S PART THREE S

INTERVENTIONS AT THE

WORKER AND WORK TEAM LEVELS

KAREN L. MEDSKER

any HPT interventions intended to improve individual and group or team performance include instruction. This is true for at least four reasons:

(1) many HPT practitioners are or were specialists in learning and teaching, including instructional design, training, and education; they are experts in designing, developing, implementing, and evaluating instruction; (2) a large body of research informs instructional practice; we know how to make learning happen; (3) managers and other HPT clients often prefer instruction as a method for improving performance; it is familiar and comfortable; and (4) instruction is truly needed in many situations; changing business needs, new knowledge, new technologies, and worker mobility create constant requirements for people to learn. In addition, other interventions often have an instructional component.

M

Consequently, the first four chapters of Part Three are about instruction. Michael Molenda and James Russell define instruction, distinguish it from information giving and cognitive support, and identify it as one important intervention within the broad array of performance-improvement interventions, such as job design, tools, incentives, and job aids. They point out that instruction should be used to bridge skill and knowledge gaps, and describe how instruction often can be used along with other interventions to meet performance challenges. The chapter describes procedural instructional design and development models, which typically advocate a systems approach to planning instruction, and specific lesson-design frameworks from a variety of theoretical perspectives. The authors also discuss method and media selection, current use of various instructional delivery systems, and evaluation of learning and impact resulting from instruction.

Next, Kenneth Silber and Wellesley Foshay explain how to design instructional strategies, using a cognitive psychology perspective. They begin by describing how learning occurs, based on information-processing theory. Then they describe different types of knowledge. A key principle is that different types of learning should be taught differently. Their cognitive instructional design model shows how different strategies can be used to help learners acquire facts, concepts, principles, mental models, and procedures, and solve well- and illstructured problems. The authors include tables that illustrate their design principles with examples of declarative and procedural lessons.

Robert Appelman and John Wilson, in Chapter Seventeen, explain the power and roles of games and simulations. They provide details about the outcomes, aspects, and characteristics of games and simulations. They also discuss evaluation criteria for games and simulations.

In Chapter Eighteen, Jose Manuel Ochoa-Alcántar, Christy Borders, and Barbara Bichelmeyer take a look at the past, present, and future of distance education. They present a forthright discussion about the pros and cons of distance training, including information about planning and administering distance training programs.

In Chapter Nineteen, another type of education experience is presented. According to Margo Murray, mentoring is the deliberate pairing of two people with different skills and experiences, with the purpose of transferring those skills and experiences from one person to the other. The mentor’s tasks are many and may include coaching. Today, different structures or formats are used in mentoring programs. For example, the mentor is not always older or more senior than the protégé; peer mentoring and reverse mentoring are two variations. This chapter describes several contemporary formats and provides specific examples. It also discusses success factors, pitfalls and ways to avoid them, and benefits of mentoring for the mentor, the protégé, and the organization.

Sometimes people fail to perform as desired, not because they do not know how, but because they do not want to. Richard Clark explores the issues of work motivation, which he demonstrates is a major problem in today’s organizations. After defining motivation, Clark lists and describes the major motivation killers found frequently in organizations, following with universal principles of motivation, with research support for each. Another section of the chapter discusses financial incentives and their effect on performance. Finally, he offers advice on how to motivate teams.

Another intervention aimed at improving the performance of individuals and teams is to shift from a traditional, top-down, overt management approach to

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an unobtrusive approach that seeks to develop a shared set of values, norms, and beliefs. Anthony Marker’s chapter points to alignment, or congruence between organizational goals and performer behavior, as a critical factor in organizational success. But how is alignment to be maintained, either in a growing organization or in a lean organization using self-managed teams? Marker shows how the unobtrusive model is more effective. He suggests guidelines for the HPT practitioner in getting manager buy-in, and steps for making the shift.

Because much of the work in today’s organizations is being done by groups or teams, improving group performance is essential. Michael Cassidy and Megan Cassidy, in Chapter Twenty-Two, focus on the critical conditions for work-group productivity, such as who should be included, the roles and responsibilities within the group, and attention to technical and social dimensions of the group’s work. The authors discuss operational, tactical, and strategic levels of group functioning. They also explain the benefits of modeling the problem or decision, lay out steps for guiding a group through a problem-solving or decision-making process, and describe common problems in work groups and ways to overcome them.

The final chapter in Part Three describes the latest thinking and practice related to performance support systems, or PSS. Authors Steven Villachica, Deborah Stone, and John Endicott define PSS broadly to include learning, guidance and tracking, task-structuring support, knowledge management, communities of practice, tools, and even motivational components: an integrated set of on-line and off-line methods and resources that support performance. As the authors point out, a large-scale performance support sytem could include most or all of the interventions described in this handbook. The chapter sets forth conditions for choosing PSS, variations on and other names for PSS, examples, benefits, and project-development considerations.

Part Three of the handbook includes a wealth of guidance for HPT practitioners for improving the performance of individuals and teams, backed by extensive research and the chapter authors’ many decades of observations and experiences.

|  |  |  |
| --- | --- | --- |
| S | CHAPTER FIFTEEN | S |

Instruction as an Intervention

Michael Molenda, James D. Russell

A

lthough instruction is only one of many possible performance interventions, it is one of the most valuable, flexible, and frequently used. This chapter begins by placing instruction into the larger context of performance improvement. Next, it provides guides to planning instruction, with emphasis on selecting an appropriate lesson framework and then selecting appropriate methods and media within that framework. It also provides data on how different forms of instruction are being implemented currently in the workplace. It concludes with an overview of assessing learner outcomes and evaluating the impact of instruction.

**INSTRUCTION AIMS AT IMPROVING CAPABILITIES**

*Instruction* is a generic term referring to any effort to stimulate learning by the deliberate arrangement of conditions and experiences. Instruction is often viewed as covering a spectrum of efforts, ranging from very narrow in scope to very broad in scope and with purposes ranging from immediate application in the workplace to general personal development. Some advocate labeling the ends of the spectrum as “training” and “education.” Stolovitch and Keeps (2002) refer to the aim of *training* as equipping learners to “consistently reproduce without variation” (p. 10). Figure skating, keyboarding, assembling a rifle, and remembering the multiplication tables are the sorts of repetitious, even mechanical,

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abilities that they would consider the subjects of training. They define *education,* on the other end of the spectrum, as efforts to achieve the broader goal of developing generalized abilities with underlying mental models and value systems. Leading project teams, responding flexibly to customer needs, and devising strategic plans are the sorts of complex abilities that could be viewed as goals of education. However, such distinctions are somewhat arbitrary, and both training and education can take place either in the workplace or in formal education institutions. The more generic term, *instruction,* encompasses the whole range of types, and so it is used here as a common denominator that can be used in different sectors to refer to the whole range of learning interventions.

The critical attribute of instruction is that it is directed at facilitating *learning.* Learning is defined as a persisting or quasi-permanent change in capability resulting from the learner’s experience and interaction with the world (Driscoll, 2000). Instruction, therefore, has as its goal a lasting change in capability. This is a crucial point in distinguishing instruction from merely providing information.

Instruction can be defined as the arrangement of purposive and controlled events that lead to the achievement of some learning goal. The learning goal can range from recalling information to comprehending and applying principles to attaining mastery of physical skills to new attitudes, or many other types of outcomes, as is discussed later.

Instruction Is One of Many Performance Interventions

Training does not take place in a vacuum, but some training professionals behave as though it does. The corporate training literature tends to place learning, instead of performance, at the center of the universe, ignoring the impact of the many environmental factors surrounding performance in the workplace. Some involved in business consulting began to see the larger picture more clearly in the 1970s as they saw instruction-only solutions fail to have lasting effects on persistent business problems. The view began to emerge that instruction alone seldom was sufficient to enable people to become effective achievers, in society or in the workplace. Over time, a new perspective emerged that the goal should be the improvement of human performance, which could best be accomplished by combining instructional interventions with noninstructional interventions, such as enhanced incentives, better tools, job aids, more supportive organizational structures, and so on.

This handbook is based on this newer view, the human performance technology perspective. One way of depicting this approach is through a visual model developed by Molenda and Pershing (2004), shown in Figure 15.1.

The major theme of the Strategic Impact Model is that instruction alone seldom solves performance problems. Almost all performance problems are rooted in more than one cause, and although training or education may be part of the solution, other interventions, such as job redesign, incentive adjustments, job

Strategic

Planning

Performance

Analysis

Design

Analysis

Performance

Interventions

*Other than instructional*

Performance

Interventions

*Instructional*

Selection

Development

Production

Cause Analysis

Deficiencies in:

Inherent

abilities

Skills and

knowledge

Physical

environment

Tools

Cognitive

support

Incentives

Organizational

sy

stems

B

A

C

D

1

2

3

4

Analysis

Design

Production

Development

A

B

D

C

1

2

3

4

E

E

Evaluation and Revision

Change

Implementation

Evaluation and Revision

Change

**Figure 15.1.** The Strategic Impact Model.

aids, better tools, or the like, are invariably required in order to make the instruction pay off. Instruction comes into play when people’s performance is inhibited by the lack of needed knowledge or skills.

The model shows explicitly how instructional interventions and other sorts of performance interventions relate to each other, springing from a common performance analysis and converging in a common implementation phase. The model specifies an array of performance interventions, of which instruction is one. It incorporates the typology developed by Wile (1996) specifying seven sources of performance shortfalls: (1) inherent abilities, (2) skills and knowledge, (3) physical environment, (4) tools, (5) cognitive support, (6) incentives, and (7) organizational systems. This typology proposes that people fail to perform adequately in the workplace when they (1) lack the basic qualifications, such as intelligence, strength, or speed, to do the job; (2) lack the specific knowledge, skills, or attitudes; (3) are given surroundings that are detrimental to good work: hot, noisy, crowded, unsafe, having poor ergonomics, and so on; (4) don’t have proper tools to do the job: obsolete machines, clumsy computer systems with faulty software, and so on; (5) lack job aids or electronic help systems that can provide information as needed; (6) have insufficient incentives: money, benefits, recognition, advancement opportunities, and so on; (7) struggle in an organizational structure with poor communication, weak leadership, oppressive supervision, and the like; or (8) some combination of two or more deficiencies.

The point is to keep constantly in mind that instruction is the solution to only one type of problem, the problem of lack of the sorts of knowledge and skills that can be learned. In many cases, people know how to do something but do not have the incentive to do it. Or they have the knowledge and incentive but do not have the tools to do the job well. Training will not give them the motivation or the tools.

Although instruction is just one tool among many in the performanceimprovement toolbox, it is an extremely vital one. When addressing business problems or opportunities, the capabilities of the workforce are often the most important component, so training or education are frequently the keystones of the change process. Even when other interventions are at the center of a change, there is almost always some need for training or education to support those other interventions. For example, if the wordprocessing system is upgraded, implementing a tool intervention, the users will need some orientation to and practice on the new hardware or software, which would be an instruction-type intervention. Or in a shift from individual to team-based operation, which would be an organizational system intervention, supervisors will need extensive reorientation of their skills and values, which would be an education-type intervention.

Distinguishing Information Giving from Instruction

Information consists of facts, news, comments, and similar representations of knowledge. Receivers are not responsible for measurable, specific actions or performance as a result of being presented with information. Often the presentation, which may be live, printed, or on the Internet, is general in content, and its purpose is to give an overview of ideas or subject matter: to generate interest, to provide background information, or to give procedural details. Information can be presented in a memo, in the classroom, in the textbook, or on the Web.

Giving information, the presentation of content, is much different from and less than instruction, the arrangement of information and events to facilitate learning. In other words, “telling ain’t training” (Stolovitch and Keeps, 2002). Trainees should not be expected to be responsible for the retention or use of information they have only seen or heard. Meaningful understanding, retention, and use require instructional activities, including practice with feedback. Active engagement with the material by questioning it, discussing it, or applying it to practice problems is the critical component of instruction. And, of course, there should be assessment to determine whether the trainees have mastered the objectives.

Distinguishing Cognitive Support from Instruction

It is easy to lose sight of the differences between two related interventions, cognitive support and instruction. Both deal with mental operations, and both may entail some presentation of information. In some cases, cognitive support can substitute for and complement instruction, but they are not equivalent.

An example can be found in the digital work environment, where people are near computer screens as they work. The computer system makes it possible to give them electronic help systems to provide advice as needed. The most common example is the help button built into most wordprocessing programs. If you don’t know how to change the margins on a page you can click on the help button, type in some key words, and receive specific advice on how to do it.

Besides computer help systems, cognitive support is provided by other sorts of job aids, which can take many forms (Rossett and Gautier-Downes, 1991). A telephone directory saves you from having to memorize every phone number you might ever need. Tables in the back of statistics textbooks provide sequences of random numbers and charts to determine levels of significance. Nearly every appliance comes with a booklet of operating procedures; the power lawnmower has the most critical operation rules inscribed on the handle. Decision-tree charts can quickly help decide if an applicant qualifies for disability payments under Social Security.

There is a real distinction between mere cognitive support and instruction. The information provided by the job aid is not meant to be memorized. It is assumed that the user will look up the information on the rare occasions that it is needed. Alternatively, instruction is meant to lead to learning, a quasi-permanent change in capability. However, with computers, it has become possible to give ever more rapid and detailed advice in specific problem situations, to the point that the computer could be said to be coaching the user. This can lead into a grey area between telling and training. That is, with consistent use, the user could gradually internalize the advice of the help system, remembering more and more of the information provided. At this point the help system may be contributing to learning, although its aim is only to provide just-in-time assistance.

In the future, the line between cognitive support and instruction will be further blurred by the trend toward work-embedded training, instruction that occurs at the worksite. Employers are increasingly reluctant to take workers off the job for training, especially since there is a lot of evidence that the training that transfers to the job is the training that most closely resembles working conditions. Transfer of training increases as the practice is more realistic. So cognitive support may take on more and more of the traits of training, what some refer to as just-in-time training, and training may incorporate more and more cognitive supports, especially in the form of electronic performance-support systems, such as help systems.

**PLANNING INSTRUCTION**

There are two broad types of guides to the preparation of effective, appealing instruction. First, there are instructional design and development models, procedural guides that focus on the steps to be followed by the planners as they proceed from conceptualizing the problem to evaluating the success of the intervention. Such models attempt to specify what decisions need to be made and in what order. Models that follow the systems approach generally recommend the sequence of analyze, design, develop, implement, and evaluate. Based on this sequence, the acronym ADDIE is often used to refer to this family of models.

Second, there are lesson frameworks or templates for the structure of instructional units, which might be referred to as a lesson, unit, module, program, or other term. These frameworks specify the nature and sequence of learning activities that should be incorporated into any effective lesson. A familiar example is the Events of Instruction framework (Gagne and Medsker, 1996). Such lesson frameworks are vitally useful during the design stage, when planners are deciding how to structure the lesson or series of lessons. Particular lesson frameworks are better suited to particular sorts of objectives, so the team’s choice may be guided by the types of outcomes that are being pursued.

Instructional Design and Development Models

In the world of formal education, teachers usually plan their own lessons, select or develop the instructional materials, conduct the classroom activities, assign and grade practice exercises, and develop and administer the tests. Their planning processes tend to be informal and pragmatic.

Alternatively, in business, military, and other large organizations, instructional processes are often allotted to different specialists: managers and supervisors decide on training needs, analysts conduct surveys and observations, designers create lesson blueprints and tests, production specialists create materials, trainers conduct the lessons, and evaluators measure the results. Coordinating the whole process may be a small team headed by an instructional designdevelopment specialist.

Furthermore, organizations other than formal education institutions tend to place a higher value on efficiency and efficacy. Instruction must accomplish its goals for the organization to survive. To do this, instructional planning procedures must be efficient, and their results must be demonstrable. In complex organizations with many units and even multiple sites there must be a standardized process for carrying out instructional planning, to avoid expensive waste and duplication of effort. Thus, in organizational settings managers and training specialists prefer instructional design and development processes that follow a systems approach.

**Systems Approach Models.** The essence of the systems approach is to break the instructional planning process into small steps, to arrange the steps in logical order, then to use the output of each step as the input of the next. At the most general level, most planners agree that the major stages are analysis, design, development, implementation, and evaluation. Therefore, the outputs of the analysis stage—a description of the learners, the tasks to be learned, and a listing of the instructional objectives to be met—serve as input to the design stage, in which those descriptions and objectives are transformed into specifications or a blueprint for the lesson. Next, the design specifications serve as inputs to the development stage, where they are used to construct the materials and activities of the lesson. In the implementation stage the instructors, materials, activities, and learners come together to use the products of the development stage. Finally, those instructional activities are evaluated to determine whether the original objectives have been met and whether further instruction is necessary.

Another key attribute of the systems approach is a commitment to conducting evaluation and revision at each step of the design and development process. At each major decision point there is an opportunity to gather data to test that decision and other prior decisions to verify that the project is moving ahead toward a solution of the originally defined problem. If the results of a step are not satisfactory—for example, if trainees in a sample group are confused by the directions in the prototype of a new simulation exercise—then the design step must be repeated to find ways to clarify the directions. Of course, sometimes it happens that further analysis leads developers to shift the target objectives and continue in a different line. This process of repeating steps until satisfactory results are achieved is referred to as an *iterative* approach. Because of this commitment to evaluation at each phase of the process, the ADDIE label is a bit of a misnomer. Evaluation is not just conducted at the conclusion of training, but at the conclusion of each phase of development.

Numerous systems-approach models have been proposed. They differ in terms of the number of steps, the names of the steps, and the recommended sequence of functions. Gustafson and Branch’s *Survey of Instructional Development Models* (1997) includes eighteen models. Their list is not intended to be exhaustive, but to be illustrative of the various ways of implementing a systems approach. Most organizations use their own home-grown model, often adapting or combining other models to guide their design and development activities.

The major steps of the systems approach are shown in Figure 15.2.

Analysis

Design

Development

Implementation

Evaluation

**Figure 15.2.** The Major Steps of the Systems Approach, Also Known as the “ADDIE

Model.”

Gagne, Wager, Golas, and Keller (2005) provide an expansion of these basic steps into a more detailed procedural guide:

1. Analysis
   1. First determine the needs for which instruction is the solution.
   2. Conduct an instructional analysis to determine the target cognitive, affective, and motor skill goals for the course.
   3. Determine what skills the entering learners are expected to have, and which will impact learning in the course.
   4. Analyze the time available and how much might be accomplished in that period of time. Some authors also recommend an analysis of the context and the resources available.
2. Design
   1. Translate course goals into overall performance outcomes and major objectives for each unit of the course.
   2. Determine the instructional topics or units to be covered and how much time will be spent on each.
   3. Sequence the units with regard to the course objectives.
   4. Flesh out the units of instruction, identifying the major objectives to be achieved during each unit.
   5. Define lessons and learning activities for each unit.
   6. Develop specifications for assessment of what students have learned.
3. Development
   1. Make decisions regarding the types of learning activities and materials.
   2. Prepare draft materials and/or activities.
   3. Try out materials and activities with target audience members.
   4. Revise, refine, and produce materials and activities.
   5. Produce instructor training or adjunct materials.
4. Implement
   1. Market materials for adoption by instructors and potential learners.
   2. Provide help or support as needed.
5. Evaluate
   1. Implement plans for learner assessment.
   2. Implement plans for program evaluation.
   3. Implement plans for course maintenance and revision [p. 22].

**The Dick and Carey Model.** The most widely known and used ADDIE-type model is the one developed by Dick, Carey, and Carey (2005), shown in Figure 15.3. It is taught in most introductory courses at colleges and universities, it has been widely adopted, and it serves as the basis for other models. The model is typical of the overall planning process for instructional interventions in business, industry, government, and military training.

The Dick and Carey model begins with needs assessment to determine whether there is an ignorance problem. It then recommends analyzing the instructional content, the learners, the instructional context, and the context in which the skills will be applied. The initial analysis leads to the specification of objectives. A unique aspect of the Dick and Carey model is that it then recommends specifying the assessment instruments and methods aligned with those objectives, prior to designing the instruction. Their concept is that if the developers can be clear enough about what and how they will be testing, they will have a much better idea of what instructional strategies to select in the next step. After developing the instructional materials and procedures to implement the strategy, the model wraps up with evaluation and revision. It recommends first a formative evaluation of the instruction, small-scale testing of the early drafts of the lesson elements, followed by revision. Then a summative evaluation is conducted at the end of the actual lesson to determine whether the lesson achieved the expected learning results.

In the Dick and Carey model and other similar models the central focus is on the design phase, creating or selecting the methods and materials that will constitute the learner’s experience. The steps of specifying objectives, selecting methods and media, and deciding on a lesson framework deserve special attention.

**Figure 15.3.**

The Dick and Carey Model.

Assess needs

to identify

goal(s)

Write

performance

objectives

Re

vise

instruction

Develop

instructional

strategy

Develop

and select

instructional

materials

Design and

conduct

formative

ev

aluation

of instruction

Design and

conduct

summative

ev

aluation

Conduct

instructional

analysis

Analyze

learners

and context

Develop

assessment

instruments

Specifying Goals and Objectives

Goals for instruction are typically classified under three broad headings according to the type of learning being pursued: cognitive, affective, and psychomotor. This classification system was proposed in Bloom (1956) and has continued to be the most popular taxonomy. Cognitive refers to intellectual skills, from simple knowledge of facts through complex problem solving. Affective refers to attitudinal and emotional changes, from the formation of preferences to complex value systems. Psychomotor refers to physical skills, including manual dexterity, athletic skills, and the like; the stem *psycho*is included in this term to remind us that many physical skills also entail mental activity. Romiszowski (1981) proposes a fourth category, interpersonal, to cover objectives related to human relations, such as those involved in teamwork, sales, coaching, and supervision.

Sometimes it is difficult to classify a learning goal or objective into just one category because most real-world instructional objectives have cognitive, affective, interpersonal, and psychomotor aspects. It is difficult to conceive of any instructional objective that doesn’t have some mental component, emotional overtone, or observable physical activity. For example, if the goal is to have the learner write a memo in proper format, this does entail the physical act of writing or keyboarding. Nevertheless, the focus is on the mental skill of remembering and applying the proper format, so this would be classified as a cognitive, not psychomotor, objective. Thus instructional objectives are classified according to which category of skill is being emphasized at any given time. Advocates of a systematic approach place great importance on clear specification of objectives at an early stage in the planning process, as the selection of instructional methods is to a great extent dependent on exactly what learning objective is being pursued.

Instructional Methods and Media

During the design phase, planners have to decide what methods to employ and what media channels to use to carry out the instruction. The term *method* simply means a way of doing something. An *instructional* method is a way of instructing or a way of involving learners in a particular sort of teachinglearning activity. Instructional methods are defined here as teaching-learning activities distinguished by the pattern of communication among teacher, learner, and different types of materials. For example, a presentation is a one-way information exposition by a teacher, or software substituting for a teacher, to a number of learners. A discussion entails free exchange of information among a group of learners. Instructional methods can be classified into about ten broad families: presentation, demonstration, tutorial, reading, reflection, discussion, expression, construction, drill and practice, and discovery-inquiry; these are shown visually in Figure 15.4.

***Teaching* Methods *Learning* Methods**

)

teacher-controlled

(

learner-controlled

(

)

Demonstration

(

modeling—teacher,

peer)

Drill and Practice

)

mental drill, memorization

(

Discovery-Inquiry

• Laboratory

• Simulation

• Game

Presentation

Reflection

Reading

)

viewing, listening

(

Tutorial

Discussion

Expression

(

verbal, action

)

Construction

(

tangible product

)

**Figure 15.4.** Typology of Instructional Methods.

Some of these methods are centered on activities controlled by the teacher or instructional system, such as presentations and demonstrations; others are more learner controlled, such as reading, reflection, and discussion; yet others can share or alternate control between teacher and learner, such as drill and practice and discovery-inquiry.

Table 15.1 gives a verbal definition of each category and shows typical formats in which these methods are embodied.

Media can be distinguished from methods. A medium is a channel that carries information between a source and a receiver (Smaldino and Russell, 2005). Today’s electronic media are often made up of multiple sets of channels constituting the delivery systems through which messages are sent. Radio programs are broadcast through the air, then picked up by radios from which the program

**Table 15.1. Methods, Their Definitions, and Their Typical Formats.**

|  |  |  |
| --- | --- | --- |
| *Methods* | *Definitions* | *Typical Formats* |
| Presentation  Demonstration  Tutorial  Reading | One-way information flow from source (Teacher) to many receivers (Learners)   * Typically verbal * May have visual supplement   One-way information flow, featuring realistic “showing” rather than “telling” • May be human or device, Teacher or Learner   * May be planned behavior modeling * May be unconscious modeling   Two-way interchange between  Teacher and Learner   * Learner exerts some control * Teacher must be able to respond flexibly   Learner engages with text or visual material   * Material instructionally encoded * Learner controls pace | Lecture, oral presentation   * With display: whiteboard, overhead transparencies, handouts, PowerPoint slides   Film showing  Radio program  Television program  Video clip  Statement made via audio or video conference  Showing “how to do it” (live, recorded)   * Teacher demo in music, dance master class * Video: sports skills   Teacher as role model  Peers as role models  Apprenticeship  Athletics: coaching  Music: master class  Mentoring  Socratic dialogue  Structured tutoring  Branching programmed instruction  Adaptive computer-assisted instruction  Teacher-student exchange in  Web chat  Teacher-student exchange via e-mail  Reading textbooks, modules, handouts  Reading Web pages, “tutorials”  Linear programmed instruction or computer-assisted instruction |

Watching video, listening to audio Video-streaming on the Web

(*Continued*)

**Table 15.1. Methods, Their Definitions, and Their Typical Formats. (*Continued*)**

|  |  |  |
| --- | --- | --- |
| *Methods* | *Definitions* | *Typical Formats* |
| Reflection  Expression  Construction  Discussion  Drill and Practice | Learner examines own performance and thoughts • Analyzes and may report  Learner creates a verbal product or physical performance   * Meant to express thought, feeling   Learner creates a tangible product   * Not a verbal message * Meant to express thought, feeling   Two-way interchange among  Learners   * Teacher may initiate, monitor, not control   Learner practices skill repeatedly   * May be internal memorization * Usually self-paced | Coach-student dialogue  Medical, psych: case conference  Written   * Short paper * E-mail to teacher * Post-class recap (, , ?) Evaluative checklist   Debriefing: post-simulation or game, or field work  “Think-aloud” protocol  Small-group process analysis  Answers to study or quiz questions  Essay, poem  E-mail messages   * Chat, bulletin board comments   Performance: dance, speech  Musical performance or composition  Multimedia presentation  Art: painting, sculpture  Design: drafting, interior decor, lighting, landscape, architecture  Seminar  T- group  Buzz group  Debate (for participants)  Panel discussion  Reacting to someone’s posting in a discussion forum  Participating in a Web chat  Participating actively in an audio or video conference  Memorization drill  Language lab  Athletic practice, drama rehearsal  End-of-chapter exercises  Recitation |

Instructional game

• Math, reading, spelling drills

**Table 15.1. (*Continued*)**

|  |  |  |
| --- | --- | --- |
| *Methods* | *Definitions* | *Typical Formats* |
| DiscoveryInquiry:  Laboratory  DiscoveryInquiry:  Simulation  Game | Learner acts on real environment, raw materials   * Usually self-paced exploration   Learner acts on *artificial* environment, materials, characters   * May be group-based * Games include artificial rules, a goal, and competition | Science experiment  Studio art, drama  Clinic (diagnosis, problem solving)  Field work   * Archeology, anthropology * Student teaching   Case study (real instances)  Project  Physical simulator  Decision-making simulation  ( policy )  Social simulation   * Role play, one-to-one * Group interaction   ( sociodrama )  Business scenario (simulated case)  Business game (competitive) |

signals are conveyed through a speaker into the air to the listener’s ear. Videotapes pass through playback devices, which send the recorded signals through wires to a TV set or monitor, generating images on a screen, which are scanned by the viewer’s eye. These common electronic delivery systems illustrate the sometimes complex chain of senders, receivers, and channels comprising a given medium. Some media are much simpler, such as the human voice traveling through the air to the listener’s ear. Whether simple or complex, the media themselves are merely channels through which almost any sorts of messages can be transmitted. They can be used effectively or ineffectively for instruction.

Sometimes people confuse media with methods. For example, the terms *e-learning* or *video-based instruction* might be used purportedly to describe what instructional methods are being used. However, although these terms tell you something about what communication channels or media are being used, they tell you very little about what teaching-learning activities or methods are being used.

E-learning simply refers to the use of words, images, and sounds that are filtered through some computer system and displayed on a viewing screen. Learners might interact with the display by clicking or scrolling with a mouse, touching a touch-sensitive screen, or typing on a keyboard. In the most prevalent type of e-learning, the learner simply reads verbal information on a screen, with the interaction limited to clicking on links or possibly on multiple-choice items, leading to more pages of text. In this case, the teaching-learning activity or *method* is simply reading, one of the most commonly used methods.

**The Relationships among Methods, Media, and Learning.** Although the issue is still debated in instructional technology circles, there is compelling evidence, both from research and from logic, that methods influence learning far more than media do. Clark (2001) convincingly argues this point, pointing to hundreds of media comparison studies and the meta-analyses of those studies. In research studies in which two different media are used to teach the same content, it usually turns out that the winning treatment is the one that uses more effective instructional methods. Even more certainly, when the studies are tightly controlled so that both media treatments use the same instructional methods, then a finding of no significant difference is inevitable.

The choice of medium does make a difference, of course. Different media can havedefinitecostandtimeadvantages.Ifyouwantathousandsalesrepresentatives scattered over eighty-five cities to participate in an interactive simulation exercise, it will probably be faster and cheaper to distribute the simulation on the Web than toarrangeforlive,face-to-facemeetings,assumingtherepshaveaccesstoInternetaccessiblecomputersatworkorhome.Themediumaccountsforthesavingsintime andcost;theinstructionalmethod,simulation,accountsforthe learningeffect.

Certainly, some delivery systems are better suited to incorporate certain methods. A demonstration is easier to communicate by television than by radio. A book is better for reading than a computer monitor. Face-to-face interaction is better for discussion than a telephone. But these built-in disadvantages can be overcome with the investment of enough time, money, and ingenuity. A highly detailed verbal description, with sound effects, can approximate a visual demonstration. Given attention to font size and background color, printed material can be read from a TV screen. High-quality multiparty discussions can be done by telephone if planned well. With ingenuity, the normal bounds of a medium can be stretched to accommodate methods that are not really well-matched with that medium. To do this, though, requires additional effort, creativity, and cost.

Alternatively, the built-in advantages of a medium can be ignored by designers. Consider the use of television to show talking heads or shots of written material; these are not the most powerful instructional methods that television is capable of carrying. Again, media can be used well or poorly; they can incorporate effective or ineffective methods. The secret of *effective* instruction is the selection of methods suited to the particular content and objectives. The secret of *efficient* instruction is the selection of media that can carry the required methods to the largest number of learners at the lowest cost.

**Models Versus Lesson Frameworks.** There are, of course, other ways of viewing the design of instruction besides the systems approach. Dozens of alternative approaches are described in *Instructional Development Paradigms* ( Dills and Romiszowski, 1997). However, most of these approaches actually are closer to lesson frameworks, as described in the following section, than to road maps for the entire instructional planning process. Approaches that attempt to portray the whole process tend to resemble the systems models, although using synonyms for the elements of the process.

Even within the systems-approach community, though, some practitioners and researchers feel that many instructional design and development models do not provide sufficiently specific directions on how to actually carry out each step, especially the crucial step of design—deciding how to construct the lesson ( McCombs, 1986; Gordon and Zemke, 2000). Although such steps may not be specified within instructional design or development models, there is a related body of knowledge that does provide such guidance. There are a number of well-known, tested frameworks around which designers can flesh out the plan for the individual units or lessons.

**LESSON FRAMEWORKS**

A major decision at the design stage is to select an overall framework for the lesson or other instructional unit. Many different frameworks have been proposed, usually inspired by a particular theory of learning. Theories of learning attempt to describe what is going on as people learn. Deeper understanding of the learning process can suggest ways to shape instruction to fit more naturally with that process, giving rise to new instructional theories and new frameworks for structuring lessons. Four lesson frameworks that are well known and widely applied are explored here in some depth: behaviorist, cognitive, constructivist, and eclectic. Many other frameworks are explained fully in Reigeluth (1983, 1999) , Davis and Davis (1998), and Medsker and Holdsworth (2001).

Behaviorist Framework

The first major post–World War II influence on thinking about lesson design was B. F. Skinner’s innovation, programmed instruction, which he created to embody the principles of learning that he and others had discovered in the operant conditioning laboratory (Skinner, 1954).

**Theory Base.** Operant conditioning focuses on the observable behavior of the learner and the events that follow the behavior. The theory holds that any behavior that is followed by reinforcing events is more likely to be learned and exhibited in the future. Complex performances can be broken into smaller components and each component can be built up by practice followed by reinforcement.

**Application of the Theory.** To apply this theory to cognitive abilities, Skinner proposed using a framework called “programmed instruction.” The programmed-instruction framework specified five major elements, according to Schramm (1962): “an ordered sequence of stimulus items; to each of which a student responds in some specified way, his responses being reinforced by immediate knowledge of results, so that he moves by small steps, therefore making few errors and practicing mostly correct responses, from what he knows, by a process of successively closer approximations, toward what he is supposed to learn from the program” (p. 2).

As research and practical experience accumulated, exemplified by Lumsdaine and Glaser (1960) and Glaser (1965), the robustness of many of these specifications came into question. That is, the sequence of experiences, the nature of the response, the timing of feedback, and the size of steps all appeared to be contingent on various learner characteristics and learning conditions. Since the specific formulaic elements of programmed instruction didn’t seem to account for its success, developers began to see that the benefit was in the underlying principles. Programmed instruction’s specifications were then broadened and simplified by Popham (1971) to four principles: “1. Provide relevant practice for the learner. 2. Provide knowledge of results. 3. Avoid the inclusion of irrelevancies. 4. Make the material interesting” (p. 171).

**Instructional Pattern.** The behaviorist approach today is characterized by precisely phrased performance objectives and breakdown of the learning task into small steps, each of which can be practiced and corrected until mastery is attained. This pattern can take the form of a self-study module in printed or computer-based form or a face-to-face session conducted by a coach or mentor with an individual learner or small group.

**Methods.** This approach favors methods that allow learners to progress at their own pace while getting feedback:

* *Reading,* including use of programmed texts, programmed audiovisual modules, and linear computer-assisted instruction (CAI)
* *Tutorial,* including on-the-job apprenticeship, structured tutoring, and adaptive CAI
* *Drill and practice,* including language labs, practice exercises embedded in Web lessons, and instructional games
* *Demonstration,* displaying the desired behavior to be learned, most likely in the form of behavior modeling (Bandura, 1969)
* *Discovery-inquiry,* including social simulations, role-play exercises, and computer-based scenarios.

**Uses.** The behaviorist approach is well-suited to skill development of the sort that StolovitchandKeeps(2002)wouldplaceintothedomainoftraining,routinetasks— simple or complex—that must be completed repeatedly with accuracy and efficiency. Intellectual skills of the lower levels, such as discrimination, concept learning,association,andchaining,whichisautomaticallyperformingamultistep procedure, have been taught successfully with the behaviorist approach ( Ertmer and Newby, 1993, p. 56). Such intellectual tasks are often embedded in a larger procedural skill lesson.

Cognitive Framework

In the decades since the 1960s, instruction has been informed increasingly by principles drawn from other sources, especially cognitive psychology. The cognitive approach emphasizes the importance of the learners’ mental and emotional processes during the course of instruction. From this perspective, learners use their memory and thought processes to generate strategies as well as store and manipulate mental representations and ideas.

**Theory Base.** One branch of cognitive theory, information-processing theory, conceives the human learner as a processor of information, similar to a computer. In this view, represented by the work of Atkinson and Schiffrin (1968), sensory inputs are selected, encoded, and stored in short-term and possibly longterm memory. Later, well-stored information may be retrieved and used.

Another branch, assimilation theory, focuses on the human learner’s cognitive structure and the processes whereby new information is integrated into the overall structure. Ausubel’s schema theory (1980) views schemata as providing mental scaffolding, containing slots that can be filled in with particular cases. These schemata allow learners to organize information into meaningful units. This theory implies that the learner’s cognitive structure at the time of learning is the most important factor in determining the likelihood of successful learning.

All branches of cognitive theory emphasize that the new knowledge must be meaningful to the learner if it is to be retained and used in the future. Another major cognitive theorist, Jerome Bruner (1966) promoted the value of learning by inquiry or discovery, discussed further on.

**Application of the Theory.** One cognitive approach, the expository strategy, involves instructional activities that present information to the learner or allow learners to read or view material and think about it, after which they practice applying it in some realistic form. The concerns revolve around attending to relevant messages, interpreting the new material, relating it to existing mental structures, and remembering it so that it can be retrieved later when needed. Designers must devise ways to gain the learner’s attention, in competition with the many distracting stimuli in the environment. Then they want to present the new information in ways that will encourage melding it into the learner’s existing mental structures or schemata. One instructional technique derived from schema theory is the advance organizer—a brief preview based on the learner’s existing knowledge, which serves as a framework for new learning. Analogies, examples, outlines, and mnemonic devices also make new information easier to remember. To improve retention and use of combinations of knowledge and skills, it is helpful to embed practice in a realistic setting.

Another cognitive approach, the inquiry strategy, turns the expository strategy upside down. It begins by immersing learners in real-world problems, leads the learners to make hypotheses about these problems, and guides them to discover an answer. This approach is commonly found in management training; for example, in desert-survival simulations.

A rather complete and thorough set of cognitive prescriptions is offered by Foshay, Silber, and Stelnicki (2003) as “a cognitive training model” (p. 23). They offer seventeen specific tactics organized around the strategic phases of gaining attention, linking to prior knowledge, structuring the content, presenting the new knowledge, and strengthening the new knowledge through practice and feedback.

**Instructional Pattern.** Training and education based on the cognitive framework are likely to take the form of lectures or recorded presentations illustrated with audiovisual supplements. In many cases it is more efficient to package cognitive instruction for self-study in the form of textbooks, manuals, or Web documents. In any case, the pattern is likely to consist of a carefully constructed arrangement of information designed to attract and hold attention, to meld the new knowledge with the learner’s previous knowledge, and to suggest ways of applying this new knowledge to practical use. The presentation will likely include opportunities to practice in the form of embedded quizzes, provocative questions, or other types of exercises.

**Methods.** The cognitive approach is likely to incorporate methods focusing on the presentation of information and learner interactions with the material and each other:

* *Presentation,* including illustrated lectures, videos, and PowerPoint shows
* *Reading,* including textbooks, training manuals, and Web so-called tutorials, which usually are not truly tutorial, in the sense of a rich two-way exchange
* *Demonstration,* including how-to-do-it demonstrations, video demonstrations, and peers or instructors serving as role models
* *Drill and practice,* including end-of-chapter exercises, recitation, and memorization drills such as spelling bees or other game-type activities
* *Discussion,* including debates, seminars, and buzz groups.

**Uses.** The cognitive approach is well suited to helping learners recall new information, comprehend how things work, and remember and use new procedures ( Davis and Davis, 1998). It applies generally to objectives in the cognitive domain, particularly to tasks at the lower and middle levels of complexity.

A Constructivist Framework

A more recent educational theory, constructivism, revolves around the notion that “knowledge is constructed by the learners as they attempt to make sense of their experiences” (Driscoll, 2000, p. 376). Constructivism can be viewed as a philosophy, an epistemology, or an instructional orientation. The label has been used by theoreticians working in different realms. Even within education there is no comprehensive set of beliefs that is embraced by all constructivists. Beyond a certain set of core beliefs, constructivists diverge into several subgroups, some of which hold positions that are contradictory to others. This discussion focuses on the core beliefs that are most widely accepted.

**Theory Base.** A core philosophical belief is that while there is a real world out there, there is no meaning inherent in it; meaning is constructed by people and cultures. In terms of epistemology, then, knowledge is constructed from and shaped by experience, and understanding of the world is socially negotiated. The name, constructivism, is a reminder that whatever is done *to* the learner in the name of instruction, ultimately nothing happens until the learner takes those inputs and *constructs* some meaning from them. Hence, giving learners ownership of the knowledge is crucial. Furthermore, that knowledge is useful only to the extent that it is embedded in a real-world context. Generalizations stripped of their context are of little practical use (Duffy and Jonassen, 1992).

**Application of the Theory.** Prescriptive principles derived from constructivism include “1. Embed learning in complex, realistic, and relevant environments. 2. Provide for social negotiation as an integral part of learning. 3. Support multiple perspectives and the use of multiple modes of representation. 4. Encourage ownership in learning. 5. Nurture self-awareness of the knowledge construction process” (Driscoll, 2000, pp. 382–383).

Although Merrill rejects the constructivist label for his work, he proposes a set of instructional principles, which he calls “first principles of instruction” (2002 a, p. 43), that are problem-centered, progressively more realistic, and focused on knowledge construction by the learner, as shown in Figure 15.5. These ideas are clearly aligned with the constructivist view. So until another representation of the constructivist perspective comes along that is at least equally coherent, Merrill’s framework can represent this perspective.

Merrill’s theory proposes four phases in the instructional process: (1) *activation* of prior experience, (2) *demonstration* of skills, (3) *application* of skills, and

4

Integration

3

Application

1

Activation

2

Demonstration

5

**Problem**

**Figure 15.5.** Visual Model of the Major Elements of Merrill’s “First Principles.”

(4) *integration* of these skills into real-world activities, with all four phases revolving around (5) a *problem.* Each of these five elements has supporting generalizations or principles, which provide the prescriptions for effective instruction. The broadest generalizations about each step of the instructional sequence are

1. *Activation:* Learning is facilitated when the learner is directed to recall, relate, describe, or apply knowledge from relevant past experience that can be used as a foundation for the new knowledge.
2. *Demonstration:* Learning is facilitated when the learner is shown rather than told.
3. *Application:* Learning is facilitated when the learner is required to use his or her new knowledge to solve problems.
4. *Integration:* Learning is facilitated when the learner can demonstrate his or her new knowledge or skill.
5. *Problem:* Learning is facilitated when the learner is engaged in solving a real-world problem [Merrill, 2002a, pp. 45–50].

**Instructional Pattern.** Merrill also proposes a simple framework for applying his first principles to training situations, called the “Pebble-in-the-Pond” model (Merrill, 2002b). The essence of his framework is to begin by imagining the simplest whole version of the task that the learner must be able to perform, the first ripple of the pebble dropped into the pond, then to identify the expanding ripples: “a progression of such problems of increasing difficulty or complexity such that if learners are able to do all of the whole tasks thus identified, they would have mastered the knowledge and skill to be taught” (p. 41). The focus on actual on-the-job problems makes this approach highly suited to immediate application on the job, one of the keys to retention and transfer of training. Merrill reports documented success in terms of better and faster learning.

**Methods.** Merrill’s approach and other constructivist approaches tend to prefer methods that immerse learners in problematic situations:

* *Discovery/Inquiry*

Includes laboratory-type activities, such as science experiments, field work, internships, and apprenticeships.

Includes simulation and game-type activities, such as business games, social simulations, simulations of work situations, videogames, and other sorts of immersive environments, including virtual reality.

* *Tutorial*

Includes face-to-face apprenticeship and mentoring; action-learning programs that emphasize action, reflection, and mentoring are a good example.

* *Reading*

Includes particularly Web text with links connecting related ideas, known as hypertext, possibly incorporating sounds and motion images, known as hypermedia.

* *Expression*

Includes multimedia productions, hypertext document construction, and other projects, especially those that are developed collaboratively.

* *Reflection*

More than any other instructional approach, constructivism emphasizes the importance of learners’ thinking back on their experiences, typically in the form of a game debriefing, dialog with a coach, keeping a journal, or the like.

**Uses.** The constructivist approach is well-suited to learning advanced skills high in cognitive complexity, particularly in domains that are not well structured, in which there may be many correct solutions to a problem, such as in management. Action-learning programs in executive education embody the constructivist approach by combining short, formal training sessions with longer periods of on-the-job work under the guidance of a mentor.

An Eclectic Framework

Lesson frameworks are seldom derived purely from one theory base. Although many frameworks reflect multiple influences, including Merrill’s, Gagne’s Events of Instruction framework is quite self-consciously eclectic, explicitly drawing on different theories.

**Theory Base.** Gagne, a leading translator of learning theory into instructional theory, proposed in early editions of his influential book *The Conditions of Learning* ( Gagne, 1965, 1977) that the information-processing view and the assimilation view of learning could be combined with behaviorist concepts to provide a more complete approach to teaching different learning tasks.

**Application of the Theory.** Gagne’s Events of Instruction framework suggests that certain mental operations must be carried out for successful learning, and it works best to do them in a certain order, at least when following an expository strategy. When following an inquiry strategy the middle steps may be done in reverse order. The best-known version of his framework has been a robust and influential outline for lesson design:

1. Gaining attention
2. Informing learners of the objective
3. Stimulating recall of prior learning
4. Presenting the content
5. Providing “learning guidance”
6. Eliciting performance
7. Providing feedback
8. Assessing performance
9. Enhancing retention and transfer [Gagne and Medsker, 1996, p. 140]

**Instructional Pattern.** Offered by Gagne as a general guide, this framework can be used to construct a lesson having a specific sequence: (1) gain the learners’ attention by telling them or dramatizing the reason for mastering this skill; (2) tell them clearly what they are expected to be able to do after the learning session; (3) remind them of what they already know and how today’s lesson adds to that; (4) demonstrate the new skill or present the new knowledge; (5) suggest mnemonic devices, ask probing questions, or give prompts that guide the learners in mastering the content; (6) make sure that the learners have a chance to practice the new knowledge or skill; (7) during the practice, confirm correct responses or desired performance and help them overcome mistakes; (8) test the learners’ mastery by having them use the new knowledge, skills, and attitudes in realistic or simulated problem situations; and (9) help the learners connect their new skills with the job by giving them on-the-job practice or simulated practice involving varied problems.

Presenting instruction in this sequence exemplifies an expository or deductive approach: telling the learners “The Point”—the concept, rule, or procedure you want them to master—and then letting them apply The Point in some practice setting. Sometimes a discovery or inductive approach may be more effective, putting practice and feedback, steps 6 and 7, before steps 2, 3, 4, and 5. This way the learners discover The Point for themselves.

**Adaptation: The “Universal Model” of Stolovitch and Keeps.** The Events of Instruction template has been adapted and simplified by many authors. For example, Stolovitch and Keeps (2002) offer a “universal model for structuring any learning session” (p. 68), consisting of five major steps: (1) tell the learners the rationale for the lesson, (2) tell them the objectives of the lesson, (3) create learning activities that lead to attaining the objectives, (4) evaluate learner performance, and (5) provide feedback on how well they mastered the objectives. They reduce the nine steps to five, but keep the essence of Gagne’s framework.

**Adaptation: Russell’s Objectives Alignment Framework.** A further simplification, the Objectives Alignment Framework, developed by Russell, is shown in Figure 15.6. The salient elements of a learning session could be boiled down to three: objectives, activities, and assessments. *Objectives* describe what you want the learners to be able to do *after* instruction. *Activities* are what the learners do *during* instruction to help them learn the content, attitudes, or skills being taught; this usually entails practice with feedback. *Assessments* are how instructors determine if learners have mastered the content, attitudes, and skills being taught. As shown in Figure 15.6, all three components of the lesson structure are interrelated. Any one of the components can be used to begin constructing the lesson, and each of the three components is equally important. Some start with the objectives, then select or design the activities, and finally develop the assessment items. If the objectives are clearly stated, it will be fairly easy to develop both of the other components.

Others prefer to start with the activities. They select the readings, class discussions, small-group projects, games and simulations, and other learning activities. They can then develop objectives by answering the question, What will the

**Activities**

Include practice

with feedback

**Assessment**

**Objectives**

**Figure 15.6.** Visual Model of James D. Russell’s Objectives Alignment Framework.

students be able to do after they complete these activities? Then they develop assessment methods that measure successful completion of the activities.

Finally, there are occasions when planners might start with the assessments. Perhaps the assessment will be some sort of company certification exam or an external government exam. The design and development team then selects activities that will enable the students to be successful on the exam. Using the completion of an exam as a method of assessment, they interpret the knowledge and skills required by the test as the lesson objectives.

In short, any one of the three components, if developed well, should lead to the other two. Regardless of where planning starts, all three components should be developed and all three must be aligned with each other; each component must fit with and support the other two. No matter how clear and ingenious the instructional activities are, they will not be the right activities if they do not give the learners practice in the skills on which they will be assessed. Similarly, if the test is not aligned with the objectives, managers will not be able to be sure that the learners have mastered the essential skills.

