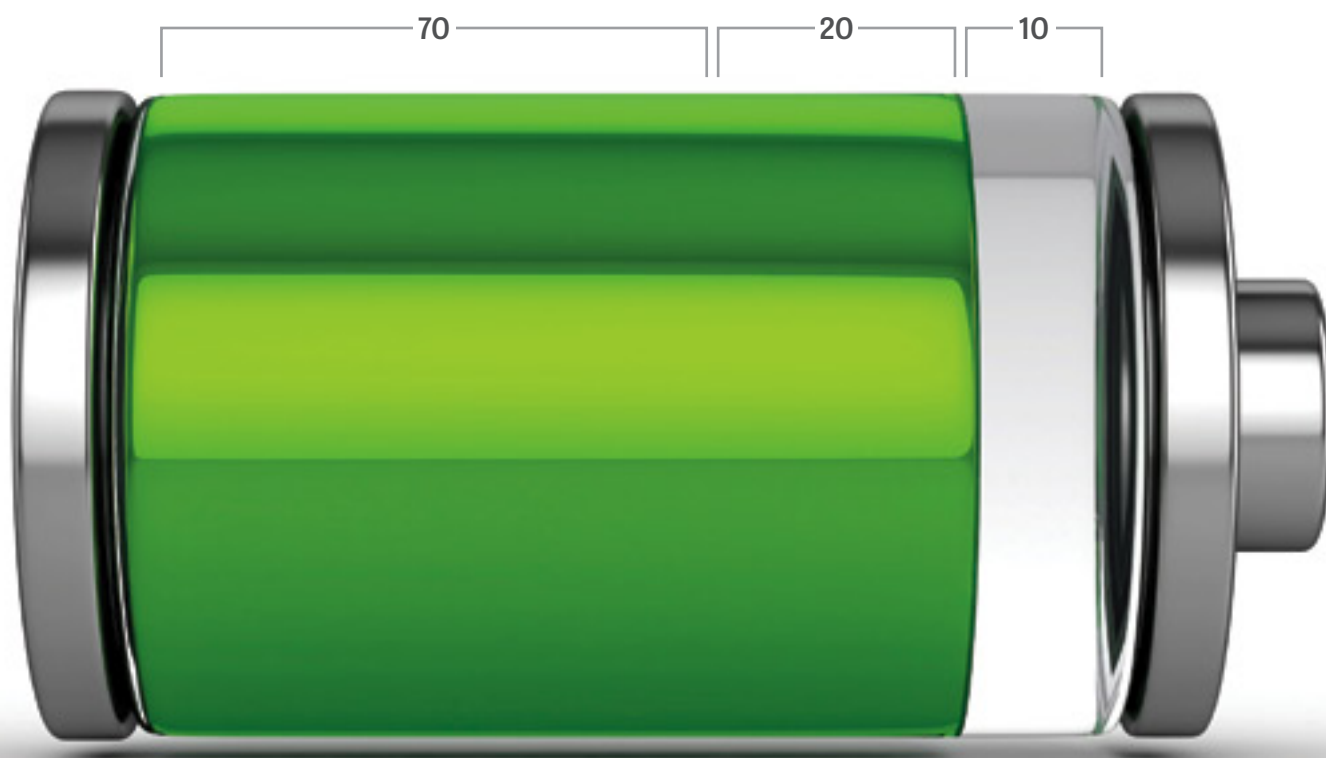


Use emerging technologies to incorporate informal and experiential learning into training activities, and optimize learning and performance.



HARNESSING

THE 90%

BY MARTY
ROSENHECK

This is a tale of two organizations. Both needed to get new hires up to speed in jobs as customer service representatives who handle a wide variety of complex cases. Both failed. One is a government agency and the other is a private company that contracts with government agencies. Both will remain unnamed to protect the innocent.

The government agency relied almost entirely on formal training. New hires completed weeks of intensive classroom, online, and broadcast training. But, when its reps got on the job, they couldn't handle the cases. In fact, it took on average one to three years after training to become proficient.

Conversely, the private company relied almost entirely on informal learning. New hires were placed on the floor from the start and told to learn from their colleagues. But their fellow reps often were too busy with their own workload to help much, and they frequently passed along incorrect information and procedures. The company had a 33 percent error rate, morale was dismal, and turnover was high.

Cognitive Advisors helped the government agency restructure its training program into a continuous learning process that integrated formal, informal, and experiential learning. As a result, employees were able to process



cases efficiently and correctly immediately after training. The firm began the restructuring process for the private company, but it was too late. Unfortunately, it lost its government contract and went out of business.

