CHAPTER ONE

WHAT IS INSTRUCTIONAL DESIGN?

Instructional design means more than literally *creating instruction.* It is associated with the broader concept of analyzing human performance problems systematically, identifying the root causes of those problems, considering various solutions to address the root causes, and implementing the solutions in ways designed to minimize the unintended consequences of corrective action. Instructional design usually encompasses not just the preparation of work-related instruction but also the selection of such management solutions to human performance problems as the preparation and use of job aids, the redesign of organizational structure and reporting relationships, the redesign of jobs and tasks, the refocusing of employee selection methods, the reengineering of job-related and task-related feedback methods, and the design and implementation of employee reward programs (Jacobs, 1987; Rothwell, 1996 and 2000).

As we use the term, instructional design is (1) an emerging profession, (2) focused on establishing and maintaining efficient and effective human performance, (3) guided by a model of human performance, (4) carried out systematically, (5) based on open systems theory, and (6) oriented to finding and applying the most cost-effective solutions to human performance problems and discovering quantum leaps in productivity improvement through human ingenuity. We follow the International Board of Standards for Training, Performance, and Instruction (IBSTPI) by making ten basic assumptions about instructional design and competencies associated with it. (See Exhibit 1.1.) In this chapter, we will explore each of the six characteristics identified above to lay the groundwork for the remainder of the book. We shall also address important recent critiques of traditional instructional design approaches.

Instructional Design: An Emerging Profession

Instructional design is an emerging profession. People can–and do–enter jobs as instructional designers and work in that capacity for their entire careers.

EXHIBIT 1.1. TEN KEY ASSUMPTIONS ABOUT INSTRUCTIONAL DESIGN AND INSTRUCTIONAL DESIGN COMPETENCIES.

Assumption 1:	Instructional designers are those persons who demonstrate design competencies on the job regardless of their job title or training.
Assumption 2:	ID competencies pertain to persons working in a wide range of settings.
Assumption 3:	Instructional design is a process most commonly guided by systematic design models and principles.
Assumption 4:	Instructional design is most commonly seen as resulting in transfer of training and organizational performance improvement.
Assumption 5:	Instructional design competence spans novice, experienced, and expert designers.
Assumption 6:	Few instructional designers, regardless of their levels of expertise, are able to successfully demonstrate *all* ID competencies.
Assumption 7:	ID competencies are generic and amenable to customization.
Assumption 8:	ID competencies define the manner in which design should be practiced.
Assumption 9:	ID competencies reflect societal and disciplinary values and ethics.
Assumption 10:	ID competencies should be meaningful and useful to designers worldwide.

Source: R. Richey, D. Fields, and M. Foxon, *Instructional Design Competencies: The Standards* (3rd ed.). Syracuse, NY: ERIC Clearinghouse on Information and Technology, 2001, pp. 36–42.

Employment advertisements for instructional designers and closely aligned jobs frequently appear in print and online. (See, for instance, the job search websites run by the International Society for Performance Improvement at www.ispi.org and by the American Society for Training and Development at www.astd.org.)

Many organizations across a broad spectrum of industries employ instructional designers. Jobs bearing this title are quite often positioned at the entry level. They occupy the first rung on a career ladder leading to such higher-level jobs as instructor, project supervisor of instructional design, and manager. But variations of this career ladder do exist. Job titles also vary. Alternative job titles may include performance technologist, performance consultant, human performance improvement specialist, human performance enhancement professional, instructional developer, education specialist, employee educator, trainer, staff development specialist, instructional technologist, or instructional systems specialist. Because variations do exist in work duties, in modes of occupational entry, in educational preparation, and in career paths, instructional design should be regarded as an emerging rather than an established profession.

However, the recent trend has been toward certification in the field. That trend suggests increasing professionalism. For instance, the International Society for Performance Improvement has unveiled a program leading to the Certified Performance Technologist (CPT) designation (for a description, see www.certifiedpt.org/WhatisCPT.htm). It is being offered in cooperation with the American Society for Training and Development as well (see www.astd.org/CPT/). That follows a growing trend for certification of many kinds, ranging from individual (such as the CPT) to e-learning product certification (see www.astd.org/ecertification/).

Instructional Design: Focused on Establishing and Maintaining Efficient and Effective Human Performance

The chief aim of instructional design is to improve employee performance and to increase organizational efficiency and effectiveness. For this reason, instructional designers should be able to define such important terms as *performance, efficiency,* and *effectiveness*.

