

SUMMARY

- ◆ Describes the theory of situated learning, which underlies the selection of a form for supporting performance
- ◆ Suggests how to apply this concept to the selection of forms

Task Support, Reference, Instruction, or Collaboration? Factors in Determining Electronic Learning and Support Options

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INTRODUCTION

As mentioned in Saul Carliner's article "Choices and challenges: Considerations for designing electronic performance support systems" in this issue, the emergence of online communication has given rise to a growing number and range of electronic resources to assist performers at the moment of need. These alternatives include both the familiar, such as online help and tutorials, as well as emerging forms, such as intelligent embedded assistants and coaches. Some of these online forms are learning resources; others provide direct assistance with tasks. Professionals will be required to consciously determine which and how many of these forms are appropriate to use in given situations.

With so many forms of performance support available, one of the challenges for technical communicators and performance technologists is choosing the right form to meet the performer's need for assistance in a given situation. This article is intended to summarize and classify these resources and to aid professionals in determining when and how to employ them. First, it describes the theory of situated learning, which underlies the selection of a form for supporting performance. Then it suggests how to apply this concept to the selection of forms. Last, it offers some suggestions for forms to use in a given situation.

In this article I use the term *performer* rather than *user* or *student* because the individual is supposed to perform a task; the content provided assists this person with the performance of that task. Also, I use the terms *form* and *structure* to refer to a type of communication product.

SITUATED LEARNING AND PERFORMANCE SUPPORT

Guiding the selection of an appropriate structure for supporting a performer is a theory called situated learning. Situated learning is learning that occurs while doing—typically, in short, iterative cycles. This type of learning is often unstructured or semi-structured, and is typically incremental, although there can be occasions of significant increases in learning or performance. Sometimes, in fact, major insights or even paradigm changes occur as performers gain perspective on their behavior or on rules and relationships among and between the variables in a situation.

Many strategies and tactics result in situated learning. They are more or less conscious, depending on the performers' awareness of what works for them—or on how

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peers and managers provide coaching and feedback. The strategies are described separately, but are closely interrelated. It's often difficult to determine when one ends and another starts.

- ◆ **Variable manipulation** (or *trial and error*): Taking action, observing the results that occur, and adjusting the action as a result
- ◆ **Observation**: Watching what happens as a result of actions, or monitoring conditions and changes
- ◆ **Modeling**: Following effective or ineffective behaviors exhibited by others
- ◆ **Coaching**: Receiving direction from others on expectations, desired behaviors, predictions of outcomes, and explanations
- ◆ **Inquiry**: Asking questions; referencing resources

Situated learning espouses the power of learning while “situated” in meaningful contexts (Brown, Collins, and Duguid 1989). Situated learning emerges from the educational theory of constructivism. Constructivism states that “learning is an active process in which learners construct new ideas or concepts based” on their current base of knowledge. Learners select information, transform it, “construct hypotheses, and make decisions, relying on a cognitive structure to do so.” Cognitive structures are schema and “mental models that provide meaning and organization to experiences” and let learners “go beyond the information given” (“Constructivist theory” n.d.).

John Seely Brown and other proponents of constructivism preach that context and the interaction with others provide meaning and present integrated knowledge to performers. The cultural context and the collaboration that occur within it are the anchors for deep, rapid learning (Lave and Wenger 1991). Deep, rapid learning is learning that occurs quickly or even immediately. For example, when the criticality of information or skills is high, even a single exposure to it results in retained knowledge or capacity. Learning in contexts where consequences are high rarely requires the repetitions needed in “out of context” learning experiences, where learners have yet to understand the significance of the knowledge or skill.

Deep learning means that learners integrate the particular knowledge or skill with other information or skills. Synthesis and integration occur. This synthesis and integration come from experiencing the interrelationships among and between variables directly—and from seeing the patterns and connections occurring. Deep learning is also retained. It's not just “temporary” or “top of mind.”

For example, consider how significant the learning is when you accidentally delete files and must learn how to

“unerase” them. The greater the significance of the lost file, the more quickly you'll find the solution . . . and the better you'll remember it in the future. Contrast this outcome with the lack of internalization that occurs when you are taught “error recovery” far in advance of encountering the problem. At most, you may remember that you can recover, but the specifics of how to do it are typically lost.

Just watch how a child observes and forms models of the world, and then tests and validates or adjusts those models. How well and how quickly learning occurs is partly a function of the child's initiative—and partly the encouragement and feedback by others. Learning successful work performance is exactly the same. Let's look at an example of situated learning.

A sales representative is often taught basic sales skills and product features and benefits in a training course, but most of his or her learning occurs when *on the job*. The sales representative learns about the customer when preparing for the call. Files and articles are reviewed. Discussions with people who have called on the account occur. Managers or coaches review planned approaches prior to a sales call, and the discussions may surface new or more specific approaches.

