Rethinking e-Learning

By Clark N. Quinn

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For all the sophistication of our technology, our view of learning has not really changed. In an era of semantic Web, augmented reality, virtual worlds, and more, we are still talking about courses!

But in business, our goals are not learning, our goals are improving performance. And courses, particularly the “event” model for courses, are one of the worst ways to go about achieving learning for performance!

We need to review recent advances in technology to ascertain the new capabilities they can provide for learning, and then we can revisit how people think and perform. We need to look at models such as spaced practice, social learning, meta-learning, and distributed cognition. With these new technologies and these ways of thinking, we can envision and deliver a richer learning experience that will lead to persistent change in abilities. And that persistent change in our ability to do, is, and has to be, our goal.

Technologies

We need to consider the changing nature of our technology infrastructure. In 2005, Marc Rosenberg’s Beyond e-Learning brought a much broader (and appropriate) perspective to e-Learning, by including eCommunity, performance support, and knowledge management. Several directions were not really part of the picture then, however. While we did have the Internet and mobile devices, the smartphone had not really taken hold, virtual worlds were still in the “too hard” basket, and “the cloud” hadn’t yet been coined as a term. The first two of these are worth a little more thought here, along with a fourth meme, the semantic Web.

Mobile devices

Mobile learning is not new, but it has only recently “crossed the chasm” from the Innovators and Early Adopters to the Early Majority (or at least to the awareness of the Early Majority). Though I, along with others including David Metcalf and Judy Brown, had felt mobile learning was ready for “prime time,” the realities until the last year or two were that mobile technology providers had maintained their protectionist approach, and furthermore the tools were not yet really available. Now those barriers have eroded, and we have a robust infrastructure for mobile delivery.

Mobile is about augmenting our performance, whether by supplementing formal learning, or by providing performance support. Our brains are really good at pattern matching (although not particularly good at remembering details or arbitrary information), at performing rote tasks repeatedly without flaws, and at doing complex calculations without support. The problem is that our cognitive architecture creates certain fixed barriers – everything from limited working memory and stereotyping to confirmation bias and retaining meaning rather than specifics.

On the other hand, we have these new mobile devices with us whenever and wherever we are, and they are increasingly capable of rich interactions and processing. We have the four C’s of mobile available:
With these, we can accessorize our brains to make us more capable than we are without support. How can we take advantage of these capabilities for learning?

**Virtual worlds**

Virtual worlds are, in many ways, related to mobile learning. Virtual worlds are now reaching the mainstream, as Karl Kapp and Tony O’Driscoll have signaled. In both mobile and virtual worlds, our normal capabilities are augmented through technology. The difference is that mobile devices augment our capabilities in the real world, whereas virtual worlds provide an artificial world where we can interact, perhaps with augmented capabilities.

There are fundamental affordances in these virtual worlds, particularly in their 3-D nature, and through the inclusion of other people via “presence.” Emergent affordances include the ability to navigate through the virtual world, and to create new 3-D structures. The social capability means that we can appear as we wish (rather than as nature endowed us), and we can share these spaces and communicate with others. The ability to co-create 3-D representations provides a real opportunity for learning.

While the ability to share space is not new, the ability to change that space, to share space with others who are not geographically proximal, not to mention the ability to have a new appearance, are new possibilities.

**Semantic Web**

One other category of technology that offers powerful new affordances is the area of semantic technologies. While still in its infancy, the use of semantics already provides content creators with valuable outcomes when managing large quantities of content and when customizing content delivery. However, we also have the capability of doing things at an individual granularity.

What we are talking about here are ways to add meaning to system-tracked content. Currently, we have to prescribe how content appears, but if we can provide information about the topic of content, and a variety of descriptors, we can devise rules that extract information on the fly. Those rules can draw both upon contextual information (“person X is looking for information Y at place Z”) and upon what’s available (“we have information A, both examples and concept presentations”) to do customized combinations.