What Is Performance?

Performance is perhaps best understood as the achievement of results, the outcomes (*ends*) to which purposeful activities (*means*) are directed. It is not synonymous with *behavior,* the observable actions taken and the unobservable decisions made to achieve work results.

There are several types of performance, of course. *Human performance* is the result of human skills, knowledge, and attitudes. *Machine performance* is the result of machine activities. *Company performance* is the result of organizational activities.

When asked to think about performance, most people in the United States think first of individual performance. There are at least two reasons why. First, people are sensitized to appraisals of individual performance because most organizations make evaluating performance an annual ritual, often linked to pay decisions. This practice has made a lasting impression on nearly everyone. Second, U.S. culture has long prized rugged individualism, implying that very little lies beyond the reach of determined heroes (and heroines) exerting leadership and acting alone. However, continuing trends point toward a sustained emphasis in the future on the performance of teams, groups, departments, divisions, or organizations. Those trends are as evident in the instructional design field–where team-based, and even virtual team-based (Bell and Kozlowski, 2002), instructional design is becoming more commonplace–as in other fields.

Defining Efficiency and Effectiveness

Traditionally, two aspects of performance have been considered–efficiency and effectiveness. These terms have no universally accepted definitions. However, *efficiency* is usually understood to mean the ratio between the resources needed to achieve results (*inputs*) and the value of results (*outputs*). Some have said that the central question of efficiency can be posed simply: *Are we doing things right?* In this question, the phrase "doing things right" means "without unnecessary expenditures of time, money, or effort."

Effectiveness, on the other hand, usually means the match between results achieved and those needed or desired. Its central question is this: *Are we doing the right things?* In this question, the phrase "right things" typically means "what others, such as customers or key stakeholders, expect or need from the organization, group, or individual."

Instructional Design: Guided by a Model of Human Performance

Instructional design is guided by a model of human performance. In the most general sense, of course, a *model* is a simplified or abstract representation of a process, device, or concept. A model of any kind is designed to help understand a problem, situation, process, or device. It provides a basis for a common understanding, and common labels, for people to discuss the issue. This applies to a model of human performance, which is a simplified representation of factors involved in producing work results. It is intended to provide labels to key factors involved in performance and clues to pinpointing underlying causes of human performance problems.

Many human performance models have been constructed. They can be categorized as *comprehensive* or *situation-specific*. A *comprehensive performance model* includes as many factors as possible affecting human performance in organizational settings. An example is shown in Figure 1.1. Table 1.1 defines and briefly describes the factors appearing in Figure 1.1.

FIGURE 1.1. A COMPREHENSIVE MODEL OF HUMAN PERFORMANCE IN ORGANIZATIONS.

