RAPID E-LEARNING REALITY CHECK

Tom Kuhlmann

Superblogger Tom Kuhlmann addresses a topic of importance and one of frequent annoyance to me: "rapid" e-learning. It seems everywhere you go someone's promoting a rapid e-learning application that's going to help build e-learning courses in no time at all and with no required programming. In today's economy, and with increasing pressure from organizations to do more with less, the promise of rapid e-learning is attractive. But what is rapid e-learning? Where does it fit in the e-learning landscape? And can it fulfill the promise? Something isn't always better than nothing, but speed to market is always an important consideration. I appreciate Tom's taking an excellent, frank look at the prospects of rapid e-learning and setting the record straight. Whether rapid authoring is too often maligned or simply called out for what it isn't—well, that may still be the very kind of controversy we invite here. In any case, Tom has undertaken a more substantive analysis and comparison than typically fuels the discussion.

WHAT IS RAPID E-LEARNING, ANYWAY?

Rapid e-learning has been defined in different ways. The most popular tends to be focused on the software. A few years ago the tools to create e-learning courses required specialized programming skills. You couldn't just open up Flash or Authorware and create a course. There was a learning curve. Today, that's not the case. Many tools allow just about anyone to publish e-learning courses with little programming know-how. Now this doesn't mean that everything published is going to be good. That still requires sound instructional design. But it does mean that the tools are available for organizations to efficiently develop and deploy their e-learning courses.

The second most common definition of rapid e-learning involves the simplification of the production process. What used to require a team of people now can be accomplished by just one or two. Many e-learning developers wear multiple hats. They act as the instructional designer, graphic artist, LMS administrator, and course author. The challenge for organizations is to balance their cost-consciousness with course effectiveness. Just because you can create a course doesn't mean you always should. So an ongoing concern is to ensure that the easy authoring is balanced with effective course design. Not everyone with a rapid e-learning tool is going to build a great course. But with the right implementation and focus on instructional design, a rapid e-learning strategy can prove to be an effective and affordable solution for many organizations.

Regardless of how rapid e-learning is defined or what tool is used to build the e-learning courses, the end result is that the courses do exist. My guess is that the learners don't care how it was authored. What they and their organizations expect are e-learning courses that are effective and help the organization meet its goals.

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RAPID E-LEARNING TOOLS COME IN MANY FLAVORS

Let's do a quick review of rapid e-learning tools. Many people tend to think that rapid e-learning tools are just rooted in PowerPoint to Flash publishing. But the reality is that rapid e-learning applications are diverse and include more than basic PowerPoint conversions.

When authoring any e-learning course, someone decides what content to add to the screen. This can include text, audio, images, and interactive multimedia. You typically have two types of e-learning tools to author courses. One type is *freeform,* where you start with a blank screen and have to decide how to construct the look and feel of the course and where to place the objects. The other is *form-based,* where the software is built to accomplish a specific function or interaction. Most of the design and structure is pre-built and only requires that the developer add content to the form. Typically, you can insert text, images, narration, and multimedia. Figure 1 compares the two types of tools.

Freeform Authoring. Freeform tools are great because the look and feel of the course isn't defined for you by the authoring software. You start with a blank screen from which the sky's the limit. These types of tools can range from Flash, which it is typically used to custom-build courses, to something as simple as PowerPoint.

Many of the rapid e-learning tools act as add-ins to PowerPoint. Essentially, they provide the course infrastructure and logic and let the developer leverage the easy authoring environment in PowerPoint. Each PowerPoint slide is converted to a single Flash movie. The rapid e-learning software builds the player structure and everything else to play the Flash movies authored in PowerPoint. Examples of freeform tools are shown in Figure 2.

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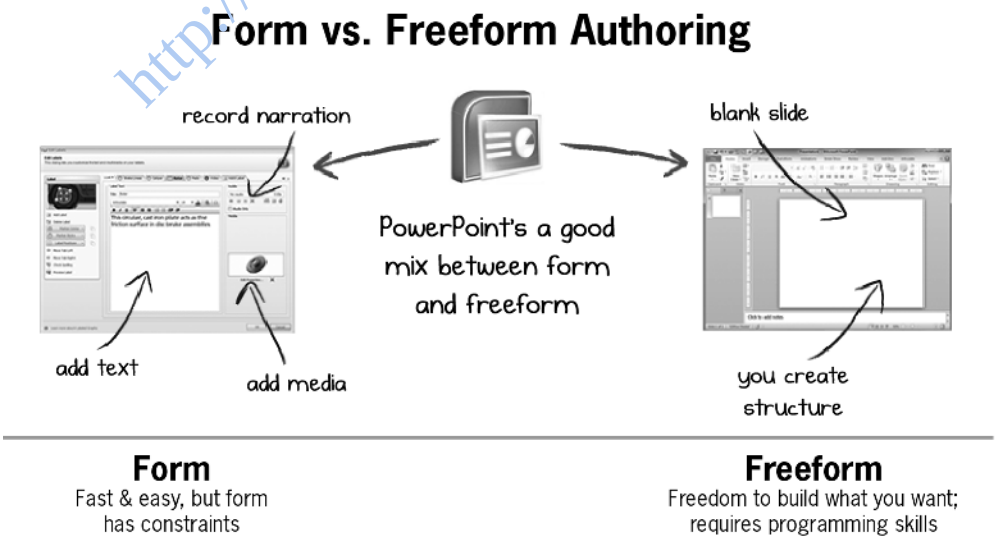

Figure 1. Form vs. Freeform Authoring

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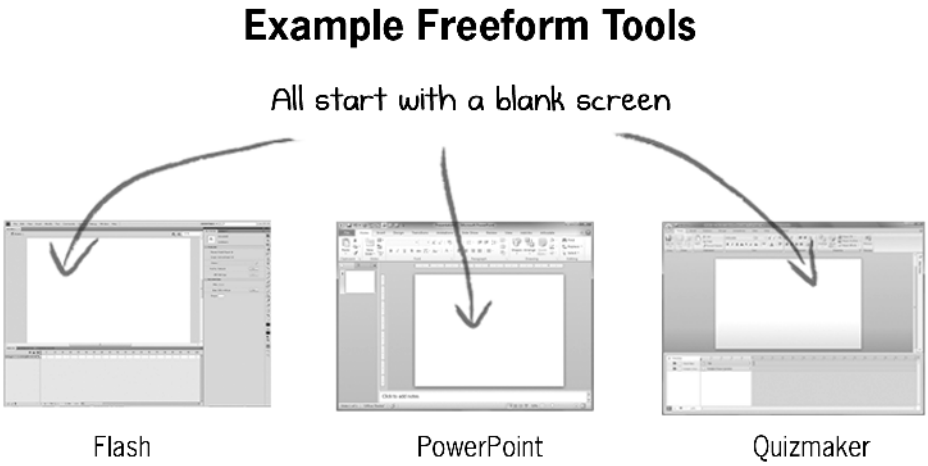

Figure 2. Examples of Freeform Tools

Form-Base Authoring. When it comes to building multimedia content, it doesn't get any easier than a form-based application. For the most part, the software does everything—all you have to do is add your content. Because the forms are predetermined, they can be simple or complex. It really just depends on how they're designed. The output can be simple presentations or highly interactive learning activities. The main point is that the form is pre-designed to a specific function. Figure 3 shows some examples.

Both types of tools are effective for e-learning, but they also have their drawbacks. For example, while freeform authoring is highly flexible, it also entails more custom programming. Thus, to build more than simple content, you need to have some programming skills. You're not just going to open up Flash and start building a course. Even building good PowerPoint-based e-learning requires more than a basic understanding of PowerPoint.

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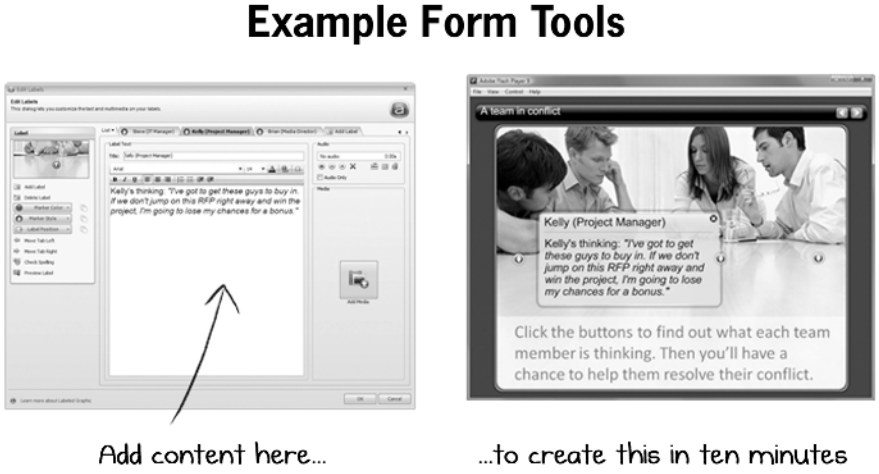

Figure 3. Examples of Form-Based Authoring

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To get away from the programming requirements, you can use a form-based tool. The form makes creating a course or interaction easy, because the structure is predetermined and only requires content be added. But then the form only gives you what the form is designed to give you. Think of it like a Jell-O mold. If you want a crab-shaped chunk of gelatin, you need a crab-shaped mold. Just like the crab mold, the form-based output is only going to give you what it's designed to give you. So it's easy to build content without being a programmer, but at the same time the easy authoring introduces some constraints if you want more than what the form is designed to give you.

Figure 4. Examples of PowerPoint-Based Rapid e-Learning

Many Flash programmers have their own versions of forms whereby they create a course structure that can dynamically pull in content. All they do is swap out the content. It's really not much different for rapid e-learning forms, outside of the fact that the content is modified by a non-programmer in an easy-to-use interface.

POWERPOINT'S A VERSATILE APPLICATION

To some, anything created in PowerPoint sucks. But it's important to separate PowerPoint as an authoring tool for e-learning courses from what people commonly do with it. This is especially true because building e-learning courses is different from building presentations (which is the cause for most of the complaints). Despite the complaints, PowerPoint is a great application to author e-learning courses. PowerPoint 2007 and 2010 have introduced a lot of new features that make authoring e-learning courses much easier and more Flash-like. Figure 4 shows some examples.

PowerPoint offers a very rich authoring environment in which you can create interactive and engaging e-learning courses. Because you start with a blank slide, you have a lot of flexibility in how your course looks and feels. You're not limited to any particular template. Essentially, the rapid e-learning software combines all of the graphics, audio, and animations in each PowerPoint slide to create a Flash movie. That published output can be indistinguishable from content created in Flash. And that's the attraction to PowerPoint-to-

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Flash e-learning tools—you can create Flash output without learning Flash. Another benefit of PowerPoint is that it is used by so many people, so the transition to e-learning is usually pretty easy. For the most part, anyone can create and publish an e-learning course with minimal instruction. That's not true of more complex tools like Flash. PowerPoint also offers a lot of built-in graphics features that minimize the need for additional graphic design support.

Before rapid e-learning, most organizations had limited access to multimedia development, if any. Even in large organizations, being able to build and deliver e-learning was cost-prohibitive. That's changed—mostly because of the PowerPoint-based authoring.

A lot of the criticism of PowerPoint-based e-learning is misguided. PowerPoint's a versatile tool. Yet there's rarely a distinction between when it's used for presentations, to build graphics, for author videos, or to create e-learning courses. Unfortunately, there are a lot of bad presentations (and e-learning courses for that matter), so it's easy to blame the tool.

With that said, there are limitations to PowerPoint-based authoring. One of the challenges is that, because the tools are easy to use, a lot of courses are built by people with limited instructional design experience. On top of that, they stick to the default PowerPoint templates and essentially take what were bad presentations and make comparable e-learning courses. So there's a need for more focus on instructional design.

Another limitation is the technology. PowerPoint was not really designed to be converted to Flash and used for e-learning. Because of this, the courses tend to be linear. Although, over the last few years, many of the rapid e-learning tools do offer some interactive branching capabilities, and PowerPoint's own hyper-linking works well. In either case, building interactive content is probably not intuitive to the first-time user and does require more than basic PowerPoint skills.