During and after the call, the sales representative tries things and finds that they work or don't. Then he or she adjusts and tries something else. Detailed research about the product cements basic learning and increases depth of knowledge. Product literature is read. Comparisons with competitor information are researched on the Web. Sometimes calls to product management are required to answer client questions—and there may be collaborative discussions on how to “close” with other representatives. These discussions can be formal or informal, or they can occur simultaneously or through threaded discussions online.

But in each of the activities just described, learning and synthesis occur. Over time, the sales representative develops approaches that work specifically for that customer and for that sales representative. In addition, joint calls with and coaching by managers, customer feedback, and post-call reviews provide perspective as well as ideas for new behaviors.

In determining the most effective type of support, observing the *in context* learning cycles is a good place to start as a basis for modeling and constructing appropriate support interventions.

Many argue that instructional programs that teach out of context are far less effective than ones teaching through partial or whole simulations. Jan Herrington and Ron Oliver (1995), among others, have attempted to integrate the research in situated learning into an instructional context as reflected in their comments below:

TABLE 1: THE FOUR MODES OF LEARNING BEHAVIOR

Mode	How It Is Manifested	Comments
Doing	<ul style="list-style-type: none"> ◆ Manipulation of variables or trial and error ◆ Modeling—observing others and copying behavior ◆ Being “walked through” tasks such as what occurs with on-the-job coaches or help desks that guide performance in what is effectively joint work 	<ul style="list-style-type: none"> ◆ Is most powerful when feedback includes expert coaching and when behavior models are correct and complete ◆ Often yields inconsistent performance ◆ Is frustrating and time consuming ◆ Often results in performance plateaus at low levels: people figure out enough to “get by”
Formal Learning	<ul style="list-style-type: none"> ◆ Instructional programs (courses) ◆ Structured guidance by others in large enough chunks to be viewed as “instruction,” such as procedures 	<ul style="list-style-type: none"> ◆ Requires people to step “out of context” to experience the instruction ◆ Can be unavailable or frustrating because there is not enough time to learn
Referencing	<ul style="list-style-type: none"> ◆ Looking up information in formal resources ◆ Asking questions 	<ul style="list-style-type: none"> ◆ Is sometimes difficult because reference materials are inaccessible, obtuse, or not organized in the way that the performer thinks ◆ Can be unavailable or frustrating because people are not always there to answer questions or their responses are inadequate
Collaboration (Doing, formal learning, and referencing may involve collaboration.)	<ul style="list-style-type: none"> ◆ Can often be “joint trial and error” or discovery ◆ Often occurs when new knowledge is being generated 	<ul style="list-style-type: none"> ◆ Can be more or less powerful and effective based on who is involved ◆ Can be expensive ◆ May be synchronous (such as live chats) or asynchronous (such as listservs)

TABLE 2: CONDITIONS FOR SELECTING APPROPRIATE RESOURCE TYPE

Condition	Then provide . . .	Comment
No electronic media are available . . .	Paper reference Instruction (classroom or media-based—for example, video or paper) Help desk	Determine whether you should advocate technology purchase; monitor cost of technology over time to see when price points make it appropriate.
Performers cannot use technology while performing . . . Required actions must be taken independent of available technology because it impedes customer interaction . . . Performers need to understand core concepts and mental models on which to “hang” detail . . .	Instruction	Don’t assume customers will object to technology as a resource—or that it will interfere with human interaction. Increasingly, customers question people who don’t use technology in their work. Don’t overestimate “how much people must know” before they “do.”
The content is high in volume . . . The content is dynamic and changes frequently . . . Content can be represented in numerous ways (for example, animations, text, illustrations, examples), so better understanding is possible . . .	Online reference Granular or “chunked” content Powerful search engines Multiple access techniques data through Views (for example, by Product, by Use, by Task) and Filters	While some must “convert” paper to online information, the old model of the paper manual makes poor viewing online. Reconceptualize the structure. Represent the knowledge in its most powerful form, which may not be text. Make content granular.

What are the critical characteristics of situated learning for instructional design?

A critical reading of the principal theorists (and critics) of situated learning reveals a number of important characteristics that have added to the evolving theory of situated learning, and an attempt has been made here to distinguish those features. Many of these authors believe that useable knowledge is best gained in learning environments that feature the following characteristics. The learning environments will:

- ◆ Provide authentic context that reflect[s] the way the knowledge will be used in real life;
- ◆ Provide authentic activities;
- ◆ Provide access to expert performances and the modeling of processes;

- ◆ Provide multiple roles and perspectives;
- ◆ Support collaborative construction of knowledge;
- ◆ Provide coaching and scaffolding at critical times;
- ◆ Promote reflection to enable abstractions to be formed;
- ◆ Promote articulation to enable tacit knowledge to be made explicit;
- ◆ Provide for integrated assessment of learning within the tasks.