As a result, what we have on tap is the ability for the system to react to situations and create customized content. So-called mass-customization already exists (e.g., Amazon recommendations), using aggregate information, but we could also use best principles of learning to do targeted interventions based upon particular characteristics of a context. And that’s potentially powerful.

**The learning it’s not about**

When I say, “our goals are not learning,” I mean that our focus needs to be on the ultimate performance needed, not on the associated learning. There are times when the appropriate support will be from peers or mentors, or from job aids, not just from courses.

Consequently, after the technologies we have to hand, we need to think about what we know about how people perform. What do we know about supporting individuals in learning and performance?

From looking at kids (before schooling extinguishes their love of learning), we see what I call the seven C’s of natural learning:
Choose what we are interested in
Commit to do what is necessary to learn about it
Create expressions of our understanding as application
Crash when our expressions sometimes fail
Copy others’ performances
Converse with others about the topic
Collaborate to co-create a shared understanding as well as an artifact

This does not much represent what we do with learning. We need to visit some of the more esoteric areas of cognitive science to think more powerfully about learning and performance. We start with formal learning.

**Spaced practice**

One of the robust results of looking at making learning “stick” is that so-called “mass practice” does not work as well as spaced practice. Our goals for learning are retention over time until needed, and transfer to all appropriate (and no inappropriate) situations. Will Thalheimer’s review of the research has revealed that spacing practice over time, so that we revisit applying the knowledge to problems again several times, with periods of sleep in between, gives far better results (in terms of retention) than when all the practice occurs at one time, on one day.

Our “event” model of learning, in which we bring people together, physically or virtually, and have a unitary learning experience, is one of the least effective learning mechanisms we know. If we reactivate that knowledge, and have the learner reapply that knowledge again over a period of days, the knowledge will last much longer. The actual quantity of practice, and spacing between practices, is dependent on the time between real application of the knowledge and desired level of competency, but spacing is far better overall.

**Social learning**

As I said in an earlier article in *Learning Solutions* ([http://www.learningsolutionsmag.com/articles/57/social-networking-bridging-formal-and-informal-learning](http://www.learningsolutionsmag.com/articles/57/social-networking-bridging-formal-and-informal-learning)), there are reasons why social learning should be considered. Learning on your own typically is not quite as effective as learning together. It may just be reprocessing, but when we need to work with others to negotiate a shared understanding, we develop a richer understanding (unless only one person is actually contributing). Usually, we have to express our thoughts clearly, and listen to others, and then if others have different understandings, we have to work to reconcile them.

Social learning is not only for formal learning, but also informal. There is not a binary division, but instead a continuum between novices exposed to received wisdom and experts co-creating shared understanding, a steady transition from the periphery of legitimate participation to the center of a community of practice. When we ask questions of a community, share our knowledge, or co-create new understandings (new products, services, or problems solved), we are learning in the broad sense of the term.

As my colleagues in the Internet Time Alliance and I argue, social learning needs to be as much a part of the infrastructure of effective companies as does any other form of IT. Enabling sharing information will be the only sustainable advantage.

**Meta-learning**

Assuming that learners are both capable self-learners and capable social learners is a mistake. Some may be good at one or the other, or both, but an individual having a full suite of learning skills is not a safe bet. Instead, we need to be explicit about learning skills, looking at learning to learn, or meta-learning.

This means identifying learning skills, articulating them, assessing them, and developing them. The task of the learning unit staff in the future will be facilitating learning, looking at all opportunities to support communities, including courses, performance support, and community. This nurturing role will include not only providing
infrastructure, tools, and knowledge, but also developing learners as learners.

**Distributed cognition**

Cognitive psychology advanced beyond behaviorism by positing that we actually *could* try to determine what went on in the head. Situated cognition has gone beyond knowledge in the head to recognize that our brains not only operate "in the wild" (as Ed Hutchins would have it), but use information in the environment as part of the thinking process.

This recognition that our processing uses external representations is an important component in looking at ways to support performance. When should we provide tools, whether representational or computational, instead of trying to put all information in the head? We need a richer picture of how we perform, rather than a simplistic and ineffectual model that posits we can know everything we need.

