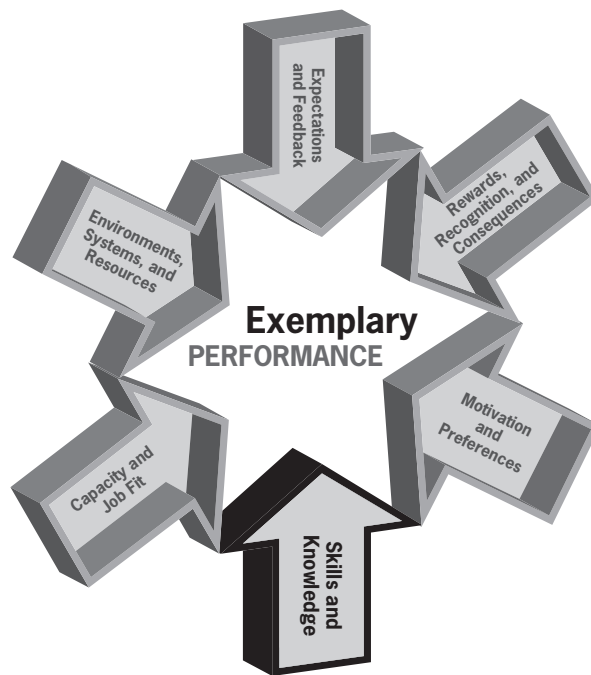


CHAPTER TEN

Replicating Your Stars!

Training and Performance Support

Figure 10.1. The Role of Skills and Knowledge in the EPS Model



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In This Chapter

- Why Training Is Not the Default Tool for Improving Incumbent Performance
- Where to Store Required Skills, Knowledge, and Procedural Information
- Designing, Developing, and Delivering Context-Intensive Training
- Developing and Implementing Performance Support

In Chapter Four we discussed how to capture the DNA of your exceptionally high performers. A significant component of their DNA is their rich mental models of how they produce exceptional results. A high percentage of these powerful mental models are the skills, knowledge, and information that your stars apply within the work process, as seen in Figure 10.1.

Well-designed training is an effective and efficient tool for transferring the requisite skills, knowledge, and information to workers who are newly assigned to a role. We consider well-designed training to have the following characteristics:

- The structure of the training should precisely mirror how your stars produce exemplary results.
- The content should align with actual work practices.
- Rich, role-specific examples and practices should be included.
- Sufficient practice is provided to support skills transfer to the work setting.
- An explicit decision must be made between storing the information in the memory of the performer or making it available through performance support.
- The training concludes with a simulation of the critical work processes at the highest level of fidelity that is practical.¹

When new-hire training is designed and developed, based on a Profile of Exemplary Performance captured from your star performers, we consistently see impressive results. For example, ramp-up times for new hires are reduced by 30% or more.

Concurrently, training design, development, and delivery times are all shortened by 20% to 40%. The combination of faster ramp-up times and reduced training cycles has a significant impact on the value that new hires produce in the early months of their employment.

We won't dwell on this positive impact of context-intensive training for on-boarding new hires. We will merely say that, although training is absolutely essential for new hires, you shouldn't assume (and management often does) that training is the key tool for improving the performance of incumbents. Clearly, this is an inaccurate assumption.

Why Training Is Not the Default Tool for Improving Incumbent Performance

Historically, productivity has been a strong predictor of a business's success. Although this construct has typically been applied to manufacturing, it is also now used when discussing knowledge work. Manufacturing production constitutes an increasingly smaller proportion of the U.S. economy. Currently, it employs less than 10% of the workforce. On the other hand, more than 70% of the workforce is now tied to knowledge and services industries, where productivity has stagnated, despite massive investments in information technology. Clearly, moving the productivity needle forward represents a substantial opportunity.