Like anything, there's always a tradeoff. There's a place where the tools work and a place where they don't. It's just a matter of understanding the tool's capabilities. I've found that PowerPoint's easy to use and capable of delivering decent e-learning courses. To prove my point, I recently built a mockup of an Allen Interactions course previously built in Flash. My goal was to only use PowerPoint (for the graphics as well as the e-learning). While it wasn't an exact duplicate, it still maintained the core instructional design components. It demonstrates that, with sound instructional design, you can even use a tool like PowerPoint to build effective e-learning, as seen in Figure 5.

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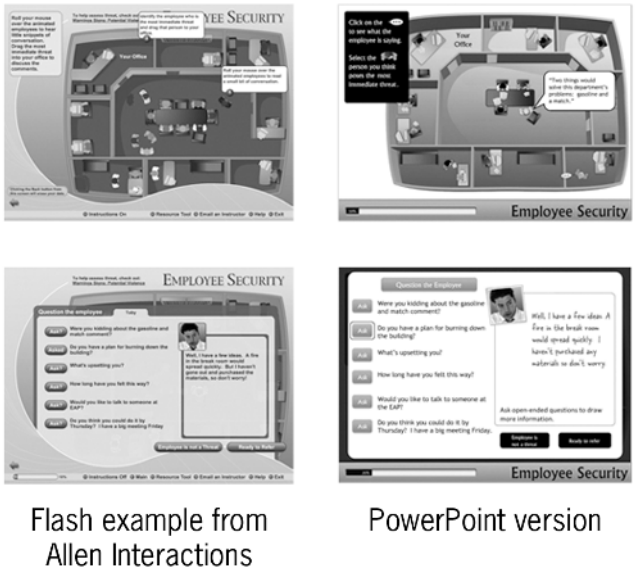

Figure 5. Comparing Flash Courses to PowerPoint Courses

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As I noted earlier, different types of tools make up what is known as "rapid e-learning." Many organizations tend to use a combination of tools and do a lot of hybrid development by which they combine the rapid authoring with some custom Flash elements. It's easy to see why rapid e-learning is attractive. It does make content creation easy. However, it doesn't replace sound instructional design. The ongoing challenge for organizations that use these tools is to equip their teams with the resources and means to build effective e-learning courses and not just expect that anything will do.

RAPID E-LEARNING HAS DEMOCRATIZED E-LEARNING

A blog author recently commented on the mainstream media's excuse for lost revenue. The media blamed their losses on all of those pesky bloggers, claiming that bloggers had fragmented the market. The blogger's response was that the market was always fragmented. It's just that previously the technology didn't exist to serve it. I hear similar complaints from e-learning vendors. They say those pesky rapid e-learning developers have fragmented their market.

But my response is the same as the blogger's. Rapid e-learning hasn't fragmented the market. It's only serving a market not served before. In the past you needed money or programmers to build an e-learning course. That's no longer the case. Now, the capability is available to everybody, not just a handful of programmers or corporations with deep pockets.

Many large organizations have formal e-learning teams, yet their resources aren't available to the smaller business units. Some managers may want to train their employees, but these departments are not big enough to warrant any assistance from the formal training groups. In the past, they just made do with what they had. The "learning" still happened. They just ended up with lots of job aids and redundant face-to-face training sessions. However, with rapid e-learning tools they're able to build the e-learning courses they need. They may not build award-winning courses, but they are building courses that help them meet their objectives. This is saving the organization time and money.

NOT ALL E-LEARNING IS THE SAME

e-Learning means different things to different people. Working on a $200,000 e-learning course with a team of Flash programmers provides a different perspective than that of a site safety manager who has to build e-learning courses with no budget. How they see e-learning is different. And considering the disparity in resources, how they approach e-learning is different. If I always had a team of Flash programmers and graphic artists (and a healthy budget), I'd also question how one could possibly build effective e-learning with a simple application like PowerPoint. But the reality is that most e-learning courses built today are built by people who have no resources other than their authoring tools. Is this ideal? No. But it's the reality they work in. See Figure 6 for two types of course focus.

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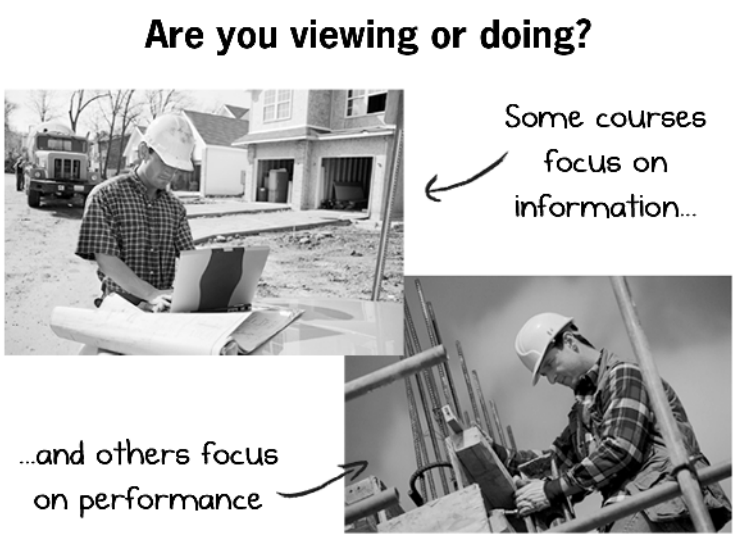

Figure 6. Are You Viewing or Doing?

Objectives for e-learning courses are also different from situation to situation. Not all courses are created equal. Working with an executive who demands an immediate impact to the organization's performance requires a different intervention than the human resources manager who wants to share simple changes to the organization's bonus plan. Some courses are only intended to share information, while others seek to change performance. The main goal is to build a course that is appropriate to the objectives and then to use the least resources to meet those objectives. That's just good business.

In addition to different purposes, not all e-learning centers on corporate training and performance improvement. For example, universities and colleges don't typically focus on performance in the same way as corporation would. Because of this, they tend to build fewer performance-based activities into their e-learning courses. This makes sense because the e-learning courses they offer are only pieces in a larger curriculum that includes other learning support. Many of them seek to convert lectures and other material to multimedia for online delivery and use that in conjunction with other activities, so they tend to focus more on efficient information delivery.

The examples in Figure 7 shows how rapid e-learning adds value to the curriculum design. Both examples show how organizations are leveraging many of the web's interactive learning opportunities. One is of a Google Map and YouTube mashup as part of learning the Seven Wonders of the World. The other is an embedded virtual world wherein learners can explore and interact with each other—both done in PowerPoint and with no programming.

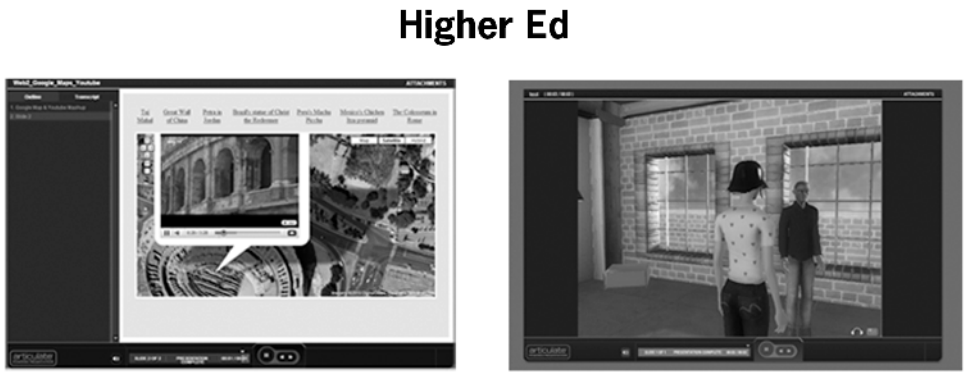

Figure 7. Example of Higher-Ed Rapid e-Learning

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Because of easy authoring, rapid e-learning has spawned a consumer education industry. Consider these two quick examples that weren't possible a few years ago and demonstrate the democratization of e-learning. First, a dentist uses rapid e-learning to teach children how to brush their teeth. He has no programming skills, yet can deliver a rich multimedia experience to his patients. Second, an auto dealership teaches car owners about miscellaneous repairs. The courses are built and maintained by the mechanics. They use it as a teaching experience. The customers love it because, instead of being confused about the repairs and possibly feeling ripped off, they feel empowered and educated.

The main point in all of this is that there is no single type of e-learning or a single approach to how the courses should be built. Instead, there are multiple ways to build the many types of e-learning. Some courses are simple and some are complex. Some are high-profile with a large budget and a full production team. And others are limited and have no budget. And for each situation, there's an appropriate tool. Sometimes, rapid e-learning tools are the right tools and sometimes they're not.

WORKING AT THE SPEED OF BUSINESS

When it comes to the world of business, the organization's overarching objective is not to build an e-learning course. Instead, it wants to meet a specific business goal, and an e-learning course is merely a solution for doing so. Thus, the appropriate thing is to step away from the solution and focus on the business objective. At that point, determine the best solution to satisfy the organization's goals. From this perspective, rapid e-learning can be a very effective solution to meet the organization's e-learning needs.

Here's an approach that I've found works. I start with a rapid e-learning tool to build courses. The tools are capable and can meet most of the organization's e-learning needs. This lets you take care of the low-hanging

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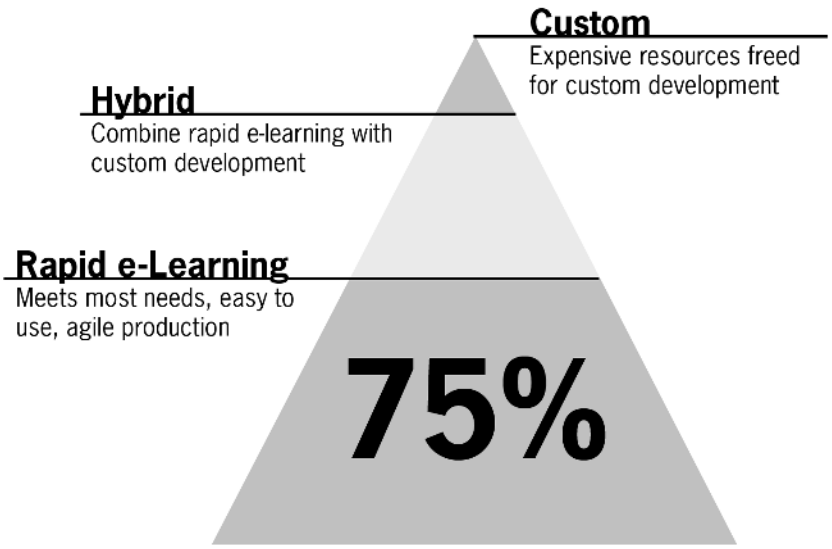

Figure 8. Rapid e-Learning Hierarchy

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fruit and many of the simple, information-based courses. From my experience, you can probably build 75 percent of your courses with this approach. (See Figure 8.) Although this obviously varies based on the types of e-learning courses you need, the main point is that you're not committing expensive Flash development resources to projects that can be satisfied with the rapid e-learning software.

While the rapid e-learning software can do quite a bit, it can't do everything. Many courses require some custom development. In that case, the next step is to do some hybrid development where the course's infrastructure comes from the rapid e-learning application, but is augmented with custom Flash pieces. This lets you leverage the rapid e-learning tool's easy publishing and still create the custom programming that might require variables or other logic-based interactivity. This is a popular production strategy for many organizations that want to leverage both the rapid authoring and the custom Flash skills of their developers.

However, there will always be some courses that require more. For example, you're not going to build flight simulator training in PowerPoint. So the next stage is to commit your resources to custom development. Using this strategy, your resources are used in a manner appropriate to the organization's objectives. You don't want your resources or multimedia developers committed to content that can easily be created with rapid e-learning software. They are expensive resources and you want them working on the types of projects that warrant them.

One of my favorite e-learning examples is of an organization that had a weekend fatality. The safety team scrambled. They shot some onsite video detailing the accident, interviewed the CEO, and pulled together a refresher training program. All of this content was assembled by the site safety manager using a digital camera and rapid e-learning tool. And it was delivered to all of the production facilities in less than twelve hours. If the corporate e-learning team were involved, it would have taken three months of back-and-forth meetings just to perform a needs analysis, let alone deliver anything. The course met the organization's immediate needs. They needed to document the incident and then swiftly communicate with the other production facilities. And that's operating at the speed of business.