My article does not intend to explore the relative merits and foundations of situated learning. But frankly, they make eminent sense to me.

TABLE 2: CONTINUED

Condition	Then provide . . .	Comment
<p>Complexity prevails . . . Consequences of error (customer credibility, cost, time delays) are high . . . Tasks are complex (numerous steps, lots of branching, or multiple conditional relationships) . . . Many rules apply . . . Relationships between content and context are difficult to determine . . . Tasks are relatively simple or moderately complex . . . but they exceed the performers' ability to accomplish because of skill level, available time, interruptions, or motivation . . . Tasks are prone to error (for example, lots of little details, numerous steps, and so forth) . . . Precise task sequences must be followed without fail . . .</p>	<p>Interactive performance support tools (for example, wizards or applications that structure task performance based on data or performer choices)</p>	<p>Integrate knowledge in a wizard or in user interface displays, and create links to related knowledge that is "too much" to display all of the time. Don't assume experts can't benefit from structure. Typically experts are only "relatively" better than newer performers. There is often much room for their performance to improve. Balance structure and freedom when designing. Learn more about performance support tools at www.epsscentral.com.</p>

My advocacy in this article is that technical communicators, performance technologists, and others who develop performance support systems understand how much faster and cheaper it is to provide resources in the *real* work context than to attempt to simulate work in an instructional context. For example, rather than send experienced Windows users to a 4-hour training course to learn about the new version of Windows that the technical support department installed on every computer, situated learning may occur when the performers try out the new version or, for performers who want a preview of what's changed, when they view a 10-minute guided tour of "What's new with the latest version of Windows?"

Similarly, rather than send a technical support person to a 1-week installation planning course for an upgrade to a mainframe operating system, why not develop a wizard that guides users through the process? In fact, companies that have done so have not only been able to eliminate the need for training but streamlined the installation process by 80%.

Through forms used to support performance online, technology enables *just-in-time* reference, instruction, and information. But technology can also provide more personalized support, which can further promote deep, rapid learning. Personalized support includes coaching, conditional feedback, and collaboration with peers. Coaching and conditional feedback require significantly more advanced analysis and design than forms in wider use, and they may also require programming. The tradeoff for these additional resources, however, is that these resources accelerate learning and skill development because they are available to performers *in context*, they are consistent and well designed, and (hopefully) they support best practices. In contrast, when such resources are provided by human beings, they are more likely to be inconsistent and incomplete, and they almost invariably reflect the expertise of the person closest at hand.

Technical communicators, performance technologists, and others developing performance support systems must develop a familiarity with the different forms

of performance support available, and they must recognize when each is most effectively used. This recognition results from developing a familiarity with the different types of behavior that performance support can develop. The designer must also identify the performance need underlying a given situation and then match the specific performance challenge with a form of performance support that is likely to address that need.

CHOOSING A FORM: IDENTIFYING THE PRIMARY BEHAVIOR MODE

Before one can choose a form of performance support, a designer needs a broad view of the different types of behavior that can be developed and the issues that performance support must address to build that mode. There are four primary modes used to learn and develop skills, as Table 1 explains.

CHOOSING A FORM: IDENTIFYING THE UNDERLYING PERFORMANCE GOAL

Identifying, structuring, and implementing the most powerful resource to support each of the modes listed above is the goal.

Although knowing that electronic performance support can develop one or more of the modes of behavior is helpful information, determining which one to develop when addressing a particular performance problem requires an in-depth understanding of the underlying performance problem and a clear statement of the desired performance. These issues are addressed in other articles in this special issue of *Technical communication*. But note that a flawed analysis can result in an inappropriate design. For example, a designer might decide to simplify a procedure to avoid errors by data entry operators. But if the designer fails to note that the procedure was originally written for sales executives or that it assumes that data entry operators have access to information that they do not have, the simplified procedure will not correct the work errors.

More significantly, designers might have identified the correct problem underlying the poor performance, but they have historically relied on a common form such as a training course or reference manual and may not think broadly enough to choose a more appropriate form to address the challenge. For example, if technical communicators have traditionally developed help systems to instruct new users, they could easily fall into the trap of continuing to develop help systems, even when these will not quickly or effectively develop performance. Furthermore, if technical communicators lack familiarity with other structures or do not

feel confident about developing them, they are not likely to change their behavior.

This situation creates a problem because help does not always “help” performers. Consider the situation when a performer is trying to enhance efficiency with a particular operation. Help merely tells the performer the different ways to perform the same task. It does not analyze in which of those ways the performer completes a task in the least amount of time.