This Objectives Alignment Framework is probably the simplest and most robust expression of the framework first proposed by Gagne. It has the virtues of being well-tested in practice and easy to communicate to new instructors or designers.

**Methods.** The eclectic approach may be implemented through a combination of methods associated with the behaviorist, cognitive, and constructivist approaches.

**Uses.** The eclectic approach is well-suited to training goals that combine routine tasks and skills at the intermediate level; they are likely to include cognitive, affective, and psychomotor skills together.

**DELIVERY ENVIRONMENTS FOR INSTRUCTION**

Instruction can take place in many different environments, from a formal classroom to the actual workplace, and in many places in between or in combination. These delivery environments can be placed into three major categories: face-to-face classroom, which might be augmented by audiovisual media; distance learning that is telecommunications-based or computer-based; and independent self-study.

Face-to-Face Classroom Instruction

**Potential Uses.** The advantages of face-to-face instruction are obvious because the classroom has been and continues to be the most popular venue for instruction. The presence of an instructor and fellow learners gives a social dimension that is difficult to replace. Both the instructor and fellow learners can serve as behavior models and sources of inspiration. The ability to adapt spontaneously and flexibly to the group’s needs, the ability to share stories, the opportunity to network, and simply having an appointment to learn give the classroom environment numerous advantages. It is especially appropriate for pursuing interpersonal skills, seeing demonstrations of skills, and practicing those skills with immediate feedback and corrective guidance.

**Trends in Use.** Despite many earlier predictions to the contrary, face-to-face classroom instruction is still the most universally applied format in the corporate realm, being used “always” or “often” at 91 percent of companies (Galvin, 2003, p. 31) with no significant downward trend over the preceding several years. The traditional audiovisual media used in face-to-face instruction show a pattern of slow decline, although video materials continue to be very widely used. Videorecordings are used always or often at 52 percent of responding organizations, according to Galvin (2003, p. 30). The traditional analog media are being replaced gradually by digital formats, including projection of Web pages and presentation software such as PowerPoint.

In terms of the percentage of *time spent in training,* instructor-led face-toface classroom instruction occupied 69 percent of all training time in 2003, a decline of five percent from the previous year. Another ten percent of time was spent in classrooms with remote instructors, an increase of three percent since the previous year. Participation in computer-based learning occupied 16 percent of time, an increase of four percent over the previous year (Galvin, 2003, p. 22). So most organizations still use face-to-face classroom instruction, but trainees are spending a larger proportion of their training time in distance or computerbased learning, and the computer-based learning is increasingly delivered through the Internet or private intranets.

Distance Learning via Synchronous

Telecommunications Media

**Potential Uses.** When it is impractical or expensive to bring learners together in one geographical location, but the attributes of face-to-face instruction are still needed, organizations turn to synchronous distance learning, typically through teleconferences transmitted over broadcast, satellite, or computer networks or through a cable television network that is owned or leased by the organization. This ensures that everyone gets the same message at the same time and allows real-time two-way exchange.

It is possible to arrange multipoint audio conferences via the Web; these can be combined with electronic whiteboards to allow collaborative learning at a fraction of the expense of other telecommunications options.

**Trends in Use.** A small proportion of organizations, 12 percent in 2003, used broadcast or satellite television to disseminate training programs to multiple sites (Galvin, 2003, p. 30). Two-way videoconferences distributed over satellite, cable, or the Web are used always or often for training at 22 percent of all organizations (Galvin, 2003, p. 30). They tend to be used as supplements to other forms of training or for special purposes, such as the introduction of new products or the roll-out of new tools at organizations with widely scattered locations.

Distance Learning via Asynchronous Computer-Based Media

**Potential Uses.** Asynchronous (not at the same time) delivery is suited to prerecorded programs that need to be accessible all the time to many people for independent study. Typically, computer-based lessons have been transmitted over local area networks (LAN) or, more recently, through CD-ROMs or DVDs. Transmission via the Web is becoming increasingly popular. This form of distribution enables anytime, anywhere access. Some degree of interaction or even collaboration among learners is possible through discussion boards, chat rooms, instant messaging, or shared work spaces. The advantage of asynchronous group interaction is that participants have the time to think about questions or problems and can take time to formulate a response. Less assertive participants often find they have a better chance to get a word in edgewise in discussions that are asynchronous.

**Trends in Use.** Computer-based delivery systems have played a gradually expanding role in training over the past decade. In the early 1990s, this meant modules distributed via floppy disk or LAN. Since then distribution has migrated toward CD-ROM or DVD formats or, more recently, to the Internet or an organizational intranet. According to the 2003 *Training* survey, 45 percent of companies distributed instruction in digital storage media format. However, 63 percent used Internet or intranet delivery (Galvin, 2003, p. 30).

Games and Simulations

**Potential Uses.** Games and simulations are often seen as ideal pedagogical methods for learning to make decisions about complex business problems, for practice under realistic conditions, or for repetitive drills on facts or concepts to be memorized. They may be used in face-to-face classroom contexts or in immersive computer environments, so-called “micro worlds.”

**Trends in Use.** About a quarter of all organizations use classroom-based games and simulations regularly. However, by using the computer to present the problems and select appropriate responses, more sophisticated programs can be run faster and less expensively than in face-to-face settings. Considering these potential advantages, it is perhaps surprising to see that computer-based games and simulations are used regularly within only about ten percent of organizations ( Galvin, 2003, p. 31).

Independent Self-Study

**Potential Uses.** Programmed instruction, developed in the 1960s, dramatically demonstrated the possibility of packaging a wide range of subjects into modules for self-paced independent study. The requirement of continuously interacting with the material and getting feedback about progress at each step accounted partly for the success of this approach. More recently, independent study has been converted to delivery through interactive CD-ROMs or so-called Web tutorials, which typically are not truly tutorial but do present the content in a step-by-step form. This can be an attractive option because it allows learners to start and stop the program at any time and progress at their individual pace.

However, experience has shown that learners in the workplace tend to lose interest and drop out of such programs. There appear to be at least two factors at work. First, text-based materials can be repetitive and boring, with only superficial levels of interactivity. Second, self-study does not fit the way many adults prefer to learn. Adults tend to seek social learning settings; they want to hear stories about others’ experiences, what works and what doesn’t work.

When self-study is the most practical approach due to time and cost constraints, the loss of the human dimension can be overcome to some extent by employing video episodes in the program. The moving image is certainly preferable when teaching interpersonal skills or complex physical tasks or conveying messages from specific sources, such as a credible expert. Even for verbal material, a human with facial expressions and body language can hold interest far longer than can straight text.

**Trends in Use.** Since 2002, the *Training* survey has included self-study as a separate instructional context. Since then self-study based on print and audiovisual modules has been declining, while the use of Web-based self-study grew from 36 to 44 percent of organizations using it always or often, making it one of the most widely used instructional delivery environments (Galvin, 2003).

Blended Learning

In everyday parlance, trainers have tended to classify learning events into discrete categories: face-to-face classroom instruction, on-line learning, independent study, action learning, and so on. In fact, though, corporate training and education programs increasingly consist of hybrids; for example, face-to-face classroom meetings interspersed with Web-based team projects; satellite videoconferences followed by small-group discussions at remote sites; on-the-job action learning plus mentoring via e-mail. Combining conventional and on-line delivery has come to be recognized as a third alternative, referred to as blended learning. The advantages of combining formats are obvious. On-line activities offer self-pacing, standardization of information dissemination, and rapid deployment of new material, while face-to-face learning allows live human interaction, practice with feedback, team building, networking, and the other functions that are tied to people’s emotional responses. There is a growing consensus that the future belongs to blended approaches.

Selecting Delivery Systems

In the instructional technology literature there is a long tradition of creating schemata for matching delivery systems with different learning objectives. A highly regarded guide from the audiovisual era is by Reiser and Gagne (1983). More recently, a group of training specialists and consultants (Pallesen, Haley, Jones, Moore, Widlake, and Medsker, 1999) have developed a delivery system selection model that attempts to take into account economic factors as well as the capabilities of each of the various categories of delivery systems and environments, including desktop multimedia, satellite, audiovisual media, teleconferencing, Internet or intranet, electronic performance support systems, and electronically enhanced live classrooms. They then assess the suitability of each for a range of different learning objectives. The result is a model that would be suitable for selecting appropriate delivery systems and environments for blended learning, helping to decide which elements of a lesson or course could be delivered electronically and which would work better in a face-to-face classroom environment.

**EVALUATING INSTRUCTION AND ASSESSING LEARNER OUTCOMES**

Evaluation and assessment may be aimed at two basic targets: the instruction itself and the learners. For each target, three phases of evaluation may be used: formative, summative, and confirmative. Consequently, there are six different categories of evaluation and assessment (Hellebrandt and Russell, 1993). Formative Evaluation of Instruction

Formative evaluation of instruction is done during the development of the materials in order to improve them. Often this type of evaluation is called “learner tryout and revision.” This type of evaluation is done while the materials are still in draft form.

Summative Evaluation of Instruction

Summative evaluation of instruction is designed to determine the ultimate effectiveness of the materials. Often this process is called “validation” or “verification.” It is conducted after the materials have been developed and have been used by the trainees. A major issue is what should be measured to determine success. A widely accepted framework is Kirkpatrick’s four levels model (1998), which proposes that one could evaluate program success by any of four criteria: (1) the reaction or satisfaction of learners, (2) the attainment of learning objectives, (3) the on-the-job behavior changes that follow instruction, or (4) organizational results, the overall impact of the instructional program on the organization’s goals or the so-called bottom line. Managers would be most interested in the fourth level of evaluation, the return on investment. The selection of any of these targets could be justified, but the choice is often made out of convenience rather than out of careful consideration of the demands of the situation. There is widespread agreement that the first level, learner reaction, is the one most often tapped, simply because it is the easiest sort of information to gather and it satisfies the trainer’s immediate concern: is my audience happy?

Confirmative Evaluation of Instruction

Confirmative evaluation of instruction is conducted some time after initial implementation of the instruction, perhaps months or years later. The purpose is to determine whether that lesson or program is still enabling trainees to meet the original objectives. The evaluation process may determine that the content has changed since the original development of the material or that the characteristics of the target audience have changed. In either case, the materials would need to be revised.

Formative Assessment of Learners

Formative assessment of learners is conducted to diagnose learning problems and may result in prescribing some sort of enrichment or remediation. It occurs during instruction and uses self-check, progress tests, nongraded quizzes, or instructor observation.

Summative Assessment of Learners

This form of assessment is conducted at the end of instruction to give a certification of competency. It can be viewed as a sort of final exam administered to measure trainee achievement. These assessments can be paper-and-pencil or performance-based, and they can be norm-referenced, learners compared to each other, or criterion-referenced, with learners compared to an objective standard of competence. Outside of formal education settings, criterion-referenced tests are usually the more appropriate choice. Shrock and Coscarelli (2000) argue forcefully that because test scores can affect people’s careers and life paths, it is imperative to follow systematic procedures in developing and administering tests, so that tests can withstand legal challenge. They provide a fourteen-step process for criterion-referenced test development, a process that yields valid and reliable measures of people’s mastery of specific competencies. Another comprehensive guide to preparing effective tests, administering tests, analyzing the results, and reporting and using test results is provided by Westgaard (1999).

Confirmative Assessment of Learners

Sometime after completion of instruction, usually months or years later, learners may be retested to confirm whether they have maintained their competence demonstrated during summative assessment immediately after the instruction.

**CONCLUSION**

In the past, instruction was probably overused as a panacea for virtually any and all problems of human performance in the workplace. Now it is seen as one intervention among an array of performance interventions, to be used when there is a clear indication of an ignorance problem.

Another common misconception is that instruction is somehow improved when it is conveyed through a newer media-delivery system. Computer-based delivery systems can distribute lessons faster and possibly more inexpensively, but they lead to better learning only if they employ better instructional methods.

Inthecorporaterealm,astandardizedapproachtodevelopinginstructionisoften beneficial, streamlining the planning process and ensuring some consistency across different times and locations. Adopting or adapting a particular instructional design and development model is a common means of improving instructional planning, and a systems approach model is most often chosen. A weak link in the use of such models is the design stage. It is a complex task to select and apply powerful instructional methods and strategies to widely varying objectives, diverse learners, and different working situations, with different delivery systems available.

Designers do not have to start from scratch. They can borrow frameworks, such as the behaviorist, cognitive, constructivist, or eclectic frameworks, to help organize a lesson or module. These are robust generic frameworks that have been proven in practice. At the very least, they can turn to a simple template such as Russell’s Objectives Alignment Framework to make sure that at least there is alignment among the lesson’s goals, its activities, and its test; this alone makes a huge difference in the effectiveness of a lesson.

Learners can participate in instruction in a variety of delivery environments, from face-to-face classrooms to on-line tutorials to on-the-job, work-embedded training. There is a trend to move training as close as possible to the work situation, both to save time off the job and to increase the likelihood that the worker will actually use the new knowledge and skills. Distance learning and self-study formats can be vehicles for moving instruction closer to just-in-time. This can be effective as long as everyone remembers that telling isn’t teaching, and that the mere transmission of information to the worker is not equivalent to providing instruction. Neither face-to-face classroom instruction nor distance learning is effective unless learners are actively engaged with the material and have opportunities to practice with feedback.

In the end, it is impossible to determine if the design decisions were the right ones without valid evaluation. Formative evaluation of instruction and assessment of learners allow early detection of flaws before final development and implementation. Summative measures allow managers to determine whether the training hit the mark in terms of benefits over costs. This is how instruction can prove its value.

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S CHAPTER SIXTEEN S

Designing Instructional Strategies

*A Cognitive Perspective*

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A

comprehensive treatment of the cognitive approach to instructional design would go well beyond the scope of a single chapter, of course. This chapter will focus on one of the most critical parts of the design process, the definition of instructional strategies. We apply current cognitive-based research on teaching and learning to formulate instructional strategies for the different knowledge types one typically addresses in training.

**THE COGNITIVE APPROACH TO DESIGNING INSTRUCTIONAL STRATEGIES**

How Learning Occurs from a Cognitive Point of View

There are many theoretical models in cognitive psychology about how learning occurs (Anderson, 1995a, 1995b; Ausubel, 1968; Best, 1989; Hannafin and Hooper, 1993; Klatzky, 1980; Zechmeister and Nyberg, 1982). Though there are differences among them, they generally agree on how learning occurs. According to these models, there are several components of the mind, and each is involved in the learning process in certain ways. The components are perception and sensory stores, short-term memory, and long-term memory.

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**Perception and Sensory Stores**

*Perception is selective.* There is more stimulation in the environment than we are capable of attending to and of encoding or internally translating for storage in memory. Therefore, we only attend to certain things because they are either (1) related to what we already know, or (2) so novel they force us to attend to them.

*Limits of the sensory stores.* Our sensory stores are capable of storing almost complete records of what we attend to, but they hold those records *very briefly.* During that very brief time before the record decays, we do one of two things: (1) we note the relationships among the elements in the record and encode them into more permanent memory, or (2) we lose the record forever.

**Short-Term or Working Memory**

*Rehearsal.* When information is passed from the sensory stores to memory, we mentally rehearse it. Examples include repeating phone numbers several times, or creating associations to names, such as Ted with the red hair, to help memorize them when you first hear them at a party. The former, simply repeating the information over and over, is called *passive rehearsal.* It does not seem to improve memory as well as rehearsing the information in a *deep and meaningful* way, like the latter way of creating associations.

*Limited capacity.* There seems to be a limit on the amount of information we can rehearse at one time. The classic Miller Principle (1956) shows . . . that we can remember seven plus or minus two bits of information at most, and that to remember more we have to “chunk” or group information in manageable sizes. The findings of this study still seem to apply, with some modifications of how you define a “bit,” element, or a “chunk” (Sweller, 1999).

*Format.* At this point, the information is not yet organized and encoded, but there is some evidence that there are separate spaces for storing and rehearsing verbal information and visual and spatial information.

**Long-Term Memory**

In general, theorists believe that long-term memory is organized based on context and experience. That means we encode, store, and retrieve information in the way we have used knowledge in the past and expect to use it again in the future. There are several phenomena psychologists agree on about what strengthens the memory process.

*Memory strength.* Information in memory has a characteristic called *strength,* which increases with practice. There is a *power law of learning* that governs the relationship between the amount of practice and response time or error rates. The formula is *Strength*  *Practice to Power x.*

*Elaboration.* Elaboration means adding information to the information we are trying to learn. It involves tying the new information to existing information, or creating a new knowledge structure that combines the old and new information.

*Chunking.* Memories are stored not as individual bits or as long strings of information, but in “chunks.” Chunking divides large amounts of information into logical groups of about three to seven items. The more complex the information, the smaller the chunks should be.

*Verbal and visual information.* It seems we encode verbal and visual information differently in memory. We use a linear code for verbal information and a spatial code for visual information. We remember visual information very well, especially if we can place a meaningful interpretation on the visuals.

*Associations and hierarchy.* Information is organized in memory, grouped in a set of relationships or structures, for example, hierarchically. Using such a structure makes it easier for us to remember, because there are more related pieces of information activated when we search for information.

By comparison with computers, humans can remember far fewer separate pieces of data, but are much better equipped for pattern recognition skills such as analogical reasoning, inference, and comprehension of visual and verbal languages.

Types of Knowledge

When they discuss learning, cognitive psychologists often draw distinctions between different categories of knowledge. The biggest distinction is between *declarative* knowledge and *procedural* knowledge: declarative knowledge is knowing *that,* and procedural knowledge is knowing *how.* The basic difference between the two types of knowledge is that declarative knowledge tells you *how the world* is, while procedural knowledge tells you *how to do things in the world.*

There are different types of declarative and procedural knowledge. Declarative knowledge includes facts such as names, concepts such as groups or categories, and principles and mental models, or how the world works. Procedural knowledge varies by *degree of structure,* on a continuum from well-structured, such as algorithmic knowledge with fully defined inputs, processes, and outputs, to ill-structured, such as design knowledge with undefined inputs, processes, and outputs.

**THE COGNITIVE INSTRUCTIONAL DESIGN MODEL**

The model for the cognitive approach to instructional design (Foshay, Silber, and Stelnicki, 2003) describes the five learning tasks learners have, according to cognitive psychologists. For each learning task, it describes the two to five lesson elements trainers must put in their lessons to help learners accomplish the learning task. They provide the blueprint for the lesson structure modeled here. The instructional strategies recommended here are based in mainstream cognitive psychology (Anderson, 1995a), sometimes called the cognitive information processing view of learning. While the research on which the model is based is sound regardless of one’s philosophical approach, this model is *not* based in the cognitive inquiry or problem-based learning approaches (Medsker and Holdsworth, 2001) . More complete descriptions are available in Foshay, Silber, and Stelnicki, 2003 . See also Foshay, 1986 and 1991; Foshay and Gibbons, 2001; and Foshay and Kirkley, 1998. Portions of the model are based on Dick and Carey, 2001; Bonner, 1988 ; DiVesta and Rieber, 1987; Gagne, 1985; Gagne, Briggs, and Wager, 1992; Merrill, 1983; Reigeluth, 1999; and Reigeluth and Stein, 1983.

The model is a way to

* Synthesize and summarize the components of a well-designed lesson
* Relate what learners have to do to learn, to what you as a designer have to do to help them to learn
* Present a general framework for instructional design up front, with the notion that each subsequent component will teach how to apply this framework to teaching a certain type of knowledge
* Provide a job aid that you can use as you design training

The Cognitive Instructional Design (ID) Model, shown in Table 16.1, has two columns and five rows. The left-hand column lists the five tasks learners have to do in learning, one in each row:

1. Select the information to attend to
2. Link the new information with existing knowledge
3. Organize the information
4. Assimilate the new knowledge into the existing knowledge
5. Strengthen the new knowledge in memory

The right-hand column lists the seventeen elements of a training lesson that you design to help learners accomplish the five learning tasks. In each row, the table lists and describes briefly the lesson elements that relate to each of the five learning tasks. Eight of the seventeen elements are the same for all categories of knowledge and appear in boldface roman in the table. The other nine elements vary by type of knowledge and appear in boldface italic in the table.

The elements on the right side of the model are purposely *not numbered.* The reason for this is that within any row, you can manipulate the sequence of the elements the situation calls for. To accomplish the learning task, it is crucial that all elements listed in any row be included. However, within a given

**Table 16.1. The Cognitive Instructional Design Model.**

*What Learners Must Do to Learn*

*Elements Trainers Must Use to*

*Help Learners Learn*

1. **Select the information to attend to**

Learners must heighten their attention and focus it on the new knowledge being taught because that new knowledge is seen as important and capable of being learned.

1. **Link the new information with existing knowledge**

Learners should put the new knowledge in an existing framework by recalling existing or old knowledge related to the new knowledge, and linking the new knowledge to the old.

1. **Organize the information**

Learners must organize new knowledge in a way that matches the organization already in mind for related existing knowledge to

* + Make it easier to learn
  + Cut mental processing
  + Minimize confusion
  + Stress only relevant information.

1. **Assimilate the new knowledge into the existing knowledge**

Learners must integrate the new knowledge into the old knowledge so that these combine to produce a new, unified, expanded, and reorganized set of knowledge.

**Attention.** Gain and focus learners’ attention on the new knowledge. **WIIFM.** Tell learners “What’s in It for Me” in the new knowledge. **YCDI.** Tell the learners “You Can Do It” in learning the new knowledge.

***Recall.*** Bring to the forefront the prerequisite existing (old) knowledge that forms the base on which the new knowledge is built.

***Relate.*** Show similarities or differences between the new knowledge and old knowledge, so that the new knowledge is tied to the old.

**Structure of content.** Present the boundaries and structure of the new knowledge, in a format that best represents the way the new knowledge itself is structured. ***Objectives.*** Specify both the desired behavior and the knowledge to be learned. **Chunking.** Organize and limit the amount of new knowledge presented to match human information-processing capacity. **Text layout.** Organize text presentation to help learners organize new knowledge. **Illustrations.** Use well-designed illustrations to assist learners’ organization and assimilation of new knowledge.

***Present new knowledge.*** Using a different approach for each type of knowledge, present the new knowledge in a way that makes it easiest to understand. ***Present examples.*** Demonstrate real-life examples of how the new knowledge works when it is applied.

**Table 16.1. The Cognitive Instructional Design Model. (*Continued*)**

*Elements Trainers Must Use to*

|  |  |
| --- | --- |
| *What Learners Must Do to Learn* | *Help Learners Learn* |
| **5. Strengthen the new knowledge in memory**  Learners should strengthen the new knowledge so that it will be remembered and can be brought to bear in future job and learning situations. | ***Practice.*** Involve learners by having them do something with the new knowledge. ***Feedback.*** Let learners know how well they’ve done in using the new knowledge, what problems they’re having, and why. **Summary.** Present the structure of con- |

tent again, including the entire structure of knowledge.

***Test.*** Have learners use the new knowledge again, this time to prove to themselves, you, and their employer that they have met the objectives of the training. ***On-the-job application.*** Have learners use new knowledge in a structured way on the job to ensure they “use it, not lose it.”

row, it is not crucial that they be done in a particular order. For example, you could begin a lesson with any of these sequences:

* Attention ➝ WIIFM ➝ YCDI
* Attention ➝ YCDI ➝ WIIFM
* YCDI ➝ WIIFM ➝ Attention
* YCDI ➝ Attention ➝ WIIFM
* WIIFM ➝ Attention ➝ YCDI • WIIFM ➝ YCDI ➝ Attention

**USING THE MODEL TO BEGIN ANY LESSON**

For any category of declarative or procedural knowledge lessons, learners must select the information to attend to (Keller, 1987; Keller and Burkman, 1993; Wlodkowski, 1985). The first three lesson elements help them do this. These elements are familiar to most, so a brief summary is provided here:

* *Attention.* Provide appropriate cues and signals to learners to help them focus and retain the stimuli related to the relevant new knowledge.
* *What’s in it for me (WIIFM).* Show learners how the learning is important to them personally, jobwise, or to their careers.
* *You can do it (YCDI).* Instill a sense of confidence in learners that they can learn the lesson content and use it on the job.

**USING THE MODEL TO TEACH FACTS**

Issues

*Facts do not exist in isolation.* They are stored in long-term memory in networks that are based on those relationships, and retrieved through those networks. The networks in which these facts are stored are created, and related to one another, based on the context in which the facts are learned and used. Facts are best retrieved in the same context in which they are learned*.* We learn facts by building onto existing networks of facts*.*

General Strategies for Teaching Facts

*Context.* Present both the learners’ existing knowledge structure and the new facts, and show how the facts and knowledge structure relate in the context of a meaningful use of the facts. Give learners a hint about which existing networks to recall and add onto. Teach and practice facts in a context, preferably the context in which you expect them to be used; in the case of training, this is usually the job setting and tasks.

*Objectives.* When writing objectives for fact-level teaching, use verbs such as *state, define, recite,* or *list.*

*Job aids.* Depending on how the facts are used, consider giving learners a job aid so that they can look up facts as needed, rather than requiring them to memorize large amounts of information.

*Embedding.* If the number of facts to be taught at once is limited to a very few, perhaps just one or two chunks, consider embedding fact teaching within the teaching of other kinds of learning.

Teaching Facts Using the Lesson Elements

*Recall.* Stimulate recall by the learner of all those appropriate knowledge structures that will include the facts to be learned. One function of Ausubel’s “advance organizer” (Ausubel, 1968) is to recall previously learned knowledge on which the new knowledge is based.

*Relate.* Relate the new facts to the knowledge structures you just got the learner to recall. To increase likelihood of recall, use a context that is similar to the one the learner will be in when the facts will be used. Again, a portion of the “advance organizer” emphasizes bridging or linking the new knowledge to the old by emphasizing the similarities and differences between them. Use verbal statements, images, tables, and so on to point out the relationships you want the learner to form. What is important is that the relations be meaningful to the learner within the structure of the task.

*Structure of content.* State how you have structured the facts for easy learning. This helps the learner get prepared to receive the new facts and relate them to appropriate existing networks of facts in memory. This is the place in the lesson at which you present the structure of the facts to the learner. Remember that it is best if the structure is directly related to how the facts will be used. An iconic rather than verbal representation works best.

*Objectives.* State both the desired content and behavior.

**Assimilate**

*Present new knowledge.* Present facts within structures. First, provide cues that signal the structure. These cues need to be distinctive, meaningful, and related to the learner’s existing networks of facts. Where appropriate, use visual images of the facts, maps, diagrams, colors, tables, typography, and even sounds to provide additional cues to the learner about the structure of the facts. Follow these guidelines for what cues to include and the sequence in which to include them:

* *Step 1.* Show the facts.

Use the structure you presented above.

Establish links to what the learners already know.

Reinforce the way the structure will be used.

* *Step 2.* Explain the structure.

Include an explanation of the structure you presented.

If possible, retain the display of the facts during the explanation, to help support encoding and storage, or memorization.

**Strengthen**

*Practice.* In fact learning more than most types of content, practice is crucial. It is crucial to aid the learner both in building the new fact network and in retrieving it at the appropriate time. Follow these guidelines for building in practice:

* Use only questions that present the cues the learner will use “on the job.”
* For wrong-answer feedback, restate the structure rule the learner violated, if possible, as well as the factual association.
* Practice first within the structure you presented, even if it is only a list, and then intermix items from different parts of the structure. At the beginning, keep the total number of facts being practiced at one time to one structure or list of seven or fewer facts, then broaden out until the entire structure of facts is being practiced.

*Feedback.* Let learners know how well they have done in using the new knowledge, what problems they are having, and why.

*Summary.* Present the structure of content again, including the entire structure of facts. But you do not need to list each individual fact.

*Test.* Have learners use the new knowledge again, this time to prove to themselves, you, and their managers that they have met the training objectives.

*On-the-job application.* Have the learners use new knowledge in a structured way on the job to ensure they “use it, not lose it.”

**USING THE MODEL TO TEACH CONCEPTS**

Issues

A concept is a group of things such as objects, events, or abstract ideas that have some features in common. The features a thing *must* have to be part of the concept are named *critical features* or *critical attributes.* Other features may be present, although their form can vary among members of the group. These are called *variable features* or *variable attributes.* A third type of feature that may be present is irrelevant to whether things are in the group or not, so they are called *irrelevant features* or *irrelevant attributes* ( Fleming and Bednar, 1993; Tiemann and Markle, 1983).

Learners store in memory an idealized *prototypical example.* However, learners usually need additional examples to understand a concept.

A change in one or more critical attributes in a concept creates a different but related concept. These are called *coordinate* concepts. In addition, most concepts are part of or *subordinate* to other concepts, and have concepts that are part of or *superordinate* to them. These relationships create knowledge structures.

General Strategies for Teaching Concepts

Teach individual concepts and their knowledge structures, to help the learner create a correct knowledge structure that allows for the correct application of the prototypical example or critical and variable attributes to easily categorize new examples. Teach, relate, and differentiate several related new concepts at the same time, rather than teaching one concept at a time. Discuss a prototypical example of each concept, its critical and variable attributes, and its relationships to other concepts in the knowledge structure. Then give additional examples and nonexamples as needed, including analogies (Stepich and Newby, 1988). Do *not* present a narrative definition, but instead give a bulleted list of attributes of a single concept or an attribute matrix for all the related concepts.

Teaching Concepts Using the Lesson Elements

**Link**

*Recall.* Recall existing concept structures that the learner needs in order to understand the new concept knowledge you are teaching.

*Relate.* Relate the concepts you are teaching to their place in concept structures the learner already knows.

**Organize**

*Structure of content.* The structure of content should show the relationship between five to nine new concepts. If the concept structure is larger than that, show those that are at the high level. Wherever possible, the structure should be iconic rather than semantic.

*Objectives.* The objectives should describe both the behaviors to be learned and the knowledge to be understood.

**Assimilate**

*Present examples and present new knowledge.* Follow these guidelines:

* *Step 1.* Show the concepts, using a sequence that includes prototype examples, followed as needed by definitions and contrasts, and additional examples. Focus on presenting the prototype example. Use abstract diagrams or definitions when needed to highlight key attributes. Otherwise, use realistic video, photos, or illustrations.
* *Step 2.* If learners need more help in understanding the concepts, then you need extensive presentation and practice on the parts of the definition:

Compare and contrast to show the logical relationships between the concepts.

Use a hierarchy or a contrast table to make the comparisons visible and easy to see.

* *Step 3.* Present as many additional examples as needed to assure appropriate generalization, while avoiding errors of misconception, overgeneralization, and under-generalization. Use these principles to select and construct the examples:

Include initial practice by having learners label and classify the examples.

Contrast examples of one concept with those of others you are teaching, or those that the learner already knows.

Keep all examples in view, if possible, or present them in close succession.

*Sequencing*

* Start with *close in* examples that are similar to the prototype example, then include more *far out* ones.
* After presenting some positive examples, mix positive and negative examples.

*Range*

* Use a range of examples that emphasize the variability of positive examples.
* Remember that in a coordinate concept set, any positive example of one concept is a negative example of all the others.
* Be sure to use examples across the whole concept structure at once, not just isolated concepts.

**Strengthen**

*Practice and feedback.* Practice with additional examples. Use these principles to build the practice (Tosti, 1990):

* Begin by having the learner classify or construct additional examples. Use the same practice formats as earlier.
* Examples used in practice must be new to the learner and not used previously.
* Use realistic contexts, preferably including simulations or scenario-based exercises.
* Include context and irrelevant information, so the learner is required to select only the relevant information.
* Include prompts and cues not found in the real world only when essential, or for wrong-answer feedback.
* Let the learners know how well they have done in using the new concept knowledge, what problems they are having, and why.
* In wrong-answer feedback, include an explanation of the attribute missed.

*Summary.* Present the structure of content, showing the critical and variable attributes or the prototypical example.

*Test.* Have learners use the new knowledge again to prove to themselves and upper management that they can perform the training objective*.*

*On-the-job application.* Have learners use the new knowledge in a structured way on the job to ensure they “use it, not lose it.”

**USING THE MODEL TO TEACH PRINCIPLES AND MENTAL MODELS**

Learners construct mental models by synthesizing their knowledge of facts, concept, and principles into a model, often hierarchical, with causal relationships. Mental models are constructed for a particular purpose, and are very context bound. For example, mental models of trees and how they function will differ if you create them based on being a forester, an ecologist, a tree surgeon, or a tree worshipper. Solving problems involves constructing, modifying, or otherwise manipulating a mental model of the problem.

General Strategies for Teaching Principles and Mental Models

Relate principles to one another and to existing knowledge in mental models. Help learners learn or create mental models that are related to the context in which they will be using the knowledge, and synthesize their declarative knowledge well enough to use it as the basis for problem solving.

How to Teach Principles and Mental Models

Using the Lesson Elements

**Link**

*Recall.* Recall existing declarative knowledge structures such as facts, concepts, principles, and mental models that the learner needs to understand the new principles and mental model knowledge you are teaching.

*Relate.* Relate the principles and mental model you are teaching to existing knowledge structures such as facts, concepts, principles, and mental models the learner already has and the context in which the new mental model will be used.

**Organize**

*Structure of content.* The structure of content should show the complete new mental model, including context, principles, and structure, and should incorporate existing mental models, concept structures, and facts.

*Objectives.* The objectives should require the learner to use the principles in some way. Most common is to have the learner *predict* what will happen next when observing or manipulating an object or scenario, or explain why something happened or why a particular decision is, or is not, justified. In response to a Why? question, the correct answer is often close to a statement of the relevant principle. Note that the event being observed or manipulated can be real or in a game or simulation, and it can be a normal or abnormal function.

**Assimilate**

*Present examples and new knowledge.* Follow these guidelines:

* *Step 1.* Show the principles in action, using prototypical examples in the form of stories both about how the principle works when it works and how it works when it does not work. People usually remember the prototype, idealized or first example, not the principle or mental model in verbal form. Make stories credible, vivid, and straightforward enough to highlight key principles. Tell the stories verbally with testimonials, or with realistic video, photos, or illustrations.
* *Step 2.* State the principles involved in the mental model and the mental model itself:

Present the context for the principles and the mental model.

Present the principles as “if . . . then . . .” statements or “because . . .” reasons.

Display all principles in the mental model simultaneously to facilitate comparison and contrast, or to show how the principles fit together in the mental model.

Show how the principles integrate with existing mental models, concept structures, and fact structures to create the new mental model.

Show what the mental model looks like, with some kind of diagram.

Be sure you are representing the system at the level of detail on which the learner will be operating. For example, do not show a full schematic diagram if a block diagram of the system shows what the learner will be manipulating. You should have determined the correct level of detail in your task or content analysis.

* *Step 3.* Present as many additional examples as needed to ensure that all applications of the mental principles and mental model in the desired context are exemplified.

**Strengthen**

*Practice.* Ask questions that require application of the principles to new situations. For example, you can ask the learner to

* Predict how the system will respond to something the learner does or observes.
* Explain by stating the reason why the system behaved as it did.
* Generate or select another example of the system’s behavior.

*Feedback.* Let the learners know how well they have done in using the new knowledge, what problems they are having, and why.

*Summary.* Present the structure of content, showing the complete new mental model, including context, principles, and structure and incorporating existing mental models, concept structures, and facts.

*Test.* Have the learners use the new knowledge again to prove to themselves, the trainer, and the employer that they can perform the training objective.

*On-the-job application.* Have the learners use new knowledge in a structured way on the job to ensure they “use it, not lose it.”

**USING THE MODEL TO TEACH PROCEDURES OR WELL-STRUCTURED PROBLEM SOLVING**

Only use this instructional strategy if the well-structured problem solving you are teaching is not likely to go out of date, is not like many other procedures you are teaching, and must be recalled from memory because it is too time critical, complex, or critical to be simply looked up.

General Strategies for Teaching Procedures and Well-Structured Problem Solving

Be sure to identify both the declarative and procedural knowledge components of skills. Give each appropriate instructional emphasis and make the relationships clear. When you teach the well-structured procedural components, first introduce the real problem-solving context for the procedure, then either alternate between teaching declarative and procedural knowledge, or integrate the two. Use direct or deductive teaching strategies for declarative knowledge and well-structured problem solving. When teaching wellstructured problem solving, allow learners to retrieve the procedure if appropriate, for example, from a reference card. If the procedure is frequently used, encourage memorization of the procedure and practice until it is automatic. Within a problem exercise, help the learners understand or define the goal, then help them to break it down into intermediate goals. Use the errors learners make in problem solving as evidence of misconceptions, not just carelessness or random guessing, and, if possible, determine the probable misconception and provide feedback to correct it. If transfer is a goal, use multiple contexts for each procedure, and ask questions that encourage the learner to grasp the generalizable part of the skill across many similar problems in different contexts. Plan a series of lessons that grow in sophistication from novice-level to expert-level understanding of the knowledge structures used. If speed of performance or cognitive load is an issue due to problem complexity, stress, fatigue, and so on, add extensive practice to build automaticity, or automatic performance. Always include practice situations that allow the learner to choose the procedure from among other alternatives or to recognize that it is needed. The requirement for contextualized learning means that procedures always require a simulation or some kind of onthe-job-training or apprenticeship. As with any kind of learning, the amount of practice depends entirely on the criterion. Additional issues are discussed in Jonassen (1997, 2000), Mayer (1993), and Newell and Simon (1972).

The sequence of instruction described here is not the only one that has been shown to be effective. For example, backward chaining works. Discovery-based or inductive strategies also may be acceptable if certain conditions are met.

Teaching Procedures or Well-Structured Problem

Solving Using the Lesson Elements

**Link**

*Recall.* Recall concepts, principles, and mental models needed to represent the procedure.

*Relate.* Relate the concepts, principles, or mental models to the purpose of the procedure.

**Organize**

*Structure of content.* Name and number the steps in the procedure and highlight any branches.

*Objectives.* Objectives should describe both the behaviors to be performed and knowledge to be learned. Inform trainees of the objective at an appropriate time during the presentation.

**Assimilate**

*Present new knowledge and examples.* Follow these guidelines:

* Show a worked-out example that is a prototype example as an application of the procedure.
* Include an explanation of each step in the procedure at the level of detail appropriate to what the learner already knows.
* Introduce, then show, the individual steps, each with its own explanation.
* Point out the cue that signals the beginning of the step, the action, and the feedback that shows the step has been correctly completed.
* Relate the steps to facts and concepts as the steps use them. Teach the concepts and facts as they occur if the learner does not know them.

**Strengthen**

*Practice.* Practice using additional examples. Present a new problem scenario and ask the learner to select or recall the procedure from among alternatives. Broaden the practice to include content and irrelevant information so the learner is required to select only the relevant information.

*Feedback.* Let the learners know how well they have done in using the new knowledge, what problems they are having, and why.

*Summary.* Restate the structure of content, such as the entire procedure.

*Test.* Have the learners use the new knowledge again, this time to prove to themselves, the trainer, and the employer that they have met the performance objectives of the training.

*On-the job application.* Have learners use new knowledge in a structured way on the job to ensure they “use it, not lose it.”

**USING THE MODEL TO TEACH ILL-STRUCTURED PROBLEM SOLVING**

Issues

The following issues are key in teaching problem solving (Clark, 1998).

*Problem space definition.* When learners are presented with a problem, the first thing they must do is represent it in their minds. They must create a mental representation of the initial state, goal state, constraints, and so on of the problem. After recognizing there is a problem in the first place, learners now try to figure out what kind of problem this is. What they create is called a *problem space.*

The most difficult part of the task of ill-structured problem solving, and one that contrasts greatly with well-structured problem solving, is this defining of the problem space. Unlike with well-structured problem solving, the learner cannot just try to match the new problem with problems encountered in the past and use that match to define the problem space. The problem, by definition, is difficult, if not impossible, to classify. It is defined by the context or situation that presents it, and not by a specific set of declarative and procedural knowledge that one has learned. Therefore the problem space must contain information about many possible initial states, goal states, operations, and constraints of the problem. It also must contain a great deal of declarative and procedural knowledge that might be related to the problem.

*Check the results—reflect.* In ill-structured problem-solving, since the solution is almost always one of many possible solutions, it is important for the learners to be able to justify why they came to the solution they did. This involves both checking the results of implementing the solution, to see if it solved the problem, and, more important, reflecting on the process of getting to the solution.

This reflection activity is uniquely important to ill-structured problem solving. Reflection on the process becomes part of the mental model that is stored along with the problem and its solution. And it is the reflection on the process that aids both in more effective problem solving the next time and in generalization of the process to new and related problems.

*Errors in learning ill-structured problem solving.* The problems people have in learning to do problem solving include

* Defining the problem space too narrowly, or incorrectly.
* Assuming the problem is like another they have already solved when it is not.
* Not seeing that a problem is in fact like one they have already solved.
* Defining the problem in terms of the solution.
* Searching for an algorithm that will provide a simple solution to the problem when only heuristics will work.

General Strategies for Teaching Ill-Structured Problem Solving

Emphasize ill-structured problem solving when delayed transfer is a goal of instruction. For ill-structured problem solving, the main training tasks are (1) problem-space definition, (2) generating the heuristics to solve the problem, and (3) reflection over the problem-solving process (Silber and Stelnicki, 1993). Most of the strategies for well-structured problem solving apply, with the exceptions and additions listed here.

Use inductive teaching strategies to encourage synthesis of mental models for ill-structured problem solving. Within a problem exercise, help the learners understand or define the goal, then help them to break it down into intermediate goals. Plan a series of lessons that grow in sophistication from novice-level to expert-level understanding of the knowledge structures used. Encourage the learners to use their declarative—that is, context—knowledge to define the goal or properties of an acceptable solution and then invent a solution. Allow many right strategies and solutions, and compare them for efficiency and effectiveness. Ask questions and make suggestions about strategy to encourage learners to reflect on the problem-solving strategies they use. Do this either before or after the learner takes action. This is sometimes called cognitive coaching. Note that *minimalist* or discovery-based strategies may be acceptable under some circumstances.

In designing simulations, games, and exploratory environments, begin by modeling the process of building a strategy, using the cognitive coaching techniques previously discussed, then change the problem and let the learner invent a strategy. Then change the whole problem space and let the learner invent a similar strategy.

Teaching Ill-Structured Problem Solving Using the Lesson Elements

**Link**

*Recall.* Recall related declarative knowledge that is part of the mental model and procedures that are analogous to the one you are teaching in whole or in part.

*Relate.* Relate the current procedure to what the learner already knows about the mental model and the analogical procedures.

**Organize**

*Structure of content.* Show the mental model for a heuristic or a class of abstract problems. Develop an abstract diagram or other representation of how the components in the problem space interact. Present *worked examples* of typical problems, and then articulate the strategy steps used to solve the problems. Worked examples can take many forms, including “think-alouds” and step-bystep solutions. Note features of the problem that are unique to that problem, as opposed to those that are typical of a class of problems. Not all of the typical features or exceptions need be covered in these initial worked examples as long as they are covered elsewhere in the activity. Be sure that the cognitive processes such as cues and decisions are made clear in the example as well as in the performance.

*Objectives.* Tell the learner that the purpose of the lesson is to understand a particular general procedure for solving a particular broad class of problems that you name.

**Assimilate**

*Present new knowledge and examples.* Follow these steps:

* *Step 1.* State the class of problems to which the heuristic applies.
* *Step 2.* Show the heuristics.
* *Step 3.* Show the steps or general approach of each heuristic.
* *Step 4.* Explain that the heuristic is a guide the learner can use to generate a specific solution or procedures for a problem.
* *Step 5.* Teach the underlying principles, or stimulate recall on them.
* *Step 6.* Since problem representation is a major part of problem solving, the heuristic may have two major subparts, or two heuristics: one for representing the problem and one for solving the equation. Both heuristics need to be taught and practiced.
* *Step 7.* Show a specific example of application of the problem, such as a worked example, emphasizing the key decisions and information used in the step-by-step application of the procedure.

**Strengthen**

*Practice.* Practice using a range of similar problems. Use scenario-based simulations and games, on-the-job mentoring, or on-the-job training. Use these principles:

* If necessary, provide part-task practice of relevant algorithmic methods, such as facts, concepts, principles, and rote procedures. Part-task practice can be wrapped into the scaffolding of the whole skill practice described in the next step.
* Provide scaffolded practice. Scaffolded problems can take several different forms. One way is to ask the learner to provide part of a

solution and ask the learner to do the rest, such as by interrupting a think-aloud or completion problem, in which we present a partial worked solution and ask the learners to complete it. Also possible are interactions in which the sensitivity of feedback triggers is modulated, so that in early problems, feedback would be available at every step, and in later problems feedback would only be available for the final output.

* Provide significant support to the learner on initial problems, slowly withdrawing that support until the learner is doing the whole task independently.
* As you scaffold, do *not* distort the basic logical structure of the strategy. Each practice should be a complete beginning-to-end use of the strategy. Make the problem easier by providing direction, eliminating irrelevant detail, avoiding branches for special cases or extra steps, and avoiding or clarifying points of confusion.
* Provide a range of problems, including prototypical problems, problems that require unusual uses of the heuristic, and problems in which the heuristic is an inappropriate choice, or nonexamples.
* Provide a range of contexts.
* Do not increase problem difficulty while decreasing support. Modulate both difficulty and support, but only one at a time.
* Be sure to include features that expose anticipated learner misconceptions.

*Feedback.* As you engage in dialogue with the learner about how he or she has defined each of the basic problem characteristics, ask the learner to explain why he or she made the decision, and what knowledge he or she used to make the decision.

* Listen to the explanations for errors that reveal flaws, such as gaps or misconceptions in the learner’s mental model of the problem space. When you find one, point it out to the learner.
* Look at the sequence of steps the learner is going through, and check it against the heuristics identified in the cognitive task analysis. When the learner skips a step, does a step out of order, or does a wrong or unnecessary step, first ask the learner to reflect on the strategy in use, that is, “Are you sure you want to do that now?” If that does not cause the learner to correct the error, state the missing heuristic to the learner, that is, “You do not have enough information to do that yet. Remember that <heuristic>.” If that does not work, then model

the solution and include a “think-aloud” explanation of why the solution is as it is, that is, “Here is how I think about problems like this. . . .”

*Summary.* The structure of content is the fully generated heuristic for problem solution. If possible, the learner should generate it.

*Test.* Problem solving has to be tested with a performance-based strategy: the only way to find out if a learner can solve problems is to have the learner solve problems of realistic complexity and in realistic contexts, without extra scaffolding. You can do this with well-designed simulations, handson exercises, role plays, and projects. Consequently, paper-and-pencil testing formats usually favor open-ended—that is, divergent or essay—questions that are scenario-based. In many content areas, however, paper-and-pencil formats are too limited to capture the context and complexity of the desired performance. In these cases, on-line simulations and various kinds of live group exercises, role plays, and projects are needed depending on the content area.

*On-the-job application.* In the first few weeks following training, make sure the learner encounters a wide range of tasks that are of typical difficulty and that are representative of the objective. It is helpful to have the learner do some tasks and review, critique, and troubleshoot similar tasks done by others.

**TEACHING LESSONS COMBINING DIFFERENT TYPES OF LEARNING**

It is rare for instructional designers to actually design and create separate lessons for each type of knowledge; this approach is too fragmented and takes too much lesson time. It is also rare for them to combine the lessons for all given types of knowledge into one lesson; this approach creates context, but moving back and forth among the different elements within the lesson becomes confusing to the learner.

The approach the authors recommend is to combine individual lessons into two lessons: one combining all the relevant declarative knowledge and a second combining the procedural knowledge. This approach provides context without overloading the learner.

A sample set of lessons that show how the events are combined when lessons contain multiple types of learning is shown in Table 16.2, for declarative knowledge, and Table 16.3, for procedural knowledge.

**Table 16.2. Combined Declarative Knowledge Lesson.**

*Sample Lesson Element Description*

**Lesson Overview and Mental Model Presentation**

1. **Select**

*Attention.* The attention component should explain that you are teaching concepts and principles that you need to solve the problem just presented in the scenario.

*WIIFM.* Establish the context in which the problem is solved. This should be the framework for all explanations, examples, and practice throughout the lesson.

*YCDI.* Build the learners’ confidence that this is a skill they can learn by showing them how they have already done similar things.

1. **Link**

*Recall.* Recall related declarative knowledge that is part of the mental model, and concepts that the learner already knows and that are analogous to the one you are teaching, in whole or in part.

*Relate.* Relate the mental model to what the learner already knows, often by use of an analogy.

*Attention.* After the title screen, begin the lesson with a video clip of people in a confusing store meeting; then show them emerging from the meeting and complaining about it. Ask, “Has this ever happened to you?”

* + If yes, go on.
  + If no, state “You’ve been lucky so far. It will.”
  + Continue: “Good meetings begin with a plan. That’s what we’ll concentrate on in this lesson.”

