet, Brown (2001) found considerable variability among trainees in their level of practice and time on task, both of which predicted knowledge gain. Learners who elected to skip materials or to move quickly reduced their knowledge gain. Thus, employees who learn most from this type of training environment are those who complete more of the practice opportunities made available to them and who take more time to complete the experience.

What about training via smartphone? We know that computer-based training is comparable to classroom-based training with respect to learning outcomes, but we know far less about the effectiveness of learning via smaller mobile devices (Cascio, 2017; Kraiger, 2014). There are three important characteristics of learning via smartphone: (1) Learners are no longer tethered to a workstation or conference room; (2) they are interacting with content through a much smaller visual frame; and (3) training through the presentation of meaningful units of content in a single setting is replaced by an assumption that learners can assimilate smaller chunks of information at different times and build a cohesive understanding of the knowledge and skills they need to do their jobs (Kraiger, 2014).

Regardless of the mode of training—technology delivered, classroom, or on the job—the answer to the question “Why do employees learn?” is that they invest effort and time in the learning opportunity (Brown, 2001; Brown & Sitzmann, 2011). Regardless of the instructional features embedded in a program, it will work only through the learner's deliberate cognitive processing. Hence, all training programs should be designed to promote active learning by trainees, because active learners are motivated, mastery oriented, and mindful (Brown & Ford, 2002; Hira, 2007).

The specification of objectives and the creation of an optimal environment for training are essential features of sound training design. So also is careful attention to the determinants of effective team performance, assuming teams are relevant to a given situation.

This concludes our treatment of training design. Before we consider theoretical models to guide training and development efforts, however, we pause to examine a topic of special and growing importance—team training.

TEAM TRAINING

As part of the changing nature of work, there has been an increasing emphasis on team performance. Almost 90% of corporations worldwide use teams of one sort or another (EY, 2017). A *team* is a group of individuals who are working together toward a common goal. It is this common goal that really defines a team. If two team members have opposite or conflicting goals, the efficiency of the total unit is likely to suffer (Kramer, Thayer, & Salas, 2013;

Mathieu, Hollenbeck, van Knippenberg, & Ilgen, 2017). For example, consider the effects on a baseball team when one of the players *always* tries to hit home runs, regardless of the team's situation.

Clearly, individual training cannot do the whole job; we need to address interactions among team members (De Church & Mesmer-Magnus, 2010). These interactions make team training unique—it always uses some form of simulation or real-life practice and always focuses on the interactions of team members, equipment, and work procedures (Bass, 1980; Colvin, 2006).

Researchers (Cannon-Bowers & Bowers, 2011; Salas et al., 2002; Salas, Tannenbaum, Cohen, & Latham, 2013) have developed a systematic approach to team training that includes four steps:

1. *Conduct a team-training needs analysis.* Such an analysis has two objectives: (1) to identify interdependencies among team members and the skills required to master coordination of team tasks and (2) to identify the cognitive skills and knowledge needed to interact as a team (e.g., knowledge of team member roles and responsibilities).

2. *Develop training objectives that address both taskwork and teamwork skills.* In general, a core set of skills characterizes effective teamwork. These include adaptability, shared awareness of situations, performance monitoring and feedback, leadership/team management, interpersonal skills, coordination, communication, and decision-making skills. Attitudinal skills that characterize effective teamwork include belief in the importance of teamwork skills, belief in placing the team's goals above those of individual members, mutual trust, and shared vision (Cannon-Bowers & Bowers, 2011). Sequence the training so that trainees can master taskwork skills before learning teamwork skills (Salas et al., 2002, 2013).

3. *Design exercises and training events based on the objectives from step 2.* As with individual training, opportunities for guided practice and constructive feedback are particularly important for team training (Salas et al., 2002, 2013). Strategies for doing this include the following:

- *Team-coordination training* (focusing on teamwork skills that facilitate information exchange, cooperation, and coordination of job-related behaviors)
- *Cross-training* (providing exposure to and practice with other teammates' tasks, roles, and responsibilities in an effort to increase shared understanding and knowledge among team members)
- *Guided team self-correction* (providing guidance to team members in reviewing team events, identifying errors and exchanging feedback, and developing plans for the future)

4. *Design measures of team effectiveness based on the objectives set at step 2, evaluate the effectiveness of the team training, and use this information to guide future team training.* Important constructs to evaluate include collective efficacy, shared knowledge structures, team situational awareness, and shared mental models (Kraiger, 2003).