Most learning leaders and professionals know that neither of these extremes of purely formal training (expensive, low transfer rates, quickly outdated) or purely informal learning (haphazard, inconsistent, slow) will deliver the needed results. We are well aware of the popular 70-20-10 model based on research by the Center for Creative Leadership. It says that 70 percent of the learning in organizations is experiential, 20 percent is informal, and only 10 percent is formal.

We have that 10 percent well in hand, and learning management systems handle formal learning well. However, most of the learning leaders I talk with want to incorporate the 90 percent (informal and experiential), but they are struggling to figure out how to do it in a way that leads to results—especially for people learning new skills.

How do we harness the 90 percent? The answer is to apply principles from cognitive science research powered by emerging technologies such as the Experience API, mobile devices, badging systems, and data analytics.

Apprenticeship 3.0

Long before the 70-20-10 meme became popular in learning and development circles, John Seely Brown, Allan Collins, and Susan Newman derived a set of principles from cognitive science research that they call “cognitive apprenticeship.” They recognized that traditional apprenticeship models were an effective way to learn manual trades, such as blacksmithing or cobbling, but that they didn’t apply directly to knowledge work.

So they abstracted the key elements of traditional apprenticeship (apprenticeship 1.0) and added what has been learned about the development of expertise to adapt the model to work for learning cognitive tasks such as reading and mathematics. Since then, I have been applying cognitive apprenticeship (apprenticeship 2.0) to the development of

complex skills in the workplace.

Some organizations, like the government agency described earlier, have implemented cognitive apprenticeship successfully. But most have not, even though they recognize that it is the right way to get employees up to speed. Why don’t more organizations implement cognitive apprenticeship? Because it can be difficult to manage and track.

Fortunately, the emergence of new technologies (see sidebar on page 57) is finally making this approach feasible. The Experience API, data analytics, Open Badges, and the rapid adoption of mobile devices are making it possible to take the cognitive apprenticeship model to the next level—which I call apprenticeship 3.0. These technologies can make apprenticeship scalable, automate guidance and tracking of progress on the job, and enable analytics and visibility of informal and experiential learning.

A GPS for learning

Here are apprenticeship 3.0 guidelines that serve as a kind of GPS to help organizations develop the optimal path to top-notch performance.

Taxonomy of cases. Begin by identifying one or more master practitioners and asking them to identify all the situations or cases they handle on the job. Once you have a stack of notes, have the experts sort them into categories.

Inevitably, they’ll come up with a finite set of categories and subcategories that reveal the prototypical cases and variations. Then ask them to identify the skills and knowledge needed to handle these situations. This is the taxonomy of cases that is based on how master practitioners implicitly organize their job knowledge in their minds.

Practical performance goals. Use the taxonomy of cases to identify a set of practical performance goals, which are the specific competencies that employees need to be proficient at their jobs. This will ensure that learning and performance goals are focused on what people actually need to do. The taxonomy of cases and practical performance goals become the roadmap for learning.

Systematic set of experiences. Cognitive science research makes it clear that people develop expertise primarily through experience. The problem is that it can take 10 years or 10,000 hours to accumulate all the experiences needed to develop expertise because real life is unpredictable and haphazard.

That time can be shortened by using the taxonomy of cases to establish a learning path that is designed to systematically expose new hires to each of the experiences for which they need to develop proficiency. The experiences can be on the job, simulations, or even observations.

Simple to complex. These experiences need to be sequenced in a specific way to promote optimal learning. One rule of thumb is to begin with simpler experiences and gradually increase the complexity.

Like levels in a video game, each experience should be just difficult enough to be interesting and hold attention, but not so challenging that it causes overload and frustration.

Scaffolding and fading. Learning experiences need to be supported through scaffolding and fading. Scaffolding involves providing the learner with support early on (for example, getting help from a coach or guidance in a simulation) and then gradually removing the scaffolding and fading back so the learner can take on more responsibility for the task, ultimately standing on her own.

Reflection. Although experience is essential for learning job skills, it is not sufficient. People also must have opportunities to reflect on each experience. Reflection enables learners to abstract lessons learned from experience and to apply them to new situations.

Coupled with meaningful feedback, reflection helps learners make course corrections for the next experience. It can be done informally by talking with coaches or peers in a community of practice, through social media, by examining the results of one's actions, or by simply jotting down reflections on a mobile device.

Mini-tutorials. Optimization of learning is centered on experience and reflection, but there is a role for more formal content. It should be

Emerging Technologies That Power Apprenticeship 3.0

Experience API. The Experience API is the new standard (developed by the ADL with Rustici Software) that provides a simple format for tracking learning activities that are outside the confines of a learning management system such as a knowledge base, SharePoint, or social sites.