*WIIFM.* “Actually, <characters in meeting video> don’t have to suffer through meetings like this. By understanding the elements of good meetings, you’ll be able to ensure that this bad experience doesn’t happen to your groups. Your store meetings can be a valuable way to make things work better, and to beat the competition.”

*YCDI.* “Planning meetings well isn’t much harder than planning them badly, it’s just a matter of knowing what to do. It’s a skill any successful professional develops, and you can, too.”

*Recall.* “You probably already know many of the concepts involved in planning from other contexts:

< Show visual [hierarchy or actual graphic ] which is first approximation of the structure of content. Have learner click on each element for a label.>

* Agenda
* Decision making
* Record keeping
* < And other components the learners already know>.”

*Relate.* “Planning a meeting is like planning a party, a card game, or a home-improvement project.

**3 . Organize**

*Structure of Content.* This should show the mental model, including concepts, principles, and skills.

Develop an abstract diagram or other representation of how the components in the problem space interact, present *examples* of typical concepts and principles, or both.

Click on the drawings below <of planning a party, and so on> to see what they have in common. In each of these examples, you see that planning involves

* Why you’re doing it
* What you’d like the goal to be
* Who’s going to be involved
* The time, place, and expense
* The steps to follow from beginning to end.”

*Structure of Content.*

< Show complete visual diagram of the parts of a successful meeting, with arrows that show how they interact. Pop on each meeting plan part and arrow as you name it, until the whole model is built.>

*Alternative Using Example*

|  |
| --- |
| your cursor over the arrows, and you’ll see what to call the ways the parts interact.”   * < Show example store meeting plan parts with arrows that show how they interact. When the learner rolls the mouse pointer over each part or arrow, its name pops up.> * “When all names have been displayed, activate the ‘go on’ icon.” **Principle Lesson 1**   **1 . Select** |

* “Here’s an example of a plan for a successful meeting. Roll your cursor over each part, and you’ll see that part’s name. Roll

*Attention.* Transition to first principle (*WIIFM* and *YCDI* are redundant and are omitted).

*Attention.* “Take a look at the first arrow in the diagram. It stands for the first rule for successful meetings <the rule of meeting purpose>. Click on it to see how it works.”

(*Continued*)

1. **Link**

*Recall* and *relate.* This is a great time for an analogy—transition to first principle (*WIIFM* and *YCDI* are redundant and are omitted).

1. **Organize**

*Structure of Content.* Show how the principle fits in the mental model.

*Recall* and *Relate.* < Show video of basketball team in huddle.>

“When you’re playing basketball, the first thing you have to know is how points are awarded. Having a clear meeting purpose is like knowing how you’ll score points.”

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| “When you have a clear purpose, it’s possible to develop all these parts of the plan: agenda, participants, logistics. . . .”  **Concept Lesson 1**  **1 . Select** |

*Structure of Content* < Show mental model, with first arrow (purpose) highlighted, and pop on the plan parts it connects to.>

*Attention.* Transition to first concept structure (*WIIFM* and *YCDI* are redundant).

1. **Link**

*Recall* and *relate.* Another great place for an analogy.

1. **Organize**

*Structure of Content*. Show the concept structure.

*Attention.* “Let’s see what the different purposes of meetings are and what they mean.”

*Recall* and *relate.* < Show posterized still photo of basketball video.>

“Meetings are like discussions you have with your teammates in a basketball game. Sometimes you’re just talking about how the game is going. Sometimes you need to decide what play to use . . . and so on. Just as different conversations have different purposes, so do meetings.”

*Structure of Content*

< Bring up diagram next to basketball photo. >

Diagram of meeting purposes should include these components, indicating the arrangement from simple to complex, and with information flow coming in, going around within, and coming out of each.

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| < Pop on components individually :>   * Information sharing * Discussion * Project review * Operations review * Decision making * Problem solving   *Objective Objective.* “At the end of this lesson, you’ll know  the differences between meetings with these six different purposes—you’ll be able to define them and pick out examples of each.”  **Fact and Concept Lesson 1**  ( Remember that only “Present Definitions” is needed when teaching facts. Examples are needed for teaching concepts.) |

**4 . Assimilate**

*Present Explanations* (for facts).

*Step 1. Show the facts.* Use the structure you presented earlier.

*Step 2. Explain the structure.* Include an explanation of the structure you presented.

*Present Definitions: Learner Chooses Sequence.*

< Delete basketball visual. Add one meeting icon for each meeting purpose.> “Click on each meeting purpose icon to see its definition.”

*Information sharing.* Objective or content is to disperse news, intelligence, policy, and so on, to appropriate participants.

*Discussion.* Objective is to share various points of view about an issue.

*Project review.* Objective is to examine or reexamine proposed current projects as to soundness, management, progress, and success.

*Operations review.* Objective is to systematically examine the soundness, management, progress, and success of business procedures and processes.

*Decision making.* Objective is to choose among several options to proceed with an action.

*Problem solving.* Objective is to consider a question or statement or situation proposed for solution and achieve a resolution to it.

(*Continued*)

**5 . Strengthen**

*Practice.* For fact, learners define. For concept, they select or classify.

*Feedback.* For each incorrect answer, provide an explanation that corrects the probable misconception that caused the learner to select that choice. For each correct choice, tell the learner the choice is correct. Then move on to the next example and question.

*Summary.* Place the concept structure back into the mental model.

*Test.* This is a great time for progressively more far-out positive examples and close-in negatives.

*Practice (facts).* First, define each of these meeting types:

* Information sharing
* Discussion
* Project review
* Operations review
* Decision making
* Problem solving

*Practice (concepts).* “Here are some more meetings. See if you can correctly identify the purpose of each one.”

<Show eight video clips of meetings, each followed by the question, “What meeting purpose did the example show?”>

*Feedback.* < Give an example of incorrect answer feedback.> “This is not an example of decision-making, because the participants are sharing information, but they are not trying to reach consensus.”

*Summary.* < Show the full mental model, with the concepts just taught highlighted.> “So now you can see all the types of meeting purposes and how they relate to the rest of the meeting plan.”

*Test*

<**Fact test**>

“Define the six types of meetings.”

<**Concept test**>

“Here are some more meetings. See if you can correctly identify the purpose of each one.”

< Show video clips of meetings, followed by question asking “What meeting purpose did the example show?”>

*Transition.* Back to the principle

<**Score test**>

*Transition.* “Now let’s see how the meeting pur-

1. **Assimilate**

*Present Principle.* Using the concepts just taught, *present*  *examples* of operation.

1. **Strengthen**

*Practice.* Predict or explain; this is a great time for simulation.

*Feedback.* Give diagnostic feedback as in concept lessons.

*Summary.* Place principle and related concepts back into the mental model.

poses drive the rest of the parts of the meeting plan.”

**Principle Lesson 1**

< Continue with full mental model graphic, but change highlighting to include principle arrow.>

*Principle.* “If a clear-cut meeting purpose is specified, then you can clearly specify the meeting plan’s participants, logistics, and agenda.”

*Example.* “Here’s Ginny.” <Show video still.> “Let’s see how she decides on the participants, logistics, and agenda for her meeting.”

<In audio, play narrative in which Ginny introduces herself and explains her meeting’s need, how she decided on a purpose, and how she used the purpose to decide on the participants, logistics, and agenda. Pop on handwritten notes listing participants and agenda items as she talks.>

*Practice.* “Here’s George planning another meeting in the same company.” <Show example.> < Ask these questions >:

* How do you think he decided on his agenda, logistics, and participants?
* Did he do it right?
* If not, why not?
* How do you think the meeting will go?

*Feedback.* Be sure the system provides diagnostic feedback for wrong answers!

< Repeat with as many examples as the learner needs to correctly explain and predict.>

*Summary.* < Show the mental model diagram, with concepts and related principle highlighted.>

“So now you can see how a clear meeting purpose really drives the rest of the meeting plan.”

(*Continued*)

*Test.* Same as “Practice.”

*Transition.* To the second principle.

*Test.* Provide scenario-based examples for which the learner needs to correctly explain and judge the purpose (in the agenda) and predict the outcome.

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| have the right participants.”  **Principle Lesson 2**   |  |  | | --- | --- | | **1 . Select** |  | | *Attention.* Make the transition to first principle (*WIIFM* and *YCDI* are redundant).   1. **Link**   *Recall* and *Relate.* This is a great time for an analogy.   1. **Organize**   *Structure of Content.* Show how the principle fits in the mental model. | *Attention.* “Take a look at the second arrow in the diagram. It stands for the second rule for successful meetings <the rule of correct attendees>. Click on it to see how it works.”  *Recall* and *Relate.* < Show video of football team in huddle.>  “When you are playing football, the second thing you have to know is what types of players you need to put on the field at any given time. Knowing which participants need to be at a meeting to accomplish a purpose is like having a clear idea of the football team composition.”  *Structure of Content.* < Show the mental model, with the second arrow (purpose) highlighted, and pop on the plan parts it connects to.> |   “When you have the right participants, it is possible to accomplish the purpose of the meeting.”  **Concept Lesson 2**  **1 . Select** |

*Transition.* “Now let’s take a look at the second principle of meeting planning: ensuring that you

*Attention.* Make the transition to the first concept structure (*WIIFM* and *YCDI* are redundant). **2 . Link**

*Recall and Relate.* This is another great place for an analogy.

*Attention.* “Let’s see what the different types of meeting participants are and what they can do.”

*Recall* and *Relate.* < Show posterized still photo of football team on field.>

|  |
| --- |
| “Participants are just like players at different positions in a football game. Some play offense, some defense, one is the main play caller, some perform special functions. Just as teams have different types of players, so do meetings.”  **3 . Organize**  *Structure of Content.* Show the *Structure of Content*  concept structure. < Bring up diagram next to football photo. >  < The diagram of meeting participants should include these participants, indicating the arrangement from least to most influential, and with information flow coming in, going around within, and coming out of each.>  < Pop on participants individually :>   * Subject-matter experts * Stakeholders * Decision makers * Decision influencers * Appropriate participants * Facilitator * Chairperson   *Objective Objective.* “At the end of this lesson, you’ll know the differences between these types of meeting participants. You will be able to define them and pick out examples of each.”  **Fact Lesson 2**  ( Only “Present Definitions” is needed ) |

**4 . Assimilate**

*Present Definitions.*

*Step 1. Show the facts.* Use the structure you presented earlier.

*Step 2. Explain the structure.* Include an explanation of the structure you presented.

*Present Definitions: Learner chooses sequence.*

< Delete football visual. Add one participant icon for each meeting participant.> “Click on each meeting participant icon to see its definition.”

*Subject-matter experts.* Individuals with highly specialized skills or knowledge in specific fields or subjects.

(*Continued*)

**4 . Assimilate**

*Present Definitions.*

*Present Examples.*

Note that in this medium, sequence of definitions (fact lesson above) and examples (concept lesson here) can be learner controlled unless you deem a particular sequence to be critical to understanding.

*Stakeholders.* Individuals who have a vested interest in meeting decisions, outcomes, or actions.

*Decision makers.* Those empowered with making judgments, reaching conclusions, and having the institutional authority to make decisions that stand as final.

*Decision influencers.* Those who directly or indirectly may shape decisions by reason of their expertise, vested interest, or other factors.

*Appropriate participants.* Subject-matter experts, stakeholders, decision makers, and influencers; that is, all those needed to achieve a meeting’s objective(s).

*Facilitator.* Individual who specializes in running groups gathered for specific purposes. In most cases this individual participates only indirectly in a meeting’s business by moving things along.

*Chairperson.* Individual who runs the meeting and participates in discussion and decisions.

*Present Examples: Learner chooses sequence.*

< Meeting participant icons are still on screen. > “Click on each meeting participant icon to see an example of that person in a meeting.” <Each example is a video clip.>

* Subject-matter experts
* Stakeholders
* Decision makers
* Decision influencers
* Appropriate participants
* Facilitator
* Chairperson

**5 . Strengthen**

*Practice.* For fact, learners define. For concept, they select or classify.

*Feedback.* For each incorrect answer, provide an explanation that corrects the probable misconception that caused the learner to select that choice. For each correct choice, tell the learner the choice is correct. Then move on to the next example and question.

*Summary.* Place the concept structure back into the mental model.

*Test.* This is a great time for progressively more far-out positive examples and close-in negatives.

*Practice (facts).* First, define each of these meeting types:

* Subject-matter experts
* Stakeholders
* Decision makers
* Decision influencers
* Appropriate participants
* Facilitator
* Chairperson

*Practice (concepts).* “Here are some more participants in the meeting. See if you can correctly identify who each one is.”

< Show eight video clips of a meeting, each followed by the question, “What type of participant is (participant name)?”>

*Feedback.* < Example of incorrect answer feedback> “Perhaps you thought Joe is the chairperson because he spoke the most. But a chairperson doesn’t necessarily have the most to say; it’s *what* the chairperson says that defines this role. Try again.”

*Summary.* < Show the full mental model, with the concepts just taught highlighted.>

“So now you can see all the types of meeting participants and how they relate to the rest of the meeting plan.”

*Test.* “Define the seven types of participants.”

(**Fact test**)

“Here are some more meetings. See if you can correctly identify the roles of the people in the meeting.” (**Concept test**)

< Show video clips of meetings, followed by the question, “What type of meeting participant did the example show?”

(*Continued*)

|  |
| --- |
| *Transition.* Back to the principle. <**Score test**> |

1. **Assimilate**

*Present Principle.* Using the concepts just taught, *present*  *examples* of operation.

1. **Strengthen**

*Practice.* Predict or explain; this is a great time for simulation.

*Feedback.* Provide diagnostic feedback as in concept lessons.

*Transition.* “Now let’s see how the meeting participants influence the rest of the parts of the meeting plan.”

**Principle Lesson 2**

<Continue with the full mental model, but change highlighting to include the principle arrow.>

*Principle.* “You must have meeting participants from all categories in a meeting for it to be successful; if any are missing, the meeting is likely to fail.”

*Example.* “Here’s Ginny.” <Show video still.> “Let’s see how she decides on the participants to invite to her meeting.”

<In audio, play narrative in which Ginny introduces herself and explains her meeting’s purpose and how she decided on which participants in the organization to invite and why. Pop on handwritten notes listing participants as she talks.>

*Practice.* “Here’s George planning another meeting in the same store.” <Show example.> < Ask these questions >:

* How do you think he decided on his participants?
* Did he do it right?
* If not, why not?
* How do you think the meeting will go?

*Feedback.* Be sure the system provides diagnostic feedback for wrong answers! Sample feedback message: “George only invited four people to his meeting, so you may think that he couldn’t possibly have people in each role. But remember that one person can fill more than one role. Try again.” < Repeat with as many examples as the learner needs to correctly explain and predict.> *Summary.* Place the principle and related concepts back into the mental model.

*Test.* Same as practice.

*Transition.* To the second principle.

*Summary.* < Show the mental model diagram, with concepts and related principle highlighted.>

“So now you can see how having the right meeting participants is necessary for a meeting’s success.”

*Test: Practice.* “Here’s George planning next month’s meeting for his store.” <Show example.> < Ask these questions >:

* How do you think he decided on his participants?
* Did he do it right?
* If not, why not?
* How do you think the meeting will go?

*Transition.* “Now let’s take a look at the third principle of meeting planning, ensuring that you have the agenda items.” (Note: This and the rest of the principle lessons, and their subordinate concept and fact lessons, will *not* be illustrated here since the pattern repeats.)

**Mental Model Testing and Lesson Summary**

**5 . Strengthen**

|  |  |
| --- | --- |
| *Practice* and *Test.* Practice the concepts and principles taught so far and provide feedback. Activities should include classification or generation of examples, and prediction and explanation of system behavior (a good way is to ask questions such as, “Why do you have to do this?” or “What would you have to do if . . . ?”).  *Summary.* Refer back to the mental model. | *Practice.* “Here’s Dani planning another meeting for her store.” <Show example of Dani planning a meeting employing all the principles and concepts (purpose, participants, agenda, and so on).> < Ask these questions >:   * How do you think she decided all the meeting elements? * Did she do each element right? * Did the whole set of elements fit together correctly? * If not, why not? * How do you think the meeting will go? Why?   *Summary.* < Show complete visual diagram of the parts of a successful meeting, with arrows |

that indicate how they interact. Pop on each meeting plan part and arrow as you name it, until the whole model is built.>

**Table 16.3. Combined Procedural Knowledge Lesson.**

1. **Select**

*Attention*. The attention component should explain that you are teaching a specific procedure for solving a type of problem, even if some of the problems are new.

*WIIFM.* Review the context in which the problem is solved. *YCDI.* Build their confidence.

1. **Link**

*Recall* and *Relate.* Recall related declarative knowledge that is part of the mental model used in the procedure and the analogous procedure(s).

1. **Organize**

*Structure of Content.* Show the structure of the procedure.

*Sample Lesson Element Description*

< Well-structured procedure for planning a routine meeting.>

*Attention.* “Now let’s put it all together, and start planning some meetings! There are lots of variations, but here’s a simple way you can use to plan a meeting.”

*WIIFM.* “There’s a temptation to ‘pooh-pooh’ this procedure or to shortcut some of the steps. Even the pro’s follow this procedure; as you will learn, it ensures meeting success!”

*YCDI.* “It’s a simple procedure—a lot like the ones you probably use already for planning other kinds of events, from group outings and carpools to vacations to household projects.”

*Recall and Relate.* “Planning a meeting is just like the way you would plan a dinner party.” < Show stills of steps of planning a party.> “First you have to decide why you want to have it, then you decide whom to invite, then you decide when to have it, then what food to serve, and so on. In planning a meeting you have to do essentially the same steps.”

<Party steps dissolve to meeting steps automatically or as mouse goes over steps.>

“You have already learned what to call these steps and the principles involved in doing them.”

< Show the mental model of meeting elements from the “Declarative Knowledge” lesson.>

*Structure of Content.* “Now let’s see how you do the steps, in order to figure out how to plan your meeting.”

< Show procedure diagram >:

1. Clarify the meeting’s purpose(s).
2. Choose appropriate participants.
3. Establish the date, time, and length of meeting.
4. Arrange for room set up and equipment.

*State the Objective.*

**4 . Assimilate**

* Present examples and knowledge.
* Show a worked-out example. Include an explanation of each step. Introduce and then show the individual steps, each with its own explanation. Point out the cue that signals the beginning of the step, the action, and the feedback that shows the step has been correctly completed.
* Relate the steps to facts and concepts as the steps use them.

1. Create the agenda. It must include all the information from steps 1 through 4 and any additional meeting activities.
2. Send the agenda to all concerned.
3. Appoint the person responsible for taking minutes and the person responsible for providing a permanent official record of the meeting.

*Objective.* “You’ll be able to plan meetings just like Ginny does.”

*Model It.* “Let’s rejoin Ginny as she plans her meeting, and we’ll see how she uses these seven steps to plan her meeting. Click on each step to see what she does.”

< Clicking on each of the steps plays a video clip with Ginny explaining her thought process as she performs the step. Handwritten notes appear that show the output of each step.>

“Now let’s look at each step in detail. Click on each step to learn how to do it.”

< Show each step. Explain how to do it, and show another positive example.>

< Each of the steps is accompanied by a second positive example that shows how Ginny applies the technique of that step to plan her meeting. Begin this sequence by introducing Ginny’s scenario:> “Now let’s look at another example of how people use this strategy to plan their meeting. Ginny needs to decide how to plan a meeting for <describe scenario>.”

1. *Clarify the meeting’s purpose(s ).*

Recall the types of meeting purposes and the principle of aligning everything with purpose.

< Show video clip of Dani doing the first step of the procedure and verbalizing aloud the purpose of her meeting.>

(*Continued*)

*Sample Lesson Element*

*Description*

< Show the list of substeps for doing this step as she verbalizes them:>

* + Think about the need that prompted the meeting.
  + Match the need with the six meeting purposes using a job aid.
  + Decide which purpose will match the need best.
  + Select the purpose.

1. *Choose appropriate participants.*

Recall the types of meeting purposes and the principle of aligning everything with purpose.

< Show video clip of Dani doing the second step of the strategy and verbalizing aloud why she’s doing it that way as well as what she’s doing.>

< Show the list of substeps Dani is using for doing this step as she verbalizes her thought process:>

* + Think about the purpose of the meeting.
  + Match the need with the seven meeting participants using a job aid.
  + Decide who in the organization fulfills each of the meeting participant categories for this meeting purpose.
  + Decide who in the organization could be a back-up for each participant category in case the primary person is not available.
  + If there is no person to fill the category, go to the project leader to have an additional person added to the project.

*3 –7. <Repeat for all strategy steps. >*

*8 . Appoint the person responsible for taking minutes.*

**5 . Strengthen**

*Practice* and *Test.* Practice the procedure steps taught so far and provide feedback.

*Summary.* Refer back to the mental model.

*Transition.* To the ill-structured problem-solving lesson.

**1 . Select**

*Attention.* The attention component should explain that you are teaching a general strategy for solving a class of problems, even if some of them are new.

*Practice* and *Test.* “Now you try it. Here’s the setup:”

< Show scenario. It opens with the following narrative over the visual of a small group of people discussing hiring matters.>

“You are part of a human resource team at Knox Company. The team has decided to do some work process redesign and has asked you to set up the work process redesign team and the first meeting. Decide what you should do first as leader of the team. Type in your answer after the question and click on ‘What’s the answer.’”

“What steps do you think would be best for planning this meeting?”

<Answer: A list of steps that is like the standard procedure.>

“What should you do for the first step?”

< This format continues until all the steps of the procedure for planning a meeting are covered.>

*Transition.*

“Now that you’ve practiced planning a meeting in a simple situation, let’s see what happens when you have to plan a meeting in a situation that is not so cut-and-dried—one in which you have to do things on the fly and create your own procedure.”

< Here the lesson generalizes to an ill-structured procedure for planning nonroutine meetings.>

*Attention.*

< Show video clip: Joe home in bed asleep; phone rings in middle of night; governments in three of the fifteen countries in which his company has global offices have found a serious defect in one of the company’s products and are

(*Continued*)

*WIIFM.* Establish the context in which the problem is solved. This should be the framework for all explanations, examples, and practice throughout the lesson.

*YCDI.* Build confidence.

**2 . Link**

*Recall.* Recall related declarative knowledge that is part of the mental model, and procedures that are analogous to the one you are teaching, in whole or in part.

*Relate.* Relate the current procedure to what the learner already knows about analogous procedures.

*Sample Lesson Element Description*

going to shut them down; it’s only a matter of time till the other twelve countries do the same. Joe and Joyce call an emergency meeting at 8 A.M. Eastern time of all the people needed to fix this and come up with a plan by noon to address the crisis.>

*WIIFM.* “This could be you facing this new kind of problem. What would you do in this kind of situation?”

*YCDI.* “You can solve this problem because you already have the skills to figure what elements need to be brought together and how to bring them together. You need to develop your own procedure for planning this unusual meeting, by applying the principles of meeting planning that you already know.”

*Recall.* “You already know the strategy for planning a meeting and the related principles and concepts.”

< Show the mental model of meeting elements from the “Declarative Knowledge” and “Procedure” lessons.>

“But this situation is different. There isn’t time to use the routine process for planning this meeting, and you have to act before you know all the details. The problem you are facing is one of a class of problems you will face throughout your career—one where it’s easy to solve if you have the time and resources, but in reality you do not have all the elements you need to solve the problem and you have to create a way to solve it while you are missing some of the key elements.

*Relate.* “This is like cooking when the main ingredients did not arrive, the store is closed, the refrigerator power is off, and the gas stove is ‘on the fritz.’ It’s like playing football when five

**3 . Organize**

*Structure of Content.* This should show the mental model for a heuristic for a class of abstract problems. Develop an abstract diagram or other representation of how the components in the problem space interact.

*Objective.* State the ill-structured objective.

of your top players are injured, the weather is abysmal, none of your plays is working against the opposition, and you are forced to play one man short in a ‘must-win’ game.

“Conventional recipes and plays will not work.”

*Structure of Content.* “In an emergency business situation, you have to juggle these elements that are crucial to resolving the crisis.”

Documents

People

Time

Location

Av

ailability

Commitment

Expertise

Authority

“There are five guidelines for manipulating these elements:

1. Most crucial
2. Sequence
3. Difficulty
4. Cost
5. Expertise”

*Objective.* “The purpose of this lesson is to understand a general procedure for creating a meeting for a particular type of problem— getting people together to solve an emergency.”

(*Continued*)

**4. Assimilate**

* State the class of problems to which the heuristic applies.
* Show the heuristics.
* Show the steps or general approach of each heuristic for representing, then solving the problem.
* Explain that the heuristic is a guide.
* Recall the underlying principles.
* Show a specific example of application of the problem.

*Sample Lesson Element Description*

*Present Knowledge and Example.* “You already know from prior lessons that you need these elements to make good business decisions, and where each of these elements can reside in an organization.”

< Show example and definition and where they reside by moving the mouse over them.>

Documents

People

Time

Location

Av

ailability

Commitment

Expertise

Authority

“So what do you do in a crisis when you cannot have all of them?”

“Some guidelines are as follows:

* Based on the type of crisis, decide which are most important; for example in this crisis, authority to make decisions, and expertise about what to do are the most important elements.
* Based on the type of crisis, decide if you can access the elements in sequence instead of simultaneously; for example, in this crisis, you need expertise and documents first, and might need authority after some recommendations have been developed.”

“Watch Joe and Joyce as they think through how to resolve this crisis and plan a series of meetings.”

**5 . Strengthen**

*Practice* and *Test.* Provide scaffolded practice, supporting the learner on initial problems, slowly withdrawing that support; provide a range of problems, including prototypical problems, and a range of contexts; modulate both difficulty and support, but only one at a time.

< Show video of Joe and Joyce brainstorming; show “think-aloud” balloons of the principles as the video shows each; show both negative uses of heuristics, with Joe and Joyce correcting themselves and explaining why to each other, and positive examples.>

<Show final plan on screen with mental model.>

< Play audio of Joe and Joyce presenting this plan to the CEO, including their reasoning.>

*Practice*and*Test.*“Usingwhatyouknowabout meetingplansandyourexperienceinplanningroutinemeetings,howshouldyougoaboutplanning thisemergencymeeting?Clickontheplanning stepsyouneedtotake,andplacetheminorder.If youneedtoskipastep,dragittothetrashcan.”

< Learner selects planning steps and places them in order. For each step that is dropped in the trash can, ask, “Why do you think you should not do that step this time?”>

< For each step that is dragged into the plan, ask, “Why do you think you should take the time to do that step?”>

< If the plan will generate all the components of the mental model, then show the following scenario:>

“It’s 8 A.M., and the meeting participants assemble. They’re looking harried, and no one has slept well. The boss looks at the learner and says, ‘OK, looks like a good plan for this meeting—let’s go!’”

<If the strategy will not lead to a sound meeting plan, then run the following scenario:>

“It’s 8 A.M., and the meeting participants assemble. They’re looking harried, and no one has slept well. The boss looks at the learner

(*Continued*)

*Summary.* Repeat the mental model.

*On-the-Job Application.* In the first few weeks following training, make sure the learner encounters a wide range of tasks that are of typical difficulty and are representative of the objective.

*Sample Lesson Element*

*Description*

and says, ‘We’ve got an emergency here, and your plan will just waste our time. I’ll take over from here.’”

*Summary.* < Repeat the mental model diagram.>

“You can see that no matter how flexible you need to be to accommodate the situation, any planning strategy that gets you all the components of a good meeting plan will work. Now you’re ready to try it on your job.”

*On-the-Job Application.* < Give the learner a checklist (rubric) recording the next meeting she or he plans, and rating how well the meeting went. The next week, bring the learners back together to recount their meeting planning processes and why they did it that way, and to judge the effectiveness of the meetings that resulted. Discuss how to do it differently next

time.>

**SUMMARY AND CONCLUSION**

A basic principle of instructional design is that different types of knowledge are taught best with different types of instruction: there is no one best way to teach everything. This chapter showed how a basic lesson structure can be adapted to teaching three types of declarative knowledge and the range of procedural knowledge structure. Typically, training needs to include both procedural and declarative knowledge, and it is common for the full need to include all of the types of knowledge discussed here. It is also common, therefore, for a given instructional solution to teach the knowledge types in combination. We have explained and given examples of how this can be done while maximizing efficiency and minimizing redundancy. Taken together, we believe the strategies described here will result in maximally effective instruction that is also optimally efficient to design, develop, and use.

Successful use of the strategies in this chapter depends on a careful prior analysis of the knowledge types and structures to be learned, often called a *cognitive task analysis,* as well as a careful analysis of the learner’s prior

knowledge, frame of reference, motivation, and confidence. These strategies are generalizable across media: with suitable adaptation, they work in platform training or in a variety of on-line approaches from instructor-led distance education to tutorial computer-based training and simulation. They also carry substantial implications for assessment, which are beyond the scope of this chapter. A fully competent instructional designer will need to develop skills in all of these areas to effectively apply the strategies presented here.

Of course, a chapter such as this can provide only a summary. To encourage you to learn more about these strategies, we have included in our references section a number of current resources to add to your bookshelf, and to your knowledge structure.

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S CHAPTER SEVENTEEN S

Games and Simulations for Training

*From Group Activities to Virtual Reality*

Robert L. Appelman, John H. Wilson

T

here have always been controversy, confusion, excitement, and passionately held opinions about the topic of games and simulations. Many people view games as being devoid of content and structured only for entertainment, while, for example, flight simulators are viewed as essential training tools for airline pilots. Some people say that videogame simulations are useless, nonconstructive forms of entertainment, and that games especially are detrimental to youths and a complete waste of time for an adult population ( Bandura, Ross, and Ross, 1961; Barmazel, 1993; Griffiths, 1999; Herz, 1997). Yet others claim that only through games and simulations will we ever be able to reach the engagement, learning, and performance levels educators and trainers have been seeking for centuries, thus targeting games and simulations as the latest panacea for instruction and performance interventions (Crawford, 1984 ; Gee, 2003; Gibbons, Fairweather, Anderson, and Merrill, 1998; Rollings and Ernest, 2000; Thiagarajan, 1994).

For there to be such widespread opinions, there must also be some element of truth feeding each point of view, and this makes it particularly difficult for human performance technologists to decide if and when to use a simulation or game, and to determine which of the many modes of delivery would be appropriate to meet their training goals in specific contexts. The purpose of this chapter is to assist in the selection process. We plan to do this by first addressing the definitions of games and simulations, then introducing selected case studies of implementation, followed by a focus on strategies for development. By laying

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out these options, development variables, and examples of successful use, we aim to help you be able to determine the potential of games and simulations for meeting your performance-intervention needs and determine if the return on the development and implementation investment will balance out to the positive side of the equation.

**CLASSIC PERCEPTIONS OF GAMES**

The first thing that usually pops into someone’s mind when the word *game* is mentioned is some activity that is strictly nonwork-related, is done by choice, is “fun and entertaining,” and will not require any recall of the game play for future nongame use. A trainer implementing a game as an intervention must immediately confront these perceptions by addressing the facts that a game is being used for something work-related, that there is no choice but to play, and that there is an expectation to remember and reflect upon the game play. The aspects of the game being fun and entertaining may still be the case, but determining just what “fun” is and what “entertaining” is usually requires some deeper analysis and redefining on the part of both the trainer and trainee. Both fun and entertainment are primary motivators that the trainer may use to increase the engagement and focus on the topic at hand.

**OUTCOMES, ASPECTS, AND CHARACTERISTICS OF GAMES**

To sort out just what a game is requires delineating the difference between what happens during an activity or game and what outcomes result from the experience with that game. For instance, fun, entertainment, learning, and improved competency are all *outcomes* of a game. Game elements such as the specific tasks, consequences, and available interactions are *aspects* of a game. There are specific combinations of these aspects that are targeted at certain outcomes, and these become *characteristics* that define games from other forms of solutions. Six characteristic are present in all games:

1. *Challenges:* goals and tasks
2. *Rules:* instructions that govern how the game works
3. *Interaction:* the user’s relation with aspects of the game
4. *Contrivance:* modification of realism to benefit game play
5. *Obstacles:* elements of the game encountered
6. *Closure:* an end to the game

Outcomes

Discussions surrounding needs within an organization, performance problems, lack of information, or even too much information will begin to frame desired *outcomes* that the selected intervention is to generate. Establishing an outcome first is pivotal because it will be the yardstick for success of any decisions made in selection and implementation of the intervention, be it a game, simulation, or direct instruction. Games may achieve many desired *outcomes,* such as

* Increased skill
* Understanding the implementation of a process
* Deeper understanding of relationships and concepts
* Awareness of cross-training needs

Aspects and Characteristics

The elements of the game, from the arrangement of people in a group to gameboard arrangement to virtual rooms and avatars that are placed in virtual space, are all *aspects* of a game. The *aspects* are what a player interacts with to achieve the optional or required tasks that a player may perform while engaged in gameplay. These *aspects* are the variables of the game designer, who manipulates them to achieve the desired *outcomes.* All games will have aspects with some degree of challenges, rules, interaction, contrivance, obstacles, and closure.

**Challenges.** If there is no *challenge* to a player, then boredom ensues and little benefit is reaped from the experience. Presenting tasks in which players must compete with each other or work together to overcome obstacles in their path may present engaging *challenges.* Drawing upon previous knowledge and skills, the ability to seek and find new information or solutions, or forming new relationships and strategies to solve problems may all be *challenges* that make a game engaging.

**Rules.** The *rules* of the game also create a *challenge* in a game. In a role-play game, a rule may be “You may not speak until you hear a direct question,” or, on a board game, “You may only move the number of spaces shown on the dice,” or, in a virtual game, “You may only get into a room after you have completed a specific task.” The *rules* of a game work in harmony with the tasks to achieve specific *outcomes.* In a team-based game a facilitator may state rules at the beginning of an activity, but depending on how the game is progressing, the facilitator may also change or add rules. When facilitators are absent, then the rules must be more rigid and embedded in the *instructions* that accompany a game, or within the artificial intelligence (AI) of a virtual game.

**Interaction.** If players do not *interact* with a game, then they are not playing, they are passive observers. This does not mean that passive observation cannot be part of what a player is asked to do during gameplay, but if there is no *interaction* through dialogue and decision making, then there is no gameplay. What makes a game engaging is the interaction with the *aspects* of the game.

Often it is the need for more and more interactive aspects of a game that causes game designers and implementers to stretch their resources and skills. As with challenges in a game, if the interactivity for a player is too low, then boredom ensues.

**Contrivance.** If you could really fail, offend someone, lose your job, or even get physically hurt, then the game would not be fun, nor would it be a constructive activity. In a game there is a suspension of significant negative consequences to gameplay such that new doorways may be opened for people to explore. To this extent any game has a certain amount of *contrivance* to allow the players freedom to try things that they may not do otherwise, or to just have fun interacting with critical elements. However, for any game to be an effective intervention there needs to be some correspondence, however fleeting, to the player’s real day-to-day existence.

**Obstacles.** For there to be challenges, there need to be obstacles along the gameplay path. These obstacles may be anything or anyone that must be dealt with in order to proceed through the game. They could be psychological in nature, as when a person must overcome a self-efficacy issue relating to communication with authority figures, or they might involve learning the operation of a piece of equipment, or, in a virtual military training scenario, to decide if a game character encountered must be terminated somehow. In training scenarios, each obstacle represents a decision point for the player on how to proceed to the end goal. Strategic placement of obstacles along a gameplay path is a key design decision of the game designer.

**Closure.** Thereisalwaysatemporalaspecttoagamethatplacesboundariesaround the beginning and ending of a game. If the endtime is reached prior to the player completingalltheobjectives,orifsomeone“wins”beforetheendofthegame,then the gameplay is over. Being within these boundaries is the aspect of *in-game* play. *Outside-game* activities focus on what occurs before or after in-game play. Closure maycometothein-gameplay,butoutside-gameactivitiesmuststillprogresstoresolution and understanding of what happened during gameplay. The degree of contrivance of the game must then be extrapolated to the real day-to-day existence of each player. The meaning of why the activity was carried out must then be discussed,sothatthedesiredoutcomesandatruesenseofclosureandunderstanding can be achieved.

**WHAT ARE SIMULATIONS (SIMS)?**

*Simulations* began when people started to role play events that occur in real life. Whenever one proceeds into an activity that somehow mirrors a process, place, or event, a simulation strategy is being used to some extent. The modality of a *sim* may extend from arrangements of people to a sophisticated game like virtual spaces, and may even use both modalities in a blended learning context called “mixed reality.”

Simulations are receiving special attention because of the computer capabilities to create realistic models of people, places, and things. This makes it possible to use simulation strategies in a virtual mode to mirror more situations than could have been possible prior to this capability, and even to consider using virtual space to mirror interpersonal interactions and decision making. Like games, all cases of sims will be directed toward particular outcomes and will have certain aspects that are unique to a specific context. All will have varying degrees of the common characteristics, and players will engage in interactions and activities similar to games. However, there are subtle yet significant differences found in the targeted outcomes and structural characteristics of a simulation, compared to those of a game.

Outcomes

Outcomes are one of the primary discriminators between games and sims. Fun and entertainment may be important outcomes of a game, but they are not primary outcomes of a simulation. How a person “plays” a sim is more important than where he or she ends up, since completion or winning is not one of the characteristics. Thus the ability of the player to make critical judgments and decisions during sim-play and reflect on each of them is one of the primary outcomes. Just as with games that are being used for training purposes, the scaffolding around a simulation of outside-sim activities is just as, if not more, important than the inside-sim activities.

For example, during a role-playing simulation, real emotions may surface and decisions made may cause equally strong reactions from the players. Reflection after the simulation is critical to bring out these interactions to the level of understanding desired for the targeted outcomes. Likewise, in a flight simulator the actions of the sim pilot that result in a crash may seem devastating enough to the one who caused it, but unpacking the sequence of decisions made and pointing out the good and bad ones is where the learning occurs.

Aspects: Why Not Characteristics?

Simulations are made of elements that have more relationship to real-world attributes than is necessary in games. The degree of correspondence of any attribute of an element within a simulation to its counterpart in the real world is called “level of fidelity.” Attributes may have exact physical characteristics, matching specific people in actual places—for example, the person in a sim actually looks like the manager “George Smith,” which is high fidelity—or attributes may have only metaphoric characteristics that match—for example, the person only looks slightly humanoid, with a label of “manager,” which is low fidelity. In a team-based activity, another person would only try to emulate the interpersonal communication appropriate to the manager, which is medium fidelity.

For outcomes that require high correspondence between the actions during sim-play and the actions during actual performance, the level of fidelity of critical aspects must be high, such as with flight simulators. Conversely, when reflection of sim play during outside-sim activities is more critical, then the level of fidelity could be lower, such as with customer sales training, in which the strategic choices of the player within generic contexts are the focus.

Often, various aspects of the sim have increased levels of fidelity due to the concern for maintaining user engagement and motivation. Even though this increase may not directly affect an outcome, it may increase elements of fun and entertainment necessary to keep the user on task. However, such decisions by the designer to inflate the fidelity come at a price, since every step in fidelity will most likely multiply the development cost. An iterative rapid prototyping development process will assist in determining the appropriate final fidelity level of the simulation.

Characteristics

All simulations will have different weights of the following six common characteristics, depending on the desired outcomes.

**Challenges.** Challenges in a sim may be game-like in nature, but the focus on how one deals with each challenge will reflect more on “success” than on getting to the end of a game. Real life presents many challenges, and reconfiguring these same challenges in a simulated context can engage learners in producing innovative outcomes, thus developing new strategies and tactics for application outside of the simulation.

**Models.** Simulations are based on models of reality, and these models act like rules in a game. For instance, “laws of physics” dictate that an object will fall at 9.8 meters per second, and if while training in a virtual environment predicting when an object hits the ground is critical, then the physics model that controls the path of the object must have a high level of fidelity. If when an object hits the ground is not a critical factor, but only just that it drops, then the physics model can have lower fidelity. Similarly, if a team activity is being used to simulate the cooperation necessary between departments in a specific company, then the management model of that company must be used. If the goal is to examine alternatives to cooperation strategies, then more general models may be used or even manipulated during the sim play.

**Control.** In education we speak of learner-centered instruction and learner control. In both games and simulations there are player characters (PC), the people playing, and nonplayer characters (NPC), who are either following a script or are programmed by the AI of the game or sim. PCs of the sim must feel they have control of variables within the given model, or else they feel more like an NPC just acting out a script. Without control there are no decisions to make, so each element the PC controls is a critical design decision. The control may be to create or select a response to another person, to actuate a piece of equipment, or simply to move forward with a decision to engage.

**Manipulation.** *Manipulation* is more than control, it is how and to what degree you control. There are many variable aspects within a simulation, and the player’s choice of which ones and how they are manipulated is a critical focus of a sim. One variable in a sim may be to negotiate with people. If an outcome of the sim is to create a support base for your plan of action, then you may choose to seek and find every possible person within the boundaries and negotiate their support. Other players may select specific people to negotiate with and not contact others, thus manipulating the variable by degree of use.

In the simulation “Zoo Tycoon,” animal habitats are created by the PC that may have adequate food, shelter, and desired space to satisfy a specific animal. Manipulation of these variables is extensive, such that the PC may reduce food, space, and even shelter to find at what point the animal dies. This is important knowledge that may only be found in a simulation in which the underlying model allows authentic consequences from such manipulations.

**Authenticity.** Just as we spoke of individual elements having levels of fidelity, the setting, actions, and relationships of these elements may be described as having levels of authenticity. Simulations must have authentic variables, actions, and consequences for sim-play, but the levels of authenticity in all areas may vary. For instance, if a desired outcome is to appreciate the variety of skills that each team member has, each team member could take on the role of a different zoo aquarium fish or crustacean, thus needing to learn about the others’ capabilities and characteristics. In this case the contextual authenticity may be low, but the variable of variety of skills, combined with the player actions of selection, could match real strategies and tactics that engage the desired learning from the resulting consequences. Toward the other end of the scale, such as with flight simulators, not only must the physics models and the visual and auditory input be authentic, but also the kinesthetic input of gravity and momentum variations must be of very high fidelity, thus placing this within a high level of authenticity.

**Consequences.** Consequences are the result of the control and manipulation in a simulation by the PC within the operational limitations of the existing model. They also are the result of outside-sim activities allowing reflection and learning. Consequences for high-risk topics such as military training and medical contexts may be immediate and could bring an end to the simulation, for example, if someone dies in the sim. In other cases, the consequences may not be as apparent until debriefing after sim-play, when the results of the player decisions are posted and the composite of all player actions results in a major consequence. The feedback to the player during a sim is a design variable that can greatly affect the degree of learning from a sim. The designer may provide help, coaching, warnings, and so on as the simulation proceeds, but the goal in a sim is not to avoid failure but to understand decisions and resulting consequences. Thus, iterative simulation modules often use reflection periods in conjunction with complex scenarios and tasks.

**CASE STUDIES**

Following are brief examples of interventions using a variety of games and simulations. We will begin using the term *mode* when distinguishing between the form of delivery of these interventions. Face-to-face, team-based, computerdriven virtual, or a combination of actual face-to-face mixed with computerized information in a mixed-reality delivery are all different modes. Our intent is that the following case studies will provide some concrete examples of how specific outcomes have been met using these modes of interventions.

Training on Insurance Benefits for Helpline Trainees

**The Need.** A large midwestern insurance company that receives hundreds of phone inquiries daily for clarifications and handling of claims and claim information identified a training need to improve the content knowledge about the benefits offered and also to provide clear, accurate information to policyholders. Because of the relatively boring content, the need for understanding at a significant depth, and the desire to increase team effectiveness, a group game activity was selected as the intervention mode to use on a cohort of new trainees.

**Face-to-Face Team-Based Game Activities.** Part of any group dynamic is major hurdles to overcome, such as any group member’s fear of failing in front of peers and supervisors. This has the effect of limiting innovation and creative logical reasoning, and in general allowing only “safe” answers to surface. Fear of saying something stupid has the effect of squelching team interaction and sharing, because even if one person does know an answer to something, he or she may not get a chance to share it if no one else feels confident enough to ask. Efficiency of group management and finding ways to cover massive amounts of content, such as that in a complete listing of insurance benefits, was a major concern with this intervention strategy. In this case there was a requirement to bring the trainees to a significant depth of understanding of benefits, to train them to find information quickly and respond clearly to inquiries, and to help them achieve an accuracy level similar to an expert response.

Prior to the activities, everyone was asked to read the primary information source on the benefits and become as familiar as possible with the contents. This brought the entry level of everyone at least up to the “familiarity with content” level. You will note that the emphasis of these activities and “games” is to keep the learner active at all times with some level of cognitive processing through the introduction of frequent small challenges. That is why there are many short tasks and team interactions that keep things constantly moving. Following are three activities out of six that followed each other in rapid succession.

**Activity: Open Book.** To provide an orientation focus, each participant was asked to review the benefits for five minutes, then write ten questions on separate index cards for ten minutes. The group then separated into teams and each set of questions was collected from one team and given to another. During the next ten minutes the team selected the five best questions and discarded poorly worded ones or anything redundant or unclear. During the next ten minutes questions prepared earlier were read, and team members gained points for their team if they responded correctly. The highest-scoring team won and gained applause from the rest of the group. Note: this activity in no way requires that anyone ask a stupid question or even fail, but instead deep analysis and evaluation of the questions allow for confirmation that in fact someone in each group could generate good questions. To reinforce teamwork, a team wins, but not any individual.

**Activity: Q & A.** Next the focus was on mastery of the content by asking questions again, but specifically those that were confusing or hard to understand. The participants were asked to write two questions that related to the confusing topic and then exchange them with other participants, who then did the same. Participants read the questions they held at the end of the exchanges, thus concealing the identity of the original question writers. During the next twenty minutes the group received accurate answers in response to the questions. The last few minutes were devoted to writing individual reflections on the most important personal learning the exercise fostered. The reflection comments were mixed up and a few of them read. Note: there was no consequence for asking “stupid questions,” and no individual was singled out, yet the most difficult portions of the content were analyzed by the entire group and personal reflection was shared.

**Activity: Best Answers.** Next the focus was on application and evaluation of the knowledge acquired so far. Participants had five minutes to respond individually to an open-ended question about benefits. They formed groups, and then the answers from one group were given to another group for analysis. Before the answers were collected, though, each participant put a code number on his or her response. The group then discussed the answers given to their group and selected the best response. The “best answers” were read and discussed, and the code number was shared so that the person who wrote it received applause. This was repeated for another open-ended question. Then the teams wrote their own open-ended questions, and participants from other teams responded with answers. Note: a simple individual code protects all participants from exposure to failure and from the fear of providing “stupid” questions or responses. The teams work together on problem solving, and the activity ends with team-to-team competition with very authentic challenges.

This mode of game and simulation depends heavily on a facilitator’s skill to keep things moving, to foster a collaborative exchange among groups, and to capitalize on the game-like exercises to reduce stress and anxiety with the difficult content. This mode also allows for the most variation and accommodation to individual responsesoftheparticipantsduringthegameexperienceincomparisontoanyother mode, and when individual responses must be judged for innovation and also accuracy, the facilitator has the opportunity to do so. Training facilitators and preparing detailed scripts are necessary if this mode is to be disseminated across large numbers of employees being trained (Thiagarajan, 1994, 2004).

Pre- and Post-Test Simulations for Pharmaceutical Sales

**The Need.** The sales department in a pharmaceutical company was developing a new sales methodology that it was going to unveil to its salesforce during the annual sales conference. This new methodology was drastically different from the current sales model, and the company wanted to gain an understanding of how well the salesforce could perform using this new model before it was finalized and fully implemented. The salesforce was widely distributed over a large area, and there was no time to conduct the preliminary assessment during the sales conference.

The solution was to incorporate the mode of an on-line sales simulation in which each salesperson could engage using his or her personal computer. The first simulation that the salesforce completed was a few weeks before the sales conference.

**Pre- and Post-Test Sims.** In the pretest simulation, each salesperson interacted with a receptionist, nurse, and doctor at the doctor’s office. The goal was to build good sales relationships with each of these individuals and to investigate the environment of the office to help build these relationships. Each salesperson completed the simulation by making decisions that reflected his or her usual method of working with individuals in the doctor’s office. Data on their performance were collected through an on-line learning management system.

The salesforce attended the conference and learned about the new selling methodology. They were then instructed to complete a second simulation, or post-test, in which they made a second virtual visit to the doctor’s office to build relationships with the receptionist, nurse, and doctor. The pre- and post-test simulations were identical in their objectives, but the content differed between them.

**Results.** The company management was able to see how the salesforce performed using the new methodology they had been taught at the conference. The scoring showed that the salesforce significantly improved in their performance from the pretest to the post-test by applying the new methodology. In areas where the salesforce did not perform well, remediation was given to help improve performance and reinforce the newly learned methodology.