A popular intervention that uses these principles is crew resource management (CRM) training, usually conducted using sophisticated flight simulators. Its purpose is to improve team communication and team effectiveness, and therefore aviation safety, among aircrews. Evidence across more than 50 studies shows positive benefits in terms of improved communication and performance (Aguinis & Kraiger, 2009), but CRM seems to be more effective

in aviation settings than in health care settings, where its application is more recent (Salas, Wilson, & Burke, 2006).

Another important finding related to team training is that managers of effective work groups tend to monitor the performance of their team members regularly, and they provide frequent feedback to them (Jose, 2001; Komaki, Desselles, & Bowman, 1989). This is as true of traditional teams as it is of virtual teams (Maynard, Gilson, Jones-Young, & Vartiainen, 2017). In fact, as much as 35% of the variability in team performance can be explained by the frequency of use of monitors and consequences. Incorporating these findings into the training of team members and their managers should lead to better overall team performance.

LEARNING AND INDIVIDUAL DIFFERENCES

Once we have specified behavioral objectives, created an optimal environment for training, and determined the optimum sequencing for learning subtasks, there remains one additional problem: how to acquire the appropriate responses. This is an important question to consider because different people have their own favorite ways of learning. For example, suppose Susan wants to learn a new skill, such as photography. She might begin by checking out three books on the topic from her local library. Alternatively, Nancy might sign up for a photography class at a local school because she wants to experience it, not just to read about it. Finally, Nicole might just begin to take pictures, experimenting in a trial-and-error fashion until she gets the result she is looking for.

Susan, Nancy, and Nicole each prefer different learning methods. Susan prefers verbal learning, Nancy opts for kinesthetic (hands-on) learning, and Nicole chooses trial-and-error experiential learning. These are not the only methods; other people learn best from visual material (pictures, charts, graphs) or from vicarious experience (watching others).

The growing popularity of various forms of technology-delivered instruction (TDI) offers the opportunity to tailor learning environments to individuals (Kolodny, 2016; Kraiger & Jerden, 2007). Simulation games are one popular type of TDI. They refer to instruction delivered via personal computer that immerses trainees in a decision-making exercise in an artificial environment in order to learn the consequences of their decisions. The games are intrinsically motivating, and people report a loss of time when playing their favorite ones. When used for training, they seem to pay off nicely. Meta-analysis results indicate that relative to a comparison group, posttraining self-efficacy (belief that one can succeed) was 20% higher, knowledge of facts was 11% higher, skill-based knowledge was 14% higher, and retention was 9% higher for trainees taught with simulation games (Sitzmann, 2011).

There are drawbacks, however. Computer-based simulation games are more expensive to develop than other forms of TDI, with complex simulation games costing between \$5 and \$20 million to create. Traditional online training takes an average of 220 hours to create each hour of instructional content, whereas online simulations require 750 to 1,500 hours to create each hour of instructional content (Gabriel, 2010; Knowledge@Wharton, 2015; Sitzmann, 2011). Needless to say, in order to maximize the utility of simulation games, designers need to focus on content reuse, using software that streamlines the game-development process and offsetting development costs with savings in travel costs for training that used to be delivered via classroom instruction.

Who profits most from e-learning? Just as with computer-based instruction, research has revealed considerable variability in how much time participants spent on each module and the time they spent practicing what was taught. Not surprisingly, employees who learned most from this type of learning environment were those who completed more of the practice opportunities made available and took more time to complete the experience (Sitzmann, 2011). In other words, active learners learn the most.

Another theoretical model that is based on individual differences is the concept of trainability. We consider it more fully in the next section.

TRAINABILITY AND INDIVIDUAL DIFFERENCES

Individual differences in abilities, interests, and personality play a central role in applied psychology and talent management. Variables such as prior achievement and initial skill level (“can do” factors), along with training expectations (“will do” factors), should be effective predictors of training performance—and they are (Gordon & Cohen, 1973; Robertson & Downs, 1979, 1989). In fact, general mental ability alone predicts success in training in a wide variety of jobs (Colquitt et al., 2000; Ree & Earles, 1991). So also does trainability.