CHOOSING A FORM: MATCHING THE DESIRED PRIMARY MODE OF BEHAVIOR WITH APPROPRIATE ELECTRONIC CONTENT

Because help does not always help and courses do not always teach—while other forms of performance do build the desired performance—technical communicators, performance technologists, and others developing performance must expand their repertoire of forms of performance support and recognize the situations in which each is most effective.

Tables 2 and 3 are intended to help with those challenges. Table 2 summarizes common situations and recommends appropriate forms for addressing them. Table 3 lists the primary components of a performance support system and suggests the type of performance for which each is most appropriate. These preliminary classifications and descriptions should provide readers with an initial framework for evaluating alternatives and recommending on-demand, just-in-time resources to enable both learning and performance at the moment of need.

IN CLOSING

This article first explained that situated learning underlies the selection of a form for supporting performance. Situated learning espouses the power of learning, while “situated” in meaningful contexts. If designers can provide performers with the tools they need to develop performance within the context of their work, the learning will be deeper and more powerful than if it is provided out of context, such as through attending a training class or by reading a manual.

Many forms exist for developing performance within a situated context. Choosing the appropriate form for a given context first requires that a designer develop a general understanding of the four modes of a behavior. Then the designer must recognize which of the modes must be addressed to solve the particular performance problem at hand. Last, the designer must choose an appropriate form—such as online reference, a wizard, or collaboration with other performers—to address that performance problem.

So often, that form is different from the ones with which the technical communicator or performance technologists

TABLE 3: TYPES OF PERFORMANCE SUPPORT

Resource	Definition and Description
Reference	<p>Standalone content (in any medium) that describes, defines, or illustrates information such as definitions, concepts, procedures, facts, examples, rules, structures, and so forth. The content</p> <ul style="list-style-type: none"> ◆ May be fixed or personalized (that is, performers can select variables and see all or some of the content) ◆ Is accessed and referenced as desired by performers or may be presented to a performer based on a set of rules ◆ Can be layered to provide more detail (for example, it can have a basic layer, an intermediate layer with more depth, and advanced layer with even more depth) ◆ May utilize rules or conditions programmed into software ◆ May or may not be searchable or indexed ◆ Cannot be modified by users ◆ Can be connected to a given context by hyperlinks or program rules
Instruction	<p>Content <i>sequenced by a designer to teach</i> a particular procedure, process, concept, rule, or skill, with the goal of internalization by a learner. Any media can be employed. The instruction may</p> <ul style="list-style-type: none"> ◆ Be active or passive (that is, interactive or not) ◆ Involve scored testing before, during, or after the instruction ◆ Be fixed or conditional based on performer's choices, responses or goals ◆ Employ one or more instructional strategies including tutorials, gaming, simulation, reference-based testing, etc. ◆ Vary in scope or duration (such as brief—5–10 minutes—or long—(several hours or days) ◆ Stand alone or be available within a software context; may be automatically presented by software given a set of conditions
Performance Support	<p>Performance support tools are software applications that provide direct support of <i>work processing</i> and integrate, to varying degrees, task structuring or process support with knowledge, data, tools, and communications. They</p> <ul style="list-style-type: none"> ◆ Guide performers <i>conditionally</i> through a process or procedure, depending on any stored or input data (including user perceptions, goals, judgments) ◆ May store and transform data (for example, perform calculations, or produce deliverables such as documentation, reports, drawings, and other communications) ◆ May provide alternative interfaces and interaction mechanisms that provide a varying mix of structure and freedom (for example, some systems are big wizards that require progression through a particular approach, whereas others have a less structured interface, such as electronic forms). TurboTax is a good example of a tool with two alternative interfaces: <i>interview</i> mode and <i>IRS Forms Completion</i> mode. ◆ Focus on representing task, knowledge, and data through visualizations and metaphors, and ensure that just the right things are displayed together ◆ Typically filter content based on a performer's profile, preferences, or previous history of performance. ◆ May present reference or instruction, interactive tools, or collaboration and communications tools.
Collaboration and Communication	<p>Electronic synchronous or asynchronous collaboration and communication environments and tools that enable 1-to-1, 1-to-many, or many-to-many interaction. (Examples include instant messaging, threaded discussions, chat rooms, collaboration tools, and e-mail.) They</p> <ul style="list-style-type: none"> ◆ May or may not store communications for later review or retrieval ◆ Range from limited text entry to shared environments for generating content (for example, brainstorming), polling or voting, and/or sharing of documents, images, or applications software ◆ May support one or more media types ◆ May be invoked or automatically presented to users from a given context based on rules or data conditions

have the most comfort and experience. But providing truly useful user assistance and building outstanding performance require that designers leave their comfort zones and move, instead, into the performance zone. **TC**

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