As we noted earlier, there are all sorts of demands and use cases for e-learning. There's not a one-size-fits-all approach. It's important to be agile and flexible, and that means having the right tools for the right job at the right time. You need rapid e-learning tools in your tool chest to be agile and responsive in today's business.

THE FUTURE OF RAPID E-LEARNING

Years ago when looking for work, you went to a commercial printer who printed your resumes. Once computers arrived, you hired a desktop author to design and print your resumes. Soon after, you bought your own computer and created your own resumes. Today, you just go to a website and fill in a form.

This doesn't make you a rapid resume builder. You're a job seeker who's using technology to find a job. But over the years the technology has changed and made it easier.

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It's the same for e-learning. There's really no such thing as rapid e-learning. It's all just e-learning. The only difference is that, just like creating resumes, creating e-learning courses is getting easier. We've gone from Authorware to Flash to rapid e-learning. And soon we'll have a next generation of tools that will require no programming, yet produce complex multimedia content that not only will look and perform well, but will also offer more programming sophistication. Many critics of rapid e-learning want to blame the tools for bad e-learning. But as I like to point out, *Michael Allen's Guide to e-Learning* was written in response to crappy e-learning that existed way before rapid e-learning. So while there may be some bad courses out there created with rapid e-learning tools, they're created by people who don't know how to build good courses.

In some ways, the critics are like the typesetters lamenting the introduction of electronic resume creation. It makes sense because there's a shift in how the industry does business. But like any industry, technology changes—and our roles change as well.

Here's where I see opportunity. Course authoring is only going to become easier and more feature-rich as the technology advances. But easy authoring doesn't replace sound instructional design. There will always be a difference between good and bad courses. And those who can build good courses will flourish despite the changing technology; probably more so because of the movement by organizations to take their training online.

Another opportunity is in supporting organizations that do use rapid authoring tools. Someone has to show them how to use the tools to create better learning experiences so that they get the most out of their investment.

Something that is often overlooked about rapid e-learning (but that has benefited the industry tremendously) is that we no longer are spending time discussing how to program our courses. Instead, a lot of the conversation has shifted to how to build better courses and learning experiences. Previously, instructional designers were often cut out of the conversation, because it all centered on the technology and programming. However, now that the tools take a lot of the production conversation off the table, they've made room for more conversation about effective learning. (See

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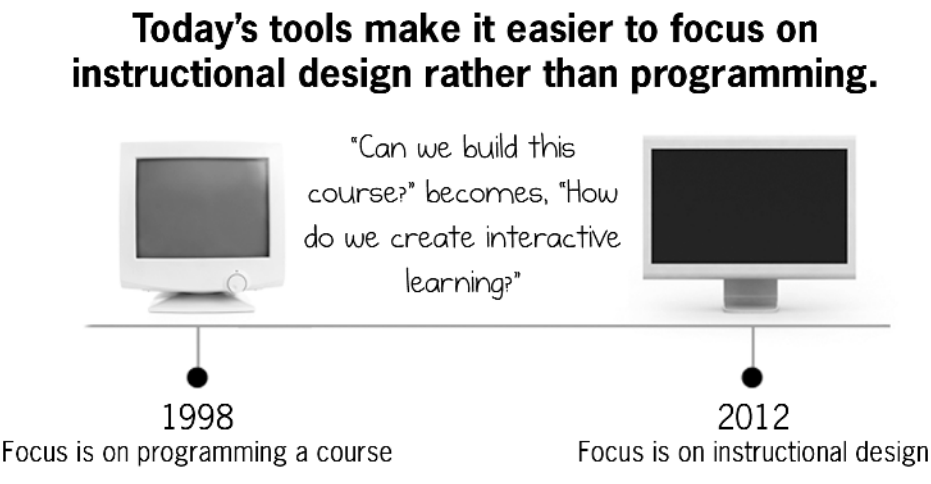

Figure 9. 1998 to Today Timeline

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Figure 9.) And that's something that hasn't always been the focus in the past.

Here's the deal when it comes to rapid e-learning. The tools are going to become more sophisticated and easier to use. We need to shift our attention to better equipping our instructional designers. They need a broader understanding of graphic design and visual communication so that those can be coupled with sound learning theory. We also need to equip our subject-matter experts. While they may not always be the best ones to develop e-learning content, the reality is that, as social media and rapid e-learning tools advance, there will be more pressure on them to create content. And if that's the case, we want their courses to be good and effective.

There's a lot more to be said about rapid e-learning. Hopefully, this is a good start.

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Anita has written four books published by AMACOM: *eLearning 2.0, Effective IT Project Management, eCommerce: A Question and Answer Book,* and *Looking into Intranets and the Internet.*

As a consultant, Anita has worked with a number of companies, assisting them to integrate current business goals and objectives into a successful Internet and e-learning strategy. She has worked with companies such as Digital, The Depository Trust Company, Global Village, Oracle, Matrixsoft, Netscape, Novell, Unilever, and 3DO.

She brings more than twenty-five years of management experience in e-learning, high-tech marketing, project management, and sales. Currently she is president of ReadyGo Inc.

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AN ARGUMENT AGAINST VOICE-OVER POWERPOINT FOR E-LEARNING

Anita Rosen

PowerPoint clearly appeals to a broad audience of users for creating presentations. Once having learned to use PowerPoint, comfort and familiarity with the tool often lead to efforts to develop e-learning with it as well. This is an especially attractive path when PowerPoint presentations exist as a starting point for e-learning development. But author Anita Rosen asks, "Should we use these PowerPoint presentations with voice-over narration for e-learning? What do the stakeholders think? Are these courses meeting their needs?" These are important questions addressed by Anita's case studies.

WHAT WORKS?

Most trainers know how to organize their thoughts, prepare a PowerPoint presentation, and present to a classroom full of adults. But can the same presentation be used on the web to create an effective learning situation? Taking the presenter out of training is not as simple and straightforward as we would like. To have content stand on its own on the web takes careful consideration.

This article is about why I believe PowerPoint is not an effective tool for creating web-based training. To determine whether or not an approach is effective, I feel it is important to know who is measuring effectiveness, what they are using to measure results, and how they identify what is not effective. For adult education in the workplace, it is not an academic person who measures course effectiveness; it is the organization's management who decides whether or not training is meeting their needs. The employees who are taking the training identify whether the experience was one they are willing to repeat.

ABOUT ORGANIZATIONS

When I speak with organizations about e-learning, I find there are multiple stakeholders who are interested in training. Each has varying needs and wants. The main stakeholders are upper management, managers, trainers, and learners. For a training program to be successful, these stakeholders must have their needs addressed and met. Over the past ten years, I have worked with many different organizations and have come in contact with all of these different stakeholders. I have worked with corporate, government, military, and not-for-profit organizations located throughout the world. Interestingly, even though these organizations have very different organizational goals, responsibilities, and structures, I find their needs and wants align based on the roles individuals play within their organizations. That is, upper management, managers, trainers, and learners typically have a similar response to what they want and expect from training. I am neither an academic nor a researcher. I am a business

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person and have asked my questions to better focus my company's products, features, and services so that they can better address our customer's training needs. Of course, I also ask these questions to satisfy my own curiosity.

WHAT DO YOUR STAKE-HOLDERS WANT?

When I work with an organization I make a point of asking stakeholders what their goal is in having a training program.

What do executives want? When I talk with upper management to discuss their goals when implementing e-learning, they typically tell me they want to be assured that their employees can demonstrate that they understand the material. I find few in upper management who have a clear idea of what a good e-learning course looks like or how it should behave. They are very clear on the results they want. Most upper managers want their training organization to provide the implementation strategy.

What do managers want? Managers have a more operational view of training. They want their employees trained so they can better perform their jobs or can meet organizational requirements. More importantly, I find that managers want to have their employees available to do their jobs. Managers articulate this by saying they want their employees to be out of the field for as short a period of time as possible. When I discuss with them what this looks like and how long an e-learning course should be, most managers want to allocate fifteen-minute timeframes for employees to train. They tell me that fifteen-minute modules make it easy to fit training into an employee's work schedule.

What do learners want? When I talk to learners about their experience with e-learning, I typically hear similar feedback. Most learners start by telling me that they prefer e-learning over classroom training because it's convenient. When I ask them about a specific experience, I repeatedly hear that it is very hard to maintain concentration for more than fifteen or twenty minutes. They appreciate having courses chunked so that they can be easily taken in that timeframe. When I ask learner to critique e-learning, the most popular comment I hear is "Don't waste my time." The time-wasters I hear most often, cited in order of importance, are:

- "I'm literate; don't read to me."
- "If a multimedia application (Flash or movie) does not clarify an idea or bring a thought being explained to life, please don't make me watch it."
- "I don't mind if a course is entertaining or not; I don't have time to be entertained for the sake of being entertained."
- "It's really hard to read a manual online; please write in an approachable style."
- "Make the navigation intuitively obvious."
- "Don't hide necessary information in mouse-overs."
- "Don't make me play a game in order to finish a training course." (The more senior the learner, the more often I hear this.)

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What do trainers want? When I speak to trainers or training managers, I am usually told how many hours of training they have provided to their constituency or how many hours of training material they have produced. When asked about what methodology they use and why they use this specific methodology, I find trainers fall into one of two categories. One group likes to tell me how easy the tool they use is. The other likes to tell me about the methodology they use for product training. They seem to want something easy to use that fits their methodology.

Because this paper is on why I don't think PowerPoint creates good courses, we will focus on those who use this methodology.

What do course creators want?

When I talk to course creators who use PowerPoint, I ask them why they chose this methodology. Inevitably I hear the following responses

- "It's easy."
- "I don't want to learn another tool."
- "I want to replicate the classroom experience."

I've been shocked on how self-serving their responses were. What surprised me even more was what they were not saying to me—specifically, how the training they are producing meets their stakeholders' needs. When I ask course creators about the learner's experience, they reiterate how easy the tool they use is for them and how they don't want to learn another tool. They then go on to defend their voice-overs.

WHAT IS THE OPPORTUNITY COST FOR TRAINING?

I don't hear trainers or their management correlating the number of hours they take building a course to the number of hours of organizational time spent taking the course. Training costs organizations money. It is costly to build a course, but it is even more costly to have employees take a course. If a trainer builds an hour-long course that five hundred employees take, and the average cost per hour for an employee is $100, the corporate opportunity cost to take the course is $50,000 (500 x $100 = $50,000). This equation puts training in a different perspective. When trainers say they used an easy methodology that created a substandard experience, what they are saying is that their time is valuable but that everyone else's time is irrelevant.

Training's Cost/Benefit Ratio. There is a excellent cost/benefit ratio if a trainer spends only eight hours creating a course (say $800 creation cost), even if the organization spent $50,000 taking it. It would be a great scenario if creation of a very effective course cost only $800. But if the number-one goal is making it easy for the course creator to build a course, I question the motivation and what it leads to.

How Course Creators Should Spend Their Time. Trainers think that if it takes them time to learn a better methodology and use a more appropriate tool, it will take them longer to create the course. The trainers may not see any benefit in working harder or longer, and frankly, if the organization is complacent, why should they?

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But these cost metrics are strong. Even if it took a trainer a full week to create a course, the organizational cost would only be $4,000 of development time to $50,000 of everyone else's time. If it cost $3,200 more to avoid wasting $50,000, wouldn't you spend it? If five hundred people benefited from a better experience, I believe that spending extra time to learn how to create an effective course is worthwhile, and we should not forget that an effective course better meets critical stakeholders needs.

I was brought into an aeronautics company by an engineering executive to provide e-learning direction. His division had been a recipient of e-learning for a number of years. The e-learning training group had been moved recently from human resources to his responsibility. While the training department was under human resources, his people had taken e-learning courses. The courses were voice-annotated PowerPoint with a test at the end. His people quickly figured out how either to let the course play in the background while they worked or how to skip ahead to the end and take the test. He said, "Now that training is my responsibility, I want courses that aren't a joke." He was looking for direction on how to turn their learning experience into one that was effective.