Trainability refers to a person’s ability to acquire the skills, knowledge, or behavior necessary to perform a job at a given level and to achieve these outcomes in a given time (Robertson & Downs, 1979). It is a combination of an individual’s ability and motivation levels. Meta-analyses based on independent samples and using different predictor–criterion pairs (sample sizes of 2,542 and 2,772) showed that in most situations work-sample trainability tests are valid predictors of training performance, more so than for job performance (Robertson & Downs, 1989).

To study more precisely the behavioral transitions that occur in learning or training, however, we need to establish a behavioral baseline for each individual. Behavioral baselines result from each individual’s prior history. The major advantage of this approach is that each individual’s initial state serves as his or her own control. Bass, Cascio, McPherson, and Tragash (1976) used this procedure in a training program designed to cope with problems of race in the working environment. To assess changes in attitude *after* training, a behavioral baseline first was established for each of more than 2,000 subjects by having them complete a statistically derived attitude questionnaire *prior* to training. Unfortunately, however, a great deal of training research ignores the concept of the behavioral baseline and the measurement of initial state.

Regardless of the medium used to deliver training, however, and regardless of its specific content, if the program is to be successful, trainers must pay careful attention to how trainees learn. Application of the classic principles of learning is essential.

PRINCIPLES THAT ENHANCE LEARNING

If training and development are to have any long-term benefit, then efficient learning, long-term retention, and positive transfer to the work situation are essential. Hence, it is not surprising that the principal theoretical basis for training in organizations has been the “learning principles” developed over the past century. Which principles should they consider? It depends on whether the trainees are learning skills (e.g., programming) or factual material (e.g., principles of hydraulics) (Wexley & Latham, 2002).

To be most effective, *skill learning* should include four essential ingredients: (1) goal setting, (2) behavior modeling, (3) practice, and (4) feedback. However, when the focus is on *learning facts*, the sequence should change slightly: (1) goal setting, (2) meaningfulness of material, (3) practice, and (4) feedback. Let’s consider each of these principles in greater detail.

Goal Setting

A person who wants to develop herself or himself will do so; a person who wants to be developed rarely is. This statement illustrates the role that motivation plays in training—to learn,

you must want to learn. One of the most effective ways to raise a trainee's motivation is by setting goals. More than 500 studies show that goal setting improves employee performance in a variety of settings (Latham, 2009; Latham & Locke, 2017; Locke & Latham, 2013). Goal setting is founded on the premise that an individual's conscious goals or intentions regulate his or her behavior (Locke, 1968). Research findings are clear-cut with respect to five issues:

1. Reviews of the literature show that goal-setting theory is among the most scientifically valid and useful theories in organizational science (Locke & Latham, 2013). On average, goal setting leads to a 10% improvement in productivity, and it works best with tasks of low complexity (Schmidt, 2013; Wood, Mento, & Locke, 1987).
2. Commitment to goals by employees is a necessary condition for goal setting to work (Locke, Latham, & Erez, 1988), and self-efficacy (a judgment about one's capability to perform a task) clearly affects it (Frayne & Latham, 1987). Once an employee accepts a goal, however, specific, difficult goals result in higher levels of performance than do easy goals or even a generalized goal such as "do your best" (Klein, Cooper, & Monahan, 2013; Klein, Wesson, Hollenbeck, & Alge, 1999).
3. When tasks are complex, participation in goal setting seems to enhance goal acceptance, particularly when employees are presented with a goal that they reject initially because it appears to be unreasonable or too difficult (Erez, Earley, & Hulin, 1985; Erez & Zidon, 1984). However, when tasks are simple, assigned goals may enhance goal acceptance, task performance, and intrinsic motivation (Shalley, Oldham, & Porac, 1987).
4. When given a choice, employees tend to choose more difficult goals if their previous goals were easy to attain and to choose easier goals if their previous goals were difficult to attain. Thus, past experience with goal setting affects the level of goals employees choose in the future (Locke, Frederick, Buckner, & Bobko, 1984).
5. The effects of goal setting on performance can be enhanced further by providing information to performers about how to work on a task and by providing a rationale about why the goal and task are important (Earley, 1985).