The Experience API sends a simple message that says, "Jane did this" to a central repository called the Learning Record Store. This technology enables organizations to track the 90 percent—informal and experiential learning—that has been so difficult to track in previous apprenticeship implementations.

Data analytics. New data analytics methods and tools enable organizations to make sense of the collection of fine-grained data on what people are doing. Organizations can run analytics to optimize the learning and correlate it to performance indicators.

Open Badges. The new Open Badges framework (developed by Mozilla) enables the awarding of badges to recognize accomplishments. These electronic badges are authenticated, so someone can click on the badge and see what the recipient did to earn that badge. These badges can be shared and displayed on company websites, or on social sites such as Facebook or LinkedIn.

Mobile devices. The rapidly growing adoption of mobile devices enables the delivery, guidance, and tracking of learning anywhere. It untethers learning from the desktop or the classroom.

dished out in small portions, as short segments that are available on demand to prepare for the next experience.

When the formal learning (for example, an online mini-tutorial or short video) is provided when it is relevant, at the teachable moment, then people are motivated to learn the content (since they will need to use it soon) and are more likely to retain it and transfer it to the job.

Performance support. Another way to provide key content at the teachable moment is through performance support on the job. You can provide performance support through an online knowledge base that serves up job-specific content when it is needed. The more embedded in the workflow it is, the better.

Mobile technology untethers the content from the desktop. Putting the content people need at their fingertips reduces the burden of having to try to cram everything into a formal training program long before they need it, most of which they will forget anyway.

Social learning. You can provide opportunities for people to get help from others—at the moment of need—through social tools such as wikis and blogs, asking questions through discussion forums, Twitter (or its internal equivalent), texting or instant messaging, or chatting with peers at the proverbial water cooler (or its electronic equivalents). These types of informal, social learning are an important part of apprenticeship 3.0.

Progress indicators and recognition of achievement. People are more motivated

to keep on learning if they clearly see their progress. People also are motivated if their accomplishments along the way to proficiency are made visible and are recognized. Badging systems, such as Mozilla's Open Badges framework, can provide an effective way to recognize achievements.

Integrated continuous learning process. Each of these guidelines is powerful in itself, but the real power of apprenticeship 3.0 emerges when they are integrated in a systematic way, using technology to form a continuous learning process.

Case study: Water Quality Association

The Water Quality Association (WQA) is leading the way in adopting apprenticeship 3.0. The organization is restructuring its education program to enable its member companies to train and certify their employees.

WQA is developing a competency-based curriculum with mobile technology that guides employees through a systematic sequence of learning activities that are aligned with required skills and competencies. Once the competencies are loaded into the system, it provides learning paths; tracks formal, informal, and experiential learning activities using the Experience API; captures experiences through a mobile portfolio app; reports on progress; and awards electronic badges.

The process began by bringing in WQA members—experts in each area of water quality—to build a taxonomy of cases and identify the key competencies that installers, service

Apprenticeship 3.0 in the Field

A newly hired equipment installer takes out his smartphone and looks at his learning path to see that his next learning goal is to install a particular piece of equipment. The learning path guides him to view a brief online tutorial on how to install it, then to review an installation procedure guide from the knowledge base, and finally to practice installing it at a customer site.

When he is done, he uses his smartphone to create an ePortfolio entry: He takes a picture of his work, adds a brief note

on challenges he faced, and geotags the customer location. He then submits his portfolio entry to his supervisor for review. When his supervisor gets a notification that he has completed the installation, she schedules a brief coaching conversation with him later that week. When the employee has demonstrated that he can successfully install that type of equipment, he is issued a badge that he proudly shares on the company website and on Facebook.

technicians, and sales reps need to do their jobs well. The capabilities are represented by badges that employees can earn by demonstrating competence in those areas.

Then the organization identified a systematic set of learning experiences that lead to the achievement of those badges. These experiences were sequenced into learning paths that optimize the development of each set of competencies.

The learning paths consist of structured on-the-job experiences via a mobile performance support knowledge base, coaching, short self-study online readings, and online mini-tutorials, all tracked via the Experience API. WQA tracks on-the-job experiences

through a mobile ePortfolio that allows field personnel to fill in a checklist, take a photo of their work, and tag its location.

The extremes of entirely formal or informal learning don't work for learning new skills, so an integrated continuous learning process is needed. Apprenticeship 3.0, in which cognitive apprenticeship principles are powered by emerging technologies, allows organizations to harness the 90 percent to optimize the path to proficient performance.

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