CASE STUDY: POWER POINT VS. INSTRUCTIONALLY SOUND WEB COURSES

So why do I say PowerPoint doesn't work? One of my customers is a telecommunications company with 100,000 employees. Their e-learning division was asked by senior management why they were spending so much time creating courses when they could just take the existing PowerPoint presentations, save them as Flash applications, voice-annotate them, put a test at the end, and put them online. The training group management was made up of instructional designers who had been on the cutting edge of e-learning. They felt that repurposed PowerPoint would create a sub-optimal experience and wanted to convey this concept to their management. I recommended that they conduct an experiment and use the results to tell the story.

The Course. We chose a compliance course that the training group had been tasked to create. Approximately 20,000 employees would be taking this course. We asked two different course creators to develop the course using the same PowerPoint presentation as their source document. We also created a test and survey that would be used by both course creators and placed at the end of each course. One course creator used a PowerPoint-to-Flash tool and annotated the slides with audio. The other course creator used ReadyGo Web Course Builder, a tool that creates a structured web course. The course creator using ReadyGo Web Course Builder was encouraged to deploy effective instructional design and web design methodology. Both course creators were familiar with the tools they were using. It took both course creators a similar amount of time to create a course.

The voice-annotated PowerPoint course was given randomly to 10,000 employees, while the ReadyGo Web Course Builder course was given to a different random set of 10,000 employees. The results were astounding.

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Measuring Effectiveness. To properly measure effectiveness, we developed a test that would measure how much an employee retained from the material, rather than measuring how much they knew when they started the course. The employees who received the ReadyGo course scored, out of a possible 100 points, 20 points higher than the employees who were given the voice-annotated PowerPoint. Additionally, the employees who received the ReadyGo courses gave 40 percent higher satisfaction feedback in the post-course survey. We made sure our questions were not nebulous. For example, we did not ask a question like, "Did you like taking this e-learning course?" We asked insightful questions, such as "On a scale of 1 to 10, compared to classroom training that you have taken in the past, how do you rank this learning experience?"

The Results. Training management believed that web design and instructional design would make a difference; however, they were surprised on how much of a difference it made. From a corporate point of view, the ReadyGo course met the requirements of upper management, managers, and learners. What manager wouldn't want employees who score 95 percent on courses over employees who score 75 percent? Put another way, an executive is assured that her employees understand the material when they score 95 percent. This demonstration showed that instructional design and web design make a difference when creating e-learning. If an organization is serious about creating web courses, it is very important to build these courses using the appropriate tools and appropriate methodologies.

WHAT WORKS?

So why doesn't voice-annotated PowerPoint work?

Audio. The quick answer is audio and PowerPoint visuals. More specifically: Adults don't prefer or don't learn best by hearing someone read to them. A defense contractor asked me to critique their current e-learning courses. When I presented my thoughts on audio, I received a lot of negative reaction from their trainers. Specifically, I contended that audio is very passive. Their courses would be better received and generate higher retention if they provided the information in a text format. I have found that when adults take an online course with audio, most people will move their eyes away from the screen within four to eight seconds. Adult learners figure that if you are going to read to them, they can multitask. Unfortunately, we are not very effective learners when multitasking.

Another point against using audio as the focal point of a course is that the average adult reads two to three times faster then most people speak. If a learner is given two courses, both covering the same material, the audio course will take forty-five minutes and the text-based course will take fifteen to twenty minutes. How many adults will choose the longer course?

The point becomes even more heightened if the target of the course is not a native English speaker. Most people who know English as a second language learned English in school. Schools outside of the United States teach in their native language while using English-language textbooks. Non-native English speakers who know English usually are

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proficient at reading and writing in it, but find it much harder to learn by listening to someone speak English.

Back to the defense contactor. Even after these arguments, the trainers were still resistant to my theory that voice-overs are not effective. We decided to let the learners decide. We also agreed that wanted them to answer two questions: (1) Do learners prefer audio tracks? and (2) Do learners learn more from audio tracks or from reading? We set up an experiment.

We took a course already produced, provided the audio track, and then added text that reflected what was being read. We gave the learners a choice: they could be read to or they could read the information themselves. We connected a cookie to the audio track so that we could monitor which path learners chose. We found that over 95 percent of the learners chose to read the material rather than being read to.

Instructional Design. For the second question, "Do learners learn well?" we took one of the PowerPoint with audio track courses and created a new course to which we applied the appropriate methodology, which included instructional design and web design. The new version did not include an audio track. We created a test that required the learners to have taken the course in order to correctly answer the questions. Again, learners who took the course with the appropriate web course methodology scored over 20 percent higher than the learners who took the voice-over PowerPoint course. This exercise convinced management and trainers that they wanted to produce courses using good web course methodology.

Visuals. As a visual point, PowerPoint is not effective on the web. Specifically, PowerPoint in a classroom is not the class; PowerPoint only represents a portion of the course content experience, since most presentations are meeting notes with some graphics. I have never left a class or presentation after which a fellow attendee has said, "Boy, that was a great PowerPoint" or "that PowerPoint made the session so interesting." It is usually the instructor who makes a course interesting, not the support materials. Instructors create learning events with their knowledge, understanding, delivery, and the hands-on experiences they facilitate within the course. If you went to an organization's website and all they had up was a PowerPoint presentation, you would think the company was a loser. That is because PowerPoint is not inherently web material. PowerPoint was designed to display information on a screen with a person standing in front of it, bringing the material to life. PowerPoint is not designed for web viewing. Web pages typically have a white or light background with small (10- or 12-point), dark fonts. Most PowerPoint presentations consist of a page with a few words, maybe a picture, a schematic, or a moving graphic. PowerPoint works well as a memory jogger for the instructor and as notes for the learner. PowerPoint was never designed to be a website. PowerPoint has a linear structure, whereas the web is designed for people to access content in a non-linear way. For e-learning, a non-linear design would include optional drill-down elements, links to supporting resources, and information organized into chapters.

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Reusability. Furthermore, I find most organizations cannot use their existing e-learning content effectively if the courses were produced using PowerPoint. Courses should be a resource, not just a one-time event. After taking a classroom course, I rarely use the material I just learned within the first few weeks. And after a few weeks, my memory of the material has started to fail. When I need to use the information, I want to be able to pick up my notes and review a section or page that I think is important or that I want to apply to work I am currently performing. After I take an e-learning course, I also want to access the course material in the future. I want to apply what I learned when it is convenient for me. I do not want to be forced to take the entire course or listen to the speaker go on about something I find irrelevant. I want all the course pages accessible from a course map, and I want to enter key words so I can be taken to the page where that information was presented. If necessary, I want to print out the page(s) I find important. A PowerPoint presentation saved as Flash file with most of its message contained in an audio track does not give me instant access to information I need, when I need it. And it cannot be printed out.

SUMMARY

I contend that if trainers built courses that were designed to work well on the web by incorporating e-learning instructional design and web design, all stakeholders, including upper management, managers, and learners, would have their needs met. Once trainers took the time to learn the skills necessary to create effective e-learning courses, they would find it does not take them any longer than producing poor courses with familiar tools like PowerPoint. The intrinsic rewards of building effective courses are great and professionally fulfilling.

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WHY E-LEARNING MUST CHANGE:

A CALL TO END RAPID DEVELOPMENT

Reuben Tozman

Reuben Tozman stirs up the rapid authoring debate with a frank assessment, alternate perspective, and fresh solution. "Rapid development allows organizations to build out e-learning while compromising quality for speed and cost. Although an acceptable tradeoff to some, rapid development addresses an antiquated notion of learning and development that is entirely event-based. Outside e-learning, technology is providing consumers with access to content on demand at lightning speed with greater and greater precision. The same technology holds tremendous promise for e-learning, but requires the industry to shift its working paradigm from supporting event-based training to something more along the lines of 'performance-centric learning on demand.'" This article discusses why we e-learning professionals should be looking outside of our industry for innovation and replacing rapid development practice with one more in tune with semantic web technology.

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The February 27–March 5 issue of *Economist* magazine printed a special report it dubbed "The Data Deluge." In one article titled "Handling the Cornucopia," the writer notes "And whereas doctors a century ago were expected to keep up with the entire field of medicine, now they would need to be familiar with about 10,000 diseases, 3,000 drugs, and more than 1,000 lab tests." The article goes on by saying "A study in 2004 suggested that in epidemiology alone it would take twenty-one hours of work a day just to stay current." In the same special report, an article titled "Data Data Everywhere," the writer says "When the digital sky survey started work in 2000, its telescope in New Mexico collected more data in its first few weeks than had been amassed in the entire history of astronomy." What does all of this mean-and more importantly what does it mean for us in the learning and development industry?

These issues are at the core of why we need to revolutionize how we build learning environments. To date most learning and education programs in both the corporate and academic sectors have been and are delivered in an "event" type format. The event format includes both online and offline learning and implies a formality in a program requiring some form of attendance. That attendance is usually away from whatever one's current tasks are. Even online learning playing out in a learning management system is learning that must be taken away from what a person is doing. Students must go to the system, log in to the system, enroll in courses, and so on. The preparation for the design and development of a learning event varies, but suffice it to say that, when it comes to e-learning, the design and development of quality online learning is a significant undertaking.

RAPID DEVELOPMENT

The term *rapid development* is a catch all phrase in the e-learning industry that represents both a suite of tools and a

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set of processes that are meant to sidestep conventional practices in the design and development of online learning. Rapid development is a response to the need for shorter design and development times, the need to do so at a reduced cost, and the need to allow for larger volumes of work to be accomplished. Rapid development pundits point to the volatility of content, the volume of content and return on investment (ROI) as key business drivers around rapid development.

Regardless of the benefits believed to be gained through rapid development, it is widely recognized that there is a compromise made in the quality of a product, but that this loss is acceptable due to the volatile nature and life expectancy of the content.

As Sheperd (2006) says: *"Are you seriously suggesting that a mere SME could possibly produce a piece of training material that anyone in their right mind would want to look at? The answer is 'yes, when the need is urgent, the shelf-life is short and you're prepared to take the time to provide them with a little training."*

The very mention of rapid development to a professional group of e-learning specialists immediately polarizes friends and foes alike, with one group of professionals believing that, although rapid development practices and tools generally don't produce the best results, there are examples of it working extremely well and that the blame doesn't lie with rapid development itself. The other side believes that the fault does lie in the very meaning of rapid development, that its essence is misguided and that the failure of the e-learning industry to produce consistently good materials lies entirely with rapid development.

Briefly explained, the process of rapid development short-circuits the heavy use of instructional designers, programmers, and graphic artists and instead creates a direct link between subject-matter expert (SME), raw content, and e-learning authoring/publishing capabilities. There are many rapid development tools in the market, and they share very similar characteristics. Some key characteristics are:

- A short learning curve
- Do not require the course developer to know how to create a course's look and feel
- Built-in navigations ensures that all navigation works
- Do not require any programming or HTML knowledge
- Integration with LMSs is built-in—no advanced skills necessary
- Deploys easily—do not require any plug-ins
- Support learning objects such as Flash, graphics, and clip art in a straightforward manner
- Support short learning events

It's safe to say, whether you believe that rapid development has successfully addressed the business drivers for its emergence or whether you believe it has not, the end products resulting from rapid development, for the gross majority of organizations, has been well below what most experts would call "quality e-learning" (as elusive as the definition may be). The one factor that determines the success of the rapid development initiative is simply whether the compromise of quality was worth it, given that the content within a course was volatile and changing anyway. This argument, and the arguments over who

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is responsible for the loss of quality (rapid development itself or those using the tools) isn't really the BIG problem.

The real problem with rapid development is that the innovation within rapid development circles runs completely contrary to the innovation in web technology that is emerging everywhere outside of e-learning. Ironically enough, the innovation in web technology that the e-learning industry is choosing to ignore is perhaps the most promising technology that can resolve the issues around volatility of content and can also completely change the paradigm of event-driven training.

CHANGING EVENT-DRIVEN TRAINING

Let's focus on this notion of event-driven training. As previously mentioned, event-driven training is training that learners must attend separately from their work or play. They must leave whatever it is that they were doing and either physically go to or log into a separate environment from the one they are currently in. For the most part, the training event that they attend is built with the assumption that the content within it will remain valid for a period of time. Sustained validity of content is a premise for the period of course design as well as when the training is being attended and some time after. From the time someone starts to prepare the training up to and including the time it's delivered, the content needs for the most part stay as is. It's probably fair to say that event-driven training is intended to leverage the cost spent developing the training over a period of time and over a number of learners.