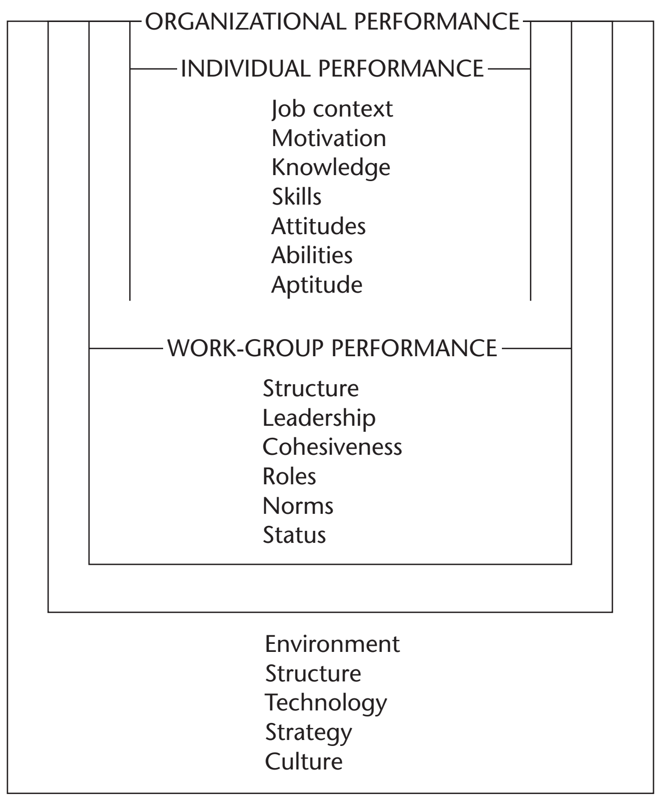


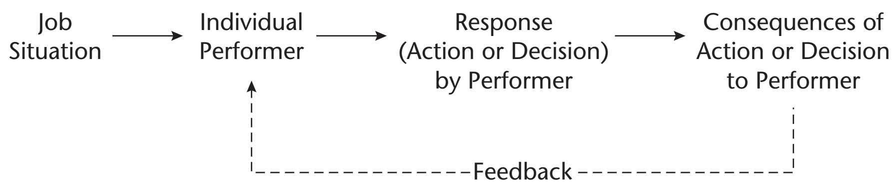
Table 1.1. Factors Affecting Performance.

Factor	Brief definition	Questions to consider about the influence of the factor on performance
	Individual Performance	
Job context	The environment of the job, including supervisor(s), equipment and tools to be used,customers, and co-workers.	Do people have the necessary equipment, tools, and resources to perform?
Motivation	The desire to perform.	Do people want to perform?
Knowledge	Facts and information essential to performing a job or task.	Do people have the necessary facts and information they need to take action and make decisions?
Skills	Abilities to do things associated with successful job performance.	Can people do the things associated with successful job performance?
Attitudes	Feelings about performance that are voiced to other people.	How do people feel about their behavior?
Abilities	Present capabilities to behave incertain ways.	Do people possess the necessary talents and mental or physical characteristics?
Aptitude	The future capability to behave in certain ways.	Are people physically and/or mentally capable of learning how to perform?
	Work-Group Performance	
Structure	The way work is allocated to members of a work group.	Is responsibility for results clearly assigned? Are people aware of what they are responsible for? Are they held accountable for achieving results?
Leadership	The way directions are given to members of a work group.	Is it clear who is in charge? Does the leader consider *how people feel* (attitudes) as well as *what must be done to achieve results* (tasks)?
Cohesiveness	The extent to which members of a work group are unified, pulling together as a group.	Are people willing to work together to achieve desired results?
Roles	The pattern of expected behaviors and results of each member of a group.	Do members of a group understand what they are responsible for doing?
Norms	Accepted beliefs of the work group.	How do members of a work group feel about the results they are to achieve? methods of achieving those results?

Factor	Brief definition	Questions to consider about the influence of the factor on performance
Status	The relative position of people in a group.	Do people have the formal authority to act in line with their responsibilities? Are other people willing to follow the lead of those who know what to do?
	Organizational Performance	
Environment	The world outside the organization.	How well is the organization adapting to—or anticipating—changes outside it that affect it?
Structure	The way work is divided up and allocated to parts of the organization.	Is work divided up appropriately?
Technology	Actions taken by people to change objects, people, or situations. Often refers to "how the work is done."	Is the organization applying work methods that reflect current information about how to do the work?
Strategy	The means to achieve desired ends. It denotes an organization's long-term direction.	Is the organization competing effectively?
Culture	Beliefs and attitudes shared by members of an organization.	Do members of the organization share common beliefs and attitudes about what they—and the organization—should do?

A *situation-specific performance model* focuses on an existing or suspected problem. One of the best known was first described in a classic treatment by Rummler (1976). (See Figure 1.2.) According to Rummler, five factors should be considered whenever a human performance problem is identified. They are (1) the job situation, (2) the performer, (3) the behavior, (4) the consequence, and (5) the feedback of the consequence back to the performer. Rummler (1976, p. 14-3) observes that "in any job there is a *situation* or *occasion* requiring a particular *performer* to make a particular response or take some action, which results in some consequence to the performer. The performer may consider that consequence to be positive or negative or to have little value. And last, *information* on that consequence is fed back to the performer."

FIGURE 1.2. A SITUATION-SPECIFIC MODEL OF HUMAN PERFORMANCE.



Source: Rummler, G., "The Performance Audit." In R. Craig (Ed.), *Training and Development Handbook: A Guide to Human Resource Development* (2nd ed.). New York: McGraw-Hill, 1976, p. 14-3. Reproduced with the permission of McGraw-Hill, Inc.

Rummler's model remains useful in analyzing human performance problems. After all, the cause of the problem *must* be determined, and each factor in this simple model can be examined as a possible cause. If it is not clear *when* the desired performance is necessary, the cause stems from the job situation. If performers are physically or mentally unable to perform, the cause stems from the performers. If performers lack the necessary skills or tools or other resources, the cause stems from the response (behavior). If the consequences of performing are punishing or do not exist, the cause of the problem stems from the consequences. If performers are given no information about the value of their performance, then the problem's cause stems from inadequate or nonexistent feedback.