Goal setting is not risk free, and possible side effects, such as excessive risk taking, ignoring nongoal dimensions of performance, pressures to cheat, feelings of failure, and increases in stress, do exist but can be controlled (Latham & Locke, 2006; Locke & Latham, 2009; Ordóñez, Schweitzer, Galinsky, & Bazerman, 2009).

That said, the results of research on goal setting are exciting. They have three important implications for motivating trainees:

1. Make the objectives of the training program clear at the outset.
2. Set goals that are challenging and difficult enough that the trainees can derive personal satisfaction from achieving them, but not so difficult that they are perceived as impossible to reach.
3. Supplement the ultimate goal of finishing the program with subgoals during training, such as trainer evaluations, work-sample tests, and periodic quizzes. As trainees clear each hurdle, their confidence about attaining the ultimate goal increases.

Although goal setting clearly affects trainees' motivation, so also do the *expectations* of the trainer. In fact, expectations have a way of becoming self-fulfilling prophecies, so that the

higher the expectations are, the better the trainees perform (and vice versa). This phenomenon of the self-fulfilling prophecy is known as the *Pygmalion effect*. It was demonstrated in one study over a 15-week combat command course with adult trainees (Eden & Shani, 1982). Where instructors had been induced to expect better performance from the group of trainees, the trainees scored significantly higher on objective achievement tests, showed more positive attitudes, and perceived more positive leader behavior. The Pygmalion effect has been confirmed in many studies using both male and female trainees (Begley, 2003). However, it does not appear to hold in situations where women are led (or instructed) by women (Dvir, Eden, & Banjo, 1995).

Behavior Modeling

Behavior modeling is based on social-learning theory (Bandura, 1977, 1986, 1991, 2013). In simple terms, social-learning theory holds that we learn by observing others. The learning process per se requires attention, retention, the ability to reproduce what was learned, and motivation.

These principles might profitably be incorporated into a four-step “applied learning” approach to behavior modeling (Goldstein & Sorcher, 1974):

1. *Modeling*, in which trainees watch videos of model persons behaving effectively in a problem situation.
2. *Role-playing*, which gives trainees the opportunity to practice and rehearse the effective behaviors demonstrated by the models.
3. *Social reinforcement*, which the trainer provides to trainees in the form of praise and constructive feedback.
4. *Transfer of training*, which enables the behavior learned in training to be used effectively on the job.

Stated simply, the objective is to have people observe a model, remember what the model did, do what the model did, and finally use what they learned when they are on the job (Baldwin, 1992). Such training affects the learning of skills through a change in trainees’ knowledge structures or mental models (Davis & Yi, 2004), and this is true both at the individual level and at the team level (Marks, Sabella, Burke, & Zaccaro, 2002).

Sometimes the goal of behavior modeling is to enable the trainee to *reproduce* the modeled behaviors (e.g., a golf swing). However, the objective of most interpersonal- and supervisory-skills training (e.g., in problem solving, conflict resolution) is to develop *generalizable* rules or concepts. If the goal is reproducibility, then only show positive (correct) examples of behavior. If the goal is generalization, then mix positive and negative examples (Baldwin, 1992).

Various types of retention aids can enhance modeling (Decker & Nathan, 1985; Mann & Decker, 1984): reviewing written descriptions of key behaviors (so-called learning points), mentally rehearsing the behaviors, and rewriting the learning points. Encourage trainees to write their own list of learning points if they wish to do so (Hogan, Hakel, & Decker, 1986; Marks et al., 2002). This leads to the development of cognitive “scripts” that serve as links between cognition and behavior (Cellar & Wade, 1988).

Research also suggests that the most effective way to practice skills in a behavior-modeling program is to include a video replay of each rehearsal attempt, and to do so in a small group with two role-players and only one or two observers (Decker, 1983). Based on a solid foundation of research, the formula for behavior-modeling training now includes five components: modeling, retention processes, role playing (or behavioral rehearsal), social reinforcement, and transfer of training (Decker & Nathan, 1985).