Algorithmic Strategy Simulation for Resource Management

**The Need.** A company that wanted to train its management on effective resource allocation had several field staff and customers to which it could apply time, training, materials, incentives, and other resources. The company used a model that reflected optimal resource management as the basis for the simulation. Strategy simulations that use algorithms to simulate real-world processes have been used for years in the business community to better understand problems and to train managers to perform well, so the mode of a computer-driven simulation was selected for this intervention.

**A Simulation Blended with E-Learning.** Because several hundred calculations were required for each action in the simulation, the company decided to develop a computer-based strategy simulation that could effectively process the data. Instead of being a distributed on-line simulation, this simulation was built to be used in conjunction with an instructor-led course on resource management. At the beginning of the course, the participants were asked to use the simulation and allocate resources to staff and customers for four simulated financial quarters. The effects of their resource management appeared in the form of product market share in the simulation. After completing the first four financial quarters, most of the participants saw a decrease in their product’s market share. The instructors next taught the participants the principles of effective resource management, and then had the participants use the simulation again for another four quarters.

**Results.** Most of the participants saw a dramatic increase in their market share after applying the principle taught in the course. One group, however, did not. Upon investigation, the instructors learned that this group had cultural conflicts with the way that resources were allocated to field staff in the simulation. The fact that the simulation reflected the effects of this conflict helped the instructors to further teach this group about appropriate resource management and to develop a solution to their cultural conflict with the company’s methodology. Accurately simulating the resource management methodology better prepared each participant to put these principles in place in the field, saving the company time and resources.

Porting Real Data into Virtual Space for Automobile

Design and Manufacturing

**The Needs.** The specific outcomes of interventions are common to most manufacturing companies, such as shortening the development period, optimizing the “fit” of different components that integrate into one unit, providing the most productive feedback to the designers on the results of design decisions, arriving at the most efficient process of fabrication, and testing the results of these decisions through formative evaluation. BMW has initiated efforts to integrate virtual reality (VR) tools and strategies at appropriate points along their process and integrate them among traditional tried-and-true methodologies. This *mixed-reality*- mode strategy has allowed many of their goals to be realized (BMW Group, 2004).

**Virtual Reality Sims.** The VR mode is created for designers first through the use of 3D computer-assisted-design (CAD) software programs that allow them to make design decisions through a graphic interface on a computer screen. These decisions are coupled to reality by making this virtual environment mimic actual dimensions of the real world such that when a line is drawn on the screen it is measured to whatever level of scale necessary. This allows the designer to create any object at any size and then “size” it to fit a preexisting form by simply scaling it to a desired size. The exact dimensions of the final object are then measured for manufacturing purposes.

This process may be considered a simulation, since all characteristics of a sim are present. The challenge is to create an object that follows the functional and formal requirements to be integrated into the gestalt of the finished automobile, and the model is the program that controls what you may do in this virtual environment. The designer has control of what is attempted and the level of manipulation of the critical variables is high. The level of authenticity is high because measurements in the VR space must match the final measurements of the real object, and the results of the designers’ decisions have significant consequences as other designers around the world attempt to integrate the object into their own process.

**Results.** Standardization of tools, data file formats, and telecommunication protocols have allowed BMW to create a design database available to any of its design centers around the world. This amalgamation of data is analogous to a virtual manufacturing center and has contributed to reducing the development period of a new model from six years in the past to just 2.5 years today (BMW Group, 2003).

**DESIGN AND DEVELOPMENT**

In the broadest sense, the human performance technology (HPT) process of analysis, design, implementation, and evaluation has direct application to what we will condense here to the analysis, design, and development of any form of game or simulation intervention. Yet, as George Geis pointed out in 1986, this process is highly iterative and rarely follows a linear path, but rather describes looping recycling patterns that continually feed new information into the design process at each stage.

While in the process of designing a game, the formative feedback from upper management could indicate a mismatch between the value of the need for this intervention and the investment allocated to complete it. Such information would affect the scope of each phase of the process and require rethinking each strategic decision. As development complexity increases, the need to extend patterns of iterative communication in an ever-increasing spiral, from the development team, through the organization, and out to the target population, becomes more critical (Spence, 2002; Toth, 1997). There is also the need to visit each center of focus of the analysis, design, and development process, to flow from mega strategic decision making through the macro tactical planning, and to implement through the micro operational tasks within each focus center. It is this outward expansion that must coexist with the inward decision making from mega to micro that creates the often difficult tension associated with analysis, design, and development.

Analysis Focus

An *analysis focus* centers on defining the workplace context and comparing this to ideal conditions through needs, task, and gap analysis. Such a focus might reveal several factors that are contributing to a performance problem, such as a lack of communication along organizational lines or a lack of respect or morale among employee groups, fostering the need for attitude changes among individuals or groups. It could identify different groups who need training or access to specific resources. This analysis focus should also identify the propensity for the use of innovative modes of game and simulation interventions at all levels of the organization. Not only must the development team be enthusiastic, but the spiral out through the upper management and target population must at least demonstrate acceptance of their use. The extent of the gap found between the actual and desired performance, coupled with the level of acceptance to use these modes of intervention, will correlate with the scope of the interventions prescribed during a *design focus.* There are certain specific factors that need to be quantified in this analysis focus. They are highlighted in the following sections.

**Your Trainees.** The number and distribution of participants can have great influence on what modality is chosen for delivery. If the group is small, less than a few hundred participants, then the developer might consider more faceto-face interactions, if that modality fits the need of the simulation or game. Although face-to-face delivery often has recurring resource needs such as the cost of facilitators and space for training, the small size of the group makes this modality ideal. For large group sizes, several hundred to thousands or tens of thousands, standalone and computer-based modalities such as 2D and 3D simulations and games can be a better choice. While computer-based games and simulations can have higher up-front costs than face-to-face games and simulations, these costs are spread across a larger group of participants and so can be less expensive than face-to-face training when the group size reaches the thousands.

The distribution of the participants is another important factor. If the group is located in a central area, where travel costs are not high, then face-to-face modalities can make a lot of sense. However, if the group is highly distributed, 2 D and 3D computer games and simulations can be very effective for delivery, since they can be sent electronically to the participant’s location via the Internet or other types of electronic delivery, decreasing travel costs.

**Motivation, Knowledge, and Entry Level.** Often overlooked in many training interventions, the motivation level of the participants is critical in making design and development decisions for games and simulations. Often games are used because of low motivation levels on the part of the participants, as described earlier in the chapter. The lower the motivation for a given topic, the more important the group engagement in the game or sim will be. Motivation can also help in making decisions about fidelity, particularly in simulations. Higher visual fidelity can be more engaging to the participants and can draw them into the experience. Alternatively, highly motivated participants may need less fidelity, because they are motivated to “make the jump” between more symbolic representations and reality.

Another important consideration with motivation is whether the simulation or game is a mandated experience or not. If it is mandated, then participation is more readily assured, but if it is not mandated, then the designer should include more motivational elements in the game or sim to encourage participation. Also, mandated games and simulations can often be designed to be more challenging, since the participants will need to “stick with it” in order to the complete the experience. Non-mandated games and simulations often need to have frequent rewards for the participants to keep them engaged in the experience so that they do not leave.

Game design and simulation design are highly affected by the knowledge and skill levels of the participants as they pertain to the topic covered in the game or sim. Is the topic new for the average participant, or does it build on existing knowledge and skills? How comfortable are the participants with the topic? Answering these questions often can help a designer decide whether face-to-face modalities or human-facilitated electronic delivery might be more effective, or if standalone modalities might be better. Obviously, good human facilitators can respond to participant concerns much more effectively than can a programmed computer or other technology, but good facilitators can be expensive and difficult to find in large numbers. 2D and 3D computer games and simulations, however, can be programmed with expert responses and are easily reproduced.

Design Focus

A *design focus* is a plan to address any needs or gaps found while one is in an analysis focus. Gaps in employee attitude might suggest the need for consensus building, culture development, skill training, or team building, while organizational analysis might reveal the need for change management, group reorganization, process improvement, or intracommunication modifications. All of these specific outcomes become the driving force throughout the entire HPT process. The design focus must specify these outcomes in a clear and specific manner, such that they can be called in for comparison against any major strategic, tactical, or operational decision that will guide the design and development of the game or simulation intervention. In this model of design and development, the evaluation component of the HPT process is embedded in every center of focus specifically to test conformance with the prescribed *outcomes.*

In a design focus the strategic question becomes, What type of experience should we place our participants in that would allow for appropriate challenges with issues, interactions with critical variables that result in meaningful consequences relative to this outcome? At a more micro tactical level is the question about further defining the experience as a game or simulation. This tactical question evaluates the importance of game characteristics such as competitionlike challenges, with content that is possibly more contrived and fun, versus simulation characteristics that are more authentic, with a greater focus on decision making during play. Questions about the participants’ need to interact through more rule-based game-like actions or through simulated variables to achieve the desired consequences must also be addressed in a design focus. At the most micro operational level are those decisions that tie together specific aspects of the experience, such as sequence of events, encounters with specific obstacles or people, and descriptions of the play-by-play details within the game or simulation experience.

Outcomes Targeting Training or Evaluation

A critical strategic design decision in the development of a game or simulation is deciding where outcomes lie on a training-and-evaluation continuum from low to high (see Table 17.1). This low-to-high continuum represents how much the designer wants a given outcome to be taught to the participants and to what extent the participants should be evaluated on a given outcome.

This has important tactical considerations, particularly in simulations. Simulations that are designed to teach more than to evaluate will have more frequent debriefing and feedback on performance throughout the experience. Conversely, simulations that are primarily meant to assess the performance of the participants on a given set of objectives will have less debriefing and feedback on performance and likely not until the end of the experience. This training-and-evaluation continuum is important for a designer to consider, given the dichotomy between training and evaluation when it comes to debriefing and

**Table 17.1. Training-and-Evaluation Continuum.**

|  |  |  |
| --- | --- | --- |
| *Aspect* | *Training* | *Evaluation* |
| Participant content familiarity | Low | High |
| Level of detail | Low | High |
| Level of fidelity | Low | High |
| Level of authenticity | Low | High |
| Frequency of debriefing | High | Low |
| Degree of feedback | High | Low |
| Complexity of experience | Low | High |
| Degree of problem solving | Low | High |
| Degree of experimentation | High | Low |
| Consequences of failure | Low | High |

feedback. If the designer provides a deep level of debriefing and feedback, while useful for training purposes, this feedback may actually help to improve performance by providing hints, strategies, and tactics. This level of feedback is not typically desired in evaluative simulations, in which the participants should not be assisted so that performance can be more accurately measured.

When considering participant actions, the different purposes of training and evaluation affect the demand for fidelity in the simulation. As mentioned earlier, the level of fidelity of critical aspects of the game or sim may vary depending on the degree to which they must have detail that reflects real-world imagery. Toward the training end of the continuum, less fidelity is needed based on participant actions, since debriefing and feedback can be used to get the participant back on the right track. But toward the evaluation end of the spectrum, more fidelity is required, since the participant should witness the outcome of his or her actions, which requires more paths through the experience and the development of more content. Since debriefing and feedback are less frequent, the experience must simulate reality at a higher level of fidelity. When imagery is not important, such as when simulating a phone call between two individuals, then less fidelity is needed. However, when imagery is critical to the core objectives of the game or simulation, such as accurately identifying an enemy vehicle, then the level of fidelity is important. With computer-based games and simulations, more visual fidelity typically means more time and costs for development, but this is not always the case if the designer can target the key content aspects for which level of fidelity needs to be high.

Game and Simulation Rules and Models

The importance of understanding what is to be modeled in the game or simulation cannot be underestimated. In a game, the rules are the driving factor for scaffolding, and in a simulation the model determines what can or cannot be done. Because many games and simulations need very detailed designs in order to achieve a high level of authenticity, a thorough understanding of the concepts for the rules or model is critical. For example, if a designer wanted to model the throwing of a ball in a virtual environment, an exact understanding of physical and gravitational forces would be necessary for the simulation to work authentically. However, rarely have rules been clearly stated, nor are models as straightforward as the scientific principles of gravity and physics. In the beginning the designer often will not know the intricacies of what is to be simulated. For example, if a designer wanted to simulate a discussion between a salesperson and a client, and wanted the client to respond to the salesperson in an authentic manner, he or she would need an understanding of common client reactions to sales tactics. This type of knowledge is nebulous and is often spread across the collective understanding of the sales staff rather than gathered in a single location. Harder still is designing simulations or games that are based on complex models, such as the effects of resource allocation on the market share of a given product. These models can be even harder to define because of the multitude of variables that affect the final outcome. For this purpose, the designer must know where and to whom he or she can turn for information that can help to build an accurate model with a high level of authenticity. Sometimes this exists already, such as in the ball-and-gravity example, but oftentimes the designer will need to seek it out in the form of subject-matter experts. The designer needs to make an honest assessment of how much is known about the model to be used and what resources are needed to get the model to a state where it can be used for a game or simulation.

Determining the rule set or model to be used can also have influence on the modality of the game or simulation. If the designer encounters a set of do’s and don’ts, then a game intervention might work best; however, if a set of if-then decisions is encountered, a simulation might meet the outcomes better. Models that involve interpersonal communication and emotional engagement may be more suited for face-to-face simulations or games in which reading facial expression and voice tone are more easily accomplished, while complex models that rely on thousands of calculations to predict the outcome of participant actions often need to be delivered via computer technologies.

Play Time, Apperception of Content, and Complexity

Games and simulations can take as little as a few minutes and as long as weeks or months to complete. The participant may be exposed to only a small fraction of the content, or may progress through the majority of it, depending on the way the game or sim is designed. A key concept here is the difference between the perception of the game from the designer’s point of view and the view of the participant. To the designer the game or sim will have multiple paths a participant can take, and all these paths must be developed, even though any given participant might not experience all paths. A participant can only traverse a game or sim along a linear path, even though they might back up to a decision node and progress in a different direction. The branching remains the same, but the time of play increases. Attempting to anticipate what a participant will do within a game or sim is the difficult part of design in these modes. A designer should consider how long, on average, it should take participants to complete the game or simulation. Often, the longer the experience, the more time and resources that are required to build it.

Debriefing and Feedback Complexity

Appropriate and timely feedback to players is a primary advantage of face-toface modalities. The amount and type of debriefing and feedback provided in a virtual mode will determine the mode’s complexity as well as the time and resources needed to develop it. The more frequent debriefing and feedback or correlation to the participant’s actions, the more content that must be written for the feedback. For example, if the participant can make four different choices, there may need to be four different types of feedback based on the choice that was made. In addition, while immediate feedback likely will deal only with a few variables, summative feedback may potentially deal with the combination of several variables over time, making the debriefing and feedback more complex.

Development Focus

Within the *development focus* are three basic phases of planning, creation, and implementation. Although these phases do have a strong linear coupling, an iterative development model flows through them a number of times, generating ever-increasing degrees of functionality and fidelity. This is also referred to as a rapid prototyping model that allows for natural milestone events in which formative evaluation may occur, allowing other members of the organization to have input. Although the general path through the development focus is the same for all modes, each mode of delivery is unique enough to warrant individual descriptions of the development focus (Appelman, 2000; Bethke, 2003; Toth, 1997; Tripp and Bichelmeyer, 1990).

Time and Resources

After the participants, purpose, and model of a simulation and game have been determined, the designer must also consider the time and resources available for development. Games and simulation can be very inexpensive to create or extremely expensive, and the designer should have an understanding of which mode is being dealt with. In an emergent form of a spiraling development model, it is easy to spiral out of control if there is no overall plan or experience in developing whatever mode is being targeted. A spiral model requires a team of experts, in subject matter, in instructional design, in mode design, and project managers, all of whom are willing to keep coming together to evaluate and redirect the development toward the desired outcome. Conferences, Web resources, and publications are increasingly available for detailed exploration into this complex development process (ACM SIGGRAPH, 2005; Bethke, 2003; DIGRA, 2005; IGDA, 2005; IMRC, 2005: ISAGA, 2005; NASAGA, 2005; Rollings and Ernest, 2000 ; Zimmerman and Salen, 2004).

Performance Tracking and Scoring

As with other types of training and evaluation, designers should consider how participant performance will be tracked and scored. This can be as simple as facilitator observation or self-reporting, or as complex as reporting performance scores to an on-line learning management system for analysis and reporting. Performance tracking and scoring are determined largely by the modality of the game or simulation delivery, but their importance cannot be understated. Tracking participant performance not only helps deliver accurate feedback during the simulation or game, but also helps to have more effective debriefing sessions after the simulation or game is completed. The good news is that in a virtual world, everything is data and very easy to capture and report. The question will be what to report in light of the desired outcomes, and who to report it to. The more accurate, timely, and pertinent the performance data the more likely that effective feedback and instruction can be provided to improve performance.

**ROI AND SUMMARY**

Throughout this chapter we have attempted to identify variables that illuminate the similarities and differences between games and simulations, as well as to provide discussion that would engage you in the decision-making process, matching your training needs with these modes of interventions. As you approach your own needs, we suggest you fully understand the opening definitions and then move to the “training-and-evaluation continuum” matrix, where you can begin matching your context needs with cells in the matrix. As the description of your particular solution takes shape, the case studies and specific discussion areas will be good question-generating exercises that will require you to ask critical questions of your mode and participant experiences to produce the desired training outcomes.

A key decision of whether to use a game or sim is the “cost of failure”; stated simply, the cost of failure is the “cost” that an organization or individual would pay if an individual or group of individuals fails at a given task in the real world. This cost might be missing a sales quota or not accurately assembling a piece of machinery. It can be as benign as not answering phone calls in time or as serious as a pilot losing his life in a plane crash. The high cost of failure in terms of human life and equipment is the reason why military forces around the world have some of the most sophisticated simulations and games known to man.

The final recommendation is to avoid selecting a game or simulation because it just seems like a neat thing to do, or because your employees would like to have “fun” learning (Appelman and Goldsworthy, 1999; Crawford, 1984; Thiagarajan, 1994). Instead, determine where both your organization and participants are with respect to role playing, using technology solutions in training, and even familiarity with playing videogames. Experimenting with these different experiential modes would provide you with some evaluative information that could point to a development starting point (Herz, 1997; Summers, 2004). Perhaps it would be best to develop first some face-to-face group activities, then move to some off-the-shelf training modules. If you have a population that is amenable to high-tech solutions, then you could consider creating some simple low-fidelity branching PowerPoint games to become familiar with the development decisions discussed here. Once you feel you have reached a critical confidence level of support from your organization and employees, that would be a good time to look for game and simulation development companies that could work with you to determine the best level of fidelity and authenticity for your context.

While many are touting the value and potential for learning of games and simulations (Amory, Naicker, Vincent, and Adams, 1998; Crawford, 1984; Filho, Hirata, and Yano, 2004; Gee, 2003; Gibbons, Fairweather, Anderson, and Merrill, 1998 ; Jones, 2003; Klabbers, 2003; Kommers, Rödel, Luursema, Geelkerken, and Kunst, 2003; Rollings and Ernest, 2000), the main goal is for you and your design team to experience these rich learning environments yourselves. You need to examine the characteristics of content density, what is challenging, the experience of low-consequence failure, and how rewarding it can be to achieve a goal in a game, or to reflect on the consequences of your experience in a simulation. Even if you decide it is not for your organization at this time, you will be making that decision from experience, and you will know when the time is right for these immersive learning environments.

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S CHAPTER EIGHTEEN S

Distance Training

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T

hirteen years ago, a chapter titled “Distance Education Systems” in the first edition of the *Handbook of Human Performance Technology* defined distance education as encompassing “the transmission of educational, instructional, or training programming to two or more people at two or more locations separated by space or in time” (Wagner, 1992, p. 513). While we may argue today that distance training can be transmitted to even a single person and a single location, the 1992 definition continues to have merit and is generally very similar to our understandings and discussions of what distance training is today. In this chapter, we use the terms *distance education* and *distance training* interchangeably, preferring the term *distance training* for human performance technology contexts. Though the 1992 definition provides a basic explanation of distance education, we currently have a broader conceptual vision due to advancements in access to Internet technology and the many options that are now used for the distribution of distance training that were not previously available.

In the conclusion of that chapter, the author stated rather prophetically that “distance education is a technology application that eventually may provide HP technologists with novel ways of solving instructional and training problems, specifically those associated with resource need and access speed” (Wagner, 1992 , p. 525).

Wagner (1999) also wrote a chapter for the second edition of the *Handbook of Human Performance Technology,* in which distance learning and distance education were discussed as alternatives to traditional, face-to-face training. In that

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chapter, Wagner also described “distributed learning” as the convergence of “audio, video, and data-transmission media into a single integrated digital ‘pipeline’”(p. 630).

The second edition also included a chapter titled “Emerging Trends in Instructional Interventions,” which focused on the concept of a virtual class ( Winer, Rushby, and Vázquez-Abad, 1999). The authors described the virtual classroom as an entity that would provide “a technology-mediated environment where people can meet, talk, access, work with a wide range of resources, and learn. In doing so, it starts to move us away from the shackles of learning in a fixed place at a prescribed time” (p. 875). Amusing in retrospect, these authors stated that “the virtual class sounds like something from a work of science fiction” (p. 875), a view that provides context for just how much progress has been made in the area of distance education during the past six years.

One topic not addressed in that edition that is currently an emerging field is “blended learning,” a rapidly evolving approach to education that blends the best features of face-to-face learning environments with the best of distance learning experiences. The purpose of this chapter is to create a bridge between the past and the future by exploring the reasons behind the burgeoning growth of distance education, documenting the current status of distance learning systems in corporate environments, identifying the issues that affect the use of distance learning systems in corporations, and providing an introduction to blended learning.

**DISTANCE TRAINING: A NOVELTY OR A REAL SOLUTION?**

The use of information technology has caused a revolution in education. Whether it is just one course or an entire academic program, learning opportunities that were not previously available to students locally are now offered via the World Wide Web. This revolution has given rise to difficult questions about the value of distance training as compared with face-to-face or residential training in terms of effectiveness, efficiency, humanness, and access, to mention a few concerns.

Whatever answers to these difficult questions ultimately emerge, current proponents of distance training see it as an important avenue to provide “more than just an opportunity to unite students from different locations in a common educational goal. It serves as a bridge from the often theoretical basis of academic studies to the real-world practices necessary for success outside university walls” (Gibbons and Brenowitz, 2002, p. 355).

Is the Excitement about Distance Training Justified?

Just because new technologies, especially the World Wide Web, are popular does not mean that they are the solution for everything, nor does the popularity of distance training mean that it is better than traditional face-to-face training. The traditional classroom and the on-line classroom both have their benefits and disadvantages. However, the novelty and popularity of electronic media may lead people to assume that distance training is the long-expected solution to all problems faced in education. Hill, Wiley, Nelson, and Han (2004) note that “few technologies have had such a global impact; further, few technologies have impacted such a wide range of sectors in our society across and within various socioeconomic groups. This is particularly true for the World Wide Web (Web). Business to education, youth to elders, world powers to third world countries—all have felt the impact of the Web” (p. 433).

The excitement about Web-based distance training might be justified in part because the field is so new, but there is no conclusive evidence that online instruction is the same, better, or worse than teaching face-to-face. On one hand, advocates of the newer technologies offer many promises ( DeCorte, Verschaffel, and Lowyck, 1994). On the other hand, it is still too early to judge new technologies as failing because they are still in development. Applying new technologies in education and corporate settings is in the early stages and it continues to grow. We are still unsure as to whether distance training will be a decent alternative to traditional education or a real revolution in education.

How Is the Distance Training Format Different from Traditional Instruction?

Hill, Wiley, Nelson, and Han (2004) note that “While [distance training] efforts hold much promise for the future of technology, particularly for learning, some researchers contend that the majority of the educational uses of these tools simply replicate classroom practice” (p. 453). Though some may argue that distance instruction is no different than traditional instruction, Romiszowski and Mason (2004) have identified several practices that differentiate distance instruction from traditional instruction and that, perhaps, only Web-based distance instruction can offer: (1) it allows instructors to teach from anywhere; (2) it allows for the possibility of increased enrollment in education or training activities without a need for more physical infrastructure; (3) it provides for asynchronous activities that allow flexible time management; (4) it allows students to learn from anywhere; (5) it allows for flexible scheduling; (6) it offers the possibility for learners to analyze their own interactions through the use of text threads; and (7) it offers the possibility for learners to see a display of their group dynamics.

The list provided by Romiszowski and Mason includes features that are related to administration and economy of the system, as well as to teaching and learning activities. We will discuss these features related to teaching and learning before proceeding to the administration of distance programs.

**Teach from Anywhere.** By definition, distance training means that the instructor does not need to be physically present to teach a particular class, and the rest of the world does not need to be physically present to take advantage of the instructor’s particular and valuable knowledge. The instructor can teach from wherever he or she is to students wherever they are, and the teaching and learning interactions are not limited to a single classroom.

**Asynchronous Activities and Learn from Anywhere.** Distance training allows students to access courses, materials, information, and classmates anywhere and anytime. While face-to-face training requires people to be in a specific place and time, participating in synchronous activities, Web-based instruction allows the students to communicate and collaborate at different times when it is convenient for them. This convenience makes learning accessible to individuals who may not have been exposed previously to the instruction, such as full-time workers and those separated by geography. The asynchronous feature of Web-based distance instruction is the key feature that distinguishes this new generation of distance technology from previous generations of video-based distance courses.

**The Possibility for Learners to Analyze Their Own Interactions.** An on-line class allows people the opportunity to participate at their own pace, without pressures such as time limits or speaking in front of a group, and gives each student an equal standing in the class. When students analyze their interactions, such as those recorded through threaded discussions, this opportunity opens a window for reflection about their own processes of learning. They can see what they have been doing and how they have done it. They can see their interactions, their participations, and their postings, all of which allow students to see their growth from the beginning to the end of the course. Having their interactions in a written format allows students to articulate, concentrate, and reflect deliberately.

**The Possibility for Learners to See a Display of Their Group Dynamics.** Group dynamics play a key role in problem-based, learner-centered, and constructivist educational experiences, and Web-based training allows students and instructors to see their interactions and reflect on them. This makes the process accountable and digestible.

Why Are These Features Valuable?

The value of the features explained in the preceding section is to make training more convenient in regard to time and place. No barriers of geographical separations interfere with people getting an education; people from anywhere are able to receive education of almost any kind. Rigid scheduling is not convenient to busy individuals who desire training but cannot move to another location to participate in a residential program because of their occupations. Second, making training a more reflective process allows people to be aware of what they are doing, enabling them to be more active rather than passive in their own learning process. Being more active equals being more involved, and who does not want to have more involved students? Business and industry today require workers who are able to take initiative and to think critically, and distance training fosters these capabilities.

How Much Evidence Is There to Support Claims of the Distance Advocates?

A comprehensive summary of research on the topic of computer-mediated communication in on-line learning environments can be found in Romiszowski and Mason’s 2004 chapter titled “Computer-Mediated Communication” in the second edition of the *Handbook of Research for Educational Communications and Technology.*

Given that Web-based training technologies are still very new, it should not be surprising to find that research in this area is currently lacking in both quantity and quality. More research is needed that identifies the effects of distance technologies and environments on learning, and a more coherent framework is needed in order to allow the results from these studies to be used for appropriate comparisons (Berge and Mrozowski, 2001; Gall and Hannafin, 1994).

There is still much to learn about distance training: “The use of the tool, as well as the research practices surrounding it, [is] in need of expansion if it is to reach its potential as a platform for educational innovation” (Hill, Wiley, Nelson, and Han, 2004, p. 453).

Hill, Wiley, Nelson, and Han (2004) point out that there is no one best way, but rather many appropriate ways to improve practices in education and training. They believe that the question related to distance training that we should be asking now is, “What are the best ways to teach students within specific contexts and under certain conditions?” (p. 453). The current issue for which we need to develop our understanding has to do with when the use of Web-based instruction becomes more beneficial for the student, as opposed to when traditional faceto-face instruction is of most benefit to students. Similarly, we need to know which practices are most suitable for different types of instructors and students, and how we can best use this information to improve teaching and learning.

The World Wide Web is still new, particularly in its use as a format for education. Students, instructors, and researchers all have much to learn about this educational environment and the technologies that support it. It is too early yet to make judgments about the worth of this developing process: we need to continue researching and learning from direct exploration. We will likely be both surprised and disappointed with the eventual findings of research, but in either case, we need time to see what research will reveal.

**THE STATUS OF DISTANCE TRAINING**

Distance training is no longer exclusively used by colleges and universities. Its influence has expanded to all levels and types of education and to all aspects of our daily lives. Families, K–12 education, and corporations are now engaged in Web-based distance training. Oblinger and Rush (2003) have estimated that “corporate America’s adoption of e-learning has come at a much more rapid pace than in higher education” (p. 593). What might be the reasons behind the widespread and rapid adoption of distance training technologies? We could cite many, but the most important might be the simple fact identified by Ruttenbur, Spickler, and Lurie (2000) that the workforce must be rapidly updated, and distance training technologies provide an effective, efficient, and economical means to address this need.

Oblinger and Rush estimated in 2003 that the 2004 worldwide corporate e-learning market would exceed $23 billion. This would represent an annual growth rate of 68.8 percent from 1999 through 2004, with North America being accountable for two-thirds of this growth. “In a time of shrinking budgets, distance learning programs are reporting 41 percent average annual enrollment growth. Thirty percent of the programs are being developed to meet the needs of professional continuing education for adults” (Gunawardena and McIsaac, 2004, p. 355). Dolezalek (2004, October) calculated that the total training budget spent in the United States in 2004 was $51.4 billion (see Figure 18.1).

Total Training Budget

46

48

50

52

54

In Billions

56

58

60

2002

2001

2000

2004

2003

51.4

54.2

56.8

54.0

51.3

**Figure 18.1.** Total Training Budget Spent in the United States in 2004.

*Source:* Adapted from Dolezalek, October 2004.

1998

2003

2002

2001

2000

1999

391

6164

3192

2270

1333

735

1000

2

0

000

3000

7000

6000

5000

4000

Corporations

**Figure 18.2.** Number of Corporations Offering Distributed Learning Courses.

*Source:* Adapted from Moe, 2002.

The number of corporations offering distributed learning courses to employees has been growing rapidly (Moe, 2002), with a total of 6,164 companies in 2003, almost two times the number that offered in the previous year (see Figure 18.2). The e-learning market is in its early stages and not old enough to be considered well established. Results from a survey designed to depict the state of e-learning provide evidence that this market is growing rapidly (see Figure 18.3) . Nearly 80 percent of survey respondents reported that they have adopted e-learning within the past four years (Hequet, 2003).

Hequet also reports that e-learning is offered to the majority of employees in 56 percent of the organizations that responded to the survey, while 45 percent of those organizations offer e-learning to select employees, and 26 percent of the organizations offer e-learning to customers, resellers, partners, and suppliers. E-training is not, however, the panacea for every training need. It does have limitations, among them, to mention a few, up-front investment required of an e-learning solution is larger due to development costs; technology issues that play a factor include whether the existing technology infrastructure can accomplish the training goals and whether additional tech expenditures can be justified; cultural acceptance is an issue in organizations in which people may be predisposed against the use of computers at all; reduced social and cultural interactions among people; suppression of communication mechanisms; and elimination of peer-to-peer learning. It appears, from the same survey conducted by Hequet (2003) about e-learning (see Figure 18.4), that the principal limitations on e-learning are cost and learner motivation.

0

5

10

15

20

Per

centage of Survey Respondents

25

30

17

%

24

%

%

26

%

11

%

20

%

2

Less than

<2

–

1

2

–

<3

3

–

<4

4

or more

Don’t

1 year years years years years know

Years Since Adoption of e-Learning

**Figure 18.3.** Rate of e-Learning Adoption by Corporations.

*Source:* Adapted from Hequet, 2003.

Don’t know

Market confusion

Cost

Employees not motivated to

learn on-line

ROI of e-learning has

not been p

roven

Employees lack Internet access

Lack of management buy-in

Lack of high-quality content

Efficacy of e-learning not p

roven

39

%

30

%

%

28

%

25

%

24

%

19

%

18

15

%

6

%

5

15

10

0

20

30

45

40

35

25

Percentage of Survey Respondents

**Figure 18.4.** Limiting Factors on Use of e-Learning in Corporations.

*Source:* Adapted from Hequet, 2003.

Dolezalek (2004, October) conducted a survey of corporate training organizations to determine the comparative usage of e-learning courses and traditional face-to-face training. She found that 31 percent of technology-based training programs were delivered by outside contractors and 69 percent by inside staff, while

**Table 18.1. Frequency of Use of Instructional Methods for Corporate Training.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Methods* | *Never Used* | *Seldom Used* | *Often Used* | *Always Used* |
| *Most Used* |  |  |  |  |
| Classroom with instructor, traditional | 3% | 13% | 67% | 18 % |
| Public seminars | 8% | 40% | 48% | 4 % |
| Self-study, Web-based  *Least Used* | 16% | 42% | 37% | 6 % |
| Classroom with instructor, virtual | 40% | 41% | 17% | 2 % |
| Computer-based games | 50% | 41% | 9% | 1 % |
| Virtual reality programs | 81% | 16% | 2% | 0 % |

*Source:* Adapted from Dolezalek, October 2004.

26 percent of the traditional training programs were delivered by outside contractors and 74 percent by inside staff. With regard to the development of technologybased training programs, 41 percent were developed by outside contractors and 59 percent by inside staff. Thirty-five percent of the traditional training programs were developed by outside contractors and 65 percent by inside staff.

Regarding the amount of interaction in training courses, Dolezalek (2004, October) found that 29 percent of trainees interacted with a human instructor while the rest (71 percent) interacted only with a computer. The most frequently used instructional formats for corporate training were (1) the traditional classroom with instructor, (2) public seminars, and (3) Web-based self-study courses. The least-used format for corporate training was the virtual classroom in which students were engaged in virtual reality programs (see Table 18.1).

**WHY CORPORATIONS ARE ADOPTING DISTANCE LEARNING**

Traditionally, educational institutions and corporate training have had clear and distinct boundaries, but in the recent past, educational institutions have been reaching out to adult learners as never before in order to increase revenues by meeting the needs of lifelong learners. Green (2000) reports that most current distance students are adult professionals who are looking for additional training. According to a 1999 survey by the National Center for Education Statistics, just over 50 percent of adults ages forty-five to fifty-four, 37 percent of adults ages fifty-five to sixty-five, and 20 percent of adults aged sixty-five or over are taking distance classes (U.S. Department of Education, 2002; Waits and Lewis, 2003 ; Wirt, Choy, Rooney, Provasnik, Sen, and Tobin, 2004). Continuing education is the fastest growth area within the educational marketplace.

Human resources and training departments in corporations of all sizes have come to the same realization as educational institutions: (1) the need for learning does not stop after an employee becomes comfortable in a new position; and (2) rapid advances in technology and the exponential growth of information require constant and continuous development for employees. To address this situation, companies are looking for ways to offer the ongoing training that employees request and require. Continuing education and training serve as means to personal advancement for employees, as well as means to keep or increase competitive advantage for the company. Berge (2003) posits that lifelong learning is now the standard for everyone: “Our global society is moving into the Knowledge Age, where technology dictates that we will live, work, and learn differently than we did in the Industrial Age. The new age demands more skills, knowledge, learning, and re-learning” (p. 601). The recognition that companies need to become learning organizations stems in part from employers’ growing awareness that employees cannot come to a job today knowing all that is needed to be successful, and that school does not prepare individuals for all the needs that will emerge in the workplace. A workforce that has employees with the ability to learn on their own and be responsible for that learning is now needed, and distance training is a viable strategy for developing a learning organization.

Berge (2003) has also identified a number of other reasons that are driving companies to use distance training. Most practically, the need to train hundreds or thousands of employees who are located in different geographical areas with the same content at the same time is a better fit for distance training than for face-to-face instruction. Second, traditional face-to-face methods of training and education incur higher costs in terms of housing and transportation, while the lower cost of distance training is attractive to employers. Third, face-to-face training requires employees to be available for a set period of time on particular days, which may interfere with the completion of regular and normal work tasks and activities. The lack of time during work hours is a great deterrent for traditional training, but the asynchronous nature of distance training may help to overcome this obstacle by allowing training to occur when it is convenient for each employee. Finally, distance training is offered in a modular format so that training can occur “just-in-time,” making it highly relevant to employees and supporting the learning that is critical to the success of the organization.

**PLANNING AND ADMINISTRATION OF DISTANCE TRAINING**

For the reasons stated earlier, we conclude that the distance training provided by an organization may be an essential element in improving the performance of employees. To remain competitive, organizations are placing more emphasis on distance training. The success of distance training initiatives is contingent on the planning and management that support these efforts. In this section, a brief description of the administrative team responsible for distance training is provided, and the functions of the team as well as the possible obstacles it might face along the way are delineated.

Functions of the Distance Training Administrative Team

In addition to the obvious need for expertise in maintaining the technology that makes distance instruction possible, the distance training initiative requires expertise in technology-based instructional strategies such as the facilitation of on-line discussion, collaboration, and learner engagement. Also, because the trainees who take distance learning courses have widely varying technology skills, it can be expected that trainees will need assistance at some point in navigating their way through the landscape of the distance training experience.

The administrative team generally consists of individuals who have expertise to support the hardware and software used for the distance training environment, who have expertise in the design and delivery of technology-based training, and who are able to provide learner support for all aspects of the distance training experience. The team is responsible for building the bridge from the traditional face-to-face training experience to the newer technologybased distance training experience, so that learners become comfortable in this new environment. Some of the key functions that the administrative team must take on in addressing this responsibility include to

* Conduct needs analysis for distance training
* Evaluate strategies and technologies for the delivery of distance training
* Determine needs for equipment, facilities, policies, and cultural change
* Research to discover successful models used elsewhere
* Determine incentives for designers, instructors, and developers and students
* Estimate costs of distance training and compare with traditional training
* Identify barriers for implementation and address these barriers
* Assess results of distance training initiatives
* Report findings and propose recommendations to improve distance training

According to Dolezalek (2004, April), the distance training implementation team can expect to spend a significant portion of its time on integration issues, making sure that the course content integrates with the technology-based learning management system and other systems within the company, such as the human resource information system, compliance recording systems, and e-mail systems.

Potential Issues and Obstacles to Be Addressed by the Administrative Team

The administrative team should expect to face obstacles as it works to integrate the distance training initiative into the organization’s existing structures. Some of the typical obstacles to successful integration of distance training that may need to be addressed by the administrative team include buy-in, access, support services, legal issues, and evaluation of distance training initiatives.

The administrative team, because it allocates the funds that make the distance training initiative possible, should ensure that the organization’s leaders believe in these initiatives. Similarly, employees are generally resistant to organizational change if there is not clear communication about the change and opportunity for employees to be involved with the change. The administrative team should therefore work to engage employees in the initiative to bring distance training into the organization.

The administrative team needs to ensure that all learners have the technology that will be needed to access courses, and that all instructors and trainees have the technical expertise to appropriately use the distance training technologies. It is important to minimize as much as possible any intimidation or fear on the part of employees regarding the initiative.

The administrative team is generally responsible for determining what support services will be needed for learners and how those services will be made available. Support services might include the availability of resource repositories, and systems for registration, payment, and advising related to training activities.

The administrative team will also need to consider and develop policies regarding legal issues such as copyright and intellectual property as they relate to distance training materials. The administrative team should work toward agreements for how legal issues related to distance training will be addressed within the organization.

Most important, the administrative team will need to determine how to evaluate the effectiveness of distance training. There is currently no consensus in the academic literature about how best to evaluate distance learning in terms of process or outcomes. Measures and indicators for success of the distance training initiative will need to be identified.

Stages of Organizational Capability for Distance Training

Solid program planning and program management will be the keys to program effectiveness and efficiency. In Figure 18.5, Schreiber (1998) describes four stages of organizational capability.

If an organization is in the early stages of transition or is experimenting with distance training options, Johnson (2004) provides recommendations for the types of content that are most suitable for making the transition from face-to-face to

Separate or sporadic

distance learning

ev

ents occur in the

organization.

The organization’s

technological

capability and

infrastructure can

support distance

learning events.

The organization

has established

a distance learning

policy, procedures

are in place, and

planning occurs.

Distance training and

education have been

institutionalized

in the organization

in such a way that

policy,

communication,

and practice are

aligned and business

objectives are

being addressed.

1

2

3

4

**Figure 18.5.** Stages of Organizational Capability.

*Source:* Adapted from Schreiber, 1998.

distance learning formats during the early stages of a distance training initiative: the administrative team should consider migrating from face-to-face to distance training for content that

* Reaches the greatest number of employees
* Is covered infrequently at very remote locations
* Is considered prework to other training activities
* Changes so frequently that it is difficult to keep the employees up to date
* Puts the learners in harm’s way
* Requires expensive equipment or is difficult to set up the training
* Requires significant drill and practice to achieve mastery
* Is linked to regulatory compliance or certification
* Requires consistent delivery

The preceding information has been provided to support the many organizations that are just beginning to venture into the use of distance learning as a means to support employee performance. Though distance training is still a relatively new activity for many organizations, the next “new thing” is on the horizon, and so the final section of this chapter will introduce the phenomenon of blended learning and discuss its potential for corporate training.

**BLENDED LEARNING: A LOOK INTO THE FUTURE**

In an article by Stephanie Sparrow in the magazine *T+D* (2004) , it was reported that according to a transatlantic survey of 150 U.S. and 118 British learning professionals by Balance Learning Ltd., a global provider of comprehensive blended learning solutions, blended learning is the delivery method of choice. According to the survey, blended learning is viewed as the most effective and efficient form of training in the United States. The results show that 77 percent of the U.S. organizations currently use blended learning, and that it accounts for 16.1 percent of all training in the United States.

Blendedlearninghasbeencomparedmetaphoricallytobrewingcoffee.Johnson (2003) statesthatfindingtheappropriatecomponentsofblendedlearningislikened to “brewing the right mix,” which refers to choosing the most suitable elements to ensure a successful training situation that can include multiple delivery methods, suchasinstructor-ledtraining,e-learningcourses,andprintedandelectronicmedia, among others.

Blended learning can be defined as a mixed model of learning in which all available technologies, from traditional printed materials through electronic documents, both on-site and in distance lectures, are used to deliver learning and to create educational experiences that are successful and that try to accommodate the best qualities of every environment and medium with the resources that the organization and the learner have at their disposition, creating a balanced combination of learning environments.

Adult learners have unique characteristics that set them apart: Learning environments that combine Internet learning with the face-to-face experiences sought by many adult learners have advantages over pure traditional classrooms and totally on-line situations. Blended learning has been recognized as an effective alternative that can combine the best features of each model, helping to foster rapport among participants and decrease “psychological” distances and isolation (Ausburn, 2004).

IBM (IBM Learning Solutions, 2004), a global services organization, recently implemented an internal blended learning training module for its employees. Based on the belief that people learn in different ways, IBM’s methodology uses four distinct educational approaches. Each approach works with the other approaches to enable employees to be more productive and to help create value for the organization. IBM’s blended learning system combines Web-based, interactive, collaborative, and face-to-face learning. This blended learning structure coordinates movement from one learning experience to the next so that each learning experience emphasizes and builds on the last. The four learning approaches are

1. *Learning from Information.* Performance support and reference materials are frequently used as a starting point. They tend to be Web-based

and take advantage of on-line information transfer. This allows an employee to access only the materials that are relevant to his or her job function. Allowing the learner to move at his or her own pace maximizes interest and motivation and empowers the user to learn the material quickly and comprehensively.

1. *Learning from Interaction, Simulation, or Games.* This type of learning enables an employee to focus on practicing with real-life scenarios, and is typically conducted on-line. Using a “learning from information” approach, it is self-directed and involves specific modules, interactive games, coaching, and layered simulations. These practice cases provide a multitude of possible choices that help employees master specific competencies at their own pace.
2. *Collaborative Learning.* This approach allows employees to work with their peers in virtual classrooms, e-labs, and collaborative sessions to build awareness through live, on-line conferences and teaming. This learning approach is typically threaded, meaning there is an expert who posts the scenarios and continually focuses the discussions.
3. *Classroom-Based Learning.* Face-to-face discussions regarding information gained through the other learning approaches help the employees understand important lessons learned. This approach includes classroom sessions, mentoring, role-playing, and coaching.

According to IBM reports, the introduction of a blended learning approach has saved the organization $24 million annually in deployment costs of IBM’s newmanager training program, Basic Blue. IBM also reports that five times as much content was delivered through the blended learning approach as was delivered by the previous new-manager program (IBM Learning Solutions, 2004).

**SUMMARY**

The use of information communications technology is becoming widespread in corporations today. Worldwide, companies are committing themselves to maximizing the potential of the new technologies, to enhancing their training needs and programs, and to best reaching different, diverse, and geographically separated populations. The commitment to distance training requires both an enabling policy framework and an understanding of the way it can be integrated into the training process. E-learning, on-line learning, and blended learning have surpassed their status of “newness” to establish one more option to answer a need for information, formation, and personal growth.

We have seen that the unique features of Web-based technologies that allow for asynchronous communication between individuals who are widely dispersed across various geographical locations has led to the widespread and rapid adoption of distance education. It has been noted throughout this chapter as well that corporations are following the lead of educational institutions in adopting the use of these distance technologies for the training and education of large numbers of employees. Additionally, we introduced a new phenomenon, known as blended learning, which seeks to integrate the best features of face-to-face and distance training environments, and reported on a model for blended learning from IBM, a multinational corporation. If IBM’s success with blended learning is replicated by other corporations, we can be assured that blended learning will experience the widespread and rapid adoption that we are currently seeing with distance training technologies.

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S CHAPTER NINETEEN S

Innovations in Performance

Improvement with Mentoring

Margo Murray

T

he use of mentoring relationships as a strategy for performance improvement has been proven to work in all types of organizations. Since 1970, some researchers and practitioners have tracked results to demonstrate the added value of greater competence, stronger confidence, and loyalty of participants involved in mentoring processes. In updating this chapter of the handbook, I will include the key success factors for effective mentoring processes. In addition, I will describe some contemporary formats of people interactions that are being called mentoring.

Myths still abound when people describe mentoring processes. There are so many different structures and activities being called “mentoring” that it must be time to clarify what is mentoring and what is not mentoring. Let us start with definitions. When I began design of the first facilitated mentoring processes, in the late 1960s, the popular dictionaries showed *mentor* only as a noun.

Men·tor *n* [ Greek] 1. A friend to whom Odysseus, when setting out for Troy, entrusted his house and the education of Telemachus. 2. [F] Hence, a faithful counselor [*Webster’s New Collegiate Dictionary,* 1958 , 2nd ed. ].

Going to the latest on-line dictionaries we find a general definition, without as much as a nod to the Greeks or the French:

men·tor *n* somebody, usually older and more experienced, who provides advice and support to, and watches over and fosters the progress of, a younger, less experienced person [*Encarta World English Dictionary,* 1999].

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A second definition acknowledges contemporary usage with a transitive verb definition:

men·tor *vt*: to act as a mentor to somebody, especially a junior colleague [*Encarta World English Dictionary,* 1999].

These definitions are already outdated in current mentoring practices, in which the mentor is not always older, a senior, and the protégé is not always younger, a junior. Some of the most effective mentoring results are gained in pairs who are peers with different skill sets. Other examples are seen in which the mentor is newer to the organization, younger, and is bringing state-of-the-art skills needed in the organization.

In an attempt to bring some clarity to the foundation for discussion and examples used in this chapter, I will start with basic concepts and definitions of the terms. When I am relating an example from an organization’s mentoring process, I will employ terms used by participants in that organization. When striving for clarity and common understanding, I will use the terms that most clearly distinguish the roles and functions. The popular and frequently used terms are not always the grammatically correct ones.

Our working definition of mentoring is, “a deliberate pairing of a more skilled or experienced person with a lesser skilled or experienced one, with the agreedupon goal of having the lesser skilled person grow and develop specific competencies” *(*Murray, 1991, p. xiv). Often there is a lot of formality and bureaucracy applied to human resources and personnel programs. To avoid this with the mentoring processes, I chose the term *facilitated,* and defined it as “a structure and series of processes designed to create effective mentoring relationships, guide the desired behavior change of those involved, and evaluate the results for the protégés, the mentors, and the organization” (Murray, 1991, p. 5).

*Training* magazine reported that 77 percent of the “Top 100” companies have formal mentoring programs (Barbian, 2002). The article cited many different formats and designs of the rated companies’ mentoring processes. Some were targeted to specific groups and some were open to all employees. When I tried to get data on results, I found that many of those companies had conducted a pilot program for a few pairs and had only anecdotal data on the results.