We will discuss models for analyzing human performance in greater detail in Chapter Two. For now, suffice it to say that instructional designers base what they do on a human performance model. Applying such a model to problem solving is the foundation of instructional design. After all, the field is associated with analyzing human performance problems systematically, identifying the root cause or causes of those problems, considering various solutions to address the root causes, and implementing the solutions in ways designed to minimize the unintended consequences of corrective action (Rothwell, 1996; Rothwell, Hohne, and King, 2000).

Instructional Design: Carried Out Systematically

Instructional design is not just a *field*. It may also be regarded as a *process* for examining human performance problems and identifying solutions. The process should not be carried out intuitively; rather, its success depends on systematic application. Instructional designers place their faith in an iterative and systematic process that, viewed holistically, is more powerful than any single part. At the same time, that process is not necessarily linear or step-by-step (Richey, 1995; Troha, 2002). Many different systematic instructional design models have been constructed to guide instructional designers in their work (see Harris and Castillo, 2002).

Instructional Design: Based on Open Systems Theory

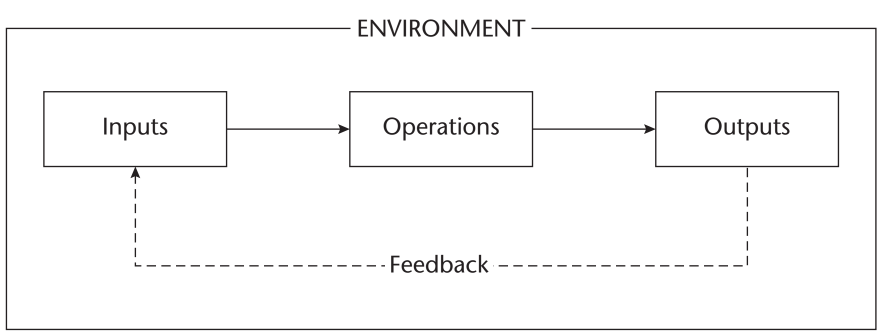
Instructional design is based, in part, on open systems theory (Richey, 1993). An *open system* receives *inputs* from the environment, transforms them through operations within the system, submits *outputs* to the environment, and receives *feedback* indicating how well these functions are carried out. To survive, any open system must gain advantages from its transactions with the environment.

Inputs include raw materials, people, capital, and information. *Operations* are activities occurring within the organization that add value to raw materials. *Outputs* are services or finished goods released into the environment by the organization. Figure 1.3 illustrates these basic components of an open system.

All open systems share common characteristics. First, they are dependent on the external environment for essential inputs and reception of their outputs. Second, there is a pattern to the flow of inputs and outputs. Third, all but the simplest open systems are composed of subsystems and interact with environmental suprasystems. A *subsystem* is a system within a system. A *suprasystem* is an overarching system that includes more than one system.

As Katz and Kahn (1978) explain in their classic treatment of open systems theory, most organizations consist of four generic subsystems. (They are called

FIGURE 1.3. THE BASIC COMPONENTS OF AN ORGANIZATION AS AN OPEN SYSTEM.



"generic" because they are found in most organizations, regardless of industry or reporting relationships.) The first is the *production subsystem,* which focuses on getting the work out. The second is the *adaptive subsystem* that includes any functions concerned with helping the organization change its internal operations to adapt to external environmental change. The third is the *maintenance subsystem,* which is concerned with streamlining internal operations and increasing efficiency. The fourth and last is the *managerial subsystem,* concerned with directing and coordinating the other three subsystems. Although organizations vary, in most firms the production or operations department exemplifies the production subsystem, the marketing department exemplifies the adaptive subsystem, the human resources department exemplifies the maintenance subsystem, and the top management team exemplifies the managerial subsystem.

Most organizations function within many suprasystems. Perhaps the most obvious is the *industry suprasystem,* composed of all organizations involved in the same basic type of work. There are also other, equally important, suprasystems. The *governmental-legal suprasystem,* for instance, is made up of all government agencies regulating the industry of which one organization is part. It also includes the applicable laws, rules, and regulations with which the organization must comply. The *marketing competitive suprasystem* is made up of all competitors, present and future. The *economic suprasystem* consists of the national and international economic environment within which the organization functions. The *technological suprasystem* is composed of the tools, state-of-the-art know-how, and work methods used in delivering the organization's services or producing goods. The *supplier suprasystem* comprises all suppliers providing inputs to an organization. Each suprasystem exerts influence on organizational performance.