Meta-analytic research demonstrates the effectiveness of behavior modeling (Taylor, Russ-Eft, & Chan, 2005). Analysis of 117 behavior-modeling training studies revealed that the largest effects were for declarative and procedural knowledge (effect sizes of about 1.0, resulting from comparing training versus a no-training or pretest condition). Declarative knowledge is knowledge about “what” (e.g., facts, meaning of terms), whereas procedural knowledge is knowledge about “how” (i.e., how to perform skilled behavior). The overall mean effect on changes in job behavior was $d = 0.27$. However, Taylor et al. (2005) reported substantial variance in the distribution of effect sizes, indicating the need to investigate moderators of the relationship between behavior-modeling training and outcomes, that is, variables that might explain the conditions under which an effect or relationship is likely to be present and likely to be stronger (Aguinis, 2004b).

Despite these encouraging results, behavior modeling may not be suitable for everyone. Different training methods may be needed for persons with high and low self-efficacy. For example, in a study involving the use of computer software, Gist, Schwoerer, and Rosen (1989) found that modeling increased performance for people whose pretest self-efficacy was in the range of moderate to high. However, for those with low self-efficacy, a one-on-one tutorial was more effective.

Another potential problem surfaces when the impact of behavior modeling is evaluated in terms of its ability to produce behavior change back on the job (i.e., transfer). Why? In some studies (e.g., Russell, Wexley, & Hunter, 1984), trainees were encouraged to use their newly acquired skills, but no formal evaluations were made, and no sanctions were levied on those who failed to comply. The result: There was no long-term behavior change. In other studies (e.g., Latham & Saari, 1979), trainees were directed and encouraged by their managers to use the new skills, and, in two cases, supervisors who refused to use them were removed from their positions. Not surprisingly, behavior changed back on the job. Although behavior modeling produces positive trainee reactions and learning, more than modeling is needed to produce sustained changes in behavior and performance on the job (May & Kahnweiler, 2000). Here are three strategies suggested by research findings (Russell et al., 1984):

1. Show supervisors why their new behaviors are more effective than their current behaviors.
2. Encourage each trainee to practice the new behavior mentally until it becomes consistent with the trainee's self-image. Then try the new behavior on the job.
3. To facilitate positive transfer, follow the training by goal setting and reinforcement in the work setting.

Why does behavior-modeling training work? To a large extent, it overcomes one of the shortcomings of earlier approaches to training: telling instead of showing (Cascio, 2017).

Meaningfulness of the Material

It's easier to learn and remember factual material when it is meaningful. *Meaningfulness* refers to material that is rich in associations for the trainees and, therefore, is easy for them to understand. To structure material to maximize its meaningfulness:

- Provide trainees with an overview of the material to be presented during the training. Seeing the overall picture helps trainees understand how all units of the program fit together and how each unit contributes to the overall training objectives (Wexley & Latham, 2002).

- Present the material by using examples, terms, and concepts that are familiar to the trainees in order to clarify and reinforce key learning points. Show them how they can use the content of the training to do their jobs better.
- Because complex intellectual skills are invariably made up of simpler ones, teach the simpler skills before the complex ones (Gagné, 1977; Gist, 1997). This is true whether teaching accounting, computer programming, or nuclear medicine.

Practice

For anyone learning a new skill or acquiring factual information, there must be an opportunity to practice what is being learned (Ehrenstein, Walker, Czerwinski, & Feldman, 1997; William, 2013). *Practice* refers to the active use of training content. It has three aspects: active practice, overlearning, and the length of the practice session.

Active Practice

Particularly during skill learning (e.g., learning to operate a machine), it simply is not enough for a trainee to verbalize or to read what he or she is expected to do. Only active practice provides the internal cues that regulate motor performance. As their practice continues and as they are given appropriate feedback, trainees discard inefficient motions and retain the internal cues associated with smooth and precise performance. This is a traditional approach that focuses on teaching correct methods and avoiding errors. Error-management training, however, is an alternative approach (Keith & Frese, 2005) whose objective is to encourage trainees to make errors and then to engage in reflection to understand their causes and to identify strategies to avoid making them in the future. Meta-analysis (Keith & Frese, 2008) reported that overall, error-management training was superior both to error-avoidant training and to exploratory training without error encouragement ($d = .44$). Effect sizes were greater, however, for posttransfer measures and for tasks that were not similar to those encountered in training. Error training might therefore facilitate a deeper understanding of tasks that facilitates transfer to novel tasks (Aguinis & Kraiger, 2009).