Most of the published accounts of mentoring experiences are described in positive terms by both protégés and mentors. Occasionally, we do hear and read about some experiences that were unpleasant or destructive for the protégés and some that were less than rewarding for the mentors. Those negative experiences are most often reported from mentoring relationships that were informal, usually happenstance, and with no specific discussion or mutual agreement about the expectations of either partner. A Catalyst organization survey reported that only 23 percent of women and 17 percent of men are satisfied with the number of mentors in the workplace who provide them with career advice (Witt, 2004).

**Table 19.1. Key Success Factors for Informal Versus Facilitated Mentoring.**

|  |  |  |
| --- | --- | --- |
| *Key Success Factors* | *Informal Mentoring* | *Facilitated Mentoring* |
| Business goals  Internal ownership of program  Development of protégé’s skills and behaviors  Comprehensive orientation of protégés and mentors  Ongoing support for mentoring pairs  Measured results | Mentoring is not tied to goals; relationships are not tracked.  Ownership is unclear; there is little support or coordination.  Mentoring is often a more generalized relationship, with less-specific focus.  There is no orientation; generic training is not linked to the specific needs of the pairs.  There is no structured support.  There is little or no follow-up, with mostly anecdotal data. | Mentoring is linked to existing business initiatives; results are measured.  Ownership is by project coordinator(s) who are skilled in communication, negotiation, mediation, and evaluation.  Mentoring is focused on skill development and transfer of experience; also is linked to individual development plan.  There is comprehensive orientation to focus on roles, key success factors, the mentoring process, and goals.  FMP coordinators facilitate, mediate, and provide resources as needed.  Baselines are established during needs assessment; |

periodic evaluations measure results; results are linked to business goals.

When there is ongoing concern for return on investments of all types, a systematic approach to any performance intervention is necessary. It cannot be left to a lucky accident to develop employees to full performance potential. The information presented in Table 19.1 illustrates the comparative key success factors of informal and facilitated mentoring (Murray, 2001b).

More and more managers and leaders are turning to mentoring as a strategy for improving human performance in leaner, flatter organizations. An exceptionally competent workforce is seen as the most promising competitive advantage when technology has leveled the playing field for many businesses. Wide ranges of entering levels of knowledge and skills of workers make classroom instruction both ineffective and inefficient. Limited time for the myriad tasks in every worker’s job makes it essential for each learning experience to be focused on specific individual needs and skill gaps. Supervisors do not support “fluff training.” Some organizations are now describing themselves as “learning organizations” with the same fervor that many expressed when describing themselves as a “total quality organization.” The criteria for attaining the stature of learning organization are even fuzzier than for total quality. With many products and services there is a quality measure that can be communicated to performer, vendor, or customer with sufficient clarity to make it feasible to achieve. I have yet to hear any proponent of the learning organization goal articulate performance indicators in a way that observers would agree was an accurate description. A facilitated mentoring process, integrated into the culture of the organization and aligned with other human performance improvement processes, can create a continuous learning climate and earn the description of “learning organization.”

The impact of a mentoring process can be measured by tracking trends in the goals, needs, and opportunities of the organization. For example, an organization has a goal of increased profits through sales. A mentoring process is implemented to shorten the cycle time for salespeople to meet sales goals. The salespeople being coached by a mentor increase their sales significantly over other salespeople who do not have mentors. Our clients cite other positive measures such as increased retention of the right people who feel valued because of having a mentor. Another client measured reduced costs of on-the-job accidents when automotive service technician mentors wore their protective gear more consistently.

Individual learning and skill development can be measured with specific performance and development objectives, both before and after the mentoring experience. Kevin Wilde, vice president and chief learning officer for General Mills, relates the importance of individual development plans: “Part of the value proposition here is great development” ( Ellis, 2004, p. 22).

**MENTORING: THE PROCESS, ROLES, AND TASKS**

In current excellent practices with facilitated mentoring, the term *mentoring* describes the *process* that deliberately pairs two people with different skills and experiences with the objective of transferring those skills and experiences from the one who has them to the one who needs them.

*Mentor* is the *role* taken on by someone who is willing to help someone else learn and grow by agreeing to interact with this person to transfer experiences and skills. Mentors may perform several tasks in the process of their interactions with protégés.

These role *tasks* include but are not limited to tutoring, coaching, listening, counseling, teaching, modeling, giving feedback, demonstrating, giving information, facilitating desired performance, and guiding. To clarify what mentors may do in carrying out their agreed roles with their protégés, following are several examples of actual pairs in which the mentor is performing one or more of these tasks.

*Tutoring*: A graduate new hire engineer in petroleum exploration brings stateof-the-art technical knowledge in petrochemical engineering, particularly using computer modeling. She is paired with a mentor who is a highly skilled, experienced engineer who tutors her in how to communicate and negotiate effectively with contract designers of equipment. The role of mentor could shift at any given moment, for example, when the new hire passes on current technical applications.

*Coaching*: A sales representative in a sports apparel distribution firm has set an objective to strengthen her sales skills in order to improve sales results in her territory. Her mentor agrees to accompany her on sales calls to observe and coach her while interacting with a customer. Coaching is done just before the task is to be performed and by subtle and timely interventions during the sales call.

*Listening*: A personnel relations manager feels drained by the constant bombardment of complaints about company policy and procedures. He wants the mentor, who may be a peer or a colleague in another department, to just listen to his venting of his own frustration with policies that he must interpret, but that he sees no way to change at this time. He wants the mentor to keep these gripes in confidence.

*Counseling*: A recent college graduate is hired into a small public accounting firm. This “junior” is immediately assigned to a series of short-term auditing, tax-planning, and consulting engagements with clients, each led by a different engagement manager. Her “senior” mentor, having experience in all functions, fills the gap in counseling on career options in the firm by assisting her in exploring all the options and selecting an area of specialty before being promoted to senior.

*Teaching*: An electrical design engineer in an aerospace company sets a longterm career goal to become a general manager. His mentor, the controller, agrees to teach him how to develop financial analyses and business proposals.

*Modeling*: A commodity manager has an objective of gaining exposure to and awareness of upper-management activities. She asks her more experienced mentor to allow her to observe her mentor’s modeling of appropriate behavior with higher-level executives at business social events.

*Giving feedback*: A territory representative knows every feature and benefit of the product being sold. His goal is to further develop skills in handling customer visits effectively. The action plan agreed to with the mentor includes having the mentor observe several customer visits and give feedback on the quality of the interaction with the customer.

*Demonstrating*: A copy center manager has a long-term career goal of working in public relations, which will require good presentation skills. Her mentor invites her to a professional society meeting to watch him demonstrate how to make an effective presentation. Following the event they discuss the strengths and areas for improvement for the mentor.

*Guiding*: A technical services center representative has a development objective of learning how to prioritize career goals, and articulate and quantify mini steps to achieve the long-term goals. The mentor takes on the role and task of guiding the protégé in the process of determining the investment the protégé is willing to make in his own career development.

*Giving information*: A warehouse supervisor aspires to be the manager in her building. Her mentor provides information on company policies and procedures that managers must follow and interpret to their subordinates.

*Facilitating desired performance*: An experienced project coordinator recognizes that he turns some people off with his abrupt way of demanding progress reports. His mentor agrees to facilitate the development of project-management skills, and to focus on the project coordinator’s style of communication and interaction with members of the project teams.

*Feedback and coaching*: A combination of these two tasks is often applied by the perceptive mentor. A petite, Asian information technology specialist is frustrated during a meeting when her inputs are seen as sabotage by the project team. Her mentor coaches her to seat herself in the line of sight of the meeting leader to more easily gain recognition. She is also coached to make her recommendations early in the discussion before the other team members are committed to a potentially less effective strategy or solution.

One additional point may help to distinguish mentoring from on-the-job training. The immediate supervisor of the function or group conducts most on-thejob training. It is sometimes delegated to a team leader or the lead performer, and the objective is to produce or refine skills needed for performance on the current job.

**EVOLUTION OF THE MENTORING CONCEPT**

The principles and practices of modeling and mentoring have been key elements in the continuity of art, craft, and commerce from ancient times. In arts and crafts guilds a young person was apprenticed to a master who was considered to be excellent in the trade or profession (Murray, 1991, 2001a). The master taught, coached, and guided the development of skills in the trade or art. To become a master, the apprentice’s skills were judged from a work sample, such as a painting, or even a horseshoe. The word *masterpiece* originated from this sample of skillful work.

The traditional picture of a mentor was of an older, long-service person who selected his own protégés and took these lucky individuals firmly under one wing to guide their life-time career development. This picture has finally faded. Occasionally there may even be a dark side to mentoring relationships. I have heard about mentors who use the protégé for work projects, take credit for the work, sometimes abuse the relationship and the mentoring partner, and refuse to let go when the protégé has outgrown the relationship. Mentors often complain that the *neophytes* attached themselves to their coattails and expected to be carried along to success with little personal effort. That describes what we would define as a *role model* or *sponsor* ( Murray, 2001a ).

The skills required of the new masters are as different from those of the apprentices of yore as the high-tech clean room is from the blacksmith shop. Yet the process by which the skills are learned, one to one, is very much the same. Certainly mastering an art, craft, or profession increases one’s marketability in diverse workplaces. Flexibility is essential when workplaces include people from dozens of different cultures. Enabling the transfer of the requisite skills and experiences in a facilitated mentoring process can strengthen this flexibility.

Different Structures Called Mentoring

Many different formats and structures are called “mentoring.” I will briefly describe a few of the more popular ones and mention some of the pluses and questionable aspects of each.

**Facilitated One-to-One Pairings.** This format has proven to be a cost-effective strategy for transferring skills and experiences. Ideally the match is based on assessed and perceived skill deficiencies or lack of experience of the protégé. The mentor selected for the match is one with mastery level in the needed skills and the desired experience.

*Pluses*

* Coaching is targeted to specific skills and competencies.
* The protégé’s privacy is protected.
* Both achieve maximum efficiency of time.
* Coaching sessions are easily scheduled.
* Results are measured.

*Questionable Aspects*

* The mentor may have limited time for one partner.
* There is deep investment in an individual employee.

**Reverse Mentoring.** *Reverse mentoring* is a term used by some corporations and agencies to describe a process of pairing a lower-level, sometimes newer person with a higher-level executive or administrator. The purpose is usually to provide an opportunity for the senior person to get direct input from the “shop floor.”

*Pluses*

* People may learn about the organization’s direction.
* The mentor’s ego is stroked.
* The protégé feels valued.

*Questionable Aspects*

* Lower-level people will not “rat on” their bosses.
* Both parties are accused of favoritism.
* Expectations are often thwarted. The mentor is not at all likely to violate policies or bypass standard procedures for promotions or plum assignments.
* The protégé is the target of jealousy by peers.
* The protégé will not reveal areas of needed growth, and thus does not grow.
* There is no measurement of outcomes.

**Group Mentoring.** Organizations using what they call “group mentoring” are citing shortages of mentors as the reason to create groups. Protégés see this as an easy opportunity to network with their colleagues. They find safety and anonymity in the group, particularly if they are reluctant to voice dissatisfaction with policies or procedures to their bosses.

*Pluses*

* The mentor’s time is spent with more people.
* It helps expand protégés’ networks.

*Questionable Aspects*

* Employees are unlikely to express skill deficiencies in a group.
* Competitiveness is increased.
* There is no measurement of results.
* Time is wasted for some participants who already have the skills being discussed.

**Circle Mentoring.** Patterned after the quality circles, *circle mentoring* is another term used for group processes. Usually the participants are peers who are coming together periodically to exchange ideas and strategies. The Mentoring Company, the organization that developed and trademarked Mentoring Circles, uses storytelling in circles in which participants share with one another their successes and failures (Tahmincioglu, 2004). What one person has learned can be passed on to the others, thus saving trial-and-error learning for some. The downside is the same as for group processes.

*Pluses*

* Peers can network.
* Sharing lessons are learned.

*Questionable Aspects*

* Employees are unlikely to express skill deficiencies in a group.
* Feedback is not specific.
* Competitiveness is increased.
* There is no measurement of results.
* The return may not justify the time invested.

Whether the mentoring pairing is up, down, or sideways, the objective of skill and experience transfer remains the key. As cited in the listings of pluses and questionable aspects above, in some formats this transfer is unlikely to happen.

**ECONOMIC IMPACT OF SKILLS LOSS**

The lack of basic skills throughout much of the workforce, and the growing shortages of workers with specific skills that are increasingly needed, create a danger that the American economy will drift into what economists call a “low skills equilibrium.” . . . [T]his can set in motion a cycle that will have destructive effects throughout our economy, and for a long time to come [Task Force on Workforce Development, 2004. p. 5].

Mentoring processes can be designed and implemented to support a wide range of business imperatives. Technical and professional skills transfers are prime examples. Susan Meisinger, president of the Society for Human Resource Management, cites this skills shortfall as a major reason for “offshoring” and alerts businesses that “A skilled workforce is vital for America’s future economic health” (Meisinger, 2004 , p. 12). With the imminent retirement of baby boomers in the United States and other countries, there will be a huge loss of investment in intellectual capital. This loss can be avoided by having retirees become mentors and passing on their skills and knowledge before departure.

Cultural Due Diligence

Global firms and organizations hiring employees with widely differing ages, education, cultural experiences, physical abilities, gender, and ethnic backgrounds are experiencing severe impact on results when the lack of awareness and sensitivity to these differences results in breakdowns in communication. Articles in recent professional journals have added religion and sexual preference to the lists of subjects for manager and supervisor training. Even unintentional offenses may result in loss of customers or legal actions. A very common problem is substandard performance due to misunderstanding of assignments when the language or communication style is different. For decades, organizations in the United States have tried mass approaches to these issues with mixed results. The popular social responsibility training of the 1960s, race relations seminars of the 1970s, T-groups of the 1980s, and diversity workshops of the 1990s have for the most part failed or fallen short of desired outcomes. The increasing diversity of the workforce (U.S. Department of Labor, 1999) will necessitate that people value the differences between themselves and others in the organization, and realize that strength comes from having multiple ways of solving problems and seizing opportunities. Preaching at groups of people that they really “oughta wanna” like people who are different from themselves has not worked. Informal mentoring relationships have actually exacerbated the problem, as many self-appointed mentors proceeded to clone themselves in their protégés. Deliberately pairing people who are different in education, age, culture, gender, or whatever has resulted in both partners coming to respect and value their differences. When working together one to one with an agreed goal, it is easier to see the strength that derives from diversity. Mentors who are matched with partners in different countries often comment on how the international experience is helping them communicate with all members of their work teams more effectively.

Professional or Technical Skills Transfer

Rapid changes in technology have leveled the playing field for many businesses. At the same time, those technological advances have made traditional training in group courses or classes less effective and certainly inefficient. When the extant knowledge and skills vary widely, group training that is aimed at the average learner probably hits the mark for only about 15 percent of the participants. The other 85 percent are forced to sit through “nice to know,” or irrelevant, content. At the very least, some find the pace too fast, while others are bored with the slowness. Some find the learning process to be of an appropriate style and others are confused or annoyed by it. When training is focused on specific technical or professional skills deficiencies, the motivation to learn is much higher and the process more efficient.

Mentoring processes are often designed to match technicians or professionals who are peers in order to facilitate the transfer of skills two ways. This broader skills base makes each of the participants more flexible and more readily assignable to a different function in the organization. Obviously, this increases their value to the organization as well as their ability to sustain their motivation for peak performance.

**KEY ELEMENTS TO MAKING MENTORING WORK**

The keys to implementing and sustaining an effective mentoring process track with those of any successful performance-improvement process:

* Identification of need, goal, opportunity, and readiness
* Planning and design: alignment with other performance support and improvement strategies
* Communication to all stakeholders
* Agreements on criteria for matching mentors and mentees
* Orientations and training for participants
* Development plans, which are essential to healthy relationships
* Evaluation and continuous improvement

The types of organizations that have implemented facilitated mentoring processes run the gamut from those in the aerospace industry to universities. The added business value they seek varies just as widely. The following notable examples were selected from more than fifty organizations that I have studied, all of which have facilitated mentoring processes in place.

*Banking:* When a rapidly growing bank put an aggressive marketing strategy in place, it changed the core skill sets required of officers and managers. New managers with marketing and sales experience and skills were recruited from financial institutions such as brokerage firms, from sales jobs in real estate, and from management positions in retail merchandising. The gaps in their experience and skills were in the banking services and products (Wells Fargo Bank, 1998) . A “map” of development was designed involving mentors, who coach on specific skills needed as well as help put into the context of retail banking the competencies already possessed by the new managers.

*Community foundation:* Even before the federal laws were passed to limit the time that welfare benefits would be provided to needy families, some community foundations saw a need to help people develop job seeking and keeping skills. In a midwestern city a community group obtained funding from the Kellogg Foundation to pilot test a mentoring process for women on welfare.

The targeted women were each matched with a successful—that is, employed— female mentor. Formal training sessions were scheduled for the mentors and mentees; their subjects ranged from home expense budgeting to how to resist an aggressive salesperson at the door. Mentees reported successes in obtaining jobs, going back to school, and ending abusive personal relationships.

*Computer manufacture, sales, and service:* A large computer manufacturing company’s reengineering efforts created a strategy of customer solution selling, to improve results in this highly competitive industry. Previously, there were specialists with hardware, software, and customer services skills. The mentoring process matched these specialists across functions to enable them to transfer their special skills and experiences. The lead coordinator reported that on eleven essential job skills, protégés increased their measured skill levels by an average of 61 percent (Duncan, 1995). In addition, these participants demonstrated measured gains in nine of eleven career-effectiveness skills measured with a skills-assessment instrument.

*Financial:* The credit card division of a bank experienced unacceptably high turnover in the Customer Service Representative position. Quality and productivity results were also below standards. A comprehensive job and task analysis revealed that all new hires were scheduled for twenty days of training in a lock-step-format, trainer-led and -paced program. The target population analysis showed that many of the new hires had extensive customer service experience, some had strong computer skills, and a few had actual credit card product knowledge. The training format was revised to be learner-oriented, with a combination of trainer modeling, self-study with print materials and computer help screens, and coaching with a mentor. Areas for mentor coaching included defusing the anger of customers with questions about their bills, navigating through complicated computer screens of customer history, and job performance planning with supervisors. In less than six months the average training time dropped to fourteen days, retention of desired employees increased, and the quality of service improved.

*Health care product distribution:* In a health care product warehouse, a mentoring process was implemented to improve retention of warehouse workers and to improve communication across functions. Results were that 18 percent of the warehouse workers were promoted or made lateral moves into other functions in the company in the first year (Garcia, 1994).

*Highway engineering:* An aging workforce in manager and higher-level administrator ranks caused an engineering agency to examine why they were losing bright young engineers after four years on the job. The formal training ran about twenty-seven months, so these losses meant a high cost to the agency. Employees saw that older, longer-service people tended to identify and bring along people very much like themselves in terms of education, gender, and ethnicity. The message sent to those outside that group was that there would be no opportunity for them, so they left. The regional administrator made the decision to implement a mentoring process that would make these valuable developmental experiences equitably available to everyone in the organization.

*Information systems:* I was asked to train mentors for a supplier of largescale information systems. The average sales cycle was nine months. Mentors were experienced salespeople, and it was thought that they would not be willing to coach new salespeople for fear of adding to the competition for their own jobs. The orientation workshops for these mentors communicated the benefits they would get from taking on this added role. One mentor joyfully related to other mentors that his partner, or protégé, closed her first big deal in just three weeks!

**RETURN ON INVESTMENT: PERCEPTION AND REALITY**

Since 1971, I have conducted workshops and collaborated with clients on implementation of mentoring processes in Argentina, Australia, Egypt, Ethiopia, Finland, India, Ireland, Korea, Pakistan, Philippines, Taiwan, Trinidad, The Netherlands, Sweden, the United States, and Venezuela. In the *readiness assessment* phase of this work, we ask clients to identify expected benefits to mentors, protégés, and the organization. At the beginning it is essential to dispel prevailing myths and clarify whether expectations can become reality. This process also enables us to capture baseline data for evaluation of the unique benefits of mentoring to an organization and the participants.

Unless a clear linkage can be made to organizational goals, needs, and opportunities, it is highly unlikely that a mentoring process will survive. Unique benefits to the supervisors or team leaders of both mentors and protégés are often overlooked.

In the following paragraphs are a few examples of the many benefits reported by mentoring participants in many countries in a wide range of organizations, such as manufacturers, oil refineries, municipal and superior courts, telecommunication, transportation, financial, and many others.

Benefits to protégés are the first to come to mind. These benefits are expressed in various ways in the organizations and cultures within which we work. The following results have been measured through analysis of development plans, checkpoint surveys, and self-report of participants. They are grouped into some specific categories, with verbatim comments noted.

*Greater understanding of business objectives:* Increased organization awareness and a clearer understanding of corporate culture and goals are often cited as gains by participants in mentoring processes. Exploring these phenomena revealed that mentors are much more likely to provide information on the mission, goals, and future direction of the organization than are line supervisors.

Some protégés also describe a deeper sense of accountability and feeling that their contributions matter.

*Focused development:* When learning activities are focused on specific diagnosed needs, skill development is far more effective and efficient. Learning from a mentor’s experience avoids costly and demotivating trial and error. Mentors can put into context the importance of training, which fosters more rapid use of relevant skills. One protégé in a small engineering firm said, “In one hour of coaching with my mentor I solved some problems I had been struggling with for four months.”

*Learning in a nonthreatening environment and process:* Fear is a fierce obstacle to learning. Few of us would tell our bosses about all of our weaknesses or lack of experience. Mentors provide safe environments to practice skills. “I found it was OK to be wrong, learn from my mistakes, and ask stupid questions. I could be real.”

*Productivity:* Appraisal and evaluation ratings are higher. This may be partly attributable to the protégés’ greater skills with planning, negotiation, and feedback when interacting with their supervisors. Another possible variable is the “Hawthorne effect,” that any extra attention improves performance (Franke and Kaul, 1978).1

*Possible advancement:* Advancement is accelerated with guided career paths and without time-consuming, irrelevant assignments. With clarity of direction, people are more likely to develop skills for taking on greater responsibilities. Even when there are few promotional opportunities, greater competence, confidence, and visibility make people more competitive for every opportunity. The Tasmanian Department of Justice perceived that women were not competing successfully for management positions. Development plans included a combination of individual coaching with mentors and group training in areas of common needs. Evaluation after twelve months showed that three mentees, or protégés, had taken up extra tertiary studies; two had been transferred to more challenging positions; one was promoted to middle management; and one had been reclassified to a higher grade level.

*Political savvy:* Participants report they gain greater insight into the maze of politics in their organizations. This makes them feel more confident and powerful as the mentoring process accelerates their acceptance as an insider.

*Career resiliency:* “The smart and successful will be preparing for career resiliency” (“Margo Murray on Mentoring,” 2002, p. 1). Directed learning activities shorten the cycle time in gaining experience to work effectively in different functions. When changes in markets, products, services, or the economy cause some functions, or entire jobs, to disappear, people with broader experience and multiple skills will land on their feet in a different function or a new organization.

*Increased visibility:* With the hectic pace of demanding jobs, line managers are, perhaps understandably, lax in giving each of their subordinates the visibility and exposure that may be beneficial. “In the mentoring process I feel noticed and visible; it has expanded my network base immensely.”

*Increased valuing of diversity:* Exposure to different cultures broadens our understanding of the increased strength of varied approaches. A very weak organization is created when everyone is educated in the same schools, solves problems in the same way, and has the same narrow view of the world.

*Team building:* Learning to work closely with another person tends to make it easier to be a contributing member or a leader of a team. “I found that it strengthened my ability to work more effectively with my team.”

*Fuzzier benefits reported by protégé participants:* “It was good to have a sounding board,” “Gives me another avenue for information,” new friendships, fun, “I feel that the organization cares about me,” “I feel welcomed,” increased loyalty, receipt of honest feedback, “My mentor had more confidence in me than I had in myself.”

Benefits for the Mentor

One of the greatest challenges for a performance technologist in implementing and sustaining a mentoring process is the task of recruiting good mentors. In Finland and Canada, we found that shy people were reluctant to volunteer as mentors yet readily agreed when invited to participate. Even more of a challenge is how to reward mentors in appropriate ways to maintain their motivation to keep agreements with their partners. Some of the key personal and professional motivators a facilitated program can offer are the following.

*Enhanced influence in the organization:* Mentors are respected for the value they add in the development of future leaders of the organization. Mentors extend their influence on the mission and direction of the organization through their partners.

*Developmental needs of the mentors are met:* The mentor’s skills in coaching, performance planning, and feedback are honed by working with protégés with varied skills and experiences. Protégés often teach their mentors new skills.

*Professional assistance on work projects:* The protégé may have a technical skill relevant to a project the mentor wants to have done. When a task can be taken as a learning experience by the protégé, additional work is accomplished for the mentor, although I caution that such tasks must be relevant to the development objectives of the protégé, not just working as an extra pair of hands for the mentor. As a mentor once said, “I am amazed at the creative and innovative input the protégé brought to this project.”

*Maintenance of motivation:* “I was just burned out with more and more of the same old work,” stated one mentor. “The fresh viewpoint of my partner sparked my enthusiasm and motivation.”

*New perspectives about the organization from the protégé’s fresh point of view:* Often managers and executives are shielded from problems at operating levels when there is fear among employees that the messenger will be shot.

Problems and issues are more openly discussed when there is a bond of trust with a mentor.

*Having ideas challenged:* Experienced and competent people may become complacent about decisions they make and strategies they use. It can be a career-limiting move for a subordinate to challenge a superior’s decisions or actions. Working with a protégé who asks *why* something is done a particular way may cause the mentor to examine approaches used and find they are outdated and ineffective. Many mentors urge their partners to challenge their thinking, and apparently enjoy the intellectual exercise more than the passive “Yes, boss” often heard from their direct reports.

Organizational Benefits

In lean times, and when most organizations are trying to do more with less to stay competitive, no program will be supported unless it contributes to the overall desired results.

Our thirty-plus years of experience and current research reveal some significant and exciting outcomes of *facilitated* mentoring relationships. The impact on the work environments as a result of mentoring experiences is remarkable. When people are more competent, knowledgeable, and confident, they contribute more to the bottom-line results of the organization. In Finland a female lawyer new to the banking world was responsible for specific reform projects in the bank. A chief with extensive experience outside banking and now in bank management was matched as her mentor. They acknowledged the value of the experience: “We discussed many ideas at first felt to be too wild, then brought them into concrete forms.” As a result of this collaboration, costly projects unsuitable to the banking environment were avoided (Petäjäniemi and Mansukoski, 1998).

Multiskilled, flexible people add greater value to downsized, leaner, and flatter organizations. They can move across functions and work with different technologies. Furthermore, they are more loyal to the organization, more likely to sustain their own motivation, and more likely to support necessary change.

Organizations are now implementing evaluation processes to measure the impact of the mentoring process on the organizations’ results, as well as on the skills and experience levels of the protégés and the mentors. Following are some of the measured results attained in facilitated mentoring processes.

*Increased productivity:* Improved performance and productivity are reported by both mentors and protégés. Protégés’ skills are strengthened, enabling them to work more effectively and efficiently. Developmental projects carried out by protégés often assist mentors with their work.

*Cost-effective development of skills:* Most mentors report that the coaching of protégés is done on their own time, at no out-of-pocket cost for the organization. When mentoring is used as an alternative training strategy, employees get to competency quicker at less cost than in classroom training formats. When training is individually based and self-paced, it is “just in time” training.

*Cost avoidance:* The Sacramento Superior and Municipal Courts reported savings of over $6,000 when a protégé working with a mentor to prepare for the job of electronic recording monitor discovered that she did not like or want the job ( Capaul, 1996). Terminating the six-week training process after short meetings between the protégé and the mentor not only saved the courts potential training costs, it saved the self-esteem and job satisfaction of the protégé, who avoided a wrong career move.

*Recruitment efforts:* Prospective employees are attracted to a firm that offers facilitated growth and development. A recruiter told me he interviewed more than one hundred business school graduates for management trainee positions in a large paper pulp manufacturing business in Canada. He was surprised to hear two-thirds of them ask if the company had a mentoring process.

*Increased retention:* The best and brightest people stay with a company that cares about their development. A doctoral dissertation study of high-technology firms revealed it cost $577,000 to replace an entry-level engineer who left after one year (Melnarik, 1998). Although the high-tech job situation has changed drastically since that study, the cost of replacing contributing employees is still significant. Alternatively, with better career counseling, sometimes the people who are good losses leave sooner.

*Enhanced image of the organization:* Public recognition that the organization provides a caring, developmental environment, including a mentoring process, can enhance the corporate image. Most of the “Top 100 Companies” have mentoring processes in place (Barbian, 2002, p. 38).

*Achieving strategic goals:* In the performance-improvement projects we have carried out, the evaluations show that organization results are better when everyone knows the targets. Sharing mentors’ experiences helps others avoid making the same mistakes. More competent and confident employees produce better results, creating a competitive edge. During a time of rapid change in one company a participant commented, “This process gave us an element of stability, and gave me an anchor, in a time of chaos.”

Benefits to Supervisors

It often surprises coordinators to find that supervisors of protégés recognize that they can benefit directly by having their people work with a mentor. This is a sensitive area, and a potential pitfall, if not managed well. It is essential that all managers and supervisors of intended participants be briefed on what the mentoring process is and is not, and on the roles and responsibilities of all participants. Otherwise, it is easy for the supervisor to feel resentment and to feel threatened by having this third person involved with a subordinate.

Supervisors have reported these types of benefits: “It gave me another resource for supporting employee development.” “I’m stretched pretty thin with day-to-day operations and have little time for people’s career development; this helped.” “I was promoted to this job on the basis of my technical expertise, and have had no training in career development stuff.” “My employee got better with performance planning and communicating with me. That helped both of us.” From one organization I received a copy of a message sent from the supervisor to the mentor expressing thanks for helping with a serious communication and motivation problem that the supervisor had not been able to handle.

**PITFALLS AND PREVENTIVE ACTIONS**

In workshops I facilitate at international conferences, I often ask the audience to play a game of “Ain’t It Awful!” With any new idea or intervention, you can always count on someone to counter the proposal immediately with, “Yes, but it won’t work here because. . . .” Brainstorming about “ain’t it awful, that won’t work here” surfaces potential pitfalls. Once these pitfalls are articulated, they can be tackled with one or more problem-solving strategies to determine how to prevent them from jeopardizing the potential success of the new program. Following are just a few of the potential pitfalls, and the strategies that may prevent them, gleaned from work done by many dedicated coordination team members in the MMHA Mentoring Coordinator Development Institute.

*Pitfall: It has been tried before.*

* Clarify exactly what the facilitated mentoring process is.
* Get people who are pro and con involved in development.
* Show that mentoring is what our competitors are doing.

*Pitfall: There is a lack of adequate resources.*

* Show proof that it reduces training costs.
* Relate benefits to organization goals and objectives.
* Present a success case: best practice, benchmarking.
* Show cost avoidance with better retention of staff.

*Pitfall: Protégés are not willing to risk being open.*

* Have the pair sign a confidentiality agreement.
* Establish level of disclosure on both sides.

*Pitfall: Program is viewed as for certain people; it is exclusive.*

* Clearly define the business case for the process.
* Establish clear, thorough communication as to what it is and what it is not.
* Align the mentoring process as one human resource strategy.
* Offer resources used in the process to others.

*Pitfall: There is a lack of mentors.*

* Provide a clear process for volunteering.
* Communicate the benefits for mentors.
* Protégés nominate several choices to be mentor.
* Tie performance as a mentor to the mentors’ key results areas and reviews.

*Pitfall: The ideal or only pairing is across a great geographical distance.*

* Leverage technology: use e-mail, faxes, and telephones.
* Establish a budget for travel.
* Schedule coaching sessions during other meetings or vacations.

*Pitfall: There is potential for the “tall poppy” or “heir apparent” syndrome.*

* Use briefings to communicate goals and objectives.
* Design for open entry, open exit, and individual applications.
* Get all stakeholders involved in the process.

*Pitfall: There is conflict between the mentor and the protégé’s supervisor.*

* Clearly define roles and responsibilities.
* Emphasize benefits to both.
* Communicate the rewards for the supervisor.

*Pitfall: It is difficult to maintain mentor commitment.*

* Review “1001 Ways to Reward and Recognize.”
* Provide formal evaluation and credit.
* Reward with “face time” with executive who has status.
* Tie to team performance bonus.

*Pitfall: It is seen as the “flavor of the month” or a “magic potion.”*

* Link to organization goals.
* Make it a consistent part of management responsibility.
* Be sure the process includes regular reviews, publicized successes.
* Get high-level support for three years minimum.
* Show how mentoring is aligned with other human performance technology strategies.
* Provide feedback on results, success stories.

One pitfall in any mentoring process, whether pairings are facilitated or informal, is that the mentor may take on an advocacy role for the protégé. Organization policies may restrict the extent of this advocacy. For example, in one federal agency, a board or panel of administrators decides all promotions. The mentoring process guidelines explicitly prohibit any mentor from participating on the promotion board when that mentor’s protégé is a candidate for the promotion.

A more likely situation is that the protégé expects the mentor to take on the advocacy role. The role of the mentor is a critical subject in discussion of the agreement between the pair. When no policies constrain such advocacy, the mentor must describe exactly how support for the protégé may be demonstrated.

**SYSTEMATIC DESIGN**

*Analysis:* This phase of the “front end” work we have chosen to call a “readiness assessment.” Some organizations want to have a mentoring process in place just to say they have one, whether or not it fills an assessed need. Performance technologists have learned, sometimes by bitter experience, that a client often wants something that is not necessarily needed. To avoid the obvious turn-off of a client, and the loss of business, calling the needs assessment a readiness assessment is often more acceptable. The purpose is still to determine the needs, goals, and opportunities the organization is facing when considering a facilitated mentoring process. This assessment includes scanning the work environment to identify commitment to and support for mentoring, as well as any indicators of resistance or objection to the proposed process. We strive to interview the top managers, administrators, decision makers, and opinion setters in one-to-one sessions. The objective is to get the widest range of opinions and expectations. In addition, we elicit data on goals, needs, and opportunities the organization is facing that may or may not be supported by a mentoring process.

*Design and production:* One of the critical success factors for mentoring is that the process be designed to fit the environment and culture of each unique organization and the identified target populations of participants. As with any performance-improvement intervention, it is essential to conduct a pilot test of the design and implementation processes to ensure they will achieve desired outcomes reliably. Good instructional design strategies are vital to selecting and producing the relevant and adequate resources needed by participants. For example, mentors matched with a protégé on the basis of the protégé’s jobspecific skill deficiency may lack the requisite skills in coaching and feedback, making it necessary to design skill practices to fill these gaps.

Data gathered in the readiness assessment phase enables us to design relevant briefings and orientations for the mentoring process participants.

*Implementation:* Any instructional or nontraining performance-improvement intervention must have an implementation plan. A critical success factor for a mentoring process is a communication plan, which ensures that everyone who needs to know something about the mentoring process gets that information on a timely basis. A well-designed mentoring process has a coordination team to administer it and ensure that it is sustained as a viable strategy for improving human performance and results.

*Evaluation and continuous improvement:* Evaluation of mentoring processes, and mentors, may take several forms. First, an evaluation process for the process itself must be planned at the beginning. Key baseline data must be captured before information about the proposed process begins to contaminate it (Murray, 1991 , 2001a). The evaluation plan must be crafted to capture only data you intend to use. Begin by asking the question, What will we do with the data? Examples of useful data include those needed to

* Report impact of the process on organization results
* Continuously improve the design of the process
* Determine that the mentoring pairs are meeting development objectives in the transfer of skills and experiences

In addition, mentors’ effectiveness must be evaluated by the mentor and protégé jointly agreeing on progress in transferring skills, willingness to share information, and the degree to which agreements about time and focus are kept.

**CHALLENGES OF SCALING UP**

When a mentoring process pilot has resulted in benefit to the organization and the participants, most want to expand the process to include key groups of employees. Some believe it is only fair to open the process to all employees. This presents a challenge when the workforce numbers in the thousands. Some organizations have implemented software systems to allow participants to create their own matches on-line. The results are mixed. Protégés do have more control over whom they seek as a mentor. However, they may choose because they want a sponsor rather than on the basis of assessed skill deficiencies. Popular mentors are often overwhelmed with requests. Some who are not well-suited to the mentor role do volunteer. The initial match is only the first step in the process. If the participants are not prepared for a successful interaction—orientation and training—they will not have a good experience. “Training both mentors and mentorees for their roles in the mentoring process is vital to the success of the program . . .” (Drahosz, 2004, p. 101).

An on-line matching process was implemented by one of the U.S. military branches in 2000, and has continued to be available. We were told by the administrator that usage by participants is not tracked or evaluated.

When there is no monitoring and tracking of what is happening with the pair, many of the pitfalls described above are likely to occur. Worse yet, with no evaluation there is no evidence that the several-thousand-dollar investments had any meaningful return.

**CONCLUSION**

Probably the most beneficial application of a mentoring process in the near future will be selecting mentors to transfer tacit knowledge. Every organization has an enormous investment in the intellectual capital of its experienced employees. Knowledge management, including the systematic cost containment of intellectual capital, will be demanded of the executive team by astute corporate boards of directors.

Results of mentoring processes are not accidental; they do not happen by chance or magic. The key to ensuring desired results and continuity of the mentoring process is to use all the best practices of human performance technology in the needs assessment, planning, design, implementation, and evaluation stages. Mentoring must be closely linked to the mission, goals, and priority strategies of the organization. Standalone programs are extremely vulnerable to economic downturns, budget cuts, and changes of affection. Only integrated, facilitated processes linked to current and future mission and business imperatives can be expected to stand the buffeting of the winds of change. Rapidly changing environments demand multiskilled, flexible workers, and mastery levels of core competencies. A mentoring process facilitates the essential performance improvement.

Note

1. Individual behaviors may be altered because the performers know they are being studied. This phenomenon was demonstrated in a research project (1927–1932) at the Hawthorne Plant of the Western Electric Company in Cicero, Illinois. This result of this series of research studies, first led by Harvard Business School professor Elton Mayo, is commonly called the Hawthorne Effect.

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| S | CHAPTER TWENTY | S |

Motivating Individuals,

Teams, and Organizations

Richard E. Clark

*Motivation is [defined] in terms of selection of pursuits from competing alternatives, intensity of effort, and persistence of exertion.*

—Bandura, 1991, p. 158

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olid evidence supports both the need for and the benefits of motivational programs at work. For the past two decades the most comprehensive surveys of attitudes toward work demonstrate a disturbing but consistent lack of motivation among employees at all levels in all types of organizations. Approximately 50 percent of North American workers confess that they do only the minimum to avoid being fired, and about 80 percent admit that they could work “much harder” (Spitzer, 1995; Buckingham and Coffman, 1999). Popular wisdom would suggest that managers in top organizations are more motivated than line workers, but this seems not to be the case. In two recent combined surveys of eighty thousand managers in four hundred organizations, the Gallup Organization found that the motivation of managers is as low as that of the people they supervise (Buckingham and Coffman, 1999). Other studies have reported clear links between organizational change cycles and work motivation, suggesting that as the momentum and extent of organizational change increase over time, work motivation decreases (Storseth, 2002).

Another body of studies testing different motivational strategies, conducted in small and large organizations, supports the claim that a well-designed and

Some of the ideas presented in this article are taken from R. E. Clark and F. Estes, *Turning*

*Research into Results: A Guide to Selecting the Right Performance Solutions,* Atlanta, CEP Press,

2002; from R. E. Clark, “Fostering the Work Motivation of Individuals and Teams,” *Performance Improvement,* 2003a, *42*(3) , pp. 21–29; and from other published and unpublished work by the author. Please address questions or comments to Richard Clark by e-mail at clark@usc.edu.

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carefully implemented motivational program can have a very positive effect on performance. Condly, Clark, and Stolovitch (2003) reviewed all well-designed motivation studies conducted in business and government settings and reported that when employees were offered money for improving their performance, individual performance increased an average of 20 percent over the short term, about three months, and over 40 percent in longer-term programs, from six months to a year. Even more dramatic was their report that team performance increased over 40 percent, even in short-term programs. Similar reports of performance benefits from motivational programs have been described in booklength reviews by Bandura (1997), Buckingham and Coffman (1999), Clark and Estes (2002), and Pintrich and Schunk (2002).

Because nearly all performance-improvement efforts are currently focused on training, we should be asking about the relative increase in performance benefits we could expect from adding motivational-improvement programs to our organizational toolkits. A recent comprehensive review by Arthur, Bennett, Edens, and Bell (2003) of research on the impact of training on performance over the past forty years reported an average 19 percent performance gain overall. The percent gain was lower in studies that were more adequately designed. The authors pointed to evidence that the factor that seemed to prevent training from having a greater impact on performance was the motivation to transfer and use the skills that had been learned. The greatest benefit they reported was in the area of interpersonal skills training, which resulted in a 27 percent performance gain.

It appears that motivation programs are at least as effective as training in boosting performance by individuals and teams. While most large organizations have formal training units and make a considerable investment in training each year, motivation seems not to be on anyone’s radar at the moment. Is motivation the vehicle that will take us to the next level in performance improvement? The purpose of this chapter is to provide a current overview of what we know about work motivation. After defining motivation and describing how to identify a motivation opportunity, the causes of and solutions to a number of common motivational issues will be discussed. An attempt will be made to distinguish between individual, team, and organizational motivation issues.

**WHAT IS MOTIVATION?**

All motivational performance analyses begin by examining progress on three goals: starting, persisting, and investing mental effort. Motivational performance gaps occur when performance goals are not achieved because of problems with one of the three motivational goals: (1) when we avoid starting or refuse to start something new, or something familiar that we have not done for some time, this is an active-choice failure; (2) when we stop or pause when working on something that is important and switch our attention to a different task, this is a persistence failure; and (3) when we refuse to work smart and invest mental effort to succeed at a novel challenge and instead use old and familiar but inadequate solutions to solve a new problem, this is a mental effort failure (Clark, 1999; Pintrich and Schunk, 2002). According to most of the top experts in motivation, one or more of these three conditions must exist for us to say we have encountered a motivation problem or opportunity. Motivation is the psychological and social process that starts and maintains goal-directed performance. It energizes our thinking, fuels our enthusiasm, and colors our positive and negative emotional reactions to our surroundings. Motivation helps us generate the mental effort that drives the application of our knowledge and skills to solve problems and seek opportunities. When we need to learn something new to achieve a goal, motivation provides the initiative and keeps us moving when we encounter difficulties. Without motivation, even the most capable expert will fail. Motivation nudges us to convert intention into action and start doing something new or to restart something we have stopped. It also controls our decision to persist at a specific work goal in the face of distractions and competing priorities. Finally, motivation leads us to invest more or less mental and physical effort to enhance both the quality and quantity of our work.

It is crucial to note that motivation does not directly influence work performance. Instead, motivation leads us to use our knowledge and skills and apply them effectively to work tasks. It is the force that initiates, starts, energizes, and continues the application of our experience and expertise. Successful performance always involves the cooperation of motivation and knowledge in supportive work environments. Without adequate knowledge, motivation alone does not increase useful performance. Thus, adequate motivation is necessary but not sufficient for effective performance.

What Causes Motivation?

After more than a century of research and argument, motivation researchers and practitioners now begin to agree that nearly everyone is willing to start, persist, and invest maximum effort in activities that they believe will make them more successful and effective. Whatever we think gives us more control is motivating, and, conversely, whatever takes away our control limits or destroys our motivation. We all value the goals, working conditions, and incentives that we believe will contribute to our success. We avoid situations that will prevent us from achieving our goals. For example, money is a nearly universal motivator because it can be exchanged for most, if not all, of the things most people define as “success.” Whether we call motivational tools “reinforcement,” “incentives,” “drivers,” “inducements,” or some other quasi-technical name, they only motivate when they are perceived as giving us more control and making us more successful or effective. Conversely, we avoid conditions that we think will delay, inhibit, or prevent control or success.

What makes motivation a complex issue is that different individuals, groups, and cultures have very different beliefs about what exactly defines control, success, or effectiveness. People working in teams may define success differently than when they are working alone. The same person may be motivated very differently in different settings; for example, when he or she is with family as opposed to relaxing with friends, or working at his or her job as opposed to volunteering services in the community. Each of these settings might present a significantly different set of motivational expectations. While our multicultural workforce may add variety that further complicates motivational planning, even people who are members of the same family or culture express a dizzying variety of individual definitions of “success” and “beliefs” about the factors that enable and inhibit success.

One way to think about the many personality types described by the Myers Briggs Type Indicator, the “Big Five” (Digman, 1990), and many of the other working and thinking style measures available today is that they reflect our personal values. Some people value reflective, analytical, and organized approaches while others value impulsive, expressive, and intuitive strategies. Some people who are confronted with barriers decide to stand fast and overcome them, and others quickly decide to avoid and withdraw. Many people work for money and recognition, and others work for the sheer joy of doing something well or learning something new. Some of us are very effective at regulating our own motivation by ignoring demotivators and creating the conditions that lead to personal success. Nearly all of us depend on coaches and friends for occasional motivational support. Most of us work with different values and styles in different situations. How can we make sense of such breathtaking variety and turn it to our benefit as performance technologists?

In any given situation in which we want to increase work motivation, we must determine what will convince people to start doing something new or different, increase their persistence at an important task, and invest mental effort. They must believe that the motivator driving their enhanced performance will directly or indirectly contribute significantly to what they need to feel successful and effective. The motivator that works has to cost less than the value of the increased performance, and it must meet current ethical and legal requirements. While it might appear that motivators have to be tailored to the different “here and now” demands of individuals, in fact there are more or less universally effective motivators and demotivators. It appears that there are a finite number of powerful, costeffective, ethical, and legal strategies for increasing work motivation for nearly everyone. The list begins with common organizational practices that have been found to destroy motivation for many people and ways to eliminate them.

1 .Act in a way that is perceived as dishonest, hypocritical, or unfair.

2 .Provide vague, impossible, and constantly changing performance goals.

3 .Impose arbitrary and unnecessary rules, policies, and work processes.

4 .Support constant competition among everyone in the organization.

5 .Point out people’s mistakes and criticize them for errors.

**Figure 20.1.** Five Motivation Killers.

What Kills Motivation in Organizations?

There are at least five elements of work environments that most researchers agree are the main destroyers of motivation (see Figure 20.1).

While a discussion of what kills motivation is a negative exercise, it is critical to emphasize that some very common and popular features of organizations hurt the work motivation of many people who work in them. Among the most common motivation killers are the following five practices:

1. **Act in a Way That Is Perceived as Dishonest, Hypocritical, or Unfair.** Organizations and individuals do not have to lie or cheat or be unfair; they only have to be perceived to be doing so to destroy motivation. Managers often feel that they must tell “innocent untruths,” refuse to keep promises as work conditions change, and favor their friends or punish their enemies. Most of us do not believe that when we do these things we are perceived by many people to be “lying” or being “hypocritical” or “unfair.” People at work are all adults, right? This is the way the world works, so get over it, right? Yet what we think about our own behavior is much less important than how our behavior is perceived by those around us. The real question is whether or not we want to act in a way that conforms to our beliefs about organizations and how they work or act in a way that is effective because it motivates people to perform better.

Private perceptions control personal motivation. When people perceive their treatment as unfair, dishonest, or hypocritical, the best we can hope for is that they will act maturely, ignore those conditions, and work hard despite it all. Yet even the most mature people are not going to work as hard when they experience dishonest and unfair behavior directed at them personally. Trust is difficult to gain and very easy to lose. Typically, organizational dishonesty and unfairness are viewed as an invitation to respond in the same manner (Bandura, 1997). Motivation is enhanced when everyone in an organization avoids even the appearance of unfairness, prejudice, dishonesty, or hypocrisy.

1. **Provide Vague, Impossible, and Constantly Changing Performance Goals.** Vagueness and inconsistency in a work environment lead most people to assume that anything goes. Impossible “stretch goals” also damage motivation ( Locke and Latham, 2002). While experienced and mature people assume that the stretch goals are only urging them to work harder, impossible-to-achieve goals damage motivation for most. Goals must be challenging and difficult; easy goals are not motivating despite what some people believe. Work goals should not be described in a way that leads people to perceive them as impossible to achieve. Vague goals are as destructive as impossible goals. In the absence of a clear vision leading to well-defined business and performance goals, people substitute their own goals, and their goals may not support the organization. Without clear performance goals and feedback, people are not committed to work and are not inclined to give their best effort (Locke and Latham, 2002). Increased work motivation is supported by concrete and challenging work goals that are focused on the near term; that is, today, this week, or this month.
2. **Impose Arbitrary and Unnecessary Rules, Policies, and Work**

**Processes.** Many studies point to the huge variety of arbitrary, disliked, and seemingly unnecessary rules and cumbersome policies as one of the major demotivators at work (for example, Spitzer, 1995). Why not ask people which work rules they dislike the most and, if changed, would motivate them to work harder and increase their commitment to their jobs and the organization? Check to see what evidence exists for the benefit of very unpopular rules and be clear about the trade-off between what might be lost if they were eliminated and what is gained if they are maintained. For example, what is gained from rules that prevent people from decorating their workspace in ways that suit them? Do we have solid evidence, beyond our preferences, that dress codes are necessary and that they add significant value to a business? How many of these rules stem from preferences or arbitrary decisions about taste that have no business value? How much of people’s behavior must you control to achieve business goals? Even the most competent and personally motivated people tend to quit trying in the face of what they perceive to be arbitrary barriers. One way to motivate people and simplify organizational work processes is to eliminate all unnecessary and arbitrary rules, policies, and procedures.