Open systems theory is important to instructional designers for two reasons. First, instructional designers recognize the critical importance of adapting to, and even anticipating, changes in the environment. Organizational and individual effectiveness depends on how well work results match environmental demands. Hence, one question that should be asked in any performance improvement effort is this: *How much will this project contribute to the organization's ability to adapt to changing environmental conditions?* If the answer is "not much" or "we don't know," then it could well be that performance improvement activities should be directed to other projects.

Second, instructional designers recognize that any *corrective* action taken to change one subsystem will affect others. The parts of any organization (system) are as interdependent as the strands of a spider web. It follows, then, that a change in one part will affect others, just as an entire spider web vibrates when one strand is disturbed. For example, if a change is made in the kinds of people selected into a job category, it will affect the kind of training they should receive. Large system changes in organizations will have effects that are partially predictable–and partially unpredictable.

However, order exists even amid apparent random disorder, a central view held by advocates of complexity theory (Olson and Eoyang, 2001; Titcomb, 1998; You, 1993). Since the first and second editions of this book, observers of the instructional design field have emphasized that much can be learned from complexity theory. More specifically, complexity theory enriches the traditional open systems orientation of instructional design by "assuming a more holistic orientation, rather than one of uni-directional causality" and by "reflecting the dynamic and unpredictable aspects of the learning process" (Richey, 1995, pp. 100–101).

Instructional Design: Oriented to Finding and Applying the Most Cost-Effective Solutions to Human Performance Problems

Instructional designers sometimes assume, mistakenly, that their role is to "offer job-oriented instruction." Sometimes others in the organization share the same misconception of their role. In fact, human performance problems cannot always be solved by instruction. In fact, instruction should only be used when the performance problem stems from a lack of knowledge or skills or the wrong attitudes and when instruction is the most cost-effective solution. Since we will use the terms *knowledge, skills,* and *attitudes* throughout this book, perhaps some definitions are in order at this point. *Knowledge* is simply "what the employee knows. It is important in terms of jobs and training because people usually perform better if they understand what they are doing and why" (McArdle, 1989, p. 34). *Skills* involve the abilities to do something–such as operate a machine. "Skills imply actions; others can observe them" (McArdle, 1989, p. 34). The term *attitudes* denotes how people feel about what they do and how they express their feelings. Instructional designers "generally accept that how people feel about what they are doing and the organization for which they are working has some effect on their performance" (McArdle, 1989, p. 34). As work becomes more focused on making decisions, processing information, and servicing customers, attitudes–traditionally neglected by instructional designers in favor of knowledge and skills–are becoming more important in the mix of what leads to effective performance (Rothwell and Lindholm, 1999).

Instruction should not be used as the solution when a performance problem stems from lack of motivation, feedback, incentives, or some other cause. It is also a costly solution because it demands substantial investments of time and money to prepare instructional materials, test them, revise them, deliver them, and evaluate them. Employees receiving off-the-job instruction lose time doing work and are usually paid while learning, which adds to the cost. At the same time, instructional designers and others involved in the preparation of instructional materials must be paid, which further adds to the cost.

For all these reasons, work-oriented instruction is a costly way to improve performance. It should only be used as a solution of last resort. Indeed, instructional designers should be certain that there will be a favorable return on *any* investment in performance improvement efforts. To this end, they may apply any one of many different methods of *cost-benefit forecasting and analysis* to estimate the expected return (payoff) on the investment. First they estimate the cost of the performance problem. Then they estimate the expected costs to rectify the problem. Finally, they compare the two. If a return on investment takes too long, instructional designers should direct their attention to other projects in which the benefits are more certain, payoffs are higher, or results can be achieved faster.

Criticisms of Traditional Instructional Design Approaches

No field of endeavor is immune to criticism. That is as true of instructional design as it is of any field. Since the publication of the first and second editions of this book, critics of traditional instructional system design (ISD) approaches have grown increasingly strident in their complaints about its real and perceived shortcomings. It is thus worthwhile to discuss early in this book the most serious concerns they have voiced.