Overlearning

If trainees are given the opportunity to practice far beyond the point where they perform a task correctly several times, the task becomes “second nature”—they have overlearned it. Overlearning is the single most effective ingredient in the prevention of decay in trained skill and knowledge (Abadzi, 2016; Arthur, Bennett, Stanush, & McNelly, 1998; Driskell, Willis, & Copper, 1992). For some tasks, such as those that must be performed infrequently and under great stress (e.g., CPR performed by a nurse to save a patient’s life), overlearning is critical. It is less important in jobs where workers practice their skills on a daily basis, such as auto mechanics, technicians, and assemblers.

Several reasons may explain why overlearning is so effective, particularly for tasks that are performed infrequently and possibly under great stress (Arthur et al., 1998):

- It may strengthen the bonds between stimulus and response, decreasing the likelihood that the response will decay or be forgotten.
- It enhances automaticity and reduces the amount of concentrated effort required to perform.
- It gives the trainee more confidence in his or her performance.

Without refresher training, however, the increase in retention due to overlearning is likely to dissipate to zero after five to six weeks (Driskell et al., 1992).

Length of the Practice Session

Practice may be *distributed*, involving rest intervals between sessions, or *massed*, in which practice sessions are crowded together. Although there are exceptions, most of the research evidence indicates that for the same amount of practice, learning is better when practice is distributed rather than massed (Goldstein & Ford, 2001; Noe, 2017). Here are two reasons for this finding:

1. Continuous practice is fatiguing, so that individuals cannot show all that they have learned. Thus, their performance is poorer than it would be if they were rested.
2. During a practice session, people usually learn both the correct performance and some irrelevant performances that interfere with it. But the irrelevant performances are likely to be less well practiced and so may be forgotten more rapidly between practice sessions. Performance should, therefore, improve if there are rest periods between practice sessions.

Varying tasks during practice trials may improve both the speed of learning as well as long-term retention (Holladay & Quiñones, 2003; Wymbs, Bastian, & Celnik, 2016), presumably because trainees had to exert greater effort during skill acquisition. One exception to the superiority of distributed practice over massed practice, however, is when people need to learn difficult conceptual material or other “thought problems.” There seems to be an advantage to staying with the problem for a few massed practice sessions at first rather than spending a day or more between sessions.

One area where massed versus distributed practice is particularly relevant is technology-delivered instruction, or e-learning. It is becoming quite popular, with 64% of organizations now using virtual classrooms (Association for Talent Development, 2016). One type of e-learning is short digital learning sessions that are available at employees’ convenience and delivered through “micro-learning apps” (Kolodny, 2016). Typically, they comprise a mix of video and interactive lessons that take fewer than five minutes to complete, and they also include a quiz. Users can access micro-learning apps either online or via their smartphones. Unfortunately, there is almost no research that assesses the relative effects of massed versus distributed practice in the context of micro-learning applications that incorporate digital content and across different categories of learners (Cascio, 2017).

Feedback

Feedback—information about one’s attempts to improve—is essential for learning to occur. Feedback provides information that enables a learner to correct mistakes (as long as the learner is told *why* he or she is wrong and *how* he or she can correct the behavior in the future) and reinforcement (which makes the task more intrinsically interesting, thereby motivating the learner). Feedback may be intrinsic (i.e., stemming directly from the performance of the task itself) or extrinsic (i.e., administered by an outside individual). It may be qualitative (“that new ad is quite pleasing to the eye”), quantitative (“move the lever two inches down”), informative (“that new machine just arrived”), or evaluative (“you did a good job on that report—it was clear and brief”).

As we noted in Chapter 5, findings generally show that the presence of feedback improves performance (Ashford & De Stobbeleir, 2013; Ilgen, Fisher, & Taylor, 1979; Martocchio &

Webster, 1992; Stajkovic & Luthans, 2003), but managers often misperceive its effects. Thus, Greller (1980) found that supervisors consistently underestimated the importance subordinates attach to feedback from the task itself, comparisons to the work of others, and coworkers' comments. They overestimated the importance of formal rewards, informal assignments, and comments from the boss.

