

SimCity, SimEarth, and Now . . .

Simulations for Corporate Training

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The jobs of airline pilots and reactor operators have a lot in common—in both, jobholders exercise a complex set of skills in an environment where mistakes can be critical. Developing skills on the job is usually not feasible, and in fact, the general public would frown upon that practice.

But who's to say that a *product manager* inadequately prepared for the complexities of her job won't crash and burn the first time she's called upon to exercise the full set of her job tasks and responsibilities? Who's to say that a *labor relations manager* improperly prepared for interfacing with union employees and union stewards won't suddenly find himself involved in a critical mass that's heating up and out of control?

Managers make decisions involving financial and legal risk. They often have to perform in “real time”—responding to employee situations or customer situations as they occur. White-collar professionals such as engineers, designers, planners, and analysts have to take into account a disparate and potentially overwhelming set of criteria and factors as they work. These criteria might include company policy, future strategy, organizational politics, legalities, past decisions/precedents, and the current and future technical issues of the business.

Training, of course, is supposed to prepare people to perform on the job. In a classroom, white-collar professionals can acquire knowledge and discuss potential strategies for dealing with on-the-job situations. This learning is *necessary*—but it's not *sufficient*. Fully training these professionals how to perform on their jobs is not something that can be achieved in a typical classroom environment, any more than a pilot can learn to fly without hands-on time at the controls. That's why airlines use flight simulators to train pilots, and public utilities use control panel simulators to train operators of nuclear reactors.

Sometimes partial training is good enough. But most businesses require more than that, especially when there is a high amount of risk associated with poor performance, when the job performance is complex, or when practice with coaching is needed to develop a sufficient level of skill.

Managers and white-collar professionals can benefit from the same type of training that airline pilots and reactor operators receive. For these workers, too, a simulation approach can be an appropriate strategy. Simulations can generate skills people need. Simulations can closely match the job environment (the “real world”). Furthermore, participants usually enjoy simulations even while taking them seriously.

Simulations place more demands on developers, facilitators, facilities, and participants, but an effective simulation can be a high-impact instructional alternative.

What Is a Simulation?

A simulation is a structured learning experience addressing a learner's entire range of on-the-job performance or a subset of that range including the most critical performance. It integrates the learner's knowledge and skills that relate to various parts of his or her performance. A simulation is an exercise where the learner can apply knowledge and skills from previous classroom training, but it's also an opportunity to learn *new* concepts.

A simulation can be a single exercise or can span multiple "rounds" in which later exercises are built on events and decisions from earlier rounds. It can be conducted with a group of learners in a classroom setting or it may require specific equipment, such as a computer or, perhaps, something that emulates the equipment used on the job.

Group simulations require a facilitator rather than an instructor. Participants often learn from each other, but a simulation is built around a specific set of instructional objectives—it is not a loose "encounter group" activity. It should approach the complexity of the real job yet still be simple enough for delivery in a learning setting. It should be structured around an output (a result) as well as the process that produces that output.

One of the many group simulations we have developed was for a Fortune 500 telecommunications company. Its purpose: train product managers and market managers on how to take a new product from concept to market. The simulation uses the vehicle of a product team planning meeting to allow participants to address a number of instructional objectives. Participants take turns leading a team planning meeting. After the meeting, participants develop a plan for the product that summarizes the conclusions reached in the meeting. The simulation helps learners to be able to

- Make product decisions based on business/financial criteria.
- Handle team conflicts.
- Be sensitive to the real-world issues faced by the various functional entities involved (development, manufacturing, sales, service, etc.).
- Recognize the variety of problems faced by different types of products (e.g., software, commodity, systems, etc.).

A simulation is *not* a typical role-play because role-plays tend to focus only on the interaction. For example, a role-play in which a boss deals with an underperforming employee probably focuses on generic communication skills. The way we build simulations, role-plays are tailored to our clients' businesses. A debrief might cover communication skills, but it will also focus on the result or output of the discussion. Should the boss have suspended the employee in this situation or not? What else could he or she have said? Was the conversation documented well enough to support the manager's position if the employee were to later file a grievance?

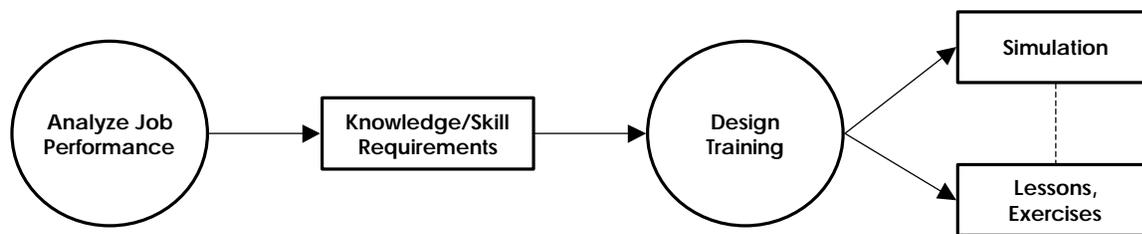
A simulation is also more than a classroom exercise. An exercise tends to focus only on the new concept being taught. A simulation *integrates* new concepts and skills with those taught previously in the course. (This allows you to address a set of learning objectives over several simulation rounds to

build job proficiency by the end of the *course*, not necessarily by the end of one round of the simulation. This makes the simulation a more complex learning environment, which typically reflects more closely the nature of the job.)

Simulations depend on prepared materials to provide participants with information about the situations they're dealing with. Usually, the designer will need to create a fictitious situation (such as a company or department or characters). You will need to include enough information for the simulation to work but not so much that the learner spends a large amount of time learning simulation environment. This same rule applies to both group- and computer-based simulations.