Rapid development claims to resolve some issues for those situations in which the content in event-driven training is volatile. In other words, if you want to prepare event-driven training and the content is extremely volatile, then the costs for planning, preparing, and delivering the training may well exceed the benefits of the training itself. The reason for this is that the content will have changed significantly before enough people have seen it and a rewrite is necessary.

OUTSIDE E-LEARNING

Outside of the e-learning world, the web is evolving to service globalization and the massive amounts of information that is being posted to it. The next generation of the web, coined Web 3.0 by Tim Berners-Lee in 2001, is a web that can read and understand itself. According to Berners-Lee:

"The semantic web will bring structure to the meaningful content of web pages, creating an environment where software agents roaming from page to page can readily carry out sophisticated tasks for users."

In other words, the future of the web will allow machines, not humans, to make sense of information on a web page. If machines can make sense of what is on a web page, then they can process that information for human consumption. Right now when Google provides a link to a web page, it doesn't "know" the actual content on the page; it only reads specific pieces of information within the source code of the page—the metadata. A web page can show or say anything and have information within the metadata of the page that runs contrary to what's actually on the page. In such cases, search engines will refer people

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to the page based on the information in the coding of the page rather than the content in the page itself.

What Web 3.0 promises to be is a web that understands the content within the pages. The words are no longer just words on a page, but are themselves the links to the actual things they represent. "Montreal, Quebec" on a web page right now isn't known to the web; however, Web 3.0 will know that Montreal, Quebec, is an actual city within Quebec, with a longitude and a latitude and people who speak both French and English.

If this seems implausible, consider Wolfram/Alpha. According to Wikipedia, "It is an online service that answers factual queries directly by computing the answer from structured data, rather than providing a list of documents or web pages that might contain the answer as a search engine would." In other words, rather than a search engine pointing you to pages that may have the information you need, Wolfram/Alpha hopes to understand your question and provide an answer to it. The answer is created based on pulling data from structured sources and reasoning with the data to provide an answer.

Another example is a project called OpenCyc, according to Wikipedia an artificial intelligence project that attempts to assemble a comprehensive ontology and knowledge base of everyday common-sense knowledge, with the goal of enabling AI applications to perform human-like reasoning." Ontology, as it is used here, is very similar to the example above and the reference to structured data. OpenCyc enables machines to process data in a manner comparable to human reasoning. OpenCyc has a database of structured information that any processing agent or program logic can understand and applies rules similar to human reasoning and logic.

As an example consider the following:

Typical pieces of knowledge represented in the database are "Every tree is a plant" and "Plants die eventually." When asked whether trees die, the inference engine can draw the obvious conclusion and answer the question correctly.

PERFORMANCE SUPPORT

In the place of event-driven training, performance support can in many cases offer the same or better learning results for the end user. Performance support is information delivered at the time of need, targeted to the context in which the person is operating, and helping the person perform a task. The format of performance support material can range in complexity from printed text to computer simulations.

Recalling the examples of Wolfram/Alpha and OpenCyc, we see examples of a web that can use the data contained within it to provide meaningful information at the time of need. If we tie this capability back to the notion of performance support–driven training and consider the one operating system that is ubiquitous to the majority of people's lives (the web) being able to execute queries and answer questions for us as practitioners, we can readily see a huge opportunity for us to leverage this.

Not only are the innovations in web technology helpful to the e-learning community, but so also are innovations in hardware. Consider that a new manufacturing technique "will enable manufacturers to produce

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25-nanometerchips, which is a huge leap considering that late last year, Intel Corp. made its first move from a 65nm process to 45nm" (Gaudin, 2008).

The shrinking computer chip brings a dramatic increase in processing power. With amazing power and chip sizes shrinking almost to atomic levels, it will be possible to place chips within many objects and communicate with them. Once again, daring to think about this in the context of performance support, one can only imagine the opportunity for support through communication with actual objects.

THE DIFFERENCE

There is a significant difference between innovation occurring outside the e-learning world and within the e-learning world. Innovation within the e-learning world is still focused on (1) providing a learning environment through events and (2) providing learning for stand-alone machines. It's true that the e-learning world has been focused on learning 2.0 for the last several years with a re-energized focus on informal learning. However, structured data has not been given much consideration at all, and there has been no significant movement away from event-driven training. Even informal learning is something that practitioners want to "structure" into events.

Key software manufacturers remain focused on using machines as stand-alone units rather than trying to harness the power of networking. We have long since surpassed the value of computers as stand-alone machines. The value of a computer today is its ability to network. Imagine owning your computer today without using it to network.

It is worth noting the findings of the North Central Regional Education Laboratory survey that within education "effectiveness is not a function of the technology, but rather of the learning environment and the capability to do things one could not do otherwise." It further highlighted that "technology in support of outmoded educational systems is counterproductive" (Hampton, 2002).

Although written in 2002, the message remains very poignant today. To support outmoded educational systems or theories through technology is counterproductive. Isn't that true of rapid e-learning that supports event-based training?

What does the alternative look like? What would innovation consistent with innovation outside of e-learning look like in the e-learning world? With the possibilities of incorporating Web 3.0 technologies or semantic technologies into the learning environment, e-learning should be moving to support performance based learning or performance support. The platform is a system that is ubiquitous to the modern age, an operating system that is always on, and machines that do the work for us.

In 2009, The Library of Congress released a new tool for educators in the United States under their main website www.loc.gov/teachers. The new tool provides educators in the United States the ability to generate their own curriculum, at run time, based on a set of topics relevant to their classroom ambitions. What's interesting is that the content is generated either as a classroom-ready package, including instructor guide and student materials, or as a SCORM 2004 e-learning package.

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The content doesn't exist in any format until the teacher says, "Create it for me." It takes about two minutes for the system to generate the materials, but the materials include up to the second revised content and are built by the teachers. There are no pre-existing combinations of topics, HTML pages, or PDF documents.

Consider the amount of preparation and man hours required to produce hundreds of classroom-ready packages and hundreds of SCORM packages if you were to try and do it using conventional authoring tools. With the Library of Congress, no such work is necessary because the machines do everything. The application reads user input and then generates what's required. New content can be added to the application at any time; old content can be modified at any time; and all changes are reflected the moment they've been made. Users are always provided with the latest and greatest. No development team required.

How does the Library of Congress application work? How is it different from what might be produced using a conventional e-learning authoring tool? The big difference is the ability for a machine to understand and read content so that it can process that content itself. In the Library of Congress application, all content is structured using an XML schema that helps the web application itself understand what each piece of content is, when the content needs to appear in a deliverable, and what it should look like when it does appear. By setting the rules of engagement, so to speak, any content that is added to the application's database using the standardized markup can be understood by the application and can therefore be processed by the application. Conventional authoring systems generate a black box of content that is dumped on a server and wrapped with meta-tags. The web can only display that information as it was prepared, but cannot itself process it. In other words to create more content, you need to author a new package.

The big change required in e-learning is to foster innovation consistent with global innovation outside of e-learning. First and foremost, we must move away from event-driven training to performance support. That does not mean that event-driven training will go by the wayside. It does mean that event-driven training would be a performance support tool when appropriate. This also means that our conventional way of building online learning, most noticeably through rapid development, must also come to an end, as the tools and processes support an antiquated learning model. Not only that, but they also fail to deliver content that is transparent and structured in a way that allows the web to process it. Conventional rapid development tools find a way to build e-learning more quickly and with fewer dollars but fail to deliver something consistent with the evolution of web technology.

Semantic web technology can produce faster results than conventional rapid development tools, simply because computers can build their own training packages for us. In addition, the use of semantic technologies and structured data means that we will be able to deliver custom-tailored learning in the format most appropriate for the context (including user decisions).

How does this paradigm shift affect design and development? Currently, our design and development teams create multiple deliverables one at a time. A typical example is the

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redesign of existing paper-based learning modules into e-learning and mobile learning. Every time an existing paper-based product is converted to e-learning or m-learning, the design and development process starts afresh. Not only do we start again, but the e-learning, m-learning, and print all contain the same content (or variations thereof) in three separate files. If content changes, changes must be made in three places.

In the new paradigm, design and development are very different. Initial design and development aren't concerned with packaging and formatting any specific content whatsoever. They are concerned with setting up the rules for web applications to package and format content. The first step is to create a taxonomy that will help a computer understand what content is, what it means, what formats are appropriate for display, what contexts the content is used in, etc. These rules all form part of a schema in which content during its creation stage is marked up with the schema language. Very similar to the Dewey Decimal Classification System for library sciences, the schema provides an algorithm that enables different technologies to query and extrapolate information.

The next step in design and development is the creation of rules for output herein referred to as a processing agent. During this stage, authors create the processing rules around the different elements in the schema. These rules tell the computer to process content of a specific type into a defined format. The rules for output must conform to and be entirely dependent on the schema. The processing agents can be integrated into various technologies and be used for a wide range of purposes and needs.

CONCLUSION

The transition away from rapid development to semantic web technologies is a massive gap that will most certainly be overcome, but is far from fruition. If truth be told, the transition isn't nearly as cumbersome as was thought and can be made by simply investing corporate dollars differently. Instead of investing in one piece of learning at a time, dollars must be invested in infrastructure that will enable learning to be produced on demand. Google was never intended to be an e-learning solution, yet I don't think any other application has done more for learning than Google.

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Thomas A. Toth

Thomas A. Toth, MAEd, based in the Denver, Colorado, area, is a designer/developer with almost twenty years of experience in the training and e-learning industry. Thomas designs and programs traditional and e-learning training courses using Adobe products and has created more than two hundred websites for corporate clients since his career began in 1996. He is the president of dWeb Studios, Inc., a web design firm, and the Catapult Training Group, a training and e-learning design and development firm in Parker, Colorado.

Thomas wears the hat of web master, instructional designer, leadership consultant, project manager, HTML programmer, graphic designer, Flash programmer, executive coach, and stand-up trainer. Thomas teaches Dreamweaver, Fireworks, Flash, Photoshop, and InDesign at local area training centers, bringing his students real-world knowledge and experience on how to use these products.

Thomas is the author of the book *Technology for Trainers,* published by ASTD in April 2003. *Technology for Trainers* is an e-learning primer, written for the learning and development professional who is faced with the task of developing e-learning for his or her organization. He is also a contributing author to the *ASTD Handbook for Workplace Learning Professionals,* published in 2008.

Thomas has his B.A. in human communication, his M.A.Ed. with a focus on educational technology, and belongs to several professional organizations such as ASTD, the American Marketing Association, eLearning Guild, and Toastmasters. Thomas is also a published and performing magician, a trained chef, and musician.

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THE RIGHT E-LEARNING TOOL FOR THE JOB

Thomas A. Toth

Multiple perspectives help in the search for optimal solutions. While Allan Henderson's article alludes to what I might call a tyranny of tools, Thomas Toth sees the same problem but suggests that embracing the richness of a broad tool pallet is a way to take command. Thomas says, "Instructional designers are often frustrated when designing e-learning because it involves much more than just writing activities and content. To actually get great e-learning off the page and onto the screen takes a skill set usually not found in the training department." This article highlights and catalogs development software. It provides instructional designers and training managers with information about basic roles and functionality of alternative tools to help them build a software "toolbox" for creating e-learning projects.

Creative training programs require fantastic instructional design, engaging activities, and a real desire to improve the learners' performance. Great facilitators use their presentations skills and mastery of the content to create a real environment for people to learn. They have a set of tools they use to add excitement to the classroom setting—toys on the table, snacks in the back of the room, clay, construction paper, and Lego™ bricks. Facilitators continually use techniques like this to take their training to the next level.

Suddenly and with little warning, the World Wide Web arrived and changed the way e-learning was to be delivered and experienced. Techniques for delivering content had to change for compatibility with the new technology medium. Computers emerged as a prime method for the distribution of content. Instead of being "wowed" by a well-designed class or instructor, learners were in front of a glowing computer screen for hours at a time, clicking buttons and interacting with computer-generated people.