Consider the following important research findings in this area:

- Feedback often results from the performers themselves proactively seeking, interpreting, and generating information (Herold & Parsons, 1985). This is more likely to occur when employees suspect the existence of a problem in their work that challenges their self-image as good, competent performers (Larson, 1989).
- When managers attribute poor performance to lack of effort by a subordinate, they are likely to use a problem-solving approach in communicating performance feedback (two-way communication). However, when managers attribute poor performance to the subordinate's lack of ability, they are more likely to use a "tell-and-sell" approach (one-way communication). Only the problem-solving approach leads to changes in behavior (Dugan, 1989).
- More feedback may not always be better. A 10-month field study of the behavioral safety performance of factory employees found that providing feedback once every two weeks was about as effective as providing it once a week (Chhokar & Wallin, 1984). In addition, the level of specificity of feedback should vary (Goodman & Wood, 2004). Increasing the specificity of feedback benefits the learning of responses for good performance, but it may be detrimental to the learning of responses for poor performance.
- Immediate feedback may not be appropriate for all learners. Withholding feedback from more experienced learners can help them think more critically about their own performance and as a result improve retention and generalization. In short, provide immediate feedback to novices and less frequent feedback to experienced learners (Brown & Ford, 2002; Schmidt & Bjork, 1992).
- The impact of feedback on performance is not always positive; it depends on the type of feedback involved. Only feedback that attributes prior performance to causes within the trainee's control, that explains why performance was effective or ineffective, and what specifically needs to be done to improve performance will be useful (Jacoby, Mazursky, Troutman, & Kuss, 1984; Martocchio & Dulebohn, 1994).
- To be accepted by performers as accurate, feedback should include positive information first, followed by negative information (not vice versa) (Stone, Gueutal, & McIntosh, 1984). When providing performance feedback on more than one dimension, allow employees the freedom to choose feedback on each dimension to reduce the possibility of redundancy and to minimize the amount of time they need to receive and evaluate it (Ilgen & Moore, 1987).
- Feedback can help improve performance over and above the level achieved with only training and goal setting. In other words, to bring about genuine improvements in performance, present training, goal setting, and feedback as a package (Chhokar & Wallin, 1984).
- Feedback affects group, as well as individual, performance (Cannon-Bowers & Bowers, 2011). For example, application of performance-based feedback in a small fast-food store over a one-year period led to a 15% decrease in food costs and to

a 193% increase in profits (Florin-Thuma & Boudreau, 1987). Another study, conducted in five organizational units at an Air Force base, applied feedback for five months, then goal setting for five months, and finally incentives for five months (all in an additive fashion). Results indicated that group-level feedback increased productivity an average of 50% over baseline, group goal setting increased it 75% over baseline, and group incentives increased it 76% over baseline. Control group data showed no or only a slight increase over the same time period, and the level of employees either stayed the same or decreased. Work attitudes were as good or better following the interventions (Pritchard, Jones, Roth, Stuebing, & Ekeberg, 1988).

- The trainee's immediate supervisor is likely to provide the most powerful feedback (Pidd, 2004). If he or she does not reinforce what is learned in training, then the training will be "encapsulated" (Haire, 1964), and transfer to the work situation will be minimal or negative.

TRANSFER OF TRAINING

To a great extent, the usefulness of organizational training programs depends on the effective transfer of training—the application of behaviors learned in training to the job or work that an employee is responsible for. Transfer may be positive (i.e., improving job performance), negative (i.e., hampering job performance), or neutral. It probably is the single most important consideration in training and development programs. Training that results in negative transfer is costly in two ways—the cost of the training (which proved to be useless) and the cost of hampered performance (Ford, 2017; Brown & Sitzmann, 2011; Burke & Hutchins, 2008).

A meta-analysis of 107 evaluations of management training revealed substantial variability in the size of training-transfer effects across rating sources (Taylor, Russ-Eft, & Taylor, 2009). In particular, the sole use of trainees' self-ratings in an evaluation of training transfer may lead to an overly optimistic assessment of transfer, whereas the sole use of subordinate ratings may lead to an overly pessimistic view of the impact of training on managers' job behavior. The use of multiple rating sources with different perspectives (supervisors, peers, subordinates, and self-ratings) is necessary to provide a more realistic assessment of transfer effects.