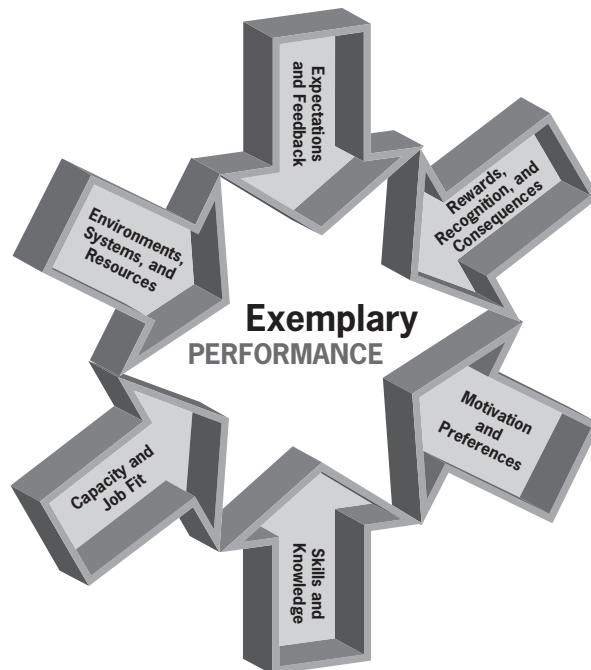
One of the factors contributing to this suboptimal improvement in productivity is management's overreliance on training as the principal tool for improving performance. When deciding whether training is an appropriate intervention to improve performance within your workforce, you should consider three important issues.

The first issue begins with a simple question: *Is the target audience performing a required task correctly some of the time?* In our work across scores of organizations, the answer to this question is almost always yes. When the answer is yes, it is clear that the target audience has the requisite skills and knowledge. If work is being performed correctly on Tuesday and doesn't meet the standards on Wednesday, it's not due to a lack of skills and knowledge. All the training in the world will not improve the performance of an employee group with this variability in performance.

The second factor has to do with a simple statistic reality. Evidence from multiple studies across the past two decades indicate that, when incumbents are underperforming, 10% to 12% of the performance gap is attributed to skill, knowledge, and information deficiencies. The rest of the deficiency is attributed to *other factors within the work system*.

This leads to the third factor, which is an issue of *alignment of the work systems*. To optimally shift the performance curve, you must align the six performance system components shown in Figure 10.2 (and introduced initially in Chapter One). There is a basic principle within systems thinking that states that, if you optimize a subsystem, you suboptimize the overall system. What this means is that if you default to training as the sole solution for improving performance and pour all of your resources into that single solution, even if the training is perfect, optimal results will never be achieved.

Figure 10.2. Aligning the Subsystems



Often management relies too heavily on training as a universal response to inadequate performance. Further, managers frequently confuse training with learning, losing sight of the fact that training is in large measure an attempt to standardize work. Unfortunately, such an intervention frequently works against innovation and the creation of new knowledge, which is foundational for knowledge and service workers. In fact, you can fairly assume that knowledge and service workers learn best when they are

Knowledge workers learn best when they are performing actual work, facing real challenges, and producing meaningful results.

performing actual work, facing real challenges, and producing meaningful results. Yes, classroom-based learning may be helpful, but only to the degree that it closely resembles the actual work situation, and when there is well-designed support on the job to transfer what is learned in class.

Where to Store Required Skills, Knowledge, and Procedural Information

When analysis determines that performance is deficient due to lack of skills or knowledge, you must decide which alternative for storing information is most effective for producing results. The options are to store the information in the memory of the performers or to store the information externally in what is referred to as performance support.²

Performance support is a class of tools that provide requisite knowledge and information, just in time at point of need. Imagine visiting your local automated teller machine (ATM) to withdraw cash. But instead of finding the usual visual cues to help you select an account and indicate an amount, you had to attend a bank-sponsored training program until you could punch in a series of numerical commands from memory. Or to further illustrate the concept, imagine this familiar scenario *with* performance support that we all rely on nearly every day: leaving a voice mail message. Just imagine trying to leave an urgent message on a voice mail system without audio prompts to direct you, requiring you to guess which numerical command was correct.

Performance support is a storage place for information, other than memory, that is used while performing a task.

Performance support is a storage place for information, other than memory, that is used *while* performing a task. It provides a signal to the performer on when to carry out increments of a task, which reduces the amount of recall necessary and minimizes error.

Performance support can appear as simple instructions to assemble equipment or complex algorithms to analyze systems. This includes tools such as checklists, decision tables, performance-centric user interfaces, embedded help systems (such as the voice mail example), job aids, and so on.

The decision whether to use performance support or long-term memory is a trade-off because each has advantages and disadvantages. Advantages of long-term memory include the following:

- Long-term memory allows performers to act quickly (within seconds), and this usually translates into higher productivity.
- The performer's hands and eyes are unencumbered.
- Performers are likely to be given more credit by other people (bosses, peers, customers) if they can respond without external aid. Often these people equate competence with speed and memory, rather than just the quality of the performance.
- In rare cases, memory storage is mandated by regulations.