**4.SupportConstantCompetitionamongEveryoneintheOrganization.** Focused competition with competing organizations is a very motivating experience for most people. Competition within an organization produces mixed results. While salespeople seem to thrive on it, there are many instances when internal competition between individuals and work teams has harmed organizations. Constant, intense rivalry within an organization is most often destructive because it focuses attention and energy away from business goals. For example, the U.S. National Academy of Sciences surveyed all of the research on organizational team-building strategies (Druckman and Bjork, 1994). The performance-improvement methods they surveyed attempted to get members of work teams to bond, collaborate, and work efficiently toward common goals by competing with other teams. When the Academyreleaseditsfindings,itwassurprisingtolearnthatmanyofthemostpopular team-building programs had succeeded in increasing collaboration and cooperation among team members, but the teams were competing in a nearly suicidal fashion with other teams in the same organization. This type of misdirected, competitivebehavioratworkhappensinmanycontexts.Organizationsshouldconsider thepossibleunintendedsideeffectsofencouragingwide-scaleinternalcompetition. A more motivational approach to competition within an organization is to encourage people to compete with themselves by asking them to exceed their own personal best in critical areas of their job.

**5. Point Out People’s Mistakes and Criticize Them for Errors.** Too many managers seem to believe that to “keep people on their toes” they have to watch carefully until someone makes a mistake and then jump on them. Or, to “keep people in line,” remind them of their past mistakes whenever they are acting independently or seem overly satisfied with something they have done. Both of these strategies are motivation killers. When most people are faced with negative, critical feedback, they react with anger or feel depressed, and many simply stop trying. Negative emotion is not only a notorious motivation killer, it also leads to acts of revenge. Buckingham and Coffman (1999) reported that about 17 percent of the managers in their sample were so angry at the way they had been treated that that they were actively trying to hurt the organization.

Two comprehensive international reviews of performance feedback research studies found that negative feedback that focused on mistakes actually depressed performance (Kluger and DiNisi, 1998; Bandura and Locke, 2003). This happened in one-third of all feedback research studies conducted both in natural settings and in the laboratory. In another third of the studies, vague performance feedback had no impact. Feedback improved performance in only onethird of the studies. Effective performance feedback was focused on describing and closing the gap between goals and current performance. When feedback emphasizes negative qualities of the performer, performance deteriorates. The finding that poor feedback was obvious in two-thirds of all well-planned research studies suggests that it may even be more prevalent in practice, since researchers tend to select typical strategies to test in experiments. Motivate people by giving them feedback that begins with descriptions of what they have accomplished and the goal they were attempting to reach, and then discuss ways that the gap between the two can be closed.

1. Help people develop levels of self-confidence in their work skills.
2. Create a positive emotional environment at work.
3. Ask people to accept and value their own performance goals.

**Figure 20.2.** Motivators That Work for Everyone.

What Helps Motivation? Universal Motivators

That Work for Everyone

Many of the strategies that contribute most to developing motivation are relatively easy to implement and cost very little (see Figure 20.2). The three motivational pressure points that work for everyone are realistic levels of self-confidence, positive emotional climates, and strong personal values for work tasks.

1. **Help People Develop Appropriate Levels of Self-Confidence in Their Work Skills.** A primary motivational goal is to support people in achieving a high level of personal confidence in their belief about their own ability to achieve performance goals in the work setting. People’s belief about whether “I have the skills required to succeed at this task in this context” is perhaps the most important factor in their commitment to work tasks and the quality and quantity of mental effort they invest in their work. It is important to focus selfconfidence on specific types of tasks. Good evidence suggests that general self-confidence is not as critical for work motivation as is task-specific confidence (Bandura, 1997).

When people lack confidence that they can succeed at a specific goal, they will not choose to tackle that goal. If they have started to work on the goal, they may find a way to convince themselves to switch to less vital tasks, invest very little mental effort, or argue about their assignment. If people are overconfident, they will not invest much mental effort in tasks and also not take responsibility when they fail or make mistakes. If people are good at something, they believe that mistakes or failures must have been caused by someone or something else. Everyone needs very high levels of confidence about their job skills. However, if overconfidence turns to arrogance, they can be tempted to ignore their mistakes and treat even very novel challenges as if they are routine and familiar.

To help people build self-confidence we must constantly check with them to learn their concerns. The real danger here is that we might believe that others are “like us” and so will respond positively to the confidence builders that we prefer. The best assumptions are that people are not like us, that other people are most likely to be motivated by very different values than our own, and that other people’s values are not “wrong or stupid,” only different. The most motivating attitude toward other people’s values is understanding and respect. We do not have to agree with other people or share their values to respect their right to hold different beliefs and styles. Keep in mind that as confidence increases, commitment to performance goals also increases.

People who are overconfident, however, make mistakes and may not take responsibility for them. They misjudge the tasks they face as familiar and well within their skill level when in fact those tasks are novel challenges that require them to develop new strategies. Overconfidence can lead them to refuse to change their view when they are not successful at the tasks. Overconfident people tend to blame others, their equipment, and fate for the mistakes they make. They need to see that the strategies they are using are not working and that the tasks they face are novel and require new approaches (Clark and Estes, 2002).

1. **Create a Positive Emotional Environment at Work.** Emotions are usually ignored in discussions about motivation, but they are very important. Positive emotions such as happiness, humor, and joy support and enhance work commitment. Negative emotions such as anger, extreme frustration, and depression kill it. Yet it is not necessary for everyone to be happy in order to be committed. It is more important that people are not excessively unhappy, angry, or depressed about work issues. Anger and depression focus much of our attention on past negative events and not on future goals. The matter seems very straightforward. Organizations will benefit from helping people maintain the level of positive emotion that supports their maximum commitment.

Yet different people sometimes have very different ideas about what helps them have positive emotions or get rid of negative feelings. Even if people were more like each other, we cannot always do a great deal to modify extremely negative work emotions. Emotions are not always event-based. Because of biological reasons or early life experiences, some people simply react more quickly with strong anger or depression to routine events they perceive as negative than do others. The effort invested in creating a positive, enjoyable work climate can pay off in increased work commitment for many people, because the result is less negativity about work.

GordonBower(1995)hassurveyedtheresearchontheimpactofapositivemood on performance. Bower emphasized asking people what would make their work environment more enjoyable. His research could be summarized as recommending the following ways to support positive emotions toward work for everyone:

* + Engage people in decisions about the esthetic design of their shared workplace. Invest in a bright, lively, positive environmental design. Let people decorate their personal workspace and themselves if the decoration will not interfere with other people or violate important policy.
  + Allow people to listen privately to music while they work if listening does not decrease work efficiency or interfere with the work of others.
  + Eliminate rules and policies that reduce work enjoyment without providing a measured benefit that is greater than the loss of commitment they cause. Ask people what policies, if modified, would increase their enjoyment.
  + Encourage everyone, including supervisors and managers, to be enthusiastic, positive, and supportive. Cynical, negative, pessimistic, and “sour grape” styles may be fashionable in some organizational cultures, but they do not encourage positive emotion or work commitment for anyone.

1. **Ask People to Accept and Value Their Own Performance Goals.** All of the advice on performance motivation up to this point can be viewed as ways to enhance people’s beliefs that if they make a strong commitment to and persist at theachievementoftheirperformancegoals,theywillbecomemoreeffective.Locke and Latham (2002) have studied work goals for over a quarter century. Their evidence suggests that while people do not have to choose their own work goals in order to be motivated by them, a personal intention to succeed at assigned goals is very motivating. Commitment to goals is somewhat contingent on our confidence thatwecanachievethegoalsweareassigned.Personalconfidenceandourjob-and task-related emotions are intimately connected with goal commitment. Our confidenceisameasureofourbeliefabouthowourownabilitywillcombinewithorganizationalprocessestosupport,orprevent,oursuccessandeffectiveness.Someof ourstrongestjob-relatedemotionsaretheproductofourreasoningandexperience abouthoweffectiveorineffectivewehavebeenandwillcontinuetobeinourwork environment.

**DIFFERENT TYPES OF VALUES FOR WORK GOALS**

Values are one of the powerful ways people express their views about what they expect will make them effective or reduce their effectiveness. People value what they believe helps them, and they reject what they believe stands in their way. Values can be viewed as preferences that lead people to more quickly adopt a course of action and persist in the face of distractions.

Of course, different people have different values. Yet research on values and performance suggests that there may be ways to identify types of values and connect them to work goals. The goal here is to increase people’s work commitment by suggesting connections between their own values and the benefit of achieving work goals. Eccles and Wigfield (1995) present evidence that most people use three different types of values.

*Interest value:* People will more easily and quickly choose to do what interests them the most. Many people are generally interested in mastering a new skill or adding to their expertise. This more “intrinsic” interest pattern often characterizes the most effective workers. Others are more interested in impressing managers with their capability. This more “performance”-oriented style can also be useful under some conditions. It is useful to suggest connections between performance goals and people’s natural interests whenever possible. Suggest that their goals represent an “opportunity to do something that interests you,” such as master a new area or get a manager’s attention.

*Skill value:* Most people seem more willing to do those things that they believe challenge one of their special skills. So people who see themselves as more analytical like brain teasers and difficult analytical problems and tasks. People who see themselves as more artistic and style conscious like tasks that involve esthetic decisions and design challenges. To support skill value, suggest connections between performance goals and people’s special abilities by suggesting that they are “good at this kind of task” and that it is an “opportunity to show your skills in this area.”

*Utility value:* So much of what we do is chosen not because we love it or can excel at it but because we want the benefits that come when we finish and to avoid the negative consequences of avoiding or delaying. This is called “utility value,” and it shifts a person’s focus from means to ends. It asks people to focus on the benefits of finishing the task and not on their lack of interest or discomfort about the means to reach the end. It is one of the ways we justify enduring something we do not like to get something we do like or avoid something that would be worse. Utility value can be enhanced by describing the realistic benefits of completing a less desired task or goal and the risks of avoiding it. Do not inflate either the benefits or the risks.

**FINANCIAL INCENTIVES THAT CREATE VALUE**

Another highly effective way to increase motivation for work is to provide financial incentives for exceeding past performance. Some question whether offering people pay or gifts tied to exceptional performance actually motivates them beyond the type of strategies we have described already. The overall results of the large body of studies that are published in reputable journals suggest that cash and other tangible incentives can be very powerful and relatively inexpensive ways to increase the value people place on work goals (see Figure 20.3 and the study by Stolovitch, Clark, and Condly, 2002, including their references for other, similar studies).

To most researchers who study this question, the evidence is clear that financial or other tangible incentives, for example, vacations or luxury gifts, can

1. Quota plans give additional pay for exceeding a previous level.
2. Piece-rate plans pay for increasing quantities of work products.
3. Tournament plans pay winners in “same job” competitions.
4. Flat-rate plans are similar to salary.

**Figure 20.3.** Four Types of Incentive Programs.

significantly increase people’s work performance by increasing their motivation. For the incentives to provide maximum benefit, the performance level must be very challenging and not routine or easy, but also not perceived as impossible. In much of the research, an impossible task is defined as one for which the probability of success is less than 15 percent.

Types of Financial Incentive Programs

There are a variety of types of financial incentive programs. Following are four prominent types.

**Quota Plans.** When organizations use a “quota plan,” they appear to get the largest motivational benefit. Quotas offer additional bonus pay for work that exceeds a previous level achieved by the individual, team, or organization, or by another organization. Quota schemes seem to give incentives the highest impact on performance.

**Piece-Rate Plans.** The second most effective use of tangible incentives is in piece-rate plans, in which a set amount of output, for example, the manual assembly of one electronics board, is tied to a set rate of pay. Quota and piecerate schemes are often combined to get the benefit of both approaches. In the combined schemes, people have an incentive to do more than simply exceed their past performance. The farther they go, the more they get.

**Tournament Plans.** The third-ranking incentive approach is “tournament plans,” in which pay is linked to performance rankings based on competition between people doing the same job. This plan is often used to motivate sales staff. The factors that are thought to diminish the effects of tournament incentives are the fact that only capable people tend to “play.” Those who feel they will not “win” tend to avoid this kind of scheme, so it may attract only top performers and overconfident people. Another problem here is that competition sometimes leads to attempts to sabotage the efforts of competitors, thus reducing the overall benefit to the organization. The lack of impact of tournament schemes may be one of the main reasons why competition is not often an effective motivator.

**Flat-Rate Plans.** “Flat rate” or “fixed pay” schemes are the least effective overall. “Work for a set salary” is the best example of a flat-rate incentive system. Here we pay people for full-time work, usually pegged at forty hours a week. Ironically, very few studies have found motivational advantages for the most common tangible incentive system used worldwide.

Disputes about Incentive Systems

Many of the disputes about pay incentives focus on evidence, drawn largely from studies with children in classrooms, that our personal interest in work tasks decreases when tangible incentives are used to reward work. The argument is that paying people to do what they would do anyway because they are interested in the job switches their motivation away from a fascination with the task to the pay they are promised for performance. In the future, the argument goes, people who are paid more for interesting work will work for extra pay and not because they are interested. The best advice is not to provide tangible incentives to people who are already achieving business goals without tangible rewards, unless there is an excellent financial reason to exceed business goals at the possible risk of future “interest” motivation. The best evidence is that giving cash or other tangible incentives to adults for increased work actually increases people’s interest in their jobs (Stolovitch, Clark, and Condly, 2002) but may decrease the interest of younger children in study and schoolwork contexts (Pintrich and Schunk, 2002).

**MOTIVATING TEAMS**

Motivating a team is often more challenging than motivating a single individual. Individuals within teams operate with a different set of goals, values, beliefs, and expectations. Yet the variety of team member personalities can be a positive force if each performer contributes his or her unique capabilities when and where they are needed.

Teamwork potentially allows a number of individuals to achieve more when they collaborate than when they work separately. Conversely, team differences are destructive when, for example, prima donnas refuse to cooperate or members loaf because there are more people available to do the job, leaving them feeling less visible.

Most of the suggestions for motivating teams are exactly the same as those suggested for motivating individuals (see, for example, Clark, 2003b, 2004, and 2005; Clark and Estes, 2002). The next section describes five researchtested motivation strategies focused exclusively on the unique qualities of teams.

Why Is Team Motivation Different from Individual Motivation?

The first critical issue in team motivation is to be clear about the definition of “a team.” Nearly everyone who studies teams emphasizes that it is unnecessary to use team-motivation strategies when teams are defined as any group of two or more people with similar skills who are simply working together to achieve a common goal (Bandura, 1997). For a team to exist, for motivational purposes, team members must play different roles or bring different skills to the table. Those different skills must be required to achieve team goals. So a team is an interdependent group of individuals, each possessing a different set of skills, but who collectively possess all of the skills required to achieve team goals.

For example, while each member of a sports team may have played all of the different positions on the team in the past, individuals specialize in the one or two positions where they excel. Since everyone cannot play every position during competition, they must depend on each other. This is true in most professions. Lawyers have experience in litigating and negotiating, but they tend to specialize in one or the other. Support teams built around litigating include, for example, specialists in jury selection, research on the legal issues involved in a dispute, background investigations, and courtroom strategies.

Many different types of teams are formed within and between organizations for various purposes. Some teams are project-based, chosen to respond quickly to rapidly changing conditions and to disband after a project is completed. Other teams are formed to take advantage of customer-related expertise in different organizations. Networked or virtual teams tend to serve over longer periods of time, depending on their success, and are assembled by brokers who serve as coordinators. Many varieties of these teams exist, three types of which have been named in this paragraph, and each of them presents unique motivational challenges and issues for members and managers. The subject of this section is motivational strategies that appear to work with all teams, regardless of their focus, makeup, or lifespan.

What Motivates Teams?

Teams, like individuals, are motivated by whatever they believe will help make them successful in achieving their most important goals. Yet teams must also share some collective beliefs if they are going to be successful. The role of team managers and leaders, or team members in leaderless teams, is to achieve the following five motivational goals, summarized in Figure 20.4.

1. **Foster Mutual Respect among Teammates.** Teams in which one or more members believe that they are working with people who lack adequate skills to achieve team goals have a major motivational problem. In some cases, this belief is simply incorrect. Highly competitive people sometimes distort the real situation and develop the self-protective view that one or more other people on their team are inadequate. Competitive spirit is good. Bolstering self-confidence
   1. Foster mutual respect among teammates.
   2. The team must believe weaker members are working hard to improve.
   3. Require team members to collaborate with others.
   4. Hold individual team members accountable.
   5. Direct the team’s competitive spirit outside the team and the organization.

**Figure 20.4.** Team Motivation Strategies.

at the expense of others is immature and destructive of team efforts. Bandura (1997) describes many studies in a variety of fields showing that “weak link” doubts about team member expertise have significantly reduced team effectiveness. Even though all team members vary in their expertise levels, when mutually supportive confidence is in place, less able team members tend to perform significantly better and work hard over time to increase their skills. Since individual team members tend to be self-focused and so think more about their own contributions and ability, team members need to be reminded about the skills of other members. One effective way to accomplish this task is to actively attribute successes to each team member’s expertise and attribute missteps or mistakes to temporary lapses and external causes.

When it is obvious that someone cannot measure up and that no amount of “reframing” their mistakes will be accepted by the group, the person with inadequate skills must be transferred as soon as possible if team motivation and performance are suffering. It is most important that the confidence team members have in each other’s expertise is the only factor that accounts for their success in highpressure situations. Bandura, after a long review of the research on sports teams, concludesthat“inpressure-packedovertimematcheswherecontestantsareevenly matched and a mistake brings sudden death defeat . . . perceived (group) efficacy emerges as the sole determinant of overtime performance” (1997, p. 383). He goes on to suggest that the same is true for all teams that are in competitive situations. What happens when you can not replace a weak link?

1. **The Team Must Believe Weaker Members Are Working Hard to Improve.** Occasionally teams must accommodate members who are novices or for some reason are not able to do the best job for the team. When teams cannot replace weaker members with more skilled people, what works best to preserve team motivation? Jackson and LePine (2003) have studied this controversial question over many years. They have recent and solid evidence that when team members believe that their weakest member is merely inexperienced, or has faltered for some uncontrollable reason, for example, illness, accident, or a family crisis, and can improve, they will give support provided that the person is investing his or her best effort to improve.

The biggest motivational challenge on a team is faced by the weakest members. They must believe that what they contribute to the team is vital to the team’s success and that the other members expect them to improve and succeed. Feedback to members who are working to improve must emphasize effort and not ability. When they make progress, it is best to attribute the progress to effort. When no progress is forthcoming, they need to be urged to “get busy,” to “get serious and work harder.” Avoid attributing success or failure to ability. Belief that performance is due to ability tends to discourage hard work. Why would anyone work harder if they believe they cannot do it because they lack the ability, or that their achievement is due to ability and not to effort? When weak links work hard and gain skills, they need to know that their team appreciates their effort and notices the result and its impact on the team’s progress.

In many teams the motivational challenge is not a weak link but instead a lack of cooperation and collaboration.

1. **Require Team Members to Collaborate with Others.** Healthy teams are made up of team players who cooperate with each other. One uncooperative person can damage the motivation of even the most capable team. The obvious examples are the arrogant, self-focused prima donnas who invest most of their effort in making themselves look good with managers and clients, at the expense of the team. Less obvious, but equally destructive, are the outwardly supportive but silently devious “back stabbers,” whose primary goal is to make their own work highly visible. Selecting people with a history of effective collaboration helps to avoid these problems. Yet very capable people are sometimes competitive and self-focused.

One of the biggest challenges facing team leaders and coaches is to promote a sense that despite differences, when the chips are down, the team will cooperate. Achieving this goal requires the development of a cooperative environment. Debriefing a team after either a success or a stumble should involve a description of the sequence of interactions among members that may have led to a positive or negative outcome. The more that members learn to see team results over time as due to interactions among them, and not exclusively to their own solitary contributions, the more they will focus on cooperation (Bandura, 1997 ; Druckman and Bjork, 1994).

Developing cooperative confidence also requires that coaches and team leaders learn to blunt the negative impact when members begin to complain that one of their team is consistently avoiding obvious opportunities to collaborate. Here also itishelpfultoattributesuccessestoeachteammember’scooperationandattribute selfish missteps or mistakes to temporary lapses, such as a misperception of the situation,andtoexternalcauses.Butwhenitisobviousthatsomeonecannotmeasure up, and that no amount of “reframing” their mistakes will be accepted by the group, the uncooperative person must be transferred to an individual performance situation if team motivation and performance are suffering.

Is it possible to find out that someone is not measuring up if the team performance is evaluated without assessing the contributions of individual members?

1. **Hold Individual Team Members Accountable.** One of the first teammotivation studies (described in Williams, Karau, and Bourgeois, 1993), performed just after 1900, established the phenomenon that has been called “social loafing.” When people pulled as hard as possible against a rope connected to a strain gauge, their best effort was recorded. When another person was added to the rope and two people pulled together, each person invested less effort in a collaborative effort than they did when he or she was alone. As more people were added to the rope, each person pulled less forcefully. When interviewed, most people seem unaware that they are not working as hard in a group situation as they did when alone.

In the past century, this phenomenon has been replicated and verified in an amazing range of research studies that represent a broad range of work and educational settings, populations, and tasks, including knowledge work ( Williams, Karau, and Bourgeois, 1993). The overwhelming evidence for social loafing actually led to early suggestions that people work alone unless teamwork is essential. Recently, a research team found a relatively simple and powerful solution for this problem. For a discussion of the history and current studies, read Williams and others, 1993. When the individuals on a team believe that their individual contributions to the team are being accurately and fairly assessed, social loafing seems to completely disappear. Therefore, the advice to all organizations is to always evaluate the contributions of the individual members of a team and make certain that every team member is aware of the evaluation process and results.

The final team-motivation strategy is to encourage and focus their competitive spirit.

1. **Direct the Team’s Competitive Spirit Outside the Team and the Organization.** Competitioncanbehighlymotivatingforindividualsorteams.Salespeopleseemto thrive on it, and many people who are raised in Western cultural traditions seem to like a bit of it. One of the most common motivational team-building exercises favored by organizational consultants is a field experience in which teams compete with other teams in order to bond and build team spirit. These events are scheduled offsite and ideally are held in unfamiliar, often rural settings to eliminate familiar surroundings and therefore interrupt habitual patterns formed at work for relating to others. Teams are challenged to do something highly novel such as build structures or navigate difficult terrain to reach a target sooner or more effectively than other teams. Individuals are asked to notice how hard they are working, how much they are collaborating, and whether they have a real desire to win.

In general, team-building exercises have been found to be very effective, but they also have a potentially ugly, unintended side effect. Druckman and Bjork (1994) reviewed all studies of team building for the U.S. National Academy of Sciences. The variety of team-building methods they surveyed shared the common goal of attempting to get members of work teams to bond, collaborate, and work efficiently toward common goals by competing with other teams. They concluded that many different approaches worked, but they were surprised to find that after team-building exercises, a significant number of teams were competing in a nearly suicidal fashion with other teams in their own organization. Stories include misguided team members who were found to be modifying or deleting the electronic files, intentionally “misplacing” or rerouting team resources, and spreading negative rumors about members of other teams in their organizations. Apparently, fostering constant, intense rivalry can help when it is directed at the organization’s competition, but it can also support a destructive level of internal competition and focus attention and energy away from organizational goals. The obvious motivational issue in this situation is to make certain that team-building exercises focus the team’s competitive energy on competing organizations, not on other teams in the same organization.

**CONCLUSION**

We should no longer tolerate the fact that the culture and practices common in most organizations cause one out of every two employees to do only what they must to keep from being fired. While psychologists estimate that approximately one in twenty employees has serious emotional problems such as depression and substance abuse issues that limit their motivation despite our best efforts, most people are willing to increase their enthusiasm for work. The most conservative estimates, based on carefully conducted field studies, suggest that it is reasonable to expect a 20 percent increase by most employees in nearly all types of organizations. The size of the impact is almost identical to the measured average performance gain due to all of the training carried out in organizations (Clark, 2004). Team-based organizations can hope for even greater gains. The programs implemented to accomplish these gains actually grow in impact over time as they become rooted in the culture of an organization. They also appear to cost much less than the benefits realized from the performance gains that they produce, although more research is needed on the economics of motivational programs. One way to visualize the potential impact is to imagine the benefits for your organization if all of the employees choose to work one extra day a week.

Some of the most powerful motivational programs can be implemented on individual and team levels by line managers, provided that careful analysis precedes implementation and that results are monitored and measured. Many of the most powerful motivational strategies require changes primarily in the way that work goals are developed and communicated, the way that performance is rewarded, and the strategy that managers use to give feedback, show interest, and encourage people.

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S CHAPTER TWENTY-ONE S

Shifting Organizational

Alignment from Behavior to Values

Anthony W. Marker

O

ne of the greatest challenges for a modern organization is that of keeping all its members moving in the same direction and continuing to do their jobs in accordance with the organization’s goals, missions, and values as the business grows. Yet as growth occurs, the hierarchical distance often increases between those setting the goals and those producing the bulk of the organization’s products and services. The greater the distance between those two organizational functions, the greater the opportunity for communication to become garbled, distorted, or simply lost. Think of the childhood game “Telephone,” in which a message is passed down a chain of people, and where the message starting out at one end of the chain may be very different from the message heard by the last person at the end of the chain. The same is true of organizations that have several layers of management separating strategic decision makers from those directly involved with producing goods and services. When this distortion or loss of communication exists in organizations, it is nearly always coupled with problems in maintaining alignment between the organization’s culture, strategy, values, and behavior. The head of the organization can no longer reliably control the organization’s hands and feet.

A result of this communication loss, particularly in recent years, has been a trend by choice or economic necessity toward flatter and leaner organizations. Organizations now actively work to eliminate extra layers of management. One major benefit of this trend is the shorter lines of internal communication that make it easier to keep an organization aligned. Improved communication can

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reduce costs and product cycle time. However, even with shorter communication lines, getting all of an organization’s resources working toward a single goal can be both costly and time consuming.

The organizations of today strive to maintain ever-greater symmetry of alignment. No matter what the trend, human performance technology (HPT) professionals have many tools at their disposal to help organizations continue to maintain an alignment between management and workers: knowledgemanagement systems, human resource (HR) policies, documentation, and training being just a few of the possibilities. One valuable approach for gaining a greater degree of organizational alignment, described in detail in this chapter, is to pass control of daily operational decisions and behavior down the organizational hierarchy from senior managers to the work teams. This approach greatly enhances strategies such as flattening organizational structure by putting the decisions and control of behavior right where those decisions must be made. Miscommunication can be reduced and alignment can be promoted between management and work teams. It is a bit like the head, senior management, trusting the hands, the teams, to decide what to do mostly on their own.

However, simply passing control down to workers will likely *not* resolve the complex organizational alignment issues HPT professionals hope to resolve. Having passed that control down, how can the head feel certain that the hands will make decisions that match the head’s values and goals? How can senior managers in an organization make sure that teams and individual workers will make choices about behaviors that are consistent with the organization’s goals and values? To understand the answers to these questions, it is important to more clearly understand the nature of the alignment problem.

**WHY ALIGNMENT MATTERS**

For the past twenty or thirty years, organizations have been experiencing an increase in competition, as well as increasing customer and societal expectations. Organizations often feel competing pressures to remain flat and lean while at the same time growing the organization and its business.

Alignment in Lean Organizations

Streamlined, or flat, management structures are often inadequate to cope with the increasing demands and pressures of modern business. Organizations are continually forced to find ways to increase the efficiency of production, the quality of their products and services, and the speed at which they deliver them ( Cummings and Molloy, 1977). This organizational challenge has become so ubiquitous and so accepted in the past few years that it has become almost trite to voice it; organizations, and the people in them, are asked to do more and more with the same or fewer resources. While the push for cost efficiency, quality, and speed may be a commonly recognized concern, its pervasiveness does not diminish the importance of the human performance interventions that organizations rely on to further their goals.

Along with an increasing pressure to perform well, the tasks involved in keeping an organization functioning have become increasingly dynamic, interdependent, and complex. Whereas flattening an organization by removing layers of management will certainly decrease the distance between management and workers, it does not address the increasingly complex and interwoven tasks caused by the recent speed and complexity of business. Simply flattening the organizational structure, without also aligning the culture, values, and norms of the organization, is unlikely to lead to the necessary increases in efficiency and effectiveness.

Alignment in Growing Organizations

Leaner, smarter, and more efficient organizations are becoming more common but eventually even these need to grow larger when they run up against their maximum output using current resources. As organizations grow, tasks tend to become differentiated and specialized. For instance, let us examine the example of a small, two-person seafood department that suddenly grows to five or six people. With an increased staff, instead of two people sharing all the tasks, certain members on the team are likely to be assigned to tasks requiring higher levels of skill, such as filleting fish. This specialization lets the department hire more-skilled workers for specialized tasks and less-skilled workers for simpler tasks. As tasks become more specialized, the workers performing those tasks understand each other’s tasks less and less; keeping those people connected, aligned, and moving toward common goals and with shared values becomes more difficult and expensive. It is a classic circular problem. In order to survive, organizations must grow, which in turn leads to specialization and pressure to centralize control and to add layers of management. Specialization and layers of hierarchy, however, lead to misalignment, which then requires decentralization of control and flatter organizational structures.

How then do HPT professionals help organizations grow their business while maintaining their alignment? While there are no foolproof solutions, as a first step it is safe to say that performance interventions often need to help pass greater control over daily activities down to teams that are closer to where the real work actually takes place; teams need a greater degree of autonomy over their daily operational behavior. More than that, those teams need to be *empowered* in order to increase their task motivation. Kirkman and Rosen (1999) suggest that empowered teams are characterized as having “increased task motivation resulting from an individual’s positive orientation toward his or her work role” (p. 58). Yet to pass control down to teams, the organization must first make sure its values, norms, and beliefs are aligned. Additionally, giving up power and control is something that many managers are hesitant to support, since they may feel that letting go of the reins will result in the organization running off course. While misalignment, in either lean or growing organizations, is a problem that can be corrected, the solutions demand that HPT professionals have a better grasp of how organizational alignment and control work.

Identifying Alignment-Intervention Warning Signs

Alignment gets all the organization’s resources working in concert and moving in the same direction. It stands to reason that misalignment is a serious threat to an organization’s ability to achieve its goals in environments where the pace and nature of business is fast, furious, and constantly changing. In one way or another, many of the organizational challenges that HPT professionals are asked to address lead back to the issue of organizational alignment; getting the organizational goals, behaviors, and values to match up. Some examples (adapted from Xavier, 2002) of warning signs that the goals, behaviors, and values might be misaligned include complaints from

* Managers who suggest that workers Do not perform up to expectations

Have difficulty in delivering quality results

Do not have a clear idea of what tasks come next

Do not perform in accordance with the organization’s stated values

* Workers who suggest that managers

Have not provided clear guidance about performance or behavior

Have not communicated exactly what is expected of them

Are holding teams accountable for outcomes over which the teams have little or no control

Teams: Defining Self-Management and Empowerment

As stated earlier, one means of flattening an organization’s structure is by passing control from management down to work teams. The behaviors that managers tend to pass down are typically immediate behaviors, or what Parsons (1969) describes as operational-level behavior and decisions. This means that managers might allow the team to control aspects of its own work process, such as scheduling, work assignments, compensation, feedback, and, occasionally, how the work is accomplished. Ouchi (1977) suggests that in organizations with large hierarchies the greatest area of control loss, misalignment of values, and behavior in our terms is in the area of relatively routine activities such as getting workers to show up to work on time, observe dress codes, and provide for customer needs. It is over these functions that management often passes control to teams, which explains the descriptor *self-managing* that is applied to such teams. They have the power, or autonomy, to make certain types of decisions.

Are self-managed teams *any* teams that take control over these aspects of their work environments and tasks? Typically the answer is no. Self-managed teams tend to be teams that are assigned to complete a relatively whole task, or portion of a larger task. In addition, self-managed team members usually have the necessary mix of skills required to complete their tasks and contribute to the team’s goals (Hackman, taken from Cummings, 1978). Further, Manz and Sims (1987) have suggested that “the use of self-managing groups involves a shift in focus from individual work methods of work performance to group methods” (p. 106).

Sharing Control in Order to Increase It

Why does shifting control over operational behaviors, that is, task autonomy, down to self-managing teams alleviate loss of control? A cohesive group, aligned with an organization’s goals and working toward a single objective, can better allocate its resources to deal with changes in its work environments than can individuals who are assigned responsibility for a smaller, more isolated, portion of that environment or task (Susman, taken from Manz and Sims, 1987). In other words, the self-managed team can collectively see enough of the picture to keep the team members aligned with the organization’s goals, more than can individuals working on smaller pieces of the task.

Traditional management structures tend to align employee behavior and outputs with the overall organizational goals from outside the work group. This form of management structure depends on controlling the team’s alignment without directly participating in the team’s tasks. When this type of structure is depicted on an organizational hierarchy chart, such managers may appear to be part of the team, but often, such team membership can be more in *name* than in *fact.* There can still be an “us versus them” perception of the relationship, particularly among team members. While such external top-down approaches to managing alignment used to be successful, current environmental pressures vastly reduce their effectiveness.

Once the team members themselves are given collective control over their operational-level behaviors, then the alignment of the team’s values with the greater organizational goals is actually maintained from the *inside* rather than from the outside. Manz and Sims (1987) suggest that because alignment is being maintained from the inside of the work team instead of from the outside, selfmanaging teams are actually characterized by higher levels of control and alignment at the group level. Once control has been shared with the team, performance pressure is no longer being exerted from outside the team in a ratio of one controller to many team members. Several team members are generally exerting pressure on each other for performance, and the ratio changes to that of many controllers to many team members. One would expect, in such a situation, that the aggregate level of control in such a situation would increase; after all, now many team members are all serving as internal monitors of the team’s behaviors.

Empowered Teams

Empowered teams further extend possibilities for adding organizational alignment. Kirkman and Rosen (1999) suggest that there is a difference between selfmanaging teams and empowered teams. While both self-managing and empowered teams share the dimension of task autonomy, that is, control over operational-level behaviors, empowered teams are further characterized by increased perceptions in three other dimensions: self-efficacy, added value, and impact. These latter three dimensions are somewhat parallel to the last three of four dimensions of motivation described in Keller’s (1983) well-known ARCS model of relevance, confidence, and satisfaction. Transforming self-managing teams into empowered teams relies on successfully going beyond mere task control toward aligning the team’s values, beliefs, and norms to those of the overall organization. As Dainty, Bryman, and Price (2002) put it, “Empowerment represents a shift towards a greater emphasis upon trust and commitment in the workplace” (p. 334).

**THE NATURE OF CONTROL: GETTING BEYOND MERE AUTONOMY**

When task autonomy is passed down to the team, how does the organization as a whole maintain alignment of that team’s behavior with the organization’s values? The answer is that management must shift its alignment efforts from the control of behaviors to the control of values, norms, and beliefs.

Alignment Approaches

There are two approaches to creating or maintaining an alignment of a team’s behavior with the organization’s values: (1) overt alignment, and (2) unobtrusive alignment.

**Overt Alignment.** The older and more traditional approach, overt alignment, relies on management’s maintaining control over the operational-level behaviors. Overt alignment is directive in nature and results, at least theoretically, in a clean and unblemished line between the directions issued by a manager and the behavior of a worker. The manager directs that workers engage in, or avoid, specific behaviors, and the decisions about those behaviors rest with the manager.

Management uses behavioral

control (A) and places less emphasis on

controlling norms, values, and beliefs (B)

(

A

)

B

)

(

***Approach***

***Intensity***

**Legend**

***Stakeholders***

Work Teams

Management

Tr

aditional

Self-

managed

Empowe

red

***Control***

Behavioral control

Control over norms,

values, and beliefs

High

Moderate

Low

**Figure 21.1.** Traditional Team Control.

*Source:* Marker, 2001, p. 15.

Alignment of behaviors to values is maintained by management from outside the work team but at costs to efficiency and effectiveness. Unobtrusive alignment relies on shifting the emphasis of control from behaviors to the control of values.

An illustration of how the traditional approach to alignment is used to control a work team can be found in Figure 21.1. The heavy line (A) extending from management to the work team represents the overt alignment of a team, or rather the direct control over the team’s behavior. The dotted line (B) that comes up from underneath the team is meant to represent unobtrusive alignment and the way in which the control of norms and values supports the team and provides a foundation for the team’s decision making. The intensity of those lines illustrates the emphasis of each of those types of approaches to alignment in a given situation. In Figure 21.1, high emphasis is placed on the overt alignment of behavior and low emphasis is placed on the unobtrusive alignment of values; thus a traditional managerial structure is depicted.

An example of traditional management exerting overt alignment over a team can be illustrated using the case of the seafood department of a grocery store. One of the seafood manager’s primary goals is to make sure that the department meets its sales goals. To achieve these goals, the manager will control operational-level behaviors such as

* Assigning employees to perform each of the various functions and tasks, including serving customers, cleaning, stocking shelves, or cutting and preparing fish
* Deciding when to order additional product so that a balance is maintained between keeping the displays full and keeping the products fresh
* Deciding shifts and hours for the team members
* Pricing fish appropriately so it sells
* Monitoring the quality of the fish and deciding when to discard old stock

The manager exerts direct control over the team members by making decisions and directly assigning tasks and behaviors. Such control often extends to when, where, and how the tasks will be performed. A single person, the manager, is typically in charge of making sure that behaviors are aligned with the organization’s values.

**Unobtrusive Alignment.** Unobtrusive alignment, however, relies on the control of a team’s norms, values, and beliefs. These values and norms serve to guide decision making and, *by extension,* behavior. Therefore, unobtrusive alignment relies on guiding the decisions teams make as opposed to directly controlling their behavior.

When we speak of unobtrusive alignment affecting norms, values, and beliefs, to what are we really referring? McGrath (1984) defines norms as “sets of expectationsaboutwhatsomeone‘ought’todounderagivensetofconditions.Violationis negatively sanctioned” (p. 200). Norms are rules or standards designed to guide member behavior (Bales, 1958; Feldman, 1984; Trevino and Victor, 1992). Feldman suggests that teams generally only enforce norms that are associated with something important to the group, such as those things that affect group survival, facilitate task accomplishment, contribute to group morale, or express the group’s central values.

There is ample evidence to suggest that aligning a team’s norms will be effective in aligning that team’s behavior:

* Groups consider loyalty an important norm (Katz and Kahn, 1978).
* Groups prefer to handle the misconduct of team members themselves ( Greenberger, Miceli, and Cohen, 1987).
* Members of self-managing teams tend to define their work roles in terms of their ability to contribute to the team’s primary task rather than in relation to a specific job (Manz and Sims, 1987).

Instead of dictating a specific behavior, unobtrusive alignment strives to develop a set of shared norms and values to draw on to make decisions about how to act in a given set of circumstances. The end goal is to influence a team’s behavior indirectly by influencing value systems the team uses to make choices and decisions instead of directly managing the behavior itself.

Let us return to our example of the seafood department and examine how it might work if the emphasis is shifted away from overt alignment and toward unobtrusive alignment. Instead of the seafood manager dictating specific behaviors, as before, the members of the seafood team would be given responsibility for meeting certain goals regarding how much profit they need to bring in given specific time, quality, and budget frameworks. The daily decisions about how to meet those goals would then fall to the team members; they would decide who worked on what shifts, who performed certain tasks, what products were sold and how they were displayed, and other operational behaviors. The types of norms and values might include

* Putting customer service first
* Selling only the freshest fish
* Obeying health and safety regulations
* Observing store guidelines about the storage and display of products
* Maintaining the highest standards of cleanliness

Unobtrusive alignment is directly linked to an organization’s culture. In fact, Child (1984) referred to the control of norms and values as “cultural control.” This type of organizational alignment from culture to values to behavior is necessary. He suggests, “When unpredictability, complexity, and information processing are very high, then decision-making may have to become diffused throughout the organization, formalization is more of a hindrance than a help, and management’s best bet is probably to rely on cultural control” (p. 167). In other words, when organizations are experiencing a great deal of change and competition, it is even more important that organizations align their culture, strategies, values, and behaviors to deal with uncertainty.

By focusing on norms and values instead of behaviors, the management’s emphasis shifts from defining specific behaviors to defining what *classes* of behavior to engage in or avoid. Unobtrusive control provides boundaries rather than shackles. The result is a team that is free to choose new and innovative strategies for dealing with its environment and tasks. This does not guarantee that such empowered teams will innovate, but it does free them to do so.

An examination of these types of approaches to alignment quickly reveals that they must simultaneously exist in greater or lesser proportions within all organizations. Pure forms of either overt or unobtrusive alignment are likely to be theoretical at best. However, we can see the distinction between organizations that rely on the more traditional overt alignment and those shifting to a more unobtrusive approach to alignment. Figure 21.2 illustrates that the way traditional management structures emphasize overt alignment differs from how organizations using self-managed teams tend to emphasize unobtrusive alignment.

**Tr**

**aditional Teams**

Emphasis on controlling

all behaviors

**Self-Managed Teams**

Emphasis on shared

control of behaviors

**Empowered Teams**

Emphasis on controlling

norms, values, and beliefs

**Figure 21.2.** Management Approaches to Alignment.

*Source:* Marker, 2001, p. 18.

Alignment and Its Link to Power

If it is just a matter of shifting emphasis, why do so many organizations still place so much reliance on overt approaches to alignment? The reason is likely the tight link of control to power. Power is essentially the ability to obtain a desired output. If an organization is going to *empower* teams, then management is going to need to pass some of this power down to those teams. However, power redistribution is not without its problems. Russ Forrester (2000) put it this way:

The most common mistake made by organizations looking to empower frontline employees is to take too lightly what they are asking the managers in the middle to do. Many top executives seem to believe that managers and supervisors who have been exercising the most power will, at the declaration of an empowerment program, readily pass that power on as easily as if they were asked to pass the muffins. That is a momentous misunderstanding [p. 70].

Perceptions of power loss by managers are important for implementation reasons. Getting a manager to give up certain amounts of control to a team is one thing, and might be accomplished based on a purely logical argument. However, convincing managers to give up *power* is “stunningly hard” (Forrester, 2000 , p. 70). HPT professionals must keep in mind the continuing, and perhaps increasing, personal needs of these middle managers for control, achievement, recognition, and security.

Control and power are, in turn, linked to perceptions of authority and responsibility. Hind (1992), described the connection between the two this way:

So why is there reluctance for managers to delegate responsibility? One of the key reasons is an inability to recognize the difference between responsibility and accountability. Responsibility has been described as the ability to respond.

Accountability can be described as being able to be held accountable in the long run. Responsibility requires a detailed understanding of narrow issues. Accountability requires a less detailed view of much broader issues. The former is dynamic and easily measurable over short time periods; the latter is passive, less easy to measure, and not so easy to control. Delegation therefore, is the art of changing responsibilities into accountabilities—short-term responding into long-term accounting [p. 39].

The results of transferring one without transferring the other are reasonably clear. Granting an individual or group responsibility for the completion of a task, for instance, without also granting the authority necessary to complete that task is a sure recipe for disaster. Likewise, granting authority for an action without also making the bearer of that authority responsible for the outcome is asking for trouble. The result can be that management is reluctant to release authority, or control and power, in our parlance, while work teams given responsibility for fulfilling a task are sure to need that authority. How does one overcome these problems?

**Power and the Horn of Plenty.** One potential way to encourage managerial buy-in to an unobtrusive alignment approach lies in helping managers understand that power is not a finite resource. If it were, then managers might have legitimate personal and organizational concerns about giving up the behavioral control associated with an overt alignment approach. However, if you can provide a convincing argument to management that transferring control to a team can actually increase management’s control over the overall level of organizational alignment, then you are much more likely to get their buy-in and willing participation for shifting from a behavior- to a values-based approach.

There is evidence going back to the late 1950s that suggests that participatory work designs, in other words, those designs in which teams control their own operational behavior, actually result in a higher aggregate level of organizational control as compared with organizations using nonparticipatory work designs (March and Simon, 1958). Tannenbaum (1961) suggested a similar impact on organizational control. This idea of increasing organizational power through participatory management, or self-management, is illustrated in Figure 21.3.

By passing the authority down to several team members who are internal to the work group, we are actually getting an increase in control over that team’s behavior. Why then do we not see all organizations using participatory management structures? Recent trends suggest that more organizations *are* shifting to participatory management models. However, the transfer of control required for unobtrusive approaches to alignment can prove difficult. That is where HPT professionals can provide assistance.

**Managing Perceptions of Power Shifts.** Delegating and transferring control is one thing, but getting management to give up something as dear and at the

Self-Managed team

Empowered team

Total available control

Tr

aditional team

Management control

Team control

**Figure 21.3.** Perceived Control Levels.

*Source:* Marker, 2001, p. 19.

same time elusive as power is quite another. If HPT professionals can make a convincing case that giving up control may lead to managers realizing an increase in power and organizational alignment—and the resulting cost savings—they may be able to make significant progress in overcoming potential managerial resistance.

When control is delegated to teams, the obvious conclusion is that power has been passed downward as well. To a certain extent that is true. The question is, What kinds and amounts of power have been passed to the teams? The control over overt behaviors tends to be for relatively minor operational decisions and actions, though this need not always be the case. Decisions regarding shifts, task distribution, and such are comparatively minor when seen from an organizational perspective. Yet teams that are given control over these aspects of their work are likely to feel both more freedom and more power. If management then shifts its focus to unobtrusively shaping the team’s norms and values to more closely align with those of the organization, then the corresponding increase in unobtrusive control may well result in an even higher aggregate level of power and control within the organization as a whole.

**SHIFTING TO AN UNOBTRUSIVE APPROACH**

HPT professionals are often the ones faced with making the theory of empowerment into a reality. You may be asked to provide training, create job aids, or perhaps help teams design policies and procedures for dealing with new processes. Unless you pay attention to the actual transfer and delegation of control between management and the team, you may well run into difficulties. The Tannenbaum and Schmidt Continuum of Leader Behavior (Tannenbaum and Schmidt, 1958) outlines seven levels of delegated control that a manager can transfer to a team. The manager

* Makes the decision and announces it
* Sells the decision
* Presents the ideas and invites questions
* Presents the tentative decision subject to change
* Presents the problem, gets suggestions, makes the decision
* Defines limits; asks the group to make the decision
* Permits subordinates to function within limits defined by the superior

These levels range from the lowest level of delegation, where the manager makes the decisions and simply announces them to the team, to the highest level of delegation, where the manager delegates to the team, within specific boundaries set by the manager, the authority to identify problems, develop possible options, and decide on a solution. However, it is not enough to know these levels of delegation. HPT professionals must ensure that the conditions required for a level of delegation to occur actually exist. Toward that end, let us look at a model that proposes some possible scenarios.

The model illustrated in Figure 21.4 suggests that there are three routes along the path to successfully shifting from an overt alignment approach to an unobtrusive alignment approach, and hence to the conditions necessary for healthy and well-functioning self-managed teams. Two of those routes result in a misalignment due to imbalances in autonomy. The top route results in too much control, or overcontrol, while the bottom route results in too little, or under-control. In both cases the results are conditions that are in a misalignment of an organization’s values and behavior at the managerial and work-team levels. The central route, however, suggests that a careful shift from overt to unobtrusive alignment can result first in self-managing teams with behavioral task autonomy and then eventually in empowered teams with greater commitment. By helping organizations avoid the pitfalls of over-control and under-control, HPT professionals can help managers pass behavioral control down to teams and eventually move from self-managed teams to the greater paybacks promised by empowered teams.