**Slow learning**

Where do we go from here? How do we align these different models of thinking to take informed advantage of new technologies? I think there are a couple of really interesting opportunities here: contextualized performance support, and contextualized learning. The former is easier to grasp.

**Contextual performance support**

We already are seeing Augmented Reality applications for mobile learning. These applications know where you are (and even which way you are facing) and layer relevant information onto your world. You can search "nearby" for food, resources, or more. There is another possible way to provide support, and that is through knowing *when* you are. That is, by looking at your calendar and knowing what sort of event you are in, the application is able to provide relevant information such as sidekicks or planners, or a client update before a meeting, or a contract checklist in a vendor meeting.

In short, we are using contextual information captured as semantic tags, and running rules that look at distributed cognition tools to deliver contextualized support. We need models of the content and context, and also of the learner. However, this is doable now, and the organizational performance outcomes should be obvious.

**Formalized performance**

A broader extension of this model is to do more than facilitate performance, by actually promoting learning as well. Instead of taking learners away from their contexts and simulating performance opportunities, how about not only scaffolding those performance opportunities, but also turning them into learning opportunities? We could provide conceptual material and examples beforehand, reactivate relevant knowledge before performance, provide support during performance, and then close the loop with either self-evaluation rubrics or connection to a mentor. We could also have the device capture performance, and share it with colleagues for feedback!

We can do this in the real world, or provide virtual worlds to practice. Most formal learning provides artificial contexts, but a closer approximation to the real world is through virtual worlds that add the immersion you would experience in the real world. The capability for sharing this space with others becomes powerful for shared learning, with reciprocal performing and critiquing to co-develop ability. Co-creation is an extension to this model, where performers can collaboratively create new understandings that may only be personally new, or indeed may be new contributions to shared understandings.

We are now linking individual learning goals, social learning power, distributed cognition, and spaced practice in a powerful, long-term learning opportunity. I like to draw upon a drip irrigation metaphor to contrast with the typical "flood" approach, or perhaps to the "slow food" movement, to champion a richer view of individual development.
This is the dream that accompanied Gloria Gery’s call twenty years ago for electronic performance support systems, that these systems could not only support performance in the moment, but also develop the learner over time. In practice, the systems typically were not built to accommodate this extra goal, but they can be, and now we can do it wherever and whenever needed, not just in the immediate system-supported workflow.

**Moving forward**

The opportunity we now have is to use technology to move from an event-based learning model that we know to be ineffective, to a more distributed and contextualized environment that elegantly spans the continuum from formal learning to performance support. And this is not science fiction – we have the tools we need now. Even if we didn’t, we should be preparing our thinking for this capability.

There are some prerequisite steps. We need to:

- Start thinking of how to characterize individuals as learners, not just by their courses completed but by preferences, devices, and goals, so we know how to customize what we deliver to person A versus person B in the same place.
- Develop content in discrete chunks that are fully labeled and tagged to facilitate content reuse and access by rules, not by hand-linking, so we can deliver just enough, not everything there is.
- Characterize contexts both geographic and semantic, so that we know both the type of event they are engaged in as well as where they are and what would be useful to them here and now, finally truly delivering on the just-in-time regardless of proximity to the desktop.
- Identify a suite of self- and social-learning skills that we can assess and develop that is relevant to a new and changing world, so we’re developing their ability to perform, not just their knowledge.
- Think more deeply about a learning model that elegantly integrates a long-term view of learning with a broad view of performance and development, and which can integrate those interim steps to create an integrated and coherent whole.
- Look at learners as a longer-term learner proposition, not merely as cogs, but as individuals of worth who are essential to the success of our organizations and society.

A true learning organization is one where the individuals are developed continuously in a holistic way, and seamlessly across technologies and contexts. That’s the goal, and our capabilities are nearer than we think. What we need is the initiative to take a stab at this. So, who’s in?

**References**


Internet Time Alliance, [http://www.internettimealliance.com](http://www.internettimealliance.com)