The disadvantages of long-term memory storage include the following:

- Despite good teaching tactics, decline in retention begins within seconds and can be serious within hours. When the interval between learning and on-the-job practice is long, loss of retention often wipes out any performance improvement, unless performance support is used.
- There is greater variability of performance for memory-based activities.
- Variables such as task interference, personal problems, and prior learning can hinder job performers from accessing long-term memory.
- The instructional design and development of training materials takes much longer to produce than performance support, resulting in higher development costs.

- Training time for long-term memory storage is greater, resulting in higher delivery costs. The delivery cost of training typically exceeds all other costs combined.
- Higher retraining costs occur when there is a change in the work process. Unlearning then relearning is one of the more expensive problems faced by trainers and educators.

If you determine that long-term memory storage is *not* the best information storage alternative, you can develop performance support. Performance support is not limited to a particular type of task. It has been developed for linear tasks such as equipment assembly and filling out forms, but has also been developed for complex tasks such as medical diagnosis, business negotiation, and the analysis of complex systems. The amount of information available in performance support is not limited; performance support can be one sentence or pages of information embedded in an information system.

The following *job tasks* are ideal candidates for performance support:

- A task performed with relatively low frequency;
- A highly complex task. A task is complex if fine discrimination of stimuli is involved, such as a fighter pilot determining whether an oncoming aircraft is friend or foe, or if there is a series of binary discriminations, such as inspecting or troubleshooting a complex electronic system;
- A task with criteria which, if not met, results in high consequence of error, such as high financial loss, injury, or loss of life (such as an engineer designing a chemical plant); and
- A task with a high probability of change in the future. That is, the way in which the task is being currently performed is likely to change because of changes in technology, policy, or equipment. In such cases, other variables being equal, it is often not worth devoting time and other resources in the costly, time-consuming process of training. It is far more cost-efficient to update a performance support tool than to retrain a portion of the workforce.

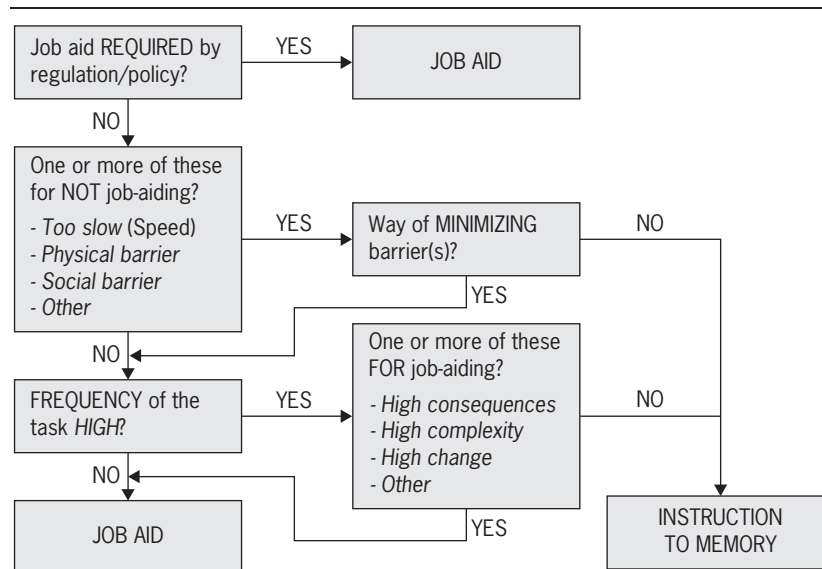
Characteristics of the task do not rule out the use of performance support. Some tasks have severe time requirements in which even seconds matter. For example, the initial actions of

a pilot during an in-flight emergency must be immediate rather than guided by performance support. Note that pilots are trained to shift to performance support (flight procedures) immediately after taking the initial corrective actions. Why? These actions are infrequently performed, are highly complex, and may have devastating consequences.

Another inhibiting factor might be the performance environment. For example, a surgeon might face the problem of how to ensure that a performance support tool is kept sterile. Social barriers might be another inhibiting factor in the use of performance support. For example, if more credit is given by bosses, peers, and customers for the use of long-term memory storage (knowing all product prices or order numbers), the job performer might not use performance support, no matter how complex the task.

Figure 10.3 provides the logic for making the decision between performance support and training to memory. We have been using this tool for decades and find that it produces consistently valid results. The most interesting aspect of this tool is the conclusion that performance support is the preferred option over training.