To maximize positive transfer, while recognizing that transfer environments are probably unique to each training application (Holton, Chen, & Naquin, 2003), designers of training programs should consider doing the following before, during, and after training (Machin, 2002):

- Ensure that peers and supervisors will support the transfer of training, and that they reinforce the value the organization places on training (Kontoghiorghes, 2004). The influence of workplace support on transfer is moderated, however, by the extent to which trainees identify with the groups providing support (Pidd, 2004).
- Maximize the similarity between the training situation and the work situation. Use interactive activities during training to encourage participation.
- Provide trainees as much experience as possible with the tasks, concepts, or skills being taught so that they can deal with situations that do not fit textbook examples exactly. This is adaptive expertise (Baldwin, Ford, & Blume, 2009).
- Ensure that trainees thoroughly understand the principles being taught, particularly in jobs that require the *application* of principles to solve problems, such as those of engineers, investment analysts, or systems analysts.

- Provide a strong link between training content and work content (“What you learn in training today, you’ll use at work tomorrow”). Action learning, in which participants focus on real business problems in order to learn through experience and application, is an excellent vehicle for facilitating positive transfer from learning to doing (Levitz, 2010).
- In the context of team-based training (e.g., in employee involvement), transfer is maximized when teams have open, unrestricted access to information; when the membership includes diverse job functions and administrative backgrounds; and when a team has sufficient members to draw on to accomplish its activities. In one study, over half the variance in participant and supervisor ratings of team effectiveness could be attributed to those three design elements (Magjuka & Baldwin, 1991).
- Ensure that what is learned in training is subsequently used and rewarded. Supervisors and peers are key gatekeepers in this process (Ford, Quiñones, Segó, & Sorra, 1992; Pidd, 2004). If immediate supervisors or peers, by their words or by their example, do not support what was learned in training, don’t expect the training to have much of an impact on work performance (Chiaburu & Marinova, 2005; Gaudine & Saks, 2004; Huint & Saks, 2003).

The attitudes of trainees may also affect transfer (Kraiger, 2014; Noe, 1986, 2008; Switzer et al., 2005). Transfer is likely to be higher when trainees (a) are confident in using their newly learned skills, (b) are aware of work situations where they can demonstrate their new skills, (c) perceive that both their work and organizational performance will improve if they use the new skills, and (d) believe that the knowledge and skills emphasized in training are helpful in solving work-related problems. Such attitudes help employees generalize KSAs learned in one training context (e.g., employee-involvement training) to other contexts (e.g., their regular duties at work).

The design of a training and development program is critical to its eventual success. No less critical, though, are implementation of the program and the measurement of outcomes resulting from it. We consider both of these important issues in Chapter 16.

EVIDENCE-BASED IMPLICATIONS FOR PRACTICE

- Perhaps the most important practical lesson from this chapter is to resist the temptation to emphasize technology and techniques in training; instead, take the time to do a thorough needs assessment that will reveal what is to be learned at the individual or team level and what the substantive content of training and development should be.
- Recognize that organizational boundaries are blurring, such that the border between employees, nonstandard workers, customers, suppliers, and even competitors is becoming fuzzier. As a result, *any* individual or group that has a need to acquire specific capabilities to ensure an organization’s success is a potential candidate for training.
- Create an optimal environment for learning to occur—ensure that the objectives are clear and that material is meaningful and relevant; incorporate opportunities for practice and feedback; and ensure that the broader organization supports the content of the training.
- Incorporate principles of learning, goal setting, behavior modeling, meaningfulness of material, practice, and feedback into training.
- The most fundamental objective of well-designed training is positive transfer back to the job or work situation. To provide a realistic assessment of transfer effects, use multiple rating sources with different perspectives (supervisors, peers, subordinates, and self-ratings).

Discussion Questions

1. Your boss asks you to identify key characteristics of organizations and individuals that are related to effective training. What would you say?
2. Transfer of training is important. What would you do to maximize it?
3. Outline a needs-assessment process to identify training needs for supermarket checkers.
4. What should individual development plans include?
5. What would an optimal environment for training and learning look like?
6. Describe the components of an integrated approach to the design of team-based training.
7. How might behavior modeling be useful in team-based training?
8. How do behavioral baselines help researchers to assess behavioral transitions in training?
9. Top management asks you to present a briefing on the potential effects of goal setting and feedback. What would you say?
10. Your boss just returned from a conference where she saw a demonstration of “rapid prototyping” for safety training of warehouse employees. She asks you to use that approach to design a training program in customer service. Outline the steps you would take.