The tools that the instructional designer uses to develop a course are very different from those used by an e-learning developer to actually build it. Many of the same design skills instructional designers use to create stand-up training can also be used to design amazing e-learning; however, the actual delivery of the content requires a completely different skill set. Previously, instructional designers passed their content to a facilitator, who would bring it to life; but in the e-learning world, it's not that easy.

The skills of the e-learning developer are very similar to those of a web programmer/designer. If web distribution is the chosen delivery method for the designer's e-learning project, the developer needs to understand browser technology, web-safe color formats, graphic design standards for the web, and other web-centric techniques. This is a huge challenge—instructional designers are frustrated when designing e-learning because it goes much further than just writing activities and content. To actually get great e-learning off the page and onto the screen takes a skill

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set usually not found in the training department.

Many people believe that good e-learning programming falls into the bailiwick of your company's IT or web marketing group rather than in the training group. I disagree. In my experience, I find it much easier to teach training people about e-learning technologies than it is to teach IT folks about training. Training groups should consist of an instructional design team, a facilitation team, and an e-learning programmer. I don't believe that training groups should outsource their e-learning work to other, more technical departments within the firm. I think that the end user benefits so much more from a programmer who has a training background, rather than a programming background.

So this puts our training groups in a train/hire situation. Should we hire someone specifically to build and program e-learning programs? Do we do enough over the course of the year to support this role? Should we train one of our facilitators or instructional designers to build e-learning?

Then, after you decide whether to hire or train, you are faced with the challenge of deciding which software tools are necessary to build the programs. A popular myth is that a single piece of software will allow teams to build e-learning projects. That simply isn't true. There are some fantastic "all in one" pieces of software that will put the e-learning project together, but what about the graphical content? The multimedia content? Video? Audio? Screen capture and recording?

Developers need a suite of software with a variety of capabilities in order to create engaging and interesting e-learning projects. There is no single software solution that will accomplish all the tasks necessary to create and distribute e-learning. Having access to the right software tools for the job is important for the development of e-learning.

The development tools are vast and varied, but they fall into generic categories. If developers have at least one piece of software in each category, they will be able to create high-quality e-learning so your organization can offer another way to receive training.

Building an e-learning project from scratch can seem like a daunting task. There are so many moving parts that it can be difficult to know where to begin. The next sections highlight each of the software categories and provide you with information about basic functionality so you can make good buying decisions and help your team use the right tool for the job.

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GRAPHIC DESIGN AND PHOTO EDITING

Surf to your favorite websites, and you will notice a few things about the pages you like. Generally, they are made up of two key elements: text and images. As you look at the page, you will notice that the interface is made up of buttons, colors, lines, and photographs. When talking about graphics, people often visualize the full-color images and "clip-art" images that appear on a web page. However, the buttons, color spots, navigation bars, gradated swirls, background images, and even the background color are all examples of graphic elements that someone had to design and create for the web page.

All of these additional graphical elements that appear on the web page come together to create the interface. In e-learning, the interface is the method for the learner to interact

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with the training program. Think about the radio you have in your car. There are buttons and slots, knobs and dials, all designed to allow you to interact with the radio. One button advances the CD to the next track, another changes the volume, while yet another stores your favorite radio stations. You tell the radio "what to do" through these buttons and dials. They are your interface to the radio.

Graphic design software's primary function is to create and edit graphic elements, but it also allows you to draw your own images or clip art. Paired with a digital tablet, more expensive software can actually simulate the stroke and pressure of a paintbrush or charcoal pen and produce amazing-looking digital artwork.

Of course, the visual appeal of the custom artwork is in the hands of the artist, not the software, so be aware that purchasing any software solution will not turn anyone into an artist. Many great graphic designers have an art background and use digital tools to create, rather than canvas and watercolor.

In addition to editing photos and creating clip art, e-learning developers use graphic design programs to design the interface for your e-learning program. Good e-learning interfaces have next and back buttons, graphical framing, and miscellaneous elements that bring the training program to life. Without a good interface, your program can be frustrating to users. These interface elements can all be created using graphic design software.

Photo editing software's primary function is to edit and manipulate photo-realistic images or images from a digital camera. Most images that come out of a digital camera are set at a very high resolution. They are designed to be printed and shared like film-based photographs. The resolution of these images is much higher than necessary for web use. In fact, most digital cameras produce images at 300 dots-per-inch (dpi) and higher. High-end digital cameras can produce images up to 1200 dpi! That's a lot of dots!

Computer monitors can reproduce 72 dpi or even 96 dpi, at best. A 300-dpi image would be much larger in file size than needed for the web. Good photo editing software has tools that allow the higher resolution photographs to be optimized for web distribution, reducing the file size, the resolution size, and saving it into one of three web-safe image file formats: .JPG, .GIF, or .PNG.

There are several great software packages that combine the elements of both a graphic design program and photo editing program; Adobe Photoshop and Fireworks fall into this category. For strictly graphic design, CoreFX, CorelDRAW, and Adobe Illustrator are good choices. For browser-based photo editing and optimization, you may want to consider Picnik or FotoFlexer. Both offer web-based solutions for editing graphics at inexpensive prices.

The matrix on the next page compares some of the more popular software packages for creating graphics and editing photos. Review this list to help you choose the right tool for the job.

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Tools for Graphic Design and Photo Editing

Software Tool	Level of Complexity	Learning Curve	Primary Function	Platform	Cost
Adobe Photoshop	Advanced	Steep	Photo editing Graphic creation	Mac and Windows	$699
Adobe Fireworks	Intermediate	Intermediate	Photo editing Graphic creation	Mac and Windows	$299
Adobe Illustrator	Advanced	Steep	Vector graphic creation	Mac and Windows	$599
CorelDRAW Graphics Suite X4	Intermediate	Intermediate	Vector graphic creation	Windows	$399
Core FX	Beginner	Easy	Vector graphic creation – Art projects	Windows	$59.99
Picnik	Beginner	Easy	Photo editing	Web Browser	$24.95 per year
FotoFlexer	Beginner	Easy	Photo editing	Web Browser	Free
Serif Photo Plus 9	Beginner	Easy	Photo editing	Windows	$9.95
Picasa	Beginner	Easy	Photo editing	Mac and Windows	Free
Xara Xtreme	Intermediate	Intermediate	Photo editing Graphic creation	Windows	$49
PaintShop Pro X2	Intermediate	Intermediate	Photo editing	Windows	$69.99
Poser	Advanced	Steep	Human 3D model creation	Mac and Windows	$249
Bryce 5	Advanced	Steep	3D landscape modeling	Mac and	$99.95

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AUDIO AND VIDEO RECORDING

Incorporating audio and video elements into e-learning projects used to be an expensive affair. The creation of good audio and video required expensive microphones and cameras, sound studios, mixing boards, and a mess of other technical hardware. The bandwidth requirements necessary to run audio and video through the web were very high. Users could wait sixty minutes for a two-minute video to download. The value/benefit proposition for incorporating video and audio into your web-based e-learning project didn't make much sense as recently as three years ago.

With the advent of high-speed connections, new video and audio file formats and a slew of high-end computer editing tools available, producing your own audio and video projects for web distribution is much easier. A quick trip to your local electronics store and less than $500 in hardware and software means that your learners can enjoy video and audio media that have been produced by your e-learning developer in-house.

Essentially, audio recording software digitally records voice-over tracks, sound effects, music, and other audio spots. Good audio software allows you to cut and crop the audio track, loop the music track, bring up or down the volume levels, and clean up the overall recording. Higher-end audio software allows you to alter the voice tones and pitch, as well as export these final files into a format for use in your e-learning program.

A conversation about audio software requires a comment or two on microphones. No matter how good your audio recording software is, you will be unhappy with the results of your finished product if your microphone is low quality; low quality microphone equals low quality audio. Take the time to research and find a microphone that fits into your budget. If the voice-over track is to be the main learning point of the e-learning project, having rich clean tones makes all the difference to the learner.

Then again, you are not going for broadcast-quality audio. Your learners are probably not listening to your audio on their THX Certified Surround Sound system at home. Odds are the audio will be coming out of tinny little laptop speakers, inexpensive desktop speakers, or earphones worn in the workplace. Be sure to get a microphone that sounds good, but you don't have to break the bank, considering how your learners will be listening to your audio. I use a $30.00 Logitech USB microphone and it works like a dream.

QuickTime Pro and Windows Sound Recorder are software tools that provide an easy way to record audio, and both have simple editing features. Adobe Sound Booth and Audacity are more robust audio software studios that allow you more control over your audio content and allow you to tweak a variety of variables to make your audio sound fantastic. And the fact that Audacity is free makes it a first choice for anyone wanting to start with audio software in his or her toolbox.

Video editing software allows you to take your digital video content directly from the camera and allows you to manipulate it. You can cut scenes, merge scenes, and apply a variety of special effects to your video to give it that professional look. Good video software will also allow you to save to a variety of web formats so you can skip the additional converting step.

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Tools for Audio and Video Recording

Software Tool	Level of Complexity	Learning Curve	Primary Function	Platform	Cost
Audacity	Intermediate	Easy	Audio recording Audio editing	Mac and Windows	Free
Adobe Sound Booth	Intermediate	Steep	Audio recording Audio editing	Mac and Windows	$199
Garage Band	Beginner	Easy	Audio recording Music creation Audio editing	Mac	$79.99
QuickTime Pro	Beginner	Easy	Audio recording Audio editing Video editing	Mac and Windows	$29.99
All Recorder	Beginner	Easy	Audio recording Audio editing	Windows	$29.95
Pyro Audio Creator	Beginner	Easy	Audio recording Audio editing	Windows	$34.99
RecordPad	Beginner	Easy	Audio recording Audio editing	Mac and Windows	$38
Multitrack Studio	Intermediate	Intermediate	Audio recording Audio editing	Windows	$119
Overdub	Intermediate	Intermediate	Audio recording Audio editing	Windows	$26.95
iMovie	Beginner	Intermediate	Video editing	Mac	$79.99
Final Cut Pro	Advanced	Steep	Video editing	Mac	$1299
Final Cut Express	Intermediate	Intermediate	Video editing	Mac	$99
Movie Maker	Beginner	Easy	Video editing	Windows	Free
CyberLink PowerDirec-tor 7 Deluxe	Intermediate	Intermediate	Video editing	Windows	$199.95
Ulead Media Studio Pro8	Intermediate	Steep	Video editing	Windows	$399.99
Corel Video Studio X2	Intermediate	Intermediate	Video editing	Windows	$79.99
MAGIX Movie	Intermediate	Intermediate	Video Editing	Windows	$89.99

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Video that comes right out of the camera is designed to be viewed on a television screen, not in a browser window. Good editing software will reduce the file size, the pixel size, and save it in a web-safe format, making it easy to use in your project.

A good video production requires good camera equipment, but don't think you need to spend a ton of money on hardware. The best thing to invest in is lighting. A consumer camera recording can be transformed to something near a professional video if the proper lighting is used. Don't think that ambient light from the overhead fluorescent bulbs or open window will be enough to light the scene. Visit your local camera shop and look for a simple lighting kit. It will really take your video segments to the next level.

There are very expensive video editing software programs designed for use by professional videographers, but those would be overkill for the purpose of a simple e-learning video segment. Apple Final Cut Express and iMovie are both excellent inexpensive programs, but only work on a Mac. Windows Movie Maker, Corel VideoStudio, and Adobe Premiere Elements are inexpensive software tools for your Windows-based machines. All offer excellent video editing capabilities at a low price tag.

The matrix on the previous page compares some of the more popular software packages for creating audio and editing audio and video. Review this list to help you choose the right tool for the job.

SCREEN CAPTURE

Using e-learning to teach people how to use software is an excellent match; using a computer to teach people how to use the software on their computers is a natural partnership. Various of software packages are available that allow you to easily record or capture screen interactions for use in e-learning projects.

Screen capture software should be able to capture both still screen shots, as well as record mouse movements and any animated content on the screen.

Some screen capture software has been designed with e-learning developers in mind, allowing for the recording of audio while simultaneously recording screen shots. This software actually provides visual tips and hint "bubbles" on software buttons pressed and links clicked as a part of the development environment. Also, the recording can be purely visual or highly interactive. During playback, the learner could be required to click on the screen and simulate using the software. These additional bits can help your team dramatically reduce the development time for software training production because much of the annotation and many direction notes are automatically created while recording the screens. Also, some software allows for a single-click export, which builds a simple interface that wraps itself around your captured presentation.

