Accelerating Expertise With Scenario-Based Learning

By Ruth Clark

Imagine accelerating the know-how of two-year electronics technicians to the level of 10-year veterans with just 25 hours of training! It might sound too good to be true. But this is exactly what a research partnership between the U.S. Air Force and the University of Pittsburgh accomplished with scenario-based learning (SBL). After all, expertise is based on experience. With a well-designed program of SBL you can compress experience spanning years in the work environment, into a few hours of training time.

What is SBL?

SBL (also called "problem-based learning" or "case-based learning") is an instructional environment in which participants solve carefully constructed, authentic job tasks or problems. While solving the problems, they are carefully guided to learn the associated concepts, procedures, and heuristics of expert performers. For example, the multimedia SBL course Gator 6, created by Sharon Sloane of Will Interactive, is designed to accelerate the expertise of new commanding Army officers, to optimize their actions and decisions in combat situations. Gator 6 starts with a "Murphy's law" video in which a combat engagement goes very wrong for the U.S. troops. After viewing the video, the learner goes back in time, and assuming the role of the commanding officer, has the opportunity to make different choices and turn the situation around. (See "Resources.")

Guidelines

1. Determine whether an SBL environment is the best design for your learners and tasks.

First, SBL generally works best teaching nonroutine job tasks that involve judgment and decision making—troubleshooting, combat decisions, most forms of analysis, and many sales or management tasks would be appropriate. In contrast, routine tasks that involve straightforward procedures are best left to a more traditional training approach.

Second, SBL is most appropriate for learners who already have some relevant job experience. For learners who are brand new to a work environment, immersion in a problem may impose too much mental load and bog them down.

2. Define the tasks, skills, and associated scenarios that are the foundation of expertise in the domain.

Since your goal is to accelerate expertise, you will need to derive your scenarios from experts. Since experts often can't clearly articulate these tasks or what knowledge they used, one useful approach is a critical incident technique whereby experts describe a challenging situation they solved on the job and explain the cues, reasons, and hypotheses for their decisions and actions.

You will need to identify a variety of scenarios that span the diverse types of situations that experts have faced in the job domain. For more on this type of analysis, see the book *Working Minds*, referenced in "Resources."

3. Design your learning environment.

Begin with the task deliverable—the final actions or decisions needed to resolve the scenario—and then flesh out the other components to support that final decision. For example, identify a typical trigger event—how the scenario should kick off. Keep record of the various data (such as documents and interviews) that will give the learner needed details about their problem assignment. Carefully plan the instructional guidance and associated learning resources. Consider how feedback will be provided as well as ways to embed opportunities for learners to reflect on their decisions and outcomes. (See "Resources")

4. Consider your media.

SBL can be successfully presented in face-to-face or e-learning self-study environments. Regardless of the delivery environment, consider presenting elements of your scenario with multimedia, which could range from high-quality video as in Gator 6, to computer animation or still photos. We are gradually accumulating evidence that greater realism brought by graphics and audio can lead to deeper engagement in the learning environment. If your environment is synchronous, incorporate team discussions and decision making as an integral learning feature. If your program is to be delivered by self-study e-learning, consider asynchronous forms of collaboration such as blogs, discussion boards, or wikis.

Does SBL work?

We are just starting to accumulate research on SBL evidence that will tell us more about which features and applications of SBL will lead to the best learning. One extensive study summarized by Gott and Lesgold (2000) showed that 25 hours of scenario-based e-learning that simulated multiple electrical

equipment failures raised the expertise of two-year Air Force technicians to the same level as 10-year veterans.

A more recent study by Kumta et al (2003) compared learning of medical students during a three-week orthopedics rotation. One group of students received traditional training, including lectures and clinical rounds. A test group received the same traditional training, plus online case studies that were reviewed independently, followed by debriefing with a faculty advisor. Learning was significantly better among students who had access to the online scenarios.

In both studies, we see the benefits of compressed experience. By resolving multiple equipment failures or orthopedic cases within a short timeframe, the technicians and medical students benefited from experience that in the real world would take much longer to accumulate.

Medical students consistently rate scenario-based learning environments higher than traditional curriculum consisting of science classes. Starting learning with an authentic job scenario makes the learning event highly relevant. The scenario creates a 'moment of need' for the knowledge and skills to resolve it. However, keep in mind that your audience may not respond in a similar manner.

Caveats

In general, the design and development effort is likely to be a bigger investment of time and resources than more traditional forms of training, especially if you use higher-end media such as video. Second, your learners may prefer a more traditional directive training environment. Third, some learners, especially those new to the job, may become overwhelmed by the combination of learning while solving a problem at the same time. And lastly, if your content is highly volatile, you may want to consider a design that is makes updating fast and easy.

Ruth Clark is President and Principal of Colorado-based Clark Training and Consulting. Her latest book is Building Expertise: Cognitive Methods for Training and Performance Improvement: 3rd ed.; www.clarktraining.com.

Checklist:

When to Consider SBL

☑ Are the skills you need to build based on judgment and problem solving?

☑ Are the job skills slow to build because of scarcity or unpredictability of the real-world events that lead to experience?

☑ Do your learners have some relevant job experience?

☑ Do you have access to subject matter experts to define scenarios and underlying decisions?

☑ Do you have time and resources to design, develop, and test an SBL approach?

☑ Will the time and resources you expend give a return on investment in accelerated expertise of critical skills?

☑ Will your learners find SBL relevant and motivational?

☑ If your content is volatile, will SBL be the best option to quickly update and redeploy updates?

Resources:

ASTD Virtual Workshop: The Essentials of Scenario-Based Learning by Ruth Clark March 16, 18, and 20, 2009. www.astd.org/content/education/certificatePrograms/essentials-Series/

How to Design Scenario-Based Learning. Day workshop Phoenix, Arizona, May 14-15. www.clarktraining.com/content/seminars/PDEE2.php

Designing Scenario-Based Instruction. Half-day workshop, January 28, 2009. ASTD TechKnowledge conference, Las Vegas, Nevada. See http://tk09.astd.org/preconf.html

Clark RC (2008). Building Expertise, San Francisco, Pfeiffer. Ch. 13

Crandall B, Klein G, Hoffman RR (2006). Working Minds. Cambridge, Massachusetts: Massachusetts Institutea of Technology

Jonassen DH (2003). Learning to Solve Problems: An Instructional Design Guide. San Francisco, Pfeiffer

Will Interactive. http://www.willinteractive.com/will

Gott SP, Lesgold AM (2000). Competence in the workplace: How cognitive performance models and situated instruction can accelerate skill acquisition, in R. Glaser (Ed.), Advances in Instructional Psychology: Educational Design and Cognitive Science. Mahwah, New Jersey, Lawrence Erlbaum Associates

Kumta SM, Psang PL, Hung LK, Chenge JCY (2003). Fostering critical thinking skills through a web-based tutorial programme for first year medical students – A randomized controlled study. J Educational Multimedia and Hypermedia, 12(3), 267-273

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