In a classic article that launched a continuing debate, Merrill, Li, and Jones (1990) distinguished between First Generation Instructional Design, which they designate ID_1, and Second Generation Instructional Design, which they designate ID_2. ID_1 "assumes a cumulative organization of learning events based on prerequisite relationships among learned behaviors" (p. 7). ID_1 has long dominated the field but suffers from many limitations, according to the article's authors. For example, they believe it focuses on parts rather than integrated wholes, provides superficial advice for organizing instruction, adopts a closed-system view of instruction that disregards the environment in which instruction is carried out, asserts an unrealistic approach to instructional development, and produces instruction that is to learners passive (and thus boring) rather than active (and thus motivating).

To solve these problems, the authors argued that a new ID_2 paradigm is needed in the instructional design field. ID_2 will lend itself to "analyzing, representing, and guiding instruction to teach integrated sets of knowledge and skills." It will also suggest ways to select "interactive instructional strategies" and will be "an open system" that is "able to incorporate new knowledge about teaching and learning and to apply these in the design process." In addition, ID_2 should–among other innovations–"organize knowledge about instructional design and define a methodology for performing instructional design," provide "a series of intelligent computer-based design tools for knowledge analysis/acquisition, strategy analysis and transaction generation/configuration," and make use of "a collection of mini-experts, each contributing a small knowledge base relevant to a particular instructional design decision or set of such decisions" (Merrill, Li, and Jones, 1990, p. 10). More recently, Merrill has recommended a "pebble in the pond" approach that relies on key principles to guide instructional design (Merrill, 2002).

Other authorities in the instructional design field have joined the chorus calling for innovative new approaches to meet the daunting challenges facing today's instructional designers (see, for instance, Clark, 2002; Dick, 1993; Gustafson, 1993; Richey, 1993; Sink, 2002). One central dilemma, however, may not be that the field is in need of new models to guide instructional design but that existing models are not effectively applied. As Richey (1995, p. 97) succinctly frames the question: "Do the difficulties [with traditional approaches] stem simply from a pervasive need for more expertise in the use of the ISD models, or do they stem from the models themselves, or from the feasibility of their practical application?" Richey's view is that "the field is conservatively leaning in the direction of enhanced models" to meet future challenges. These models, while retaining essential and proven components of ID_1, will be designed and applied in ways that will minimize its shortcomings.

Since the publication of the second edition of this book, additional critiques of the traditional ISD model have surfaced (Gordon and Zemke, 2000; Zemke and Rossett, 2002). Zemke and Rossett (2002) summarize the criticisms of the ISD model as boiling down to several key complaints. The first complaint is about the process. The point here is that "the ISD process itself is flawed." It is too slow and overly analytical for a frenetically paced world. The second complaint is about the practice. Here the criticism is that "[ISD] is pushed beyond rational utility," write Zemke and Rossett (2002), "and made into a lock-step straitjacket. That, critics say, is exactly the problem." Of course, ISD does not need to be treated that way–but, the critics assert, it too often is treated that way. Third, technological innovations have rendered the ISD model out of touch. What may have worked for classroom-based training is not appropriate, or even desirable, for e-learning and a host of emerging instructional technologies. As Zemke and Rossett (2002) note, “If traditional training is a challenge for ISD, there are those who believe it is more so for the new creative blends of online learning and performance support that are becoming prevalent today.” Zemke and Rossett quote San Diego State University (SDSU) assistant professor Vanessa Dennen, who said that “ISD in the traditional sense looks tired . . . while the rest of the world is getting wired.” But that view is not shared by everyone. Some believe that the problem with e-learning, itself under attack, is its tendency to truncate necessary steps of analysis, design, development, implementation, and evaluation.

Conclusion

The instructional design field is an exciting one that has real potential to improve employee performance and thus enhance organizational productivity, increase competitiveness, and eliminate the problems faced by workers who lead lives of quiet desperation amid sometimes chaotic and irrational organizational settings. Instructional designers view their roles as more than just “preparing instruction.” Instead, they see what they do as linked inexorably to one of continuous improvement of organizational conditions and operations. Their challenging role is to analyze human performance problems systematically, identify root causes of those problems, consider various solutions to address the root causes, and implement solutions in ways designed to minimize the unintended consequences of corrective action. While traditional instructional design models have been under attack for some time, almost everyone agrees that a systematic approach to instruction is better and more effective than unplanned, haphazard, or seat-of-the-pants approaches.

Our goal in the following chapters is to describe the competencies of instructional design work and provide the means by which practitioners can develop, or sharpen, their abilities.