Figure 10.3. Job Aid Versus Memory Decision

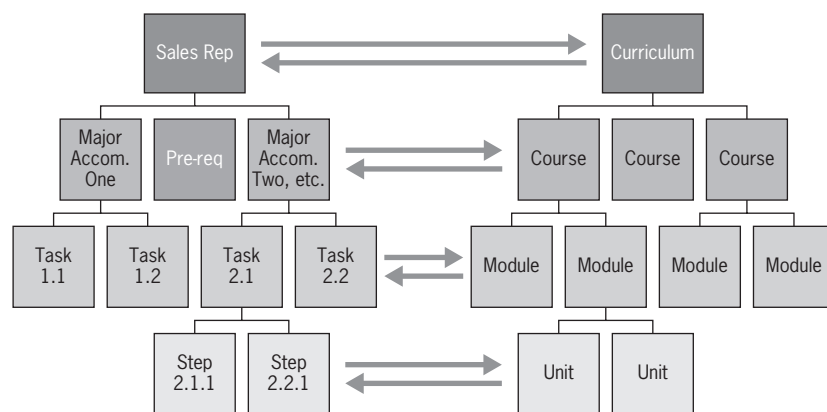


This is the reverse of all the assumptions that most managers and training organizations have in regard to the most effective and efficient way to provide skills and knowledge to performers. We believe, however, that it is always preferable to provide performance support over training, when you have reached this conclusion based on data about the actual nature of the work. If this seems counterintuitive to you, remember that the costs of developing performance support are significantly less and delivered in much less time than the equivalent training.

Designing, Developing, and Delivering Context-Intensive Training

When training (to memory) is required, we are strong advocates for context-intensive training. Context-intensive training is designed directly from the Profile of Exemplary Performance discussed in Chapter Four. The structure of the training is analogous to the work structure/process. The examples and practices are role specific and include the current best approaches captured from exemplary performers and teams. Figure 10.4 shows the structure of a sales role on the left and the corresponding curriculum model on the right.

Figure 10.4. Relationship Between Profile of Exemplary Performance and Context-Intensive Training Curriculum



Because participants never have to ask how the training relates to their work, this context-intensive design model drives measures of relevance and training transfer off scale!

If one of the accomplishments for the role is “Accurate forecast,” the corresponding course on the right would be entitled “How to Produce an Accurate Forecast.” If a key task for producing accurate forecasts is “Analyze competitive landscape,” you would need a module entitled “How to Analyze the Competitive Landscape.” Because participants never have to ask how the training relates to their work, this context-intensive design model drives measures of relevance and training transfer off scale!

When approaching the design and development of instruction, you should remember that this arena is strewn with wasteful, ineffective practices. For example:

- Providing a group of trainees with the same information for a fixed amount of time without regard to individual needs;
- Grading on a curve; or
- Using multiple-choice questions as a tool for assessing the trainees’ ability to produce accomplishments or results, versus using an appropriate level of simulation or actual on-the-job practice.

Unfortunately, these ineffective practices are such a part of the mythology of what constitutes “good” training that it is often impossible to dislodge these myths with more effective and efficient practices based on sound research.

The purpose of instructional design: to prescribe instruction that will teach the learner to perform as the role requires and, at the same time, to adjust to the needs of the individual.

Instructional design is a planning process that creates a blueprint that developers can use as a guide for drafting the instructional materials, along with the methodology to be used to deliver those materials. Many ways exist to design instruction and develop the required components to deliver it, but regardless of the mix selected, the purpose remains the same: to prescribe instruction that will teach the learner to perform as the role requires and, at the same time, to adjust to the needs of the individual.

In effect, this means you should provide instruction and practice only in those skills and tasks not yet mastered and only as much training as is needed to produce the level of competence required for the role. This context-intensive model will enhance the trainees' motivation to apply what was learned to his or her world of work. The training should also guarantee to produce graduates able to perform to the level as described in the Profile of Exemplary Performance and yet be flexible enough to avoid the enormous waste associated with a one-size-fits-all design approach.

Why do we stress the importance of designing the training based on the information captured from your exemplary performers? To do this requires a little background information as to the difference between *declarative knowledge* and *procedural knowledge*. Declarative knowledge is often described as "knowing what" and procedural knowledge is described as "knowing how."

You can learn everything there is to know about a subject, but still not be able to use that knowledge to do anything.

If you know how to use a copier, you have procedural knowledge. If you know the underlying principles concerning how a copier works, you have declarative knowledge. There is significant evidence that declarative knowledge is different from procedural knowledge. You can learn everything

there is to know about a subject, but still not be able to use that knowledge to do anything. For example, learning the rules of grammar may help you learn the Italian language, but being able to state the rules does not mean you can speak the language. Speaking requires procedural knowledge.