Over-Control

The first route illustrates what is likely to happen if management gives the team responsibility for fulfilling their goals without giving them the autonomy or overt control over their behavior that is necessary to successfully attain those goals. If responsibility is delegated to the team, then management must shift its own control

Over control

Tr

aditional

team

Under control

Successful

transfer of

task autonomy

Self-managed

team

Failed

implementation

Empowe

red

team

Failed

implementation

**Figure 21.4.** Impact of Alignment Approaches on Team Transition.

*Source:* Marker, 2001, p. 20.

away from behaviors and toward norms and values. Failure to make this shift will likely lead to a situation in which members of the team experience over-control. They are required to fulfill obligations and functions for which they have control over neither behaviors nor values. The result is likely to be a deadening effect and rising frustration in which team members go through the motions with no real buyin to the process. Under these types of conditions, it is quite possible that team members will experience symptoms of work exhaustion, such as reduced job satisfaction, reduced self-esteem, reduced organizational commitment, increased turnover, and diminished personal accomplishment (Moore, 2000). Members of our seafood team, under such conditions, might well be aware of ways to increase productivity but feel no empowerment to make changes or even participate in a decision process leading to potentially profitable missed opportunities.

Under-Control

The second route to failure is brought about when management delegates responsibility down to a team *with* the requisite authority over their overt behavior but *without* establishing an unobtrusive approach to control and guide the team’s decisions. The result may well be a team that feels empowered but also ill prepared to make the decisions needed to perform. Again, this can lead to frustration and a reduction in both performance and participation in the process. While injurious to the team, any decisions that cause the team to behave in ways outside the organization’s acceptable limits are likely to be catastrophic to the manager and perhaps even to the organization as a whole. For example, in the instance of our seafood team, team members might decide to keep the fresh fish in stock longer than is allowed by company policy in an effort to stretch resources to meet profit margins.

Balancing the Transition to Autonomy

Establishing conditions for the successful shift from an overt approach to alignment to an unobtrusive approach requires a careful shift from control of behaviors to the control of norms and values. Even when this is accomplished, the team must consist of members who have enough skill, maturity, and experience to take on that control. The complexity inherent in such changes explains, at least in part, why shifts in control structures toward self-management are so often perceived as either only partially successful or in some cases outright failures. Therefore, the shift to an unobtrusive alignment approach is a process that is likely to take place over a span of time measured in years, rather than days, weeks, or even months. While skills and knowledge are part of an intervention of this type, HPT professionals will recognize that at the heart this is a systemic change implementation with significant affective components.

Moving on to Empowerment

Once the organization has successfully gotten past the significant hurdle of passing down autonomy, it is time to empower teams and unobtrusively align the organization according to shared norms, values, and beliefs. Russ Forrester (2000) suggests several steps that transfer power gradually and in a less threatening manner:

1. Grow team members’ power first by knowledge, skills, and access to information.
2. Build team members’ confidence by allowing them to practice in riskfree situations such as case studies, simulations, and supervised trials.
3. Avoid overwhelming the system by delegating power and autonomy from the top gradually down.
4. Limit risk to managers and team members alike by delegating low-risk projects and decisions first and then working up to higher-risk situations.

Finally, for these initiatives to work, HPT professionals must make sure that the overall organizational system supports the change rather than working against it. HR policies that reward the old behavior, managers who reverse decisions made by the teams, excessive work demands, and other systemic factors can all be fatal to organizational efforts to shift alignment to an unobtrusive approach.

**CONCLUSION**

The greatest challenge for HPT professionals, when faced with organization shifts in the alignment approach, is likely to be identifying the indicators early enough to take action. Once a problem has been correctly identified, then steps can be taken to design interventions that will manage the necessary shift and transfer of control from one set of stakeholders to another. The trap to be avoided, as in so many interventions, is one of misdiagnosis by either the HPT professional or a client. The pain of an organizational control issue can easily be mistaken for a policy or training issue if the root cause is not recognized. Therefore, HPT professionals need to pay particular attention to those situations in which frictions over responsibility, authority, goals, or empowerment rise to the surface and demand attention. When these issues arise, they are signs that some deeper and potentially systemic problem needs to be addressed and that band-aid-type fixes such as simple training or policy changes are less likely to have the long-term desired impact.

Summary of Main Points

Here is a brief summary for HPT professionals of some of the main takeaways from this chapter:

* The interconnections between alignment, control, power, authority, and responsibility all suggest that an overall systems approach is necessary when dealing with such complex problems; systemic change of this kind involving interventions that address organizational structure, training, supports, and policies may take months or years to fully implement.
* When evaluating a particular organizational problem, anticipate that the greater the distance between management and production, the greater the risk of communication distortion and the misalignment of cultures, values, and behaviors.
* Diagnose organizational structure issues early if possible to avoid addressing symptoms rather than causes.
* Help management to understand that shifting control of behaviors to work teams does not guarantee success.
* Aid management in paying attention to both overt alignment of behaviors and unobtrusive alignment of norms and values. Finding the right balance can be a challenge.
* Training is often an essential component in the transition to selfmanaged teams; team members need to be experienced, skillful, and mature to effectively take on many of the common functions of self-management.
* Anticipate resistance based on perceived loss of power and try to inform stakeholders about the possibilities for expanding power and alignment through sharing and delegation.
* Transfer task autonomy and power gradually.
* Make sure that the overall system is not working against the transition and that the change is aligned with the organization’s culture and goals.

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S CHAPTER TWENTY-TWO S

Principles and Practices of Work-Group Performance

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he final draft of The International Society for Performance Improvement (ISPI) Presidential Initiative Task Force report (2003) defines human performance technology (HPT) as an integrated systems approach to improving performance. The varied implications of this definition are described in the report as well as other sources, including Stolovich and Keeps (1992). Human performance technology’s domain unambiguously includes the goal of improving people’s performance in organizational settings, as individual performers or actors, and acting in cohort with others to fulfill organizational obligations. The focus of this chapter is on the collaborative aspect of human performance.

One of the dominant and sustained organizational practices in the past decade has been the adoption of work teams to complete organizational objectives. The use of work groups is an inherent characteristic of process improvement, change management, reengineering, reinventing government, the learning organization, contemporary management and leadership theory, and so forth. Work groups have become part of the fabric of organizational life. It has been estimated, for example, that two-thirds of Fortune 500 companies use work groups in their organizations (Sivasubramaniam, Murry, Avolio, and Jung, 2002).

Workers are now often expected to function, formally or informally, in intact work groups or teams, and to demonstrate the often-cited research finding that groups have the potential of exceeding the individual contributions of their most knowledgeable and skilled members (Katzenbach and Smith, 1999 ;

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Reagan-Cirincione, 1994). Yet, despite an empirically supported link between group performance and organizational performance, the expectation of improved group performance is often unfulfilled ( Reagan-Cirincione, Schuman, Richardson, and Dorf, 1991). In turn, the promise of enhanced organizational performance is unfulfilled.

Meetings, the typical vehicle for intragroup communication and decision making, are fodder for the daily comics. Their inefficiencies are the subject of private hallway, lunch, phone, and e-mail conversations. The impact of poorly functioning work groups on organizations, however, can be substantial, resulting in interpersonal conflict and decreased productivity (Jehn, 1997). Yet the use of work groups persists, perhaps in part because when they *do* work their output reflects the creativity, richness, and commitment to action that is difficult to achieve when a single person dictates a solution or action plan to others. When work groups are properly designed and implemented, they benefit organizations by effectively meeting performance challenges in the workplace ( Katzenbach and Smith, 1999).

Perhaps the most significant value of a group lies in the potential of its diversity: the leveraging of relevant differences in perspectives that individual group members bring to collaborative organizational tasks. While homogenous groups may initially be more efficient than heterogeneous groups, the advantage vanishes quickly (Watson, Kumar and Michaelsen, 1993). Maznevski’s research (1994) , for example, supports the notion that meetings attended by people in a variety of roles and status levels result in greater acceptance of input and advice and have a salutary impact on problem-solving strategies. Hambrick, Cho, and Chen (1996) identify a positive relationship between functional and educational heterogeneity in top management teams and the magnitude of the organizations’ competitive actions. A study of Canadian banking branches (Ng and Tung, 1998) identified a higher level of organizational performance in racially mixed branches than in primarily Caucasian branches. We do not wish to oversimplify the issue of diversity and work-group performance. The literature is substantial and growing. The specific condition under which diversity of group membership positively affects group work is complex. The literature and our experience, however, suggest that diversity can contribute substantially to group and organizational performance when it is employed to challenge assumptions, question practices, and develop solutions not previously considered.

Work teams succeed when certain circumstances are present. However, when one or more of these conditions is not met, the team risks failure and frustration. This chapter is directed specifically at both team members and facilitators to help them determine which characteristics lead to effective team functioning. In particular, our aim is to provide insight into determining when it is appropriate to convene a group meeting, how to identify social and technical factors associated with group performance, and how to select approaches that will improve the likelihood of team success. We use the terms *group* and *team* interchangeably, but we limit consideration to *task groups:* groups whose basic reason for being is to complete a task in support of organizational goals, and whose work involves some level of interaction, primarily in a face-to-face setting. In addition, we exclude nominal groups, insofar as they are groups in name only: Delphi groups, because their process generally minimizes interaction among members; focus groups, due to their emphasis on gathering rather than acting on information; and groups whose primary purpose is social or therapeutic. Social groups, for example, be they formal, such as a fraternity, or informal, such as a group of persons who convene irregularly to share company, exist principally as vehicles for social networking. Therapeutic groups may be formed as part of a clinical treatment program. Groups that are formed primarily to do something in support of organizational goals, however, whether they are permanent and intact, or convened for a fixed period to complete a given assignment, are unique in a number of regards. We begin with a consideration of some fundamental issues associated with group performance, and next present a sequential, normative model for designing and implementing a task-group intervention. Our focus is predominantly on groups with an established purpose of problem solving or decision making. Nonetheless, this scope is broad, encompassing any circumstances in which a set of persons is involved in and actively engaged in acting upon data or applying judgment. Examples include planning groups, design teams, management teams, and so forth.

Before beginning, we offer a final clarification. The format of any handbook is such that only a cursory treatment of a given subject is feasible. The balance between scope and depth is a difficult one to realize. We attempt to be sufficiently broad to encompass the key dimensions of work-group performance, and to provide sufficient detail to be of practical use to the reader. The details, however, may not always be sufficient, and in such instances we recommend that readers turn to the many published sources available.

**THE CONTEXT OF GROUP PERFORMANCE**

When Is a Group Necessary?

There is no algorithm for answering the question, When is a work group necessary? The decision to employ a group is influenced as much by sensitivity to organizational norms as by the need to engage a range of expertise. For example, an organization in which members have expressed dissatisfaction with senior management, arguing that they have an insufficient role in key decisions, may benefit from the use of a representative team chartered to make recommendations. This approach may, from a strictly technical perspective, offer little additional benefit. Some heuristics do exist, however, that provide counsel on when to employ a group. Perhaps the most widely cited guidance on when to convene a group or when to make a decision autonomously comes from Vroom and his associates (Jago and Vroom, 1980). Their Contingency Model of Leadership Behavior suggests that multiple persons should be involved in the decision-making process if the decision relates to goals not universally accepted by organizational members, acceptance of the decision by organizational members is imperative for successful implementation, and there is no guarantee that the decision made by the leader will be accepted by the subordinates.

Gordon (1993) presents similar guidelines, adding that members’ previous experiences working together and the availability of time are additional supporting factors in the team-based approach. We adopt a somewhat different perspective on the time-availability criterion. It is our experience that when an organization is in crisis and time to resolve the issues is short, convening a meeting of decision makers, stakeholders, experts, and other relevant parties may prove the best approach for a supported outcome that effectively addresses the issues. Reasons for this perspective are addressed throughout this chapter.

What Are the Requisite Conditions for a Successful Work Group?

How does one define success in terms of a work group? The issue is problematic. As argued by McCartt and Rohrbaugh (1995), groups in which members work harmoniously and efficiently sometimes produce bad decisions. By contrast, groups that are largely contentious and whose members engage in personal attacks on one another may ultimately have superlative outcomes. Simply, *good* groups can produce bad decisions just as *bad* groups may produce good decisions. Using the output of a group as the criterion of success is inherently tautological. How then might success be measured? In general, well-functioning groups, those in which emotional conflict is minimized and conflict related to the cognitive dimensions of the task is maximized and managed, have a higher likelihood of generating well-thought-out and supportable outcomes ( Pelled, Eisenhardt, and Xin, 1999). Success, therefore, may best be assessed on the basis of *how* a group functions. Several conditions have been identified as necessary, albeit not sufficient, conditions for enhancing group processing. We describe these in the following paragraphs.

Groups should possess a clear charter. While this condition is seemingly obvious, a group is sometimes convened with an underlying ambiguity regarding the group’s purpose or its level of authority. For example, it may be unclear whether the group has been convened to develop a high-level strategy or to create a detailed implementation plan. Making the charter of the group explicit has the associated benefit of signifying group efficacy to its members, and elevating confidence in success (Mohammed and Ringseis, 2001). Clearly establishing group goals, both proximal and distal, has also been linked to enhanced group performance (Weldon and Yun, 2000).

Second, groups should be issue or problem focused. Groups sometimes fall prey to the trap of not making the tacit explicit or accepting assumptions that may not be accurate. A potential consequence is the risk of developing detailed and time-consuming solutions to a misdiagnosed problem. For example, a manager becomes alarmed when she observes that sales have been steadily declining over several months. She convenes a group to fix the problem. At the first meeting, someone from the finance department proposes that the decline in sales began at approximately the same time that the advertising budget had been cut. The group readily agrees to this observation and its attention turns to solving the advertising problem. In reality, however, the root cause for the decline in sales actually encompasses several factors: poor cycle time, increased market competition, and poor customer support. The reasons for misdiagnosis are myriad. Sometimes, for example, they emerge from a sense of social pressure to conform, explicit or implicit censorship of ideas that diverge from the norm, or a shared illusion that the group is impervious to failure (Manz and Neck, 1997). This is not meant to suggest that a group may not be convened with the specific charter of diagnosis, but simply that when charged to address an issue, the group sometimes fails to address the problem adequately before advancing to the solution stage.

Finally, clearly defined roles and responsibilities are essential for a group to work effectively. Each team member should understand his or her specific role and the roles of all other members. Some members may be asked to participate because they have knowledge pertinent to the task not possessed by others. Others may be involved to represent the perspective of a particular organization unit. Clarifying *what* people are responsible for in group activities is just as important as clarifying *why* they are involved.

Salas, Bowers, and Edens (2001) investigated flight crew behaviors during flight mishaps and found that avoidable errors are sometimes the result of role ambiguity among lower-ranked officers, specifically as their role relates to the legitimacy of questioning a decision of a superior officer. For example, at Houston International Airport in 1996, a departing aircraft slid along the runway during takeoff. This near-fatal error was traced to a subordinate officer’s decision not to question the senior officer’s decision despite the junior officer’s perception of a problem. The subordinate officer apparently believed it inappropriate to question the judgment of his superior. One way of avoiding potential problems associated with status differences within a group is to make explicit the role that each member is expected to play.

**GROUP ROLES**

Group Leader

A group leader is the person with primary responsibility for stewardship of the group as it executes its work. The group leader is often the most senior-ranking member in the group, but not necessarily. Nanus (1996) argues that the team leader is responsible for creating a goal for the group, gaining commitment from group members, and creating the necessary organizational or group changes to fulfill the goal. In this latter sense, the leader plays a key role in linking the work of the group to the larger organization and acting as a conduit for the bidirectional flow of information. As suggested by Likert (1967), the leader acts as a lynchpin for bridging organizationally disparate groups. Nutt (1976) describes the function as one of coalescing. McFadzean and O’Loughlin (2000) argue that the absence of a group leader leads to a decrease in performance and an increase of struggle for dominance among group members. When there are options regarding who will assume the role of leader, it may be useful to attempt to match the leader’s style with the specific parameters of the group. Myrsiades (2000) , for example, suggests that directive leadership is more compatible with large groups that thrive on structure and that lack topic knowledge, motivation, experience and time. Someone with a reserved style may be better suited to small and knowledgeable groups that are tolerant of uncertainty, experienced in intragroup interaction, motivated, and not under pressure to reach a decision quickly.

Subject-Matter Experts

Often groups need to include persons possessing expertise critical to the group’s deliberations for some or all of their meetings. These carefully selected subjectmatter experts function best within the group when they do not have genuine ownership in the group’s decisions. For example, we recently facilitated a budget-setting activity involving several groups in an organization. Each team represented a specific technical function within the overall organization. While each group was able to argue the substantive impact of varying budget allocations on the technical work of its own functional unit, the overall success of the project required the involvement of financial personnel, organizationally distinct from the technical groups. In addition, the task required that management conduct a comprehensive review across functional units.

Facilitator

Schwarz (2002) suggests that one of a facilitator’s primary responsibilities is to help the group increase the effectiveness of its interaction. An effective facilitator removes from the group the burden of managing the process, thereby permitting it to concentrate on the substance of the issues with which it is tasked. The positive impact of a facilitator on a group’s performance has been widely documented ( McFadzean and O’Loughlin, 2000; Phillips and Phillips, 1993; Anson, Bostrom, and Wynne, 1995; Wheeler and Valacich, 1996; Nelson and McFadzean, 1998). An effective group facilitator inevitably faces the difficulty of reconciling two potentially conflicting tasks: allowing the group to function efficiently and controlling, in reality or in perception, the group’s activities. Facilitators operate in the three levels of group performance described later in this chapter: operational, tactical, and strategic. Facilitators are instrumental in designing and executing the meeting, developing a suitable model or structure for the group to approach its task, engaging participation of all group members regardless of status, and so forth (Frey, 1995; McFadzean and O’Loughlin, 2000).

We have been asked on several occasions to facilitate groups in which the members, the agenda, meeting length, and other important elements of the design had already been set. In virtually all instances, we declined the opportunity, and regretted afterward those rare instances in which we accepted. It is our experience that groups in general, especially those that are grappling with contentious issues, are best served when the design of the meeting emerges from the needs. Establishing a design and then involving a facilitator places the proverbial cart before the horse. A well-conceived design, however, is not infrequently discarded in response to the dynamics that emerge in the actual meeting. The lead author once facilitated a meeting of senior managers and the organization’s board of directors. The group was convened with the primary purpose of selecting future organizational initiatives. In preparation, interviews were held with each attendee, including the board members. Several decisions recently made by the board had been met with strong resistance from senior managers. At a preparatory meeting with board members, the facilitator was informed that these decisions were irrevocable. The meeting was thus designed to take into account these immutable decisions. Within the first thirty minutes of the general meeting, however, when questioned about a specific decision, one of the board members remarked somewhat meekly, “Well, I guess *nothing* is set in granite.” The other board members nodded in silent agreement. The event precipitated the need to revise radically the meeting design in real time.

One final guideline about facilitators is in order: do not facilitate any group in which you have, or may be perceived to have, a stake in the outcome. The central tenet in this guideline is that someone external to the organization is largely immune from accusations of partiality. In this regard, the colloquial definition of a consultant as someone who borrows your watch to tell you the time, and then keeps your watch, may be apt for some facilitators as well. An alternative to using external facilitators is to engage someone adequately prepared from another part of the organization, and to return the favor when needed.

Decision Makers and Stakeholders

As suggested earlier, it is essential that the person or persons with legitimate organizational authority for a decision be actively involved in the decision-making process. In addition, representatives of key stakeholding groups affected by the decision must be involved. If one or more key players refuse to participate, the most senior manager is advised to make explicit that those abstaining are relinquishing the opportunity to shape the decision and will have to live with the consequences. In one situation in which we participated, a particularly weak executive-level manager permitted two of four senior-level managers to abstain from a critical threeday strategic planning session involving approximately two dozen persons representing all functional units. In a management session scheduled after the large meeting with the purpose of developing a follow-up implementation plan, the two managers absent from the general sessions each stated that they could not support the plan. No justification was given. The executive manager, holding that unanimous support was essential, acquiesced, and the strategic plan was abandoned. Several months later, the executive manager was dismissed from his position.

Sensitivity to Social Dynamics

Task-group work has two broad dimensions: technical and social. The technical dimension comprises issues related to how a meeting is structured, the roles of participants, length, and so forth. The social dimension, in contrast, concerns the interaction of psychologically complex individuals with one another in a social forum, may involve their attempts at dominance or territoriality, may reflect their emotional attachment to specific solutions (Jehn, 1997), and so forth. Schein (1996) effectively argues that the stage for organizational failure is set when the dynamics of relationships among human beings are ignored or viewed as irrelevant.

In a group environment, the personal goals of individual members need to be balanced with the goals of the organization (Ariely and Levav, 2000). Individuals may, for example, identify themselves more closely as members of a particular functional or demographic group with goals that are ostensibly out of alignment with the goals of task groups of which the individuals are also members.1 The technical dimension, if well managed, facilitates healthy cognitive conflict. Cognitive, or task-group, conflict arises when multiple persons view the same situation from different perspectives, even when their individual goals and values may be in harmony (Bose and Paradice, 1999). Effectively managed cognitive conflict positively affects group performance (Jehn, 1997).

McFadzean (2002) suggests that properly facilitated conflict also can reduce “group think,”2 enhance inventiveness, and permit examination of the issues from a variety of perspectives. Napoleon Bonaparte is alleged to have remarked that those who failed to oppose him, who acquiesced to his views without question, were his worst enemies, yet within the social arena also lies the danger of conflict of an interpersonal nature. The objective of anyone designing or facilitating a task group, therefore, is to facilitate cognitive conflict and to manage social conflict.

**LEVELS OF GROUP PLANNING**

A potentially useful organizing scheme for teamwork is to distinguish between three levels of planning and execution, as depicted in Figure 22.1. The continuum shown at the top of the figure is grounded in Simon’s work (1987).

As the complexity and uniqueness of a given task increases, so does the importance of addressing tactical and strategic issues. For example, a team that meets weekly obviously needs to consider operational issues, but if the meeting is largely to discuss emerging issues of importance to the group, tactical and strategic issues may be less critical. In other situations, however, all three levels may need to be addressed if the team is to complete its task successfully. A merger of two organizations, as an illustration, may prompt key individuals to meet and to develop a new strategic plan. While operational issues—such as ensuring that the meeting room is sufficiently large to accommodate all attendees—are important, they pale in relation to the more substantive issues of managing undefined status relationships among players. Proper management of these relationships facilitates group exploration of emerging opportunities, constraints, and so forth.

Simple Complex

Routine Novel

**Operational**

**Tactical**

**Strategic**

*Planning*

*Levels*

|  |  |  |  |
| --- | --- | --- | --- |
| *Examples* | Adequacy of physical environment  Adequacy of media  Sufficient time to complete tasks | Effectiveness of facilitative strategies  Ensuring full participation of attendees  Managing status differences among participants | Exploring the problem space: focusing on root causes versus symptoms  Exploring the solution space: considering all viable options  Selecting evaluation criteria |

Correctly modeling the decision

**Figure 22.1.** Levels of Planning for Effective Task Groups.

Operational

At the simplest, operational-level issues relate to the physical needs of the group. These include environmental factors such as the size of the room, availability of media, legibility of projected media, and so forth. While relatively straightforward, operational issues are not unimportant. Considerable attention has been given in the literature to factors such as the seating configuration, lighting, location onsite or offsite, and so forth (Myrsiades, 2000; Doyle and Straus, 1982). Myrsiades (2000) requested that respondents list circumstances that negatively affect a meeting and subsequently lead to ineffectiveness or inefficiency. The operational characteristics of the worst possible meeting conditions included continuous interruptions from outside parties, group members leaving and entering the room throughout the meeting, the meeting exceeding its predetermined ending time, poor ventilation, classroom style configuration, and so on.

Tactical

The tactical dimension largely involves the management of social and psychological dimensions of a meeting. Given that facilitation was discussed earlier in the chapter, we will focus primarily on tactical issues related to the status and participation of group members.

Status relates to the hierarchical positions people occupy in organizations, and the potential impact of those different levels on group functioning. The example cited previously concerning the flight crew’s performance is an instance of the undesirable impact of status on team performance. Hollingshead (1996) suggests that those who may provide the most benefit to the group may be intimidated by higher-status members, and, as such, refrain from contributing despite the potentially significant impact of their contributions. Some have argued for homogeneity in level among group members as a response to the potentially negative impact of status (McFadzean, 1998; McFadzean, 2002; Pinsonneault and Kraemer, 1990; Belbin, 1981).

While we recognize that status differences present a very real problem, we believe the solution does not lie in pursuing homogeneity but rather in managing heterogeneity. Unequal status is but one potential threat to group performance. Participants, for example, may come from different sectors of the organization. Each sector may hold an unspoken but universally acknowledged place in the pecking order. What is the best way to address these issues? The answer, we believe, lies in the technical dimension of the group, specifically, the use of techniques that help to eliminate or mitigate these factors. For example, a simple solution to the status problem is to ask each participant to record his or her ideas on a sticky note and place it on the wall for review by the group, thereby eliminating initial association of the idea with its owner. In a less threatening environment, the use of an “oral round robin,” in which each participant sequentially proposes an idea, may mitigate the adverse impact of status.

Another tactic for dealing with issues of status and participation is decomposition, which refers to the segmentation of an issue into smaller elements that then may be considered rationally. For example, one of the authors was asked to facilitate a session of approximately twenty persons representing varying hierarchical levels and sectors of the organization. The goal of the meeting was to choose between two existing technologies for a new service the organization was interested in developing. There were strident advocates of each technology in the meeting. Our approach was to identify the criteria against which the two potential solutions would be evaluated and then to rate each technology against each weighted criterion. This decompositional approach permitted the group to consider each technology’s performance against each criterion. Differences in opinion became narrowly focused. If someone asserted, for example, that a specific service might be implemented more rapidly with one technology, the rationale for the assertion was solicited. Unbundling the issues helped the group to deal rationally rather than emotionally with them. Identifying the criteria, assigning weights to them to reflect differences in importance, and applying the criteria to evaluate each technology illustrate the use of structure. At the close of a very long day, the group unanimously agreed that one technology was superior to the other and should be adopted. One participant remarked that while it was not the decision he was hoping for, it was derived fairly, was auditable, and was one that he could defend to his management.

Structure is another potentially effective tactical approach to managing issues of status and participation in groups. An example of this, sometimes referred to as the *sucker effect,* occurs when perceived involvement and commitment from some group members may influence the satisfaction of other members. According to Maznevski (1994), for a group to be effective, each member must believe that every individual in the group is participating fully and enthusiastically. If group members perceive that there is a loafer within the group they will subsequently decrease their level of involvement and performance rather than carry that individual. The use of structure, however, may be effective in eliminating the issue by making explicit the actual contributions of group members. For example, recording the tasks each group member has agreed to do, and making this public, may pressure the social loafer to volunteer for his or her share of the work. If this does not occur, and there appears to be an unequal distribution of work among participants, the facilitator can legitimately note the perceived inequality and ask for clarification or explanation.

Strategic

The literature provides ample guidance on the operational and tactical levels of group planning and performance. The strategic level, however, is less well represented. It is, however, potentially the most critical, insofar as it concerns the fundamental intellectual framework within which groups approach tasks.

As Simon (1987) and others have proposed, decisions should emerge from an iterative process encompassing several interrelated steps. Intelligence, or gathering relevant data, is the point of departure. The second step entails exploring the problem area thoroughly and attempting to distinguish root causes from symptoms. Third, the criteria against which potential solutions will be evaluated need to be developed and defined for consistency in interpretation. A robust set of potentially viable solutions should be generated. These potentially viable solutions should be evaluated against the criteria, and, finally, the preferred solution should be examined to assess how robust it is under varying circumstances. This is known as sensitivity analysis. Building on this scheme, we present in the next section a model for executing these strategic functions. While admittedly iterative, the model is intended to be applied sequentially.

**MODELING THE PROBLEM OR DECISION**

We assume that all relevant data have been collected and reviewed prior to convening the group. Realistically, however, in *acting* upon the data collected, unanticipated questions sometimes arise, necessitating additional and unavailable data. It is also important to caution against giving water to someone drowning.

Decisions that involve a single, clearly defined criterion for which there are reliable and valid data do not require a group’s judgment. If, for example, the only criterion at play in choosing to relocate to site A or site B is total annual operating cost, and site B is less costly than site A, the decision is simple. In reality, however, affairs are rarely so simple or simplistic.

Modeling is essentially structuring a problem or issue in a way that maximizes group performance in task completion. We advise considering how to model the task prior to convening the group. Not unlike the point made above that the need for additional data may emerge, sometimes, despite the best intentions and effort, the model initially chosen may need to be switched for another during the process.

Table 22.1 is a simple decision-making table for choosing between two alternative models. While we do not claim that these options are exhaustive, our experience is that they are appropriate for a majority of organizational issues.

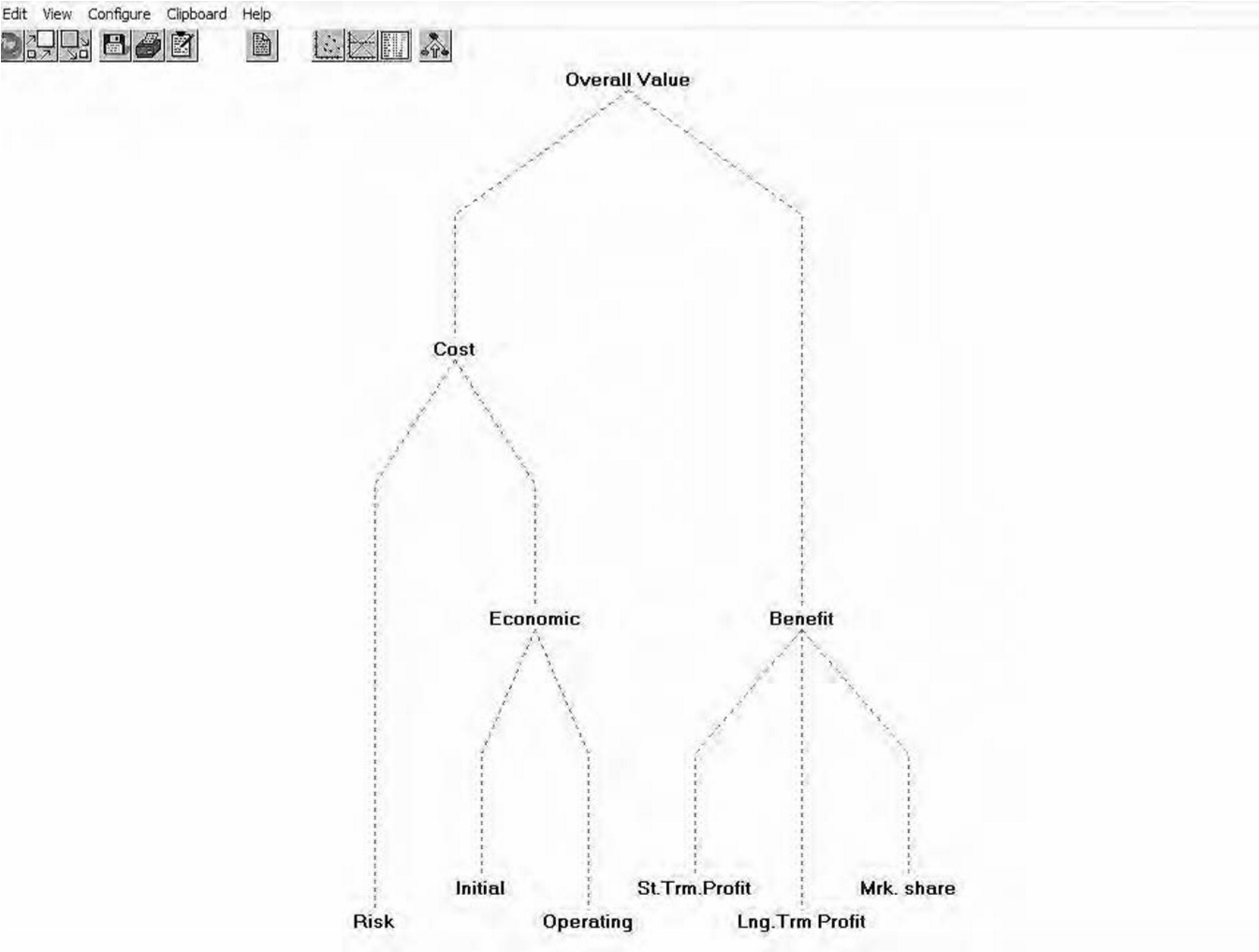
**Table 22.1. Matching Models and Circumstances.**

|  |  |
| --- | --- |
| *Condition* | *Recommended Model* |
| The choice is among a discrete set of options. | Multi-attribute |
| Options are not inherently discrete, but may be combined | Cost/benefit or resource |
| in different ways reflecting varying ways of allocating | allocation |

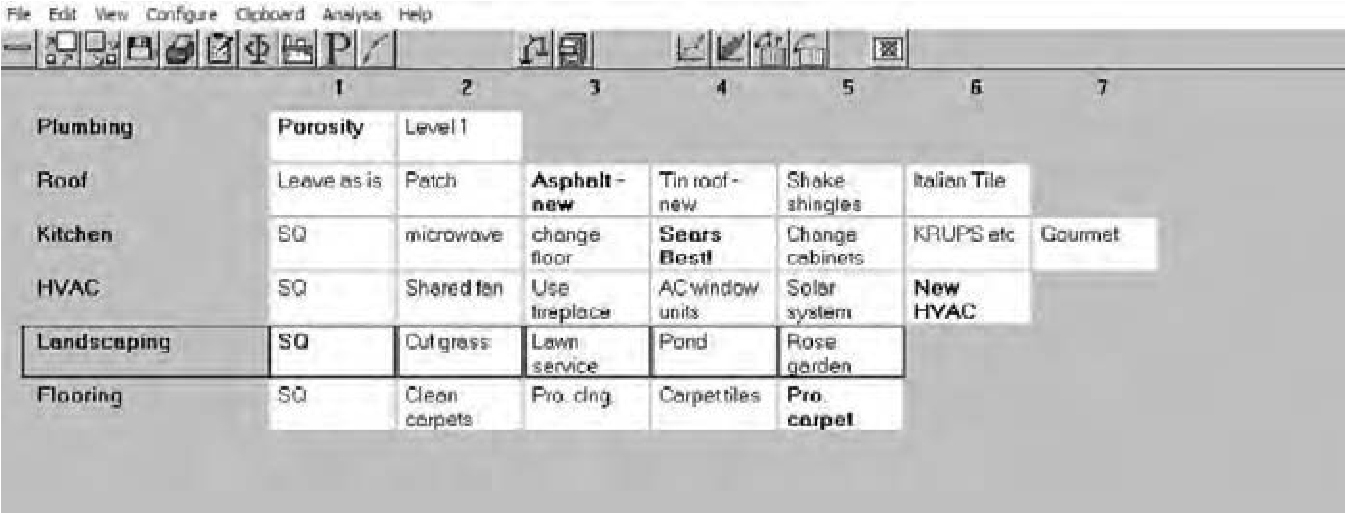
limited resources.

Some choices are inherently discrete, as presented in the earlier example regarding the selection of one of two vying technologies. When an organization has only one open position and two excellent candidates, the choice is clearly dichotomous. This is similar to the dilemmas we may face in choosing among several automobiles when we can only afford to purchase one, or grappling with the choice of two computers that use different and incompatible operating systems. When faced with such choices, a multi-attribute or criteria-modeling approach can be a very effective way of approaching the decision (Cook and Hammond, 1982). Bose and Paradice (1999) define a multi-attribute modeling approach as a technique wherein exact values of each decision maker in the group are clarified and compared. An example of a value tree, representing hierarchically nested attributes or criteria, is shown in Figure 22.2. The overall value of the options under consideration is assessed using each level in the model. This figure was generated by HiView, a groupware program designed for multicriteria decision making at the London School of Economics.

By contrast, many decisions can be modeled effectively by examining various combinations of alternatives and associated resources required to pursue them. For example, budgeting across multiple units within an organization



**Figure 22.2.** Example of a Value Tree.



**Figure 22.3.** Example Created in a Decision-Making Course.

when approached this way may facilitate team members considering increasing or decreasing allocation based on different benefits to the organization. In some instances, decisions that are not inherently discrete are conceptualized as if they were. To use a mundane example, a family decision for a vacation location may be unnecessarily cast as the beach or the mountains, when a compromise may be achievable which combines the options into a different package.

Figure 22.3 shows an example created in a decision-making course. In this scenario the students pooled their resources and purchased a house in need of much repair. The sewer pipe, for example, is leaking or evidencing porosity; the roof is leaking; the kitchen has not been remodeled since the early 1950 s; and so forth. The underlying concept is that there are limited resources, and that the members of the group hold differing values regarding how to spend those limited resources. Each horizontal row in the model represents an investment area, and each cell within the area represents a different level of investment, bounded by the least and the most anyone in the group would consider acceptable.

The roof area, for example, ranges from ignoring the leak to installing an expensive tile roof. The table was made with another program developed through the London School of Economics, Equity. Both Equity and HiView were created to help groups model typical organizational decisions and facilitate decomposition, weighting, sensitivity analysis, and so forth.

Structuring encourages the group to consider investment levels potentially greater and less than what they may have initially entertained. In addition, each option is evaluated against cost and benefit criteria. The individual arguing for the Italian tile roof, for example, is compelled to make explicit why her desired option is more or less beneficial than other options in the row. The process encourages rational evaluation and discourages emotional conflict.

Defining Criteria

Choices, either individual or group, inherently involve the application of criteria to the available options. This seemingly straightforward task, however, is often complicated by failure to make the criteria explicit, failure to operationalize criteria, and failure to distinguish the relative importance of each criterion. A necessary but not sufficient condition for success is that all members of the team understand the measures they will be using to evaluate options.

If the criteria are not specified or not operationalized, there is a strong risk of disagreement arising from insufficient communication. For example, if a new strategic venture is being considered, and benefit to the firm is identified as the primary criterion, one member may interpret benefit as market share and another may interpret it as short-term profitability, while a third person may be defining it as long-term growth. A colleague of one of the authors relates an incident in which he was facilitating a group in a rural area of New York State regarding development of rural land. With frustrations rising among the two constituencies, one supporting development and the other opposing it, he asked each group to define *development* in operational terms. Perhaps not surprisingly, each group was using a different definition. Quickly, the group was able to reach a common acceptable definition and, by so doing, came to realize that they agreed with one another more than they disagreed.

There is a similar need for explicitness in identifying the relative importance of each criterion. For example, a university department team is charged with selecting a new faculty member to replace a retiree. The team identifies a list of several criteria, including a strong record of research, excellence in teaching, and success in grant proposal writing. Each criterion may have a different weight for each member of the selection team. Were they to discuss the relative importance of each criterion and apply them to the candidates, they might develop a structure similar to the one shown in Table 22.2. The values beneath

**Table 22.2. Candidate-Evaluation Matrix.**

|  |  |  |  |
| --- | --- | --- | --- |
| *Criteria* |  | *Candidates* |  |
| *A* |  | *B* |
| *Research* |  |  |  |
| Weight 35  *Teaching* | 4 35 140 |  | 7 35 245 |
| Weight 45  *Grants* | 6 45 270 |  | 4 45 180 |
| Weight 20 | 2 20 40 |  | 7 20 140 |
| Total 100 | Total 450 |  | Total 565 |

each criterion represent the relative importance of the criterion agreed to by the group. Each of the two candidates is evaluated on a 1 to 7 scale, with higher numbers representing better performance against the criterion. In total, candidate B, with an overall score of 565, dominates candidate A.

Exploring the Problem Space

As described earlier, groups sometimes embark on the design of solutions without questioning whether they are tackling the root cause of the problem or merely the symptoms. A large body of literature is devoted to why this phenomenon occurs, and equally large amounts have been written on how to avoid the problem. Beach (1997) and others use the term *framing* to describe this phenomenon. Framing entails interpreting events based on previous experience, available data, the specific context, and often the role the person assumes in the situation. It is a way of dealing efficiently with limited information-processing capacity. Someone who is under suspicion for committing a crime, for example, may be perceived, incorrectly, to be guilty based on his or her fidgety behavior (Vrij, 2000). The classic film *Twelve Angry Men* depicts an excellent example of faulty framing; the plot centers on a dissenting juror in a murder trial who slowly manages to convince the other jurors that the case is not as clear as it seemed in court. As another illustration, Russo and Schoemaker (1989) describe a situation in which an organization’s engineers investigated a problem and quickly concluded it to be of the same type as one they had recently encountered. The diagnosis was incorrect and the manager estimated a loss of $2.6 million resulting from fixing something that was not the real cause of the problem. While framing has its advantages in efficiency, it may lead to undesirable consequences.

Numerous well-documented techniques are helpful in challenging a group’s frames and helping them think through an issue critically, including cognitive mapping, influence diagrams, Ishikawa diagrams (Ishikawa, 1982), value trees, and so forth. We briefly address one such technique, force-field analysis. As documented by Cummings and Worley (2001), force-field analysis stems from Lewin’s change model (Lewin, 1952). Lewin postulated that organizations are subjected to two forces: one that is pushing for change and one that is pushing against change. A strength of the technique is that it helps make both forces explicit in regard to a particular organizational goal, as well as facilitating a structured discussion on what the organization might do to intensify positive forces and reduce the impact of, or eliminate, negative forces.

An organization has experienced a recent increase in employee turnover. In an effort to stem the loss of valuable employees and reduce the associated costs, a cross-functional group is formed to assess the situation and make recommendations. As a point of departure, the group examines the organization’s attrition data for the past several years and compares its turnover rate with industry statistics. The data confirm that there has been a marked increase over

**Forces Supporting Change Forces Resisting Change**

Status Quo

Management awareness

and commitment to change

Employee satisfaction

with work

Impact on profits

Desired State

Distrust related

to layoffs

Supervisory

behaviors

Potential

reorganization

External job

options

High employee turnover Low employee turnover

**Figure 22.4.** Force-Field Analysis Example.

time, and that the current rate compares very unfavorably with other companies in the industry. As a way of better understanding the reasons for employee turnover, the group uses a force-field analysis diagram, an example of which is shown in Figure 22.4.

The group begins by identifying some factors that it believes may facilitate the desired change of moving from the current state of unacceptably high turnover to the desired state of reduced turnover. In turn, it identifies forces working against change. What begins to emerge is a better understanding of what may be working for and against change, as well as questions about some of the assertions. For example, while there may be clear and persuasive evidence of management’s commitment as well as an adverse impact on the organization’s profitability, evidence of employees’ satisfaction with their work may be anecdotal, requiring the review of extant data or the collection of new data. Over the course of several meetings, the group begins to develop a better sense of what is symptomatic and what is likely at the root of the issue. The benefits of this and related techniques include identification of potential forces, the impetus for targeted hypothesis testing, identification of relationships between opposing factors, identification of potential actions that might facilitate the desired change, and clarification and development of relevant metrics.

Exploring the Solution Space

As groups may fail to give sufficient attention to root causes, they also sometimes fail to search for potentially better solutions than the ones immediately at hand. Simon (1987) used the term *satisfying* to describe this phenomenon, identifying a course of action that is good enough. In large part, Simon argues that this behavior is less the result of laziness than a function of the inherently limited information-processing capabilities of humans. Our world, he suggests, is one bound by rationality (Simon, 1955).

The notion of decomposition, introduced earlier, is an inherent element of challenging assumptions regarding what should be included in the universe of potential solutions. To return to the house-improvement issue, in this example the facilitator challenges the group to expand its list of potential options as well as to define realistic anchors. In a budgeting exercise, for example, each department representative may enter the meeting using the current year’s budget as the anchor. The facilitator presents challenges, such as the following: If your budget were cut by 50 percent, what would you not be able to accomplish? If your budget were increased by 10 percent, what would you be able to do that you cannot currently do? The process of diverging from the status quo encourages the group to identify new options and to consider both the costs and the relative benefits of each.

Conducting Sensitivity Analyses and Resolving Disagreements

Reason, consistently applied within a structured process involving decomposition, can be an extremely effective device for managing emotional discord. Humans, thankfully, are not clones of the quintessentially logical Mr. Spock of *Star Trek* fame. If a member’s personal goals, for example, are at odds with the decision the group appears to be nearing, an oft-heard response is to suggest that the emerging outcome is the consequence of a specific parameter with which he or she disagrees. One particularly effective technique for addressing this issue is applying sensitivity analysis. In this context, this approach assesses how robust a choice is to changes in the relative importance of the criteria.

In Table 22.2 we presented the results of a faculty hiring team’s evaluation of two candidates. Candidate B, with a total of 565 points, is clearly superior to candidate A given the criteria, their weights, and the ratings. Assume, however, that a member of the hiring team has a strong preference for candidate A and expresses to the others that there must be something wrong with the way things were done. He argues that the group was too harsh in evaluating candidate A’s research record, and suggests raising the rating from a 4 to a 5. In this simplified example, the dissident faculty member would presumably see the consequence of this change, but in the complexity of more realistic situations, such modifications would not be quite so apparent. The group acquiesces and recalculates the total. Candidate A now has 485 points, and is still dominated by candidate B. Put more simply, the dominance of candidate B over A is insensitive to the change in the rating.

In an actual situation, an astute facilitator would probe to determine if one or more important criterion had been omitted, if the weights actually reflected the department and university’s goals, and other relevant issues. It is important to stress that the structured process effectively diverted a potentially contentious confrontation by emphasizing rationality.

Communicating Results and Garnering Support

One of the primary advantages of teamwork is the involvement of multiple actors. Those involved in the decision-making process have likely achieved an understandingofcompromisesreachedandthereasonsforreachingthem.Thoseoutside themeetinghavenotsobenefited.Therefore,unlesstheteamcomprisestheentire organization, or the decisions made are of no consequence to others, it is essential to try to engage those not directly involved. The word *communication* is derived from the Latin *communicare,* to make common. The connotation is an active sharingbetweentwoormorepersons.Thebehaviorsofsome,however,suggestaninterpretation that condones an “I told them, therefore I communicated” perspective.

The taxonomy of the affective domain (Krathwohl, Bloom, and Masia, 1964) sheds an interesting perspective on the issues of communication and commitment. The domain comprises five hierarchically ordered levels: receiving, responding, valuing, organization, and characterization by a value or value complex. Our experience suggests that this framework may be useful in partially explaining why organizational changes often do not succeed as anticipated. A senior management team, for example, meets repeatedly in a face-to-face, structured meeting format similar to what we have been describing. Over the course of two full days the group’s members are compelled to challenge their assumptions about causes, options, benefits, costs, criteria, and so forth. At the end of the meeting, the group reaches consensus about what and how changes should be made.

We speculate that the group has been engaged in affective learning. The truth, however, wrought by them in an intensive process, is now dictated to the organization as a whole. Not being afforded the same opportunity to internalize the need for change or the attractiveness of the solutions identified, organizational members resist. To be effective, organizational members need to learn in the same manner in which those in the meeting learned. Involving affected persons throughout the process is essential. What we have proposed in this chapter encompasses documenting not only the decisions themselves, but also the processes used in reaching the decisions. Both may be necessary if change is to be accepted with lessened resistance.

**SUMMARY AND CONCLUSIONS**

Were task groups not as prevalent as they are in organizations, Scott Adams, the creator of *Dilbert,* would have much less material with which to work. Groups have the potential of outperforming any individual, but to realize this promise, certain conditions need to be met. We have argued for explicitness in virtually all aspects of group design. These range from the reason the group is formed to the roles and responsibilities of its members. We presented a three-level structure for planning and implementing groups and have argued that as the complexity and impact of the decision increases, so also does the need to attend to less tangible and more strategic issues related to defining the root issues, defining potential solutions, and evaluating those solutions within an appropriate structure using clear and relevant criteria. Group performance can be exemplary, but both the technical and social dimensions within which people work collaboratively must be actively addressed.

Notes

1. It is beyond the scope of this chapter, but a growing body of literature emerging from social identity theory addresses this topic of conflicting goals (Brickson, 2000 ; Hogg and Terry, 2000).
2. Group think is the phenomenon wherein the need for group members to identify with a group dominates the approach to the group task. The group members ultimately develop a narrow perspective. Group think frequently results in a decrease in group performance (Mann and Putnam, 1990).

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S CHAPTER TWENTY-THREE S

Performance Support

Systems

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John Endicott

H

uman performance technology (HPT) practitioners face increasing pressures to close ever-changing performance gaps, support a growing flood of new products and services, and keep workers productive, all within shrinking budgets and timelines. Performance support systems (PSS), also called electronic performance support systems (EPSS), offer a powerful means of meeting these pressures. Combining any and all conceivable interventions, PSS offer significant opportunities to improve measurably the performance of people and organizations.

**INTRODUCTION**

We begin this chapter by outlining our approach to investigating PSS. We then offer a detailed description of PSS concepts and terminology. Next, we address four ways that PSS can vary. We then provide examples of PSS, followed by a discussion of how PSS can benefit organizations. After discussing development considerations, we conclude with our insights regarding the future of PSS.

The authors thank Gloria Gery and Gary Dickelman for the generous contribution of their expertise during personal and phone interviews. We also would like to thank Kim Moore of BrandonHall.com for information she provided. Last, we would like to thank Sylvie Vanasse and IBM Australia for providing PSS examples used in this chapter.