Screen capture software can also be used to add interactivity to PowerPoint presentations and turn them into a kind of "Franken-e-learning" project. Imagine building your entire e-learning project in PowerPoint, and then using screen capture software to record

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Tools for Capturing Screens

Software Tool	Level of Complexity	Learning Curve	Primary Function	Platform	Cost
Adobe Captivate	Intermediate	Intermediate	Screen capture Screen recording e-Learning components	Windows	$699
Camtasia Studio	Intermediate	Intermediate	Screen capture Screen recording	Windows	$299
Snag It	Beginner	Easy	Screen capture	Windows	$49
Snapz Pro	Beginner	Easy	Screen capture Screen recording	Mac	$69.99
Screen Hunter 5.1	Intermediate	Intermediate	Screen capture Screen recording	Windows	$29.95
FullShot Professional	Intermediate	Intermediate	Screen capture Screen recording	Windows	$59.99
Screencast-O-Matic	Beginner	Easy	Screen recording	Web browser	Free
Jing	Beginner	Easy	Screen capture Screen recording	Web browser	Free
MW Snap	Beginner	Easy	Screen capture	Windows	Free
!Quick Screenshot Maker	Beginner	Easy	Screen capture	Windows	$39.95

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the presentation as you narrate the slides. While I don't feel that this is a true e-learning project because it lacks some of the key interactive elements designed to help your learners understand the material, it can be a quick, satisfactory solution in some situations.

There are several good Windows-based capture software tools available, the most robust being Adobe Captivate. Camtasia Studio does a good job of recording and packaging as well. If you are looking for a browser-based solution, Screencast-O-Matic and Jing both offer simple screen capture functionality that you can manipulate and drop into your e-learning program.

The matrix below compares some of the more popular software packages for using and editing screen capture. Review this list to help you choose the right tool for the job.

ANIMATION/ MOTION GRAPHIC

Animations and motion graphics play a key role in any e-learning project. From simple effects that move text around the screen to more complex graphic piece that users interact with and manipulate on the screen, the level of interactivity is greatly enhanced when things are moving around the screen and can be "played with" by the user.

Today, most animation software does much more than just play simple, animated sequences over and over. Advanced functionality and interactivity can be programmed using these software tools. Interactivity helps the learners really grasp the concepts you are trying to teach. Interactivity can take the form of a simulation learners work through or a diagram they assemble, all tied to the course's learning objectives. These types of complex interactions can be created using current animation software.

Animation software allows developers to create and draw elements from within the application in addition to importing elements from your graphic design software programs. In fact, there is usually a tight partnership between the animation software and graphic design software, allowing many different image formats to be swapped back and forth.

Adobe Flash is the standard for interactive multimedia creation and, at a bare minimum, it creates simple animated sequences. Also, Flash has become a standard for the creation and distribution of online learning. From within Flash, you can take video, audio, and visual graphic elements and combine them to create a single e-learning file for distribution on the web. Flash can become a central hub for the entire e-learning project.

If you are just looking for animation software, then SWiSH is a good option. It has many of the robust qualities of Flash, but focuses mainly on creating animated sequences. It can be a less expensive solution if your developer just wants to create simple animation.

The matrix on the next page compares some of the software packages for creating animation and motion graphics, including 3D animations. Review this list to help you choose the right tool for the job.

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Animation Tools

Software Tool	Level of Complexity	Learning Curve	Primary Function	Platform	Cost
Adobe Flash Professional	Advanced	Steep	Multimedia Animation Motion graphics Interactive capabilities	Mac and Windows	$699
SWiSH Max	Intermediate	Intermediate	Multimedia Animation Motion graphics Interactive capabilities	Windows	$149.95
Pencil	Intermediate	Intermediate	Animation	Mac and Windows	Free
MS GIF Animator	Beginner	Beginner	Animation	Windows	Free
Animo 6.0	Intermediate	Intermediate	Animation 3D animated graphics	Mac	Free
Toon Boom Animate	Advanced	Intermediate	Animation Motion graphics	Mac and Windows	$999
Animate Pro	Advanced	Advanced	Multimedia Animation Motion graphics	Mac and Windows	$1999
Ulead GIF Animator	Beginner	Easy	Animation	Windows	$49.95
Ulead Cool 3D Production Studio	Intermediate	Intermediate	Animation 3D animated graphic	Windows	$129
Swift 3D	Advanced	Intermediate	Animation 3D animated graphics	Mac and Windows	$249

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CODE WRITING/ APPLICATION DEVELOPMENT SOFTWARE

Everything that appears in a browser window is there because a mesh of code has been created behind the scenes that provides instructions to the text, graphics, and multimedia on where to appear on the screen. The application development software is the "engine" behind the scene. All the miscellaneous elements that make up the content on the page are powered by this engine.

Code writing software will create HTML or XHTML and will give you the opportunity to write code by hand if you wish. If your developer doesn't write HTML, some software tools allow users to work in a WYSIWYG (What You See Is What You Get) environment, where elements can be created and moved around the screen as desired and generate HTML automatically.

Software is available for e-learning developers specifically designed for web programmers. These tools are very robust and offer a limitless opportunity for web-based creation. Other tools specifically designed for e-learning development offer a smaller set of options, but the tools and templates are targeted specifically for the development of web-based training.

Adobe Dreamweaver, Microsoft Expression, and CoffeeCup HTML Editor are all designed for web professionals, but can be used by e-learning developers as well. These tools all take the content created in other software tools and arrange it for display in the web browser. While not e-learning-specific, they do offer more choices and more flexibility for any content to be displayed in a browser.

e-Learning development software that provides a great solution includes Lectora from Trivantis, ProForm from Rapid Intake, and Knowledge Point from Atlantic Link. These software applications can import images, audio, video, and multimedia created in with other tools and create the engine that drives browser-based delivery. They also come with a variety of graphic and interface templates for you to use to ramp up your development time and extensive e-learning specific functions like question types, button coding, and navigation tools. The important thing to remember is that none of these applications stands alone. They all require images, audio, video, and multimedia created in other applications to create a rich user experience.

The matrix on the next page compares some of the software packages for creating web code and specific software for creating e-learning. Review this list to help you choose the right tool for the job.

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Tools for Application Development

Software Tool	Level of Complexity	Learning Curve	Primary Function	Platform	Cost
Adobe Dreamweaver	Advanced	Steep	Web programming	Mac and Windows	$399
Coffee Cup HTML Editor	Intermediate	Intermediate	Web programming	Windows	$49
Taco HTML Edit	Intermediate	Intermediate	Web programming	Mac	$24.95
HTML–Kit	Beginner	Intermediate	Web programming	Windows	Free
EditPad Pro	Intermediate	Intermediate	Web programming	Windows	$49.95
1st Page 2000	Beginner	Intermediate	Web programming	Windows	Free
KompoZer	Intermediate	Intermediate	Web programming	Mac	Free
Microsoft Expression	Advanced	Intermediate	Web programming	Windows	$149
Trivantis Lectora	Intermediate	Easy	e-Learning programming	Windows	$2790
Articulate	Beginner	Intermediate	e-Learning programming	Windows	$1846
Rapid Intake ProForm	Intermediate	Intermediate	e-Learning programming	Windows and web browser	$499 - $1799
Rapid Intake Unison	Intermediate	Intermediate	e-Learning programming	Web browser	$49 per month

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STRATEGIES FOR CREATING

Each of these software tools can be an important asset in the development of e-learning programs. Let's walk through a series of scenarios in which each of these tools is used in conjunction with another. These are real examples of the high level of dependence these tools have on each other.

Scenario 1: Web-Based, Text-Focused. This project is a simple, multi-age online document—a human resources new employee guide. It is text-driven and will be distributed via your company's corporate intranet. Your developer uses Photoshop to create the simple user interface and then exports the images to a web-safe format. Then she takes the images and puts them into Dreamweaver to layout the HTML pages and links. The instructional designer provides content in a Microsoft Word file, and the developer cuts and pastes the text out of each MS Word page into the Dreamweaver-designed HTML.

Scenario 2: Web-Based, New Custom Software Training. Your IT team has just completed a new contact management application that all the sales reps in the company need to learn. You use your digital camera to take a snapshot of the development team, which you then drop into Fireworks to optimize down to a web-safe format. You use Captivate to walk users through the initial knowledge sections by showing them the correct procedure and then having them click through the simulation themselves. At the conclusion of the program, you show a picture of the IT team responsible for the software creation, bringing in the picture you edited in Photoshop.

Scenario 3: Web-Based, High Multimedia. Your company is offering new managers a series of leadership development courses distributed off the company intranet. You decide that it will be highly interactive with high levels of multimedia. You use your video camera to record senior managers in the firm talking about leadership and edit them in VideoStudio. You record the audio track yourself, editing the audio in Audacity.

Because of the highly interactive nature of the design, you choose to use Flash as your main development platform. You design the graphical skeleton of the interface in CorelDRAW and import it into Flash. You use Flash to animate the content, and you link the audio to the animation. You import the video segments into Flash, which allows the user to view them easily. You program the complex personnel simulation in Flash, using images created in CorelDRAW.

As you can see by the three simple scenarios above, each piece of software in the toolbox has a very specific and needed role. They all play together in a dance that can help you create amazing and impactful e-learning. Don't try to put a square peg into a round hole. Use the right tool for the job, and you will be amazed by the quality and speed of your in-house e-learning development.

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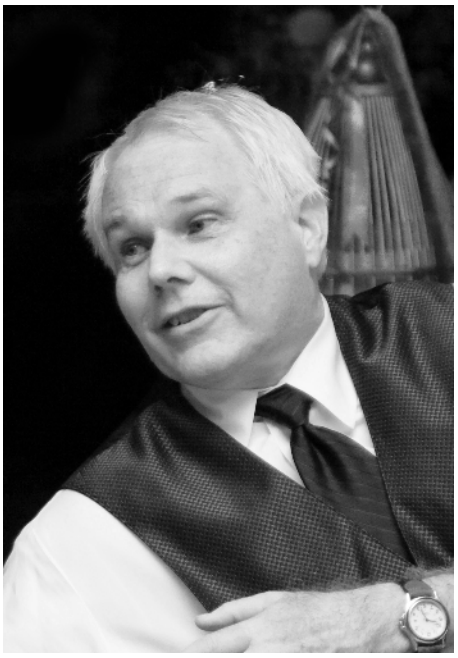

Allan Henderson

Allan Henderson is the author of *The E-Learning Question and Answer Book,* which focuses on the major concepts for e-learning in the workplace, especially the way that tradeoffs play a central role. Allan has held a number of management, technical, and training positions at IBM for the past thirty-five years and is currently the e-learning manager for business analytics in IBM's Software Group. He lives with his wife Meg in Marietta, Georgia, and can be reached at hender@us.ibm.com.

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DON'T GET TRAPPED BY YOUR E-LEARNING TOOLS

Allan Henderson

I have a particular fascination with e-learning tools, so I'm especially grateful to Allan Henderson for contributing this article. Allan says, "When creating e-learning for the workplace, the e-learning tools you have at hand will usually determine a lot about how you design the e-learning itself." My colleagues and I discuss this very point often, wondering mostly whether tools can actually lead designers to better designs (we hope so). But the danger, as Allan points out, is that the tools you plan to use will limit your thinking; in fact, the workplace business problem that the e-learning is addressing can easily get lost as you work within the capabilities and constraints of a particular e-learning tool. Allan sets a proper perspective: Don't let yourself be trapped by only thinking within what your tools are obviously designed to let you build. Don't ask, "What can I do with my tools?" Instead ask, "What is the business problem I need to solve?" And then ask, "What tools, even simple tools, can I put together to solve that business problem?" When looked at this way, your design process can generate surprising and creative solutions.

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Trainers can select from a variety of e-learning tools to carry "training" to their target audiences. The variety of options is apparent by just looking on the Internet.

Many e-learning managers and designers, however, become trapped by their e-learning tools. Once they have a comfortable tool, they don't consider the variety of other tools and sometimes don't even notice that a variety exists. They use the one or two tools they have at hand to do everything they are asked to do. They fail to ask, "What tools can I put together to accomplish my goals?"