Simulations may include a game board by which we build in unexpected events. There is also likely to be some sort of format for the output that drives the structure of the process that participants will use. Simulation materials vary, of course, depending on the client and the application.

The diagram below shows how to construct a simulation based on actual job performance. This diagram shows a simulation as a final exercise that integrates the previous learning. Simulations can also provide an experience prior to training or as a means of qualification testing at the end of training.



When Is a Simulation Most Effective?

We have used simulations in a variety of client situations. What these situations had in common were

- The complexity of the performance
- The criticality of the performance

One of our clients had assessed its marketplace and decided that in order to survive, the company needed to grow significantly. The company needed to increase greatly the number of new products, reduce product development/introduction cycle times, choose new products well, and manage them effectively. The critical role in all of this belongs to product managers who have overall responsibility for the products. Through the entire product life cycle, product managers must manage cross-functional teams of resources from marketing, engineering, manufacturing, and service.

To perform well in the product manager's job requires a mix of technical knowledge and skill in the areas of finance, market research, marketing strategy, product development, product manufacturing, industry standards, etc. In addition, product managers need to know which organizations in the company provide which services, and what the company expects to see in a business case or

product plan. Finally, they need to be able to manage a team using skills in meeting management, interpersonal communication, conflict resolution, and planning.

A simulation developed for this situation used a hypothetical product line with characteristics similar to our client's industry (but different enough to avoid disputes about issues of fact, such as the product specifications or market size data). The design allows participants to practice a very complex mix of skills by running a team meeting three times over a five-day course. In addition, it allows them to participate in eight other meetings so they can learn from other participants and learn more about the other roles on the product team.

We used a similar strategy to help a company that was changing from a functional product development process to an integrated product development (IPD) approach. IPD (also known as concurrent engineering) is a strategy to reduce cycle time and improve quality by designing a product concurrently with the processes to manufacture, install, and service the product. With IPD, designers less frequently design something that manufacturing can't build, among other advantages.

The company had attempted other ways to train people in IPD. Our simulation, however, provided a way for participants to *see* how IPD might work and to *try* it in a low-risk situation. Companies undergoing re-engineering may consider using simulations for the same reason—their employees can *experience* how work will be done in the re-engineered environment instead of just hearing about it.

Another of our clients had a situation in which they needed to “condense” experience. They were trying to change union/management relations to create a more participative environment. They needed to work within the existing union contract, however, and didn't want to incur grievances or lawsuits. Managers would have to walk a fine line between working with their employees while still serving the best interests of the company. (Experienced managers had *learned* how to walk this fine line; they had also learned most of their lessons the *hard* way.)

The simulation we developed gave each participant practice in the new environment. Participants conducted four employee meetings, including meetings for counseling, disciplining, and grievance negotiation. In addition, participants played the parts of employee or union steward in 12 meetings run by other participants. This gave them simulated experience in 16 situations, all based on actual work incidents.

The situations were arranged to become progressively more difficult. After each meeting, there was a debrief in which participants discuss the outcome and different approaches that could have been used. Those with more experience often shared war stories that helped convince less experienced participants of the relevance of the training scenario.

Simulations: The Challenge

In spite of their effectiveness in engaging participants and conveying job experience, simulations require more from developers, facilitators, and participants than “standard” classroom training.

Developers must conduct thorough analyses of the job in order to build realistic situations into the simulation. You need to learn the *job output* so you can approximate what the participants build in the simulation. You need to learn the *tasks* so you can incorporate the activities (process) in the

simulation. And you have to learn what typically goes wrong, the *performance issues* so you can weave realistic difficulties into the scenario. For example, one of the performance issues in building a product plan might be lack of clear market data. Accordingly, we might design in a team meeting in which the sales numbers don't match the numbers from the marketing department; this requires the product manager to work with the team to arrive at a sensible consensus view.

Developers also need to make the simulation situations realistic enough to engage the learners, but not *too* realistic. If the simulation situation is too similar to the actual job, learners become enmeshed in details ancillary to the main purposes of the simulation. Much of the detail comes from observing performers on the job to pick up nuances of behavior (such as jargon, interaction style, timeframes for performance, etc.)

Facilitating a group simulation is much more difficult than conducting a lecture, or even facilitating a "typical" classroom exercise. Facilitators must be familiar with both the content of the job and the simulation scenario. They have to know when to coach and when to let participants figure things out for themselves. They have to be able to debrief in a way that is constructive but not critical. They have to be able to make the transfer from the simulation to the real job. And they need to be cheerleaders, because simulations mean a lot of work for participants if everyone is to have a chance to practice sufficiently and if the simulation is to reflect accurately the real job environment.

And the challenges for the participants? Simulations are not neat and tidy textbook exercises, at least they shouldn't be. If you can build in complexities and obstacles of the types found on the job, participants will find that the simulations may be extremely intense in terms of the amount of time and effort required of them. Occasionally, too, participants are challenged by the requirement to work in a team setting; we once watched a participant get "fired" by the other members of his team for not participating constructively (and wondered what the best facilitator response should be!)

Conclusion

Do those who manage millions of dollars of corporate assets deserve to be trained in a way that will let them exercise their skills safely and confidently, much like pilots and reactor operators? You bet. Simulations are an effective way to

- Teach complex performances, such as management decision-making.
- Teach skills that must be applied in real-time, such as negotiating a deal.
- Integrate a wide range of knowledge and behaviors, such as applying financial knowledge, business strategy knowledge, technical knowledge, and communication skills to work with a team to develop a product plan.

The workplace in America and around the world is undergoing radical changes. Employees will need to access more information than ever before, work on teams and/or with partners, and continuously reduce cycle times. Simulation-based training has a great deal to offer in helping to prepare us for a work environment like the one we face for the foreseeable future.

Note: An earlier version of this article was published in CADDI's newsletter "lean-ISD" in 1998.