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Authors’ Approach

As we noted in 1998, the “field of PSS is moving too fast for articles in the peerreviewed professional literature to keep up . . .” (Villachica and Stone, 1998a, p. 443). This remains the case today, when there are even more articles, presentations, technical reports, opinion papers, and case studies. While the number of descriptions of PSS is increasing, the professional literature includes few peerreviewed studies that investigate PSS in business and governmental settings or evaluate their return on investment (ROI). Accordingly, we have based this chapter on the following sources:

* Our own experience creating PSS
* Our colleagues’ comments in telephone interviews
* An extensive search of on-line databases and the World Wide Web
* A review of related articles appearing in business trade publications and presentations made at professional conferences

Description of PSS

This section describes PSS by providing definitions, discussing how PSS fit with other performance interventions, and noting when PSS should be used. We have not changed our definition of PSS as an optimized body of integrated on-line and off-line methods and resources providing what performers need, when they need it, in the form they need it in, so that they can perform in ways that meet organizational objectives (Villachica and Stone, 1999). This definition is broader in scope than the computer-centric definitions that appear in the professional literature, as illustrated in Table 23.1.

The existence of numerous and different definitions for PSS and EPSS, used interchangeably in this chapter, reflects considerable confusion over concepts and terminology. Carliner (2002) notes that this situation arose from similar design strategies emerging from different disciplines, such as user-centered design and minimalism, which compete for the leading role in formulating future PSS conventions and practice. The idiosyncratic experiences of EPSS authors also contribute to this situation. However, while the details vary, these sources agree about the goal of PSS: expert-like performance from day 1 with little or no training. There is also agreement regarding the means for PSS to reach this goal: creating a zone in which performance can occur to standards that meet organizational objectives. Such a zone emerges with the intersection of representations appropriate to the task, appropriate to the person, and containing critical features of the real world, as depicted in Figure 23.1. There is also widespread agreement that maintaining performance within this zone requires users to be able to learn, use, and reference necessary information within a single context and without breaks in the natural flow of performing their jobs.

**Table 23.1. Sources, Types, and Definitions of EPSS.**

|  |  |
| --- | --- |
| *Source* | *Definition* |
| Gery (1991)  McIntire  (2002)  Carliner  (2002)  Dickelman  (2003)  KaplanLeiserson  (n.d.)  Ruyle (2004) | EPSS provide whatever “is necessary to generate performance and learning at the moment of need . . . to make it universally and consistently available on demand any time, any place, and regardless of situation, without unnecessary intermediaries involved in the process. . . . [They] integrate information, tools, and methodology for the user” (p. 34).  EPSS provide employees with tools and on-line support they need to get their jobs done without the involvement of another person. There is no distinction between the learning and application environments.  EPSS are “part online help, part online tutorial, part database, part application program, and part expert system” (p. 400), all of which are integrated in the form of a system. EPSS can also help capture knowledge and best practices for dissemination across the entire organization.  Describes EPSS using the phrase “business performance through human performance.” In this framework, EPSS mean the rapid construction, deployment, and maintenance or the right processes and content to enable the largest possible competitive advantage with the smallest possible expense. In his view, EPSS are about “getting the right process right—quickly and continuously” (Foreword).  The entry in ASTD’s Learning Circuits glossary provides two different definitions of EPSS. The first is a computer application linked directly to another application to train or guide users as they complete tasks constituting the target application. The second definition is more general in nature, describing a computer or other device that gives workers information or resources to help them accomplish a task or achieve performance requirements.  EPSS are computer-based job aids that provide just-in-time, just-what- |

is-needed assistance to performers on the job. EPSS typically include one or more of the following features:

* Database of job-required information organized to optimize clarity and facilitate rapid access
* Calculators and wizards that simplify and automate procedures that would otherwise be performed manually
* Decision-support modules that help users solve problems
* Embedded tutorials and simulations that provide instruction in work-related concepts and procedures

The

Performance

Zone

Appropriate to the

task or process

Contains critical

features of the world

(

*just enough appropriate*

*information*

)

Appropriate to the

person or performer

**Figure 23.1.** The Performance Zone.

*Source:* Dickelman, 1995, 1996.

**Fit with Other Performance Interventions.** As PSS still encompass one of the widest possible ranges of HPT, a large-scale application could use all or most of the methods and interventions appearing in the *Human Performance Technology Handbook.* While smaller PSS applications may reside entirely on computers, larger applications can consist of integrated, contextualized on-line and off-line components. Figure 23.2 depicts a partial listing of the potential components of a performance support system.

**When Used and Not Used.** Our experience suggests that HPT practitioners should consider using PSS when all of the following conditions are present.

* *Multiple performance gaps.* Performance gaps often appear in packs, and they typically interact with each other. For example, a lack of adequate feedback at the level of the worker often means a lack of streamlined processes at the level of the team and lost productivity to the organization. PSS can systemically address multiple gaps and the interacting relationships among them.
* *Multiple solutions.* Multiple gaps usually require multiple interventions to close them. A streamlined process also provides feedback to the individual worker. PSS can integrate these solutions, contextualize them so users understand what they are doing, and provide on-demand access to learning, information, and tools.
* *Project team alignment with business drivers and objectives.* Owing to their visibility within the organization and associated development



**PSS**

Employee

videos

Experts

Handheld

wireless

devices

Print-based

job aids

Compliance

training

Jobs

database

Automated

data collection

World Wide Web

CD-ROM

Multimedia

scenario-based

training

Instructor-led

training

Policy and procedures

manual(s)

Videoconferencing

or teleconferencing

Help desk

Meniors

and coaches

Glossary

Distance

learning

Supervisor

videos

Software

tools

FAQs

Supervisor

workbooks

Self-paced

workbooks

Electronic

communities

of practice

Learning management

sy

stem/learning content

management system

On-line

ev

aluation or

feedback system

On-line

checklists

Compliance

database

Automated

reporting

Operational

Employee

workbooks

On-line database

reports

excellence scorecards

**Figure 23.2.** Partial Depiction of Potential PSS Components.

costs, practitioners must align their efforts to create PSS with strategic business objectives and key decision makers. Without this alignment, the PSS will go unimplemented or, at best, remain a toy solution to the problem they were designed to solve.

* *Sponsorship for crossing silos.* Aligning with the business and employing systemic and systematic approaches typically require PSS to cross between the silos that arbitrarily separate departments and the activities they perform. Without adequate sponsorship that can mandate change from the top down, a PSS development effort can stall when it encounters sufficient organizational inertia.
* *Acceptance of collaborative development approaches.* PSS implementation will stall without adequate bottom-up support from the user community. To facilitate change management while ensuring accurate performance requirements and appropriate designs for meeting them, the PSS development effort should employ collaborative, prototypingbased development approaches. Accordingly, the sponsor and the client organization must be willing and able to provide release time of key managers, supervisors, and job incumbents.
* *Willingness to employ formative evaluation.* By its very nature, collaboration can increase the scope of a PSS development effort. Client organizations and project teams should employ robust formative evaluation to shape project deliverables during the early phases of the effort, when changes are less expensive to make and more money is available in the budget. Collaborative activities such as prototyping and usability testing can also provide empirical data that can direct the revision process. The client organization and the project team must be amenable to making decisions based on their alignment with business objectives and collected data, rather than on personal preference and past practice.

**BASIC CONCEPTS AND TERMINOLOGY**

This section discusses basic concepts and terminology. Building from the work of Gery (2002), Rossett (2002), and Carliner (2002), we offer a big-tent, or hybrid, taxonomy of PSS components comprising a variety of integrated performance interventions, which is depicted in Table 23.2. Depending on the nature of the performance requirements, HPT practitioners can build PSS that employ learning; guidance and tracking; task-structuring support; knowledge management; and communities of practice, tools, and motivation. A discussion of each component follows.

Learning

Learning refers to changes in the declarative, strategic, and procedural knowledge that people store in long-term memory and demonstrate in performance ( Jonassen, Beissner, and Yacci, 1993). In short, learning means the ability to

* Know or believe something new
* Recall previously forgotten knowledge
* Organize knowledge differently
* Perform tasks that were not possible before

Many workers’ jobs are in a constant state of flux, as change itself increases at a steady rate. Continual learning is a fundamental job requirement. Employees are constantly encountering new situations, information, and technologies.

**Table 23.2. Hybrid Taxonomy of PSS Components.**

|  |  |  |  |
| --- | --- | --- | --- |
| *Carliner* | *Rossett* | *Gery* |  |
| *(2002)* | *(2002)* | *(2002)* | *Hybrid* |
| Skills and  knowledge | Learning |  | Learning |
| Resources | Guidance and |  | Guidance and |
|  | tracking |  | tracking |
|  | Information | Task-structuring | Task-structuring |
|  | support and coaching | support | support |
|  | Knowledge | Knowledge | Knowledge |
|  | management |  | management |
|  |  | Data | * Knowledge * Data |
|  | Interaction and | Communications | Communities of |
|  | collaboration | and collaboration | practice |
|  |  | Tools | Tools |
| Motivation |  |  | Motivation |

As a result, they must upgrade their skills by practicing them and responding to feedback until they reach mastery and can transfer their new skills to the job. To meet this demand within a job context, big-tent PSS can include e-learning in its various forms as well as off-line learning, such as instructor-led courses, mentoring and coaching, and on-the-job training.

Guidance and Tracking

Formerly called *computer-managed instruction,* guidance and tracking components enable managers and users to monitor learning progress. Guidance and tracking systems enable end users, supervisors, and the larger organization to prescribe instruction, monitor the user’s progress, and record certification data. Organizations can also employ these systems to identify the most frequently requested resources, which usually correspond to the most in-demand skills and knowledge. The data these systems collect can greatly facilitate both needs analysis and evaluation, including the calculation of ROI.

Task-Structuring Support

Task-structuring support spares end users from having to constantly ask, “What next?” Effective support aids both novice and expert, enabling them to perform their jobs with little or no training. For novices, this support acts like the temporary beams that support a building under construction, until human performance can stand on its own. Such support is, therefore, called *scaffolding (*Collins, Brown, and Holum, 1991). Effective PSS provide both strategic and tactical levels of scaffolding.

Strategic scaffolding helps novices solve problems they are facing for the first time. Such scaffolding can take the form of high-level task descriptions, goal statements, rules of thumb, process flow diagrams, or worked examples ( Chandler and Sweller, 1991) that help users determine

* Why am I doing this?
* How do experts think about this?
* What decisions do I need to make?
* How do I monitor my progress to see if I am performing the task correctly?
* How do I know I have finished the task correctly?
* What should the end result look like?

Tactical scaffolding provides support for novice users who need help using the software itself and can include

* Descriptions of screens, windows, fields, and buttons constituting the software
* *Tool tips* that specify software components as users place a cursor over them
* Definitions of key terms
* Advisers who tell users what they can do or model the performances of experts
* Cue cards that provide step-by-step instructions while helping users make decisions
* Wizards that completely or partially automate the completion of a task, based on inputs that users provide

Novice and expert alike will benefit from two other forms of task support that affect the user interface of PSS, that is, the aspects of the software that users see and interact with to input data and control the operation of the software ( InfoStreet, Inc., 1999). To minimize novice training and ensure experts’ ease of use, the user interface of PSS should employ a flow that matches that of the job. The sequence of screens, displays, windows, fields, and buttons that appear in the software should match the natural workflow and logic of the job. To minimize the time otherwise spent looking for information, the PSS also should filter the information available to users. When such support is built into the system, users see only the images, text, features, and menu options that apply to the task at hand and their individual profiles. Users do not have to spend time finding what they need to perform their jobs. With both forms of task support, the computer has adapted to the needs of the user, rather than vice versa.

Knowledge Management

Knowledge management (KM) is about capturing and disseminating intellectual capital and expertise, especially in environments characterized by change or when key workers are leaving and taking vital knowledge with them. It is about making knowledge active (Gary Dickelman, personal communication, October 19, 2004). KM includes both data mining, that is, searching electronic databases, and the collection and dissemination of best practices. KM systems also make knowledge manifest in contextualized ways, so that users can actually employ it. To be useful, context-specific knowledge must be built into the systems, user interfaces, tools, and processes that make up users’ jobs. Jonassen (2003) describes two such KM applications. The first consists of a diagnostic tool technicians can use to troubleshoot problems they are experiencing. The second consists of a case library technicians can use to input observed symptoms of a given problem and compare them to those in similar situations.

Communities of Practice

A community of practice (CoP) is a group created, usually on an informal basis, to capture and share expertise, methods, tools, and techniques in a specific area. Members use the CoP to develop their knowledge and address recurring problems they encounter in their field (Lave and Wenger, 1994). By including members of different but related disciplines, communities of practice encourage their members to view their work in novel ways. Members are generally self-selected and share an evolving culture, language, vocabulary, stories, and agreement on best practices. Kaplan (2002) cites the following benefits of communities of practice:

* They create an informal setting for learning. Because employees learn about 70 percent of job-required knowledge outside of formal training (Henschel, 2001), it is prudent to maximize opportunities for such learning.
* They are effective at capturing tacit knowledge that cannot be delivered in other ways. In other words, a CoP brings out how things really get done.
* In addition to capturing more tacit knowledge, a CoP can be a powerful tool for disseminating it to the community at large, increasing an organization’s overall effectiveness.

PSS can support such communities of practice by providing chat rooms, contextualized archival materials, access to knowledge brokers, and support for coaching and mentoring.

Tools

Tools include applications designed to automate and otherwise support specific job functions. Their main purpose is to reduce or eliminate routine, timeconsuming tasks, freeing up more time to solve problems and make decisions. Simple examples include notepads, calculators, spreadsheets, and templates. High-end examples include report-generating engines that pull together disparate information in a database the user has completed into a finished, formatted product. The highest-end tools can be indistinguishable from other types of components, such as task-structuring or knowledgemanagement systems. Well-designed tools can eliminate or reduce the need for training, resulting in faster time to proficiency. By providing a standard set of resources, they also minimize nonstandard performances and resulting rework.

Motivation

Motivation is a vital component of PSS. There is no substitute for a motivated, engaged team that *wants* to perform. Users must actively choose to perform their job tasks, persist until they are completed, and invest the appropriate level of mental effort to complete them to standard (Condly, Clark, and Stolovitch, 2003). Willingness and persistence are often influenced by the consequences users experience. Appropriate performances need to be reinforced in meaningful ways so they will continue to occur in the future. Inappropriate performances need to result in consequences that will make them less likely to occur. A user interface that follows the natural workflow of the job reinforces the use of the PSS, while one that does not follow the workflow can actually punish its users, who must adapt to the way the PSS require them to perform their job. PSS also can help users calibrate the level of necessary mental effort required to perform a task. For example, a performance support system helping users troubleshoot a problem with a broken assembly line could provide information describing the frequency, criticality, diagnostic difficulty, and repair difficulty associated with each option for repairing the line.

**VARIATIONS**

Given the number of potential components, PSS can be expected to vary widely. While the goal of PSS remains providing contextualized support at the moment of need, they vary across four different factors: the extent to which their components are integrated, the scale at which they support performance, whether they can be worn on the body, and the nomenclature by which they are described.

Off-line On-line On-line On-line external external extrinsic intrinsic

1 2 3 4

**Figure 23.3.** Continuum of Integration for Performance Support.

*Source:* Villachica and Stone, 1999.

Integration

The first factor is integration, the extent to which performance support is woven into the applications and the jobs users perform. In the previous edition of the *Human Performance Technology Handbook,* we described a continuum of integration of PSS components, as depicted in Figure 23.3. Although our experience leads us to believe that the right-hand side of the continuum produces the greatest performance gains and return on investment, our literature review yielded no studies comparing the overall efficacy of the two approaches.

Sponsorship and timing continue to affect the extent to which HPT practitioners can direct their efforts toward the right side of the integration continuum. With inadequate sponsorship for their efforts, HPT practitioners usually arrive on the scene after the application has been created. By then, the only possible performance support is a bolt-on system. With sponsorship for collaboration across the disciplines and stakeholders affected by the application, performance support can become part of the application itself, resulting in intrinsic PSS.

Scale or Level

The second factor is the scale of the PSS, or the level of performance they serve. Although this chapter on PSS resides within the part of the handbook that addresses the worker and the work team, PSS can be scaled to any level of performance, including larger organizations and entire enterprises. As enterprisewide software becomes more commonplace, so will the enterprisewide performance support that is built into these applications.

Wearability

The third factor along which PSS vary is the extent to which they can actually be worn by the user. With increased miniaturization and computing power, users can now access on-line PSS using a variety of delivery options, including desktop and laptop computers, personal digital assistants (PDAs), and wearable computing components. Stone and Villachica (2001) report a system that employed a variety of automated formatting engines to provide market results to institutional traders and their customers using their computers, fax machines, and PDAs. Likewise, anyone dealing with parcel delivery service sees carriers using PSS residing on PDAs to track package receipt and pickup, while customers can track their shipments and billing via desktop computers, laptops, PDAs, or Internet-equipped cell phones.

Wearable PSS and software applications typically consist of head-mounted displays, PDAs, and wireless connections to databases and back-end software. The Agricultural Technology Research Program of Georgia Tech’s Research Institute has employed mobile computing technologies to develop better ways of providing real-time and immediate data storage and information access for mobile plant personnel. The resulting Factory Automation Support Technology uses speech recognition to record data in meat-processing plants (Gobert, 2002). Users include managers, supervisors, auditors, production personnel, and maintenance personnel who would otherwise need to use their hands to access such support as they manipulated product or machinery. Users can access the PSS anywhere in the plant as they perform their jobs. Other wearable applications include PSS for mechanics who maintain Honda and Cadillac vehicles (Adkins, 2003a; Barron, 1999) , U.S. Army National Guard maintenance technicians who service tanks (Barron, 1999), and dermatologists who can collaborate remotely while accessing databases of medical records and laboratory results (Gobert, 2002).

Nomenclature

The last factor on which PSS vary is the rapidly expanding nomenclature they employ. In addition to the term *knowledge management,* PSS also appear under five other common aliases.

**Business Process Integration Tools.** As their name implies, business process integration (BPI) tools provide intelligent tools for designing business processes while connecting them to underlying applications. Most BPI products contain a software engine that works as a meta application that invokes and passes data among the enterprise’s underlying applications, based on core and enabling processes (Gruden and Strannegard, 2003). Common reasons for using BPI include connectivity, process automation, and decision support.

One BPI package, ProCarta by ProCarta, Inc., sits on top of existing enterprise IT software to link existing knowledge assets to mission-critical business processes. Cited as the 2003 EPSScentral.net extraordinary PCD tool, ProCarta was described by Gloria Gery as “the most extraordinary software I have seen” ( EPSScentral.net, 2004).

**Enterprise Application Integration.** With most organizations using a myriad of different, stovepiped systems from different vendors, enterprise application integration (EAI) attempts to integrate all of them so that they work together and exchange data, methods, objects, and processing power. EAI is a close relative of knowledge management; indeed, Adkins (2003b) predicts that EAI will soon absorb knowledge management, which will become one of many features of EAI products.

**Composite Applications.** Composite applications attempt to place existing data that are locked away in an organization’s legacy systems on-line, so that they are available to the employees and customers who need them. For example, thanks to the advent of e-commerce, customers expect up-to-date information about pricing, availability, and order status. Meanwhile, employees need to update customer information in a legacy data store with a difficult-to-use interface. Composite applications make such data accessible, either by replacing the entire legacy systems or introducing new systems that replicate the legacy systems’ logic. Regardless of the method chosen, a successful composite application will make data available to end users in the form in which they need it.

**Portals.** Gery defines a portal as “an integrated, single point of access to knowledge, data, tools, communications and task support” (2003b, p. 9). They can be built for an entire organization, a role such as sales representative, a function such as a learning center, a task such as purchasing a product, or to access and use data such as those in an inventory. Advantages include collection and aggregation of data, classification, improved representation, filtration, integration within a site, and integration among other portals.

In other words, a portal pulls together resources from a variety of systems, personalizes them, and makes them available, on demand, in the form that users need. Cheese and Ives (2002) predict that portals are the “desktops of the future” and submit that to be effective, they must enable employees to view the knowledge they need, use that knowledge to make decisions, and then act on those decisions through integrated applications.

**Decision Support Systems.** Decision support systems (DSS) help managers answer relevant questions (Power, 1997). At the enterprise level, DSS are linked to large data warehouses and designed with an intimate understanding of users’ goals, priorities, and strategies. DSS have become widespread over the past ten to twenty years, producing variants such as business nervous systems that compile and digest input on what is happening within the organization, helping managers to identify areas that need attention, and business intelligence systems that provide coherent data on external, strategy-affecting events. The medical community uses DSS to help create exercise regimens for arthritis patients (Minor, Reid, Griffin, Pittman, Patrick, and Cutts, 1998) and to facilitate doctorpatient collaboration in treating pediatric asthma (Porter, 2001).

**PSS EXAMPLES**

To demonstrate PSS concepts and variability in action, we provide examples of on-line-external and on-line-intrinsic PSS.

On-Line External Example

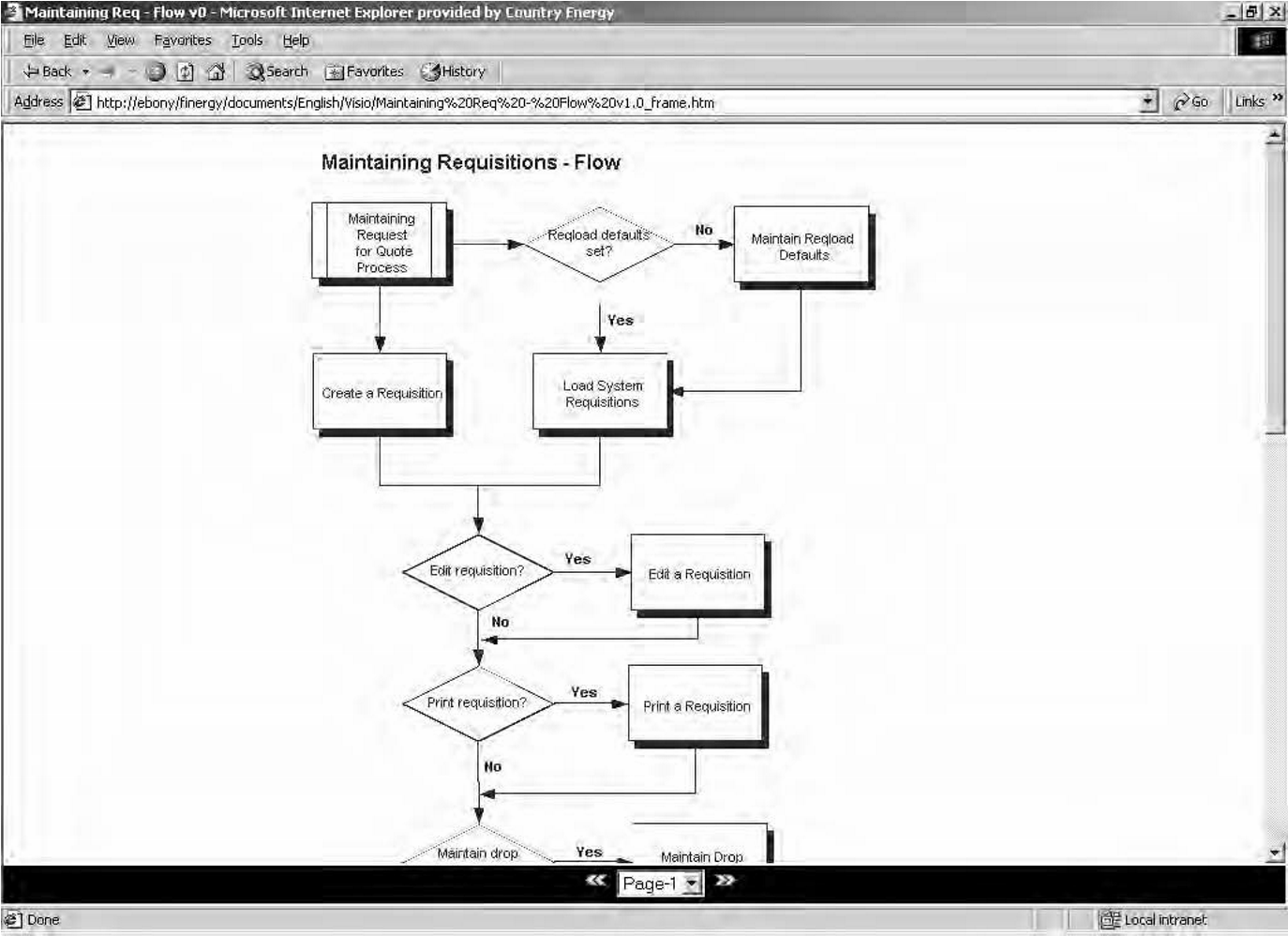
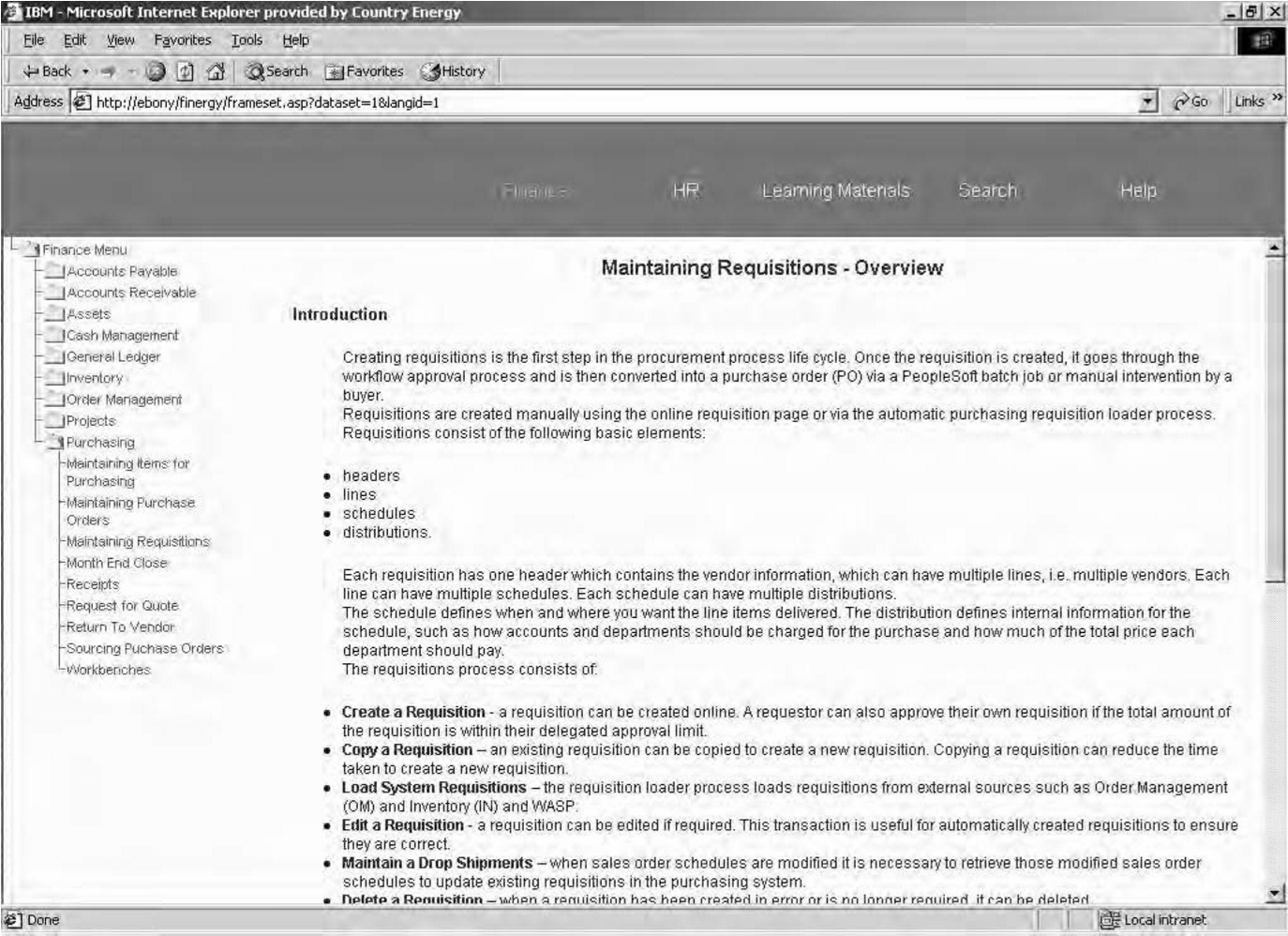
Figure 23.4 and Table 23.3 depict an on-line-external performance support system developed by IBM for a major utility company in Australia that had successfully merged and consolidated three back-office systems. It provides context-sensitive on-line help for enterprise resource planning systems such as SAP and PeopleSoft. Linked to an extensive back-end database, the system user interface calls up and displays on-line help resources, including business process overviews, flow charts, and procedures. Its screen design provides cognitive support by providing visual cues such as graphics and colors for different types of information, while its menu bar provides quick access to document information such as page references and file names.

The system user interface is browser-based, and PeopleSoft users can quickly and easily access its step-by-step, task-specific instructions by one of the following options:

* Directly from the client’s home page on the intranet site. This enables users to locate business process information and help without having to log on to PeopleSoft.
* By clicking the “Help” hyperlink in PeopleSoft or SAP. This method allows users to display context-sensitive on-line help for tasks related to the page they are viewing. Users also can resize the window or make it disappear and reappear.

On-Line-Intrinsic Example

Figure 23.5 and Table 23.4 depict an on-line-intrinsic, prototype performance support system developed by DLS Group, Inc. for the U.S. federal government. It provides a blueprint for delivering context-sensitive performance support for people who interpret satellite imagery. Designed to work as a user interface integrating data from different legacy systems, the system allows analysts to select an assignment, review the information associated with it, conduct ad hoc queries, analyze the data they have collected, and review or release the analyses for dissemination. The screen design provides a variety of forms of cognitive support for this problem-solving activity, including the use of different background colors that correspond to each phase of the analytical process and quick access to contextualized information, training, and on-line tools. The system works as the analysts’ desktop application, eliminating the need to use multiple software systems to complete their analytical assignments.



**Figure 23.4.** Screen Samples from IBM Performance Support System.

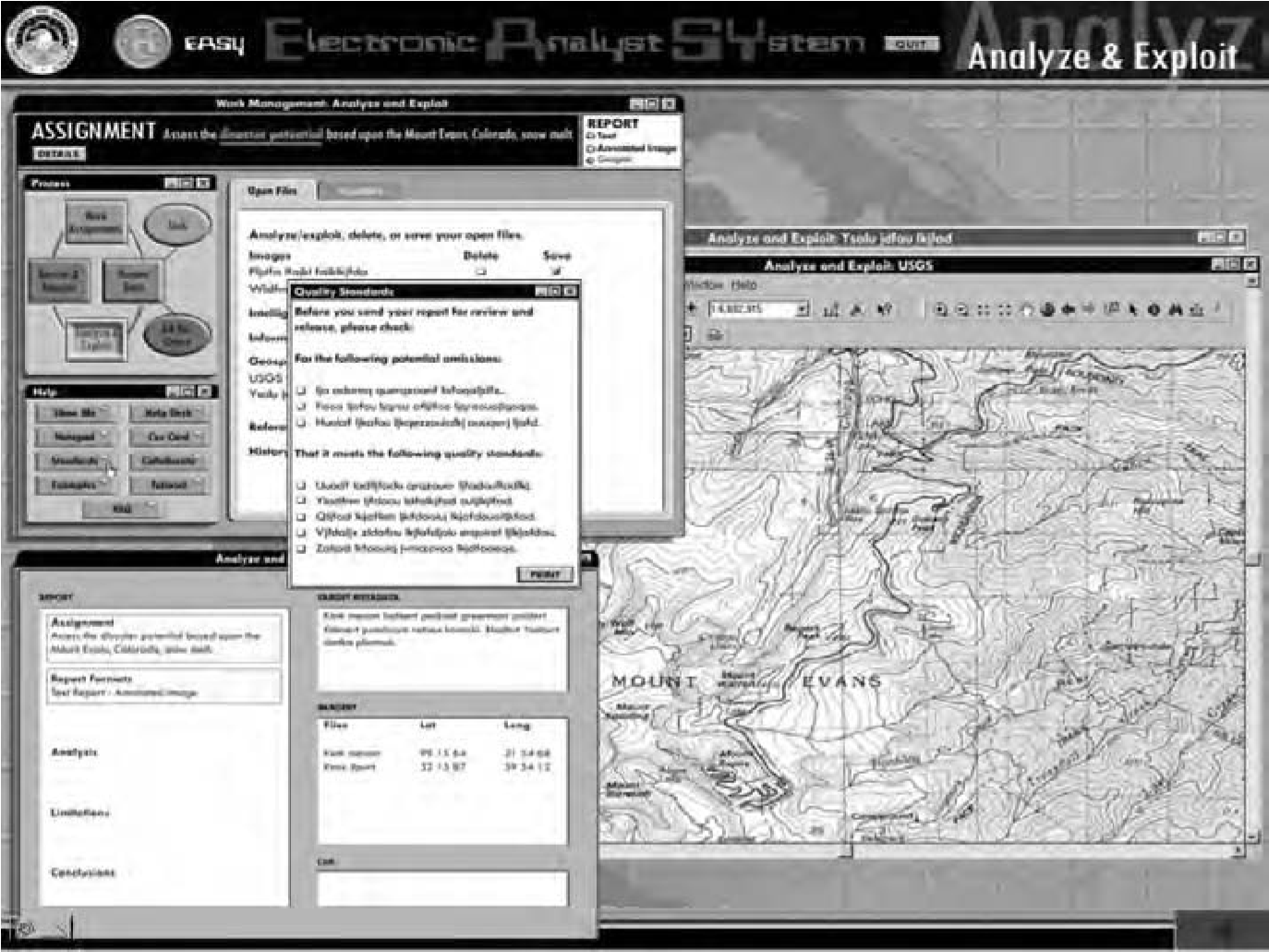
**Table 23.3. IBM Performance Support System Description.**

*Performance Support*

|  |  |
| --- | --- |
| *System* | *Description* |
| Project goal  Target audience  Components  Development | Leverage the best-practice processes within the enterprise resource planning application and support end-to-end implementation of the software and its corresponding business processes  Three thousand users who fill sixteen different roles related to finance, human resources, and payroll  Web-based learning and context-sensitive on-line help for fourteen PeopleSoft modules, plus the development and delivery of a train-the-trainer program and related documentation Three months |

effort

**Figure 23.5.** Screen Sample from EASY.



**Table 23.4. EASY Performance Support System Description.**

*Performance Support*

|  |  |
| --- | --- |
| *System* | *Description* |
| Project goal  Target audience  Components  Development effort | Support the performance of people who interpret satellite imagery for the federal government of the United States by   * Replacing stovepiped software systems with a seamless, common look and feel * Providing end-to-end support for job processes that parallel workflow * Providing both strategic (problem-solving) and tactical ( software use) levels of on-line support * Filtering and preloading the information users need for ready access.   The number of users who gather, analyze, and disseminate imagery for assorted agencies is classified.  Workflow-based user interface with context-specific access to training, information, advice, and tools. On-line training consists of short, Web-based tanning modules. Information components include worked examples, knowledge nuggets, glossaries, demonstrations, cue cards, standards, and access to human knowledge brokers. Tools include a powerful search engine and automated report assembly tools.  One and a half months. |

**BENEFITS OF PSS**

Why the interest in the various forms of PSS? Simply stated, the benefits of PSS improve the performance of people and organizations. The benefits of PSS arise from supporting performance at the time of need. Altalib (2002) reports a variety of benefits from PSS that HPT practitioners can measure, including

* Increased productivity arising from just-in-time support, such as reduction in time required to perform a task or increase in units produced or items processed
* Reduced costs rising from decreased or eliminated training
* Improved worker autonomy that reduces the burden on support teams
* Improved quality arising from standard work practices, including reduced numbers of errors and waste
* Improved knowledge capitalization, including the capturing and leveraging of skills, knowledge, and best practices
* Decreased system maintenance costs
* Improved morale, including reduced absenteeism

Other benefits can include increased revenue, decreased novice ramp-up time to competent job performance, decreased or eliminated costs associated with informal mentoring, when users get help by asking the person next to them, and improved internal and external customer satisfaction. Additional information describing the beneficial impact of PSS appears on the Website describing performance-centered design winners ( http:www.epsscentral.com/news/ pcdawards) and in Table 23.5.

**PROJECT-DEVELOPMENT CONSIDERATIONS**

Although the potential benefits of PSS are great, creating the system that realizes them requires HPT practitioners to be aware of several development considerations, including collaboration, design, implementation, and evaluation.

Collaboration

The first consideration is collaboration. The creation and successful implementation of PSS requires successful collaboration within the core development team and with the end user population. Owing to the increased scope of PSS efforts, a larger cast of characters must be responsible for building them. Describing a team developing on-line, intrinsic PSS development, Huber, Lippincott, McMahon, and Witt (1999) suggest a group comprising a project manager, a system integrator and architect, object-oriented designers, software developers, software engineers, and knowledge engineers. Gary Dickelman (personal communication, October 19, 2004) suggests that teams creating on-line extrinsic or intrinsic performance support systems must minimally possess expertise in three core areas: business-process analysis and improvement, such as reengineering; humanfactors engineering or usability science; and the architecture and management of hypertext, information, and knowledge.

Describing rapid application development (RAD) strategies, Martin (1991) suggests project managers employ small teams comprising specialists with advanced tools, that is, SWAT teams. Using this approach, a SWAT team for a particular PSS effort would consist of two to four people, including a project manager, a PSS architect, designers, and developers. Additional expertise, such as that of software architects, software developers, and graphic artists, rotates in and out of the team as needed (Villachica and Stone, 1998b). This team should have previous success working together; good collaboration skills; and tools composed of proven

**Table 23.5. Impact Data Reported for PCD Winners.**

*Year Description Reported Impact*

1. TREE, a performance support • Ease, efficiency, and accusystem that helps teachers plan, racy of the instructional organize, and manage their work. tasks that grouped students Using TREE, teachers can group performed students in meaningful ways and • Dramatic reduction in develop lesson plans with teacher training time common objectives.
2. The GoldWing 1500 Electrical • Reduced service costs Troubleshooting performance sup • Improved technician port system assists Honda service productivity technicians in servicing and trou • Improved consistency of bleshooting the electrical system task performance of GoldWing 1500 motorcycles. It • Decreased call volume for consists of three major sections: technical support
   * Troubleshooting and diagnos • Improved efficiency and tic procedures efficacy of technician
   * Repair and replacement troubleshooting procedures • Decreased training time and
   * Interactive schematics costs with corresponding

increase in training efficacy

* + Improved access to timely information about changes in products and processes
  + Preserved and disseminated technician expertise
  + Improved customer satisfaction

2000 The Eventful performance-centered • Improved productivity event management application helps users to manage the administration and operations of an eventbased sales business. This software allows users to manage suppliers and inventories, manage customer relationships, manage press relationships, conduct sales events, and process sales statements and accounts.

(*Continued*)

**Table 23.5. Impact Data Reported for PCD Winners. (*Continued*)**

|  |  |  |
| --- | --- | --- |
| *Year* | *Description* | *Reported Impact* |
| 2001  2002  2003  2004 | Step 7 Lite helps automation specialists engineer and program solutions to automation problems arising in the manufacturing industry.  The Integrated Sensor Radio Frequency Identification System alerts transportation logistics workers to in-storage and in-transit exceeded limits for conditions such as temperature, pressure, and humidity that can be corrected to prevent damage to high-value assets.  The e-Learning Development Resource Center provides the training community of the U.S. Internal Revenue Service with enterprisewide, single-point access to a wide variety of e-learning information, tools, templates, guides, and other resources. To this end, it provides task support, content knowledge, data, tools, collaboration, and integration capabilities.  Business Plan Developer assists interns creating business plans for the National Park Service. Specifically, it helps users get started, collect and analyze information, and generate appropriate reports. | * High user satisfaction rising from usability testing * Improved design efficiency * Reduced inventory of lost engines * Reduced instances of stored ready-for-issue and nonready-for-issue assets reaching “beyond economic repair” status or complete loss due to corrosion * Decreased costs to refurbish containers * Decreased loss rates for engine containers because of tracking, inventorying, and full or empty status errors * Improved access to a community of practice * Increased levels of course consistency and compliance * Leveraged expertise regarding courseware design, streamlined development processes, and the production of better courseware * Reduced training time from five days to one * Improved efficiency of data collection * Improved ease, consistency, and quality of business plans * Substantial cost savings |

*Source:* http:www.epsscentral.com/news/pcdawards.

processes, templates, code, content libraries, and applets such as macros or engines that automate the completion of various tasks. Smaller PSS efforts require the work of a single SWAT team. Larger efforts require the coordinated work of multiple SWAT teams working on different PSS components.

Design

The second PSS consideration is design. Owing to the abstract nature of the integrated components constituting a performance support system, collaborative prototyping-based design approaches are a must. Using RAD, the PSS project team can collaborate with end users to create and review iterative prototypes depicting the system. In addition to allowing the changes to the design before they become too expensive to make, prototyping also helps ensure adequate representation of the breadth and depth of the final system prior to the development effort. Subsequent usability testing ensures that the system design the project team created will be acceptable to other end users. Brown (2002) suggests that usability testing also helps identify and correct usability issues early, ensure repeated visits to the Website or system application, and provide formative evaluation data. By conducting a post-mortem workshop addressing the final prototype arising from the usability test, the PSS team can baseline project roles and accountabilities, development processes, and metrics prior to the development effort. During the development phase, the team can then concentrate on increasing its efficiency rather than coping with increasing costs of changing the performance support system as it moves into pilot testing, implementation, or maintenance.

Guiding these efforts are two core design strategies: performance-centered design (PCD) and minimalism. First articulated by Gery (1995) and subsequently modified by Marion (2002), PCD seeks to create PSS and other software that demonstrate specific attributes that improve their ease of use and organizational impact. These attributes appear in Figure 23.6. Using PCD, designers embed knowledge into the interface that users would otherwise need to access externally. Furthermore, they structure that knowledge to mirror the thought processes, interactions, and decisions involved in the task the tool is supposed to support. In essence, the tool *becomes* the task (Dickover, 2002).

Supplementing PCD is minimalism, a design strategy based on the contention that users will begin interacting with a new or unfamiliar application immediately, rather than waiting until they have received formal training (Carroll, 1990). Because of this natural predisposition to act before understanding, the minimalist approach suggests users will obtain greater benefit from targeted yet limited assistance, rather than from all-encompassing on-line support. Under the minimalist approach, it is critical that designers possess a complete and thorough understanding of what users need to accomplish a job. Through the use of RAD strategies such as collaborative analysis and design, prototyping, usability

**Clarifying the Work Context**

1 .Establish and maintain a work context

2 .Aid goal establishment

3 .Structure work process and progression through tasks and logic

4 .Institutionalize business strategy and best approach

**Optimizing the User Interface**

5 .Contain embedded knowledge in the interface, support resources, and system logic

6 .Use metaphors, language, and direct manipulation of variables to capitalize on prior learning and physical reality

7.Reflect natural work situations

8 .Use appropriate vehicles to convey information

9 .Provide information visualizations where helpful

10.Provide alternative views of the application interface and resources

**Optimizing Interactivity**

11.Observe and advise

12.Show evidence of work progression

13.Provide contextual feedback

14.Provide support resources without breaking the task context

**Optimizing Automation**

15.Accommodate performer diversity by layering or individualizing information

16.Provide access to underlying logic

17.Automate tasks

18.Allow customization

19.Provide obvious options, next steps, and resources

**Optimizing Knowledge Access and Use**

20.Provide an appropriate search function

21.Provide sufficient maps of and paths to information

22.Ensure quick and easy navigation

23.Facilitate communication through appropriate tools

24.When possible, capture and reuse knowledge

**Being Consistent**

25.Employconsistentuseofvisualconventions,language,visualpositioning,and othersystembehavior

**Figure 23.6.** Attributes of PCD.

*Source:* Gery, 1995, and Marion, 2002.

testing, and similar field research techniques, designers can identify the minimal, essential tasks that users need to accomplish right away.

Implementation

The third PSS consideration is implementation. The changes to job roles and activities arising from PSS mean that their implementation cannot be approached as an afterthought. It takes time to ensure that the organization is ready to adopt the PSS, educate users about what PSS are, communicate what they will do, brand the PSS, market them, and strategize flawless logistics that make their implementation transparent. For these reasons, the implementation effort for PSS must begin on day 1 of the project, if not before (Stone and Villachica, 2003).

Evaluation

The last PSS consideration is evaluation. Given their large scale and intensive use of technology, PSS tend to involve development costs well beyond those of traditional documentation and training. For this reason, documenting ROI is critical in making a case for PSS. Practitioners should be able to demonstrate that the new system meets the performance needs of workers in ways that postively affect the organization’s financial performance. Practitioners should be able to show that the impact of the benefits a performance support system generates is greater than the cost of creating it. In spite of our views on the importance of ROI, our review of the literature yielded few discussions of such results. Only Endicott, Villachica, and Stone (1998) and Villachica and Stone (1998a) provide published ROI data associated with implemented PSS. Neither of these book chapters was a formal evaluation study appearing in the peer-reviewed professional literature.

Given the risks associated with PSS development, evaluation should be an ongoing activity that begins on day 1 of the project. Hale (2004) describes a three-point model that lends itself to performance support system evaluation at the worker, work, and workplace levels. The first point occurs when HPT practitioners measure need during or before the analysis phase. Outputs at this point include either a rationale for action or a business case that calls for action, sets the baseline, defines goals and gains, identifies success measures, and confirms the feasibility of the effort. The second point occurs during the creation and implementation, when practitioners measure their in-process efforts to recommend corrective actions based on formative evaluation data or predictive indicators. The third point occurs after implementation, when practitioners report results, including impact and ROI data.

Elements of RAD support all three points in Hale’s model. During an initial alignment workshop that precedes the analysis phase, project teams establish critical success factors that are aligned with business objectives, as well as their corresponding measures. During design and development efforts, the project team collects baseline metrics associated with the measures, establishing a baseline. Data collected during collaborative analysis and design workshops, prototyping, and usability tests provide information for formative evaluation. After implementation, summative evaluation collects subsequent data to compare against the baseline. Depending on the needs of project decision makers, this summative evaluation could collect data describing the impact of the performance support system on the organization, the return on the organization’s investment, or the overall quality of the system, such as what worked well, what could be improved, potential breaks in the chain that links the system and its components to job performance, and organizational results.

**ANOTHER LOOK TOWARD THE FUTURE**

This chapter on PSS is the second that has appeared in the *Handbook of Human Performance Technology.* In the previous edition*,* we noted that predicting what would happen in the future is a risky venture (Villachica and Stone, 1999). We asked whether PSS represented a fad or a real contribution to the field. We said they were real and here to stay. We also stated that we believed that PSS would “move out of their current niche status to grow in importance for HPT practitioners. Given the increasing appearance of PSS on the job, HPT practitioners may well conclude that their primary role, rather than to create isolated performance interventions, is to create systems that support workplace and organizational performance” (p. 460).

With hindsight, we realize our predictions have had a mixed record. PSS are not only here to stay; in some ways they have matured and come of age. Writing of PSS, Gery (2003a) noted that “Improved design of software *for use* or work performance is occurring. We are finally seeing some software that is truly performance centered. We are achieving both performance and learning in the same context” (p. 1). She contends that such improvement occurs owing to

* Business strategies dependent on customers’ willingness and ability to use PSS
* Inability to assume that training would be required, let alone completed
* Large-scale use of customer Websites, leading to questions and problems requiring help desk staffing requirements that could overwhelm an organization

Likewise, Dickelman (2002) also maintains that PSS have matured, noting the extension of performance support principles to new user populations and applications. He also notes that disciplines outside the mainstream of performance support have become aware of its tenets and begun applying them to their own domain. However, progress on some fronts has not extended to others. Our prediction concerning PSS becoming central to HPT practitioners now seems naively optimistic.

In spite of the progress of PSS and performance-centered design appearing in a variety of new places, practitioners and client populations remain confused about PSS. Dickelman notes (personal communication, October 19, 2004) that many still think of PSS as things or technology, rather than as an advocacy or point of view that serves to integrate the many disciplines that support performance: “It is about the organizational mapping of business processes, human factors, and hypertext. It is about cross-discipline cooperation. We have the technology. It is getting all that stuff in the same place at the same time to support performance.” In other words, our focus as HPT practitioners should not necessarily be on PSS or EPSS. Our focus should be on using systemic and systematic approaches to create multiple, integrated interventions that support and improve performance in meaningful ways. When appropriate, performance support will follow.

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