While my interest is applying e-learning in the workplace, you might be interested in e-learning for schools and universities or e-learning for self-improvement. These other areas differ from workplace training because they are focused on improving the individual person. (Although I can pretty convincingly argue that people really attend universities in order to receive a diploma, not to get an education.)

Workplace learning, on the other hand, exists primarily to solve near-term business problems. For example, it's common that a company's sales personnel need to learn the details of a new product release so they can explain its value to their customers' value and increase sales. The end goal is improving the business, not improving the salesperson, although it's true that the salesperson will know more after the training.

There is no end to the deficiencies in knowledge and skills that you could address in a worker population. But only those that apply to near-term business problems are likely to be addressed by a company.

The goal in workplace learning is to improve the business.

In workplace applications, the "I will build it and they will come" approach does not get results. Few people in the workplace think, "I don't know something well enough, so I should look in the online training catalog and take an e-learning course to learn how to do

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it better." More typically, they attend training because they know they were required to do so.

Let me present two "thought experiments" to better express the salient points. The business situation for these two thought experiments is this: Your company has two hundred sales personnel around the world. They have laptop computers and cell phones and are, of course, connected by the Internet. They are very busy people. Their time during the day is already 99 percent filled with making their sales quotas.

THOUGHT EXPERIMENT ONE—LEARN THE NEW PRODUCT RELEASE

The business problem here is that the entire sales force needs to learn about a new product release coming out in a few months. The solution designer might consider creating a collection of self-contained learning modules for the sales force to download and play on their laptops, although it would need to be done very quickly, with everyone being trained within three weeks. And there isn't a large budget. We could record a series of videos on which the product development experts explain the product in a lecture format. The sales and marketing experts could lecture about how the new features affect ways the product should be sold. We could put the recorded lectures in our learning management system (LMS) so that we know who watched the recordings. But because this is an important release with some critical new product features and because it's important to know how well they've been learned, we could create a multiple-choice assessment in the LMS for each person to take after watching the set of recorded videos. Then we can use the results of the assessment to see how much of the population learned what they were expected to learn by the due date.

But what if there is no learning management system? Worse yet, what if there is no easy way to create video lectures? What can you do?

You can do more than you think. Instead of video lectures, you could create screen casts with one of the free or low-cost screen cast tools you can download from the Internet. The screen cast captures a "video" of what's on your computer screen along with an audio of someone talking about what he or she is doing. Alternatively, you could just record the audio in a free tool like Audacity and ask salespeople to open a text or PowerPoint file while playing the MP3 audio file on their laptop computers. (In fact, my phone connection at IBM lets me press a few buttons to record the audio as an MP3 file.) You could email the audio and PPT files to each salesperson. To create the assessments there are free or low-cost online tools for creating and delivering simple exams on the Internet.

What can we learn from this thought experiment? First, there are a variety of different tools you can use to achieve roughly the same effect. Second, your choice of tools will depend on your constraints and other forces pushing on the project, such as available time, budget, and subject-matter expertise.

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MY FIRST E-LEARNING EXPERIENCE

Let me tell you a personal story. My first experience with e-learning used almost no tools or budget at all. Years ago, my job was to deliver live training courses on a hardware product. I was asked to put together a class for twenty new hires who worked in one of three geographically dispersed sales centers and who contacted customers exclusively by phone. The class was to teach them enough of the product details so that they could start making the sales calls. I didn't have the right product training materials, nor did I have the budget to run three separate live classes with only a few people in each class, but I did have an experienced instructor. I was about to declare I couldn't deliver the training when I discovered that all of the new hires had been issued published books about the hardware in question by their managers. So I suggested we do an online "correspondence course" class via email. Each week the students were assigned parts of chapters to read and they were sent an email with about ten essay-style questions to answer and send back to the instructor, who read the responses and sent back feedback by email to each student. The course lasted six weeks. By our measurements at the time, it was as successful as any live course we were running.

THOUGHT EXPERIMENT TWO—CONSTANT LEARNING

In the first thought experiment, the business problem had a deadline for everyone to learn something quite specific. This thought experiment is fundamentally different.

Here's the business problem: Your company's sales management team is concerned about the skills and knowledge levels of the entire sales force, and the stated business problem is to instill "constant learning" in the sales personnel. There's too much to learn to run classes on it all, so the salespeople need to start to teach themselves. "Constant learning" here means that the salespeople will look beyond their immediate customer situations and will begin on their own to teach themselves more about the product features and about how to sell the product, even if the formal training doesn't exist for it. They will begin to do this "constant learning" as a normal part of the work week.

This looks like a tough business problem to tackle, but let's think it through a little bit.

We could run a series of webcasts, where experts speak live to the salespeople about how to do "constant learning." We could record those webcasts so that people could replay them later. Better yet, we could deliver a series of weekly webcasts on topics that they need to know. If we have enough budget, we could even build self-contained e-learning modules to be downloaded and played each week, with built-in questions and flashy animations.

However, the business problem really expresses the need for active learning, and so far our learning solution isn't very active. Listening to lectures doesn't cause learners to combine facts and come up with solutions. It's so easy to let your mind wander while attending a virtual lecture.

Instead, we could run a series of live virtual classrooms wherein the content could be much more interactive. The students could collaborate on projects in small teams and

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could interact with a live instructor remotely. Learners could even work collaboratively on case studies. We might have a virtual classroom tool just waiting for us to use, but this wouldn't solve the real business problem because we would be hard-pressed to run sessions regularly—even assuming the salespeople would attend regularly. Each session would require a commitment of hours at a time. Further, the solution doesn't really reinforce self-directed learning.

COMBINE WHAT YOU ALREADY HAVE

Let's consider a completely different approach—a variation on the technique used by chess enthusiasts who teach themselves to become better at chess by studying the games of chess masters. They work move by move through a chess game from a grand master and, for each move, they tell themselves what move they would do next and then compare their answers to what the grand master actually does.

Of course, we might not have a tool that handles the automated delivery of the sales process step-by-step.

Let's see what we would do that way by lashing together some tools we might have at hand.

Instead of a big case study with multiple moves to make one after the other, let's break the content up into smaller pieces. We could send an email to every salesperson every few weeks with what we'll call "the new sales puzzle." It could be a situational puzzle that could be answered in ten minutes. The situational puzzle could put the salesperson in a real-life situation and ask "What would you do next?"

For example, you are talking to the CEO of Company X with a certain history of dealing with you, and he asks, "What do you do next? We could provide learners multiple-choice answers to select from. Or better yet, we could use an active-learning approach so that learners would have to write out their responses. That way they could say *why* they are taking an action, not just what the action is. They would have to think, not just select. They would only need to write a few sentences—no more than a paragraph or two. Along with the puzzle itself, we could include a short list of online training and reference web pages that could help learners solve the puzzle if they wanted to look up answers. We could do that all in email, except for the web pages that already exist.

Obvious pragmatic concerns include where learners would write their answers. Do we have an automated tool for correcting essay answers? Or if we don't have a tool, who's going to read and evaluate all those essay answers? What about the non-English-language learners?

If we don't have an automated essay-correcting tool, we could have learners just email answers to a central mailbox. We could have them enter their answer into a wiki—if we weren't worried that everyone would just copy someone else's good answer when they found it there.

We wouldn't have to read all the answers for correctness if a recognized subject-matter expert answered each puzzle and sent that to everyone when we emailed everyone the next puzzle. Everyone could check their own answers against the experts' answers.

How would we know that everyone would actually act in good faith in regard to answering the puzzle if we were not looking at each

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response? Looking closely at the business problem, we find we are not really interested in tracking each person, but in improving the population as a whole. Our evaluation could therefore just sample a small group and extrapolate. If we selected a handful of answers at random and found that those answers were good, we could feel sufficiently confident that everyone's answers were acceptable. Over time we could watch to see whether response accuracy trends upward or downward. Non-English answers could be translated with the free text translation tools on the Internet.

There is a risk of the clever salespeople realizing that all the answers are not being read and trusting that their poor answers (or no answer) will not be noticed, but we can solve that problem by passing some randomly selected answers to upper-level sales managers, highlighting the ones that seem to be poorly done. A salesperson is not likely to take the risk of being embarrassed in front of his bosses by sending in a poor answer or no answer.

For people who don't like to type, we can provide options to record their answers verbally using the free Audacity audio capture tool from the Internet. We could even find an audio-to-text conversion tool.

The solution here demonstrates the use of a simple tool (email) to do something for which a comprehensive e-learning tool does not yet exist. Many e-learning managers and designers are overly biased by their e-learning tools and fail to consider what they want to do and what tools they could put together to accomplish it.

DON'T GET TRAPPED

What do you need to consider so you aren't trapped by your tools? First, make sure you have the business problem clearly in mind. The business problem addresses what the company needs, not what the individual needs.

Each e-learning job is different because each has different constraints. You have to work within constraints. You have to make tradeoffs. The only question is whether you make tradeoffs well or make them poorly.

Here's a quick checklist of constraints that will help you identify some of the major tradeoffs to make as you look for the right set of tools for your e-learning job (Henderson, 2002, Chapter 8).

- Budget: big, small?
- Number of students: large, small?
- Student time available: How many hours can the student spend on what you created?
- Student familiarity with the e-learning tool: Will students need to learn the tool as well as the material you want them to learn?
- Time to build/develop: How much time do you have before delivering?
- Expert availability: How much time can the subject-matter experts spend?
- Ease of development: Does the tool make content development easy?
- Deadline: Do you have to train a population in a fixed amount of time?
- Shelf life: Will this training stay available, or is it a single-use application?
- Skill levels? How large is the gap you want to close?

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- Need for interaction: Do you need to build in collaboration among students or with an instructor?
- Measurement and tracking: Do you need to track individual performance data or do you just need overall counts?

Let's draw an analogy. Depending on the e-learning problem you're trying to solve, you can think of the constraints in the list above as individual agents arranged around the perimeter of a circle. Each agent on the perimeter is attached by a rope to a single agent in the center of the circle. The agent in the circle's center represents your e-learning solution. Now the individuals on the perimeter start to pull on their ropes, but each has a different strength. What happens is that the agent in the center is pulled toward the strongest puller on the perimeter, but since everyone's pulling, he winds up somewhere off-center, inside the circle, but nearer to the agent pulling him the hardest.

Taking the constraints into account can look complicated, but there are typically only a few big constraints for each new business problem. Once you understand the number and strengths of your constraint and what that means to your solution, you can think about lashing several tools together that take those constraints into account. As the thought experiments showed, you really have more tool choices than you think you do.

Finally, consider the tools you can use. Different e-learning tools will let you implement different building blocks of e-learning (Henderson, 2002, Chapters 2 and 7). There are only a handful of basic building blocks for e-learning, including:

- Self-paced learning (and self-play lectures)
- Virtual interaction with people (in a virtual classroom, wiki, and so on)
- Simulations and games
- Virtual reference library (such as documents to download and read)
- Measurement and tracking

Some tools address only one of these building blocks. Others address two or more, while others will address them all.

The pace of technology improvement is relentless. Tools become out of date very quickly. Try to avoid putting all your eggs in a single basket. The tool that looks so good today may be inadequate in just a few years.

THERE IS NO PERFECT TOOL

Each tool has its advantages and disadvantages. As you put together an e-learning experience, you will need to make tradeoffs. Some tools are functionally richer from the user point of view, some are easier to use for content development, some are very expensive to operate, and some are unfamiliar to users. In IBM we have lots of tools that can be used inside the company for e-learning, but even we don't have tools that can do everything we want to do. We try to make tradeoffs consciously, instead of relying on habit.

When faced with an e-learning job in the workplace, the key questions I ask are these:

- What's the business problem? What business improvement is the company looking for?

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- What are the constraints? What are the relative strengths of each for the job at hand.
- What e-learning tools can I lash together to solve the problem?

The worst thing is to let yourself be trapped by your tools. Don't ask: "What can I do with my tools?" Instead, say, "What do I want to do and what tools can I put together to solve the business problem?"

As one of my colleagues recently said, "Wait! There are simple and effective solutions. Think—How do you solve the problem? not: How do you use your tools?"

You have tool options. You have more options than you think.

REFERENCE

Henderson, A. (2002). *The e-learning question and answer book*. New York: AMACOM.

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