Experts aren't just faster and more accurate than novices or incumbents who are performing at a lower level—they know more and different aspects of the problem, and they have insights that the novice cannot yet fully understand. In fact, six major differences exist between experts and nonexperts that are important to consider in the design of instruction.

1. In general, experts have more specific declarative knowledge. They have more principles in their mental models, and those principles operate more automatically. This allows them to synthesize their declarative knowledge and apply it more systematically to the procedures that require it.

2. Experts have better links between their declarative knowledge (mental models) and their procedural structures. These links allow them to bring principles and procedures together to solve problems more efficiently.
3. Experts are really exceptional at organizing their mental models. Solving a new problem involves constructing and manipulating that mental model and, in the process, making more associations among the declarative and procedural knowledge structures. This ability provides them with mental shortcuts that make the experts highly efficient.
4. Experts categorize and group problems differently than less experienced performers do. They are able to extract the abstract problem features from the surface symptoms they encounter and categorize those features based on their deep mental models.
5. Experts frequently generate heuristics (strategies) for solving problems by working forward from the initial condition or problem, generating a hypothesis for a solution, and then applying the new solution to see if it leads to the desired goal.
6. And finally, experts are more likely to persist if the first strategy doesn't work. A novice may give up after an initial failure.

Based on this research, the challenge for training is to assist learners to categorize problems the way experts do and to build an appropriate mental model of the work that contains all the correct components, in the right relationships, with the right operating principles. This is the logic behind a context-intensive approach to training design.

Using Structured On-the-Job Training

Structured on-the-job training (SOJT) is an approach to training design and implementation that produces a rich, context-intensive approach. This is an approach we often recommend. But first, it is important to differentiate between SOJT and unstructured on-the-job training.

In North America, on-the-job training (OJT) is most commonly used to refer to a haphazard and ineffective approach of pairing a novice with a more experienced performer. The hope is

that, through osmosis, the right information will pass at the right time from the more experienced performer to the less experienced performer. It is typically not systematic, replicable, scalable, or dependable. Unstructured OJT leads to trainees acquiring skills through the following means:

- Impromptu explanations and demonstrations by others, whether or not those providing the information are qualified performers. The research shows that when subject-matter experts serve as ad hoc coaches, they leave out 70% of the process steps that the novice requires to be successful;
- Self-initiated trial-and-error efforts; and
- Random imitation of others' behavior, regardless of whether they are qualified to serve as examples.

In contrast, SOJT is defined as the planned process of developing task-level expertise by pairing an experienced employee with a less experienced employee, at or near the actual work setting. The discrete job tasks that are documented and observed serve as the basis for the training content and objectives.

SOJT is only as effective as the experienced and knowledgeable employees who serve as the trainers. These SOJT trainers should demonstrate adequate competence in the work being presented and in the skills required to present that work to others. Therefore, in SOJT the development of trainers is often a formal, extensive process in and of itself.

Regardless of the delivery method, context-intensive training provides multiple benefits. Training is highly relevant, lean, and transfers to the work setting effectively and efficiently.

Developing and Implementing Performance Support

Would you feel safe getting on an airplane knowing that the crew had gone through their preflight routine entirely from memory? What if the company installing a sprinkler system in your new office skipped the post-installation checklist because their workers have done the installation hundreds of times before?

In the workplace, it would be unthinkable for employees to “wing it” in many situations, no matter their experience level.

Training to memory usually takes about three times as long and costs two to three times as much as the equivalent performance support covering the same material.

Performance support enables employees to perform tasks more accurately and reliably and to acquire new skills more quickly. In addition, performance support is quicker and less costly than formal training that has memory storage as its objective. Training to memory usually takes about three times as long and costs two to three times as much as

the equivalent performance support covering the same material. If the task in question has a high probability of a change in methodology, it is easier to revise a performance support than develop a new training course.

Any performance support must directly guide the task, address only those skills relevant to job performance, and be cost-effective. The following outlines how to develop and implement performance support as part of your performance improvement solution.

Task 1: Collect data about the work. You need information concerning any regulations requiring performance support, the speed of performance, physical conditions, social conditions, frequency, the consequence of error, complexity, and the probability of change for the task.

Task 2: Select storage alternatives. Choose among performance support only, long-term memory storage only, performance support plus supporting instruction, or instruction plus prompting performance support.

Task 3: Determine whether barriers to performance support can be overcome.

When a barrier to a performance support is present, sometimes it can be minimized or outweighed by the potential benefits. For example, in the case of the speed of performance barrier, a special job aid might be developed that serves as a prompt for recalling information that has been previously stored in memory. These serve as “memory joggers” and can take the form of outlines, key words, flow charts, or schematic drawings. These prompting tools are placed in the work environment in such a manner that consulting them will not slow the speed of response. Examples include wall charts, laminated pocket cards, and labels on machinery.

Task 4: Determine whether training support is needed. It is rare for performance support to stand on its own without being introduced in some formal way. Simply preparing performance support and sending it out to the intended audience has not met with as much success as introducing the support in briefings or, more typically, by building training seminars and courses on how to use the aid.

If the situation permits, self-instructional materials can be developed so that a formal training session is not necessary. These materials should provide the reader with practice exercises in using the performance support.

Task 5: Develop performance support. The performance support should be built according to specifications and guided by known rules for impacting behavior and theories on how humans process information.

Task 6: Test performance support. You need to determine whether the job performer produces the desired accomplishment as a result of using the performance support. Tryouts (developmental tests) should be carried out one-on-one with employees for whom the performance support is designed. Then conduct a formal validation test of the performance support. Finally, conduct a follow-up evaluation that answers these questions:

- Did the performance support solve or minimize the problem by satisfying the need specified in the analysis?
- Did the value produced by the performance support exceed the cost of development and implementation?³

Performance support can be delivered via various technologies. For example, laminated seat pocket cards detailing emergency procedures and equipment are used in airplanes. “Wizards” and cue cards are embedded in complex software. Audio cues are used to prompt the steps in leaving a voice mail message. In each case, the designer has selected an appropriate technology to support performance.

A task characteristic with a high consequence of error might drive you toward electronic performance support. For example, someone might use an electronic worksheet when mixing hazardous materials in a plant. The advantage over a paper worksheet

is the ability to eliminate calculation errors while providing written or audio warnings at key points in the process.

Along with the characteristics of the task, the availability of the technology should be considered. If the target audience has ready access to information technology or is already using a computer while performing the task, electronic performance support can be a cost-effective intervention.

Harless (2001) reported the following outcomes based on case studies involving job aids and performance support:

- A one-week training course for an electronics manufacturer was reduced to one day with an accompanying eight-page performance support. Performance proficiency increased by 50%.
- A chemical company reduced errors in insecticide formulation from 10% to 1% by using a two-page performance support.
- A company found no significant difference in performance between an experienced group of technicians designated as experts and an inexperienced group of technicians who employed a performance support in troubleshooting a system.⁴

Summary

Well-designed training is an effective and efficient tool for transferring the requisite skills, knowledge, and information to people newly assigned to a role. The problem is that management holds an unfounded assumption that training is the key tool for improving the performance of incumbents. When analysis determines that performance is deficient due to lack of skills or knowledge, you must decide which alternative for storing information is most effective for producing results. The options are to store the information in the memory of the performers or to store the information externally, in what we refer to as performance support.

When training to memory is required, we are strong advocates for context-intensive training. Context-intensive training is designed directly from the Profile of Exemplary Performance discussed in Chapter Four. The structure of the training is analogous to the work structure or process. The purpose of designing the instruction is to prescribe instruction that will teach the learner

to perform as the role requires and, at the same time, to adjust to the needs of the individual.

Structured on-the-job training (SOJT) is a highly recommended approach to training design and implementation that produces a rich, context-intensive approach and is defined by its use of experienced and knowledgeable employees with the right skills who serve as the trainers. Regardless of the delivery method, context-intensive training is a relevant, efficient, lean, and effective approach to shifting your stars' expertise to the solid performers, thereby shifting the performance curve.

Finally, performance support yields more accurate and reliable job performance, is less expensive to develop than instruction, and dramatically reduces formal training time. It should be considered in every project in which prior analysis shows a need for information.

Notes

1. J. H. Harless, *Accomplishment-Based Curriculum Development System* (Redwood Shores, CA: Saba, 2001).
2. P. H. Elliott, "Job Aids," in *Handbook of Human Performance Technology*, eds. H. D. Stolovitch and E. J. Keeps (San Francisco: Pfeiffer, 1999).
3. J. H. Harless, *Job Aids Workshop* (Redwood Shores, CA: Saba, 2001).
4. Ibid.

