Delivering on the Promise of eLearning

By: Ellen Wagner, Adobe Systems

eLearning is re-emerging as a solution for delivering online, hybrid, and synchronous learning regardless of physical location, time of day, or choice of digital reception/distribution device. This white paper considers some of the reasons that institutions and enterprises are turning to eLearning to help engage learners with ideas and information in revolutionary ways. It also takes a look at a number of the "Lessons eLearned" that summarize years of empirical evidence exploring learning technologies use and cognitive achievement. Finally, it offers practical suggestions for creating digital learning experiences that engage learners by building interest and motivation and providing opportunities for active participation.

The drive to share ideas and information

We are an increasingly connected global community with endless numbers of ideas and information to share. Al Saracevic recently noted in his September 9, 2006, San Francisco Chronicle column that there are more than 2.5 billion connected cellular phones, smart phones, and digital communicators and computers on the planet. The Computer Industry Almanac for 2006 reports that the number of people on the Internet (whether using 3G, WiFi, or Cat 5) has passed the 1 billion subscriber mark, with 2 billion subscribers expected in 2011. You Tube, *www.youtube. com*, announced in July 2006 that its viewers were downloading 100 million videos a day. In the country of Finland alone, more than 1 billion text messages were exchanged in 2005. The number of e-mails, text messages, and IMs exchanged on a daily basis continues to grow exponentially—and all this, futurist Wayne Hodgins reminds us, with only 13% of the world currently estimated to be "online." By all appearances, it seems we are standing on the front wave of ubiquitous connectivity. And it seems as if the more we are connected, the more we want to engage with ideas, information, and one another in ways that had not been possible even just a few years ago.

In this mostly connected, always switched-on world, eLearning makes more sense than ever before. It gives everyone who needs to learn a new skill, prepare for a new job, or pursue a new career the opportunity to complete training, get a certificate, or earn a degree without moving or leaving current employment. eLearning extends the reach of the campus and corporate learning center, and it provides learners with more ways in which to participate in education, training, and professional development, on terms increasingly defined by learners themselves, than ever before.

Description of the eLearning market

The American Society for Training and Development (www.astd.org) notes that technology mediated training and education—eLearning—represent an increasing percentage of the training and education industry. According to a recent report by Learnframe, the global

education and training opportunity is a total available market of $2 trillion. IDC (2006) has noted that the growth rate for the different education and training market segments is projected at 10-15% CAGR. In corporate sectors such as banking, finance, and insurance, eLearning is gradually upstaging conventional training methods thanks to the immense benefits eLearning offers in terms of cost savings and employee productivity. Government initiatives include looking to eLearning and training support for first responders and those involved in homeland security and emergency services. Two additional pressures affecting government employees include the growth of online self-service and the growth of centralized customer service centers, phenomena also being experienced in the telecommunications and pharmaceutical industries. The long anticipated retirements of the "Boomer" generation across all sectors is forcing organizations to actively seek out ways to capture expertise before all that expertise walks out the door. Claire Schooley from Forrester Research (2006) has estimated that more than 45% of government and pharmaceutical employees are likely to retire from service during the next five years.

As an example from one specific vertical market, that of education, a recent Datamonitor report suggested that the global learning market for higher education is set to grow with a healthy CAGR of 12%, to $1,891 million by 2008. The Sloan Consortium annual online learning benchmarking report notes that more than 90% of all post-secondary institutions in the United States currently offer some variety of eLearning. Online enrollments increased at a rate of more than 18% in 2005, compared with traditional enrollments at a rate of 4% (Allen and Seaman, 2005).

ASTD estimates that, among its top learning benchmark organizations, up to 40% of corporate education is currently being offered via some form of eLearning, much of that being delivered as online courses. A recent Gartner report (2005) suggests that perhaps only one-third of the current eLearning market features online courses in today's emerging eLearning market, with another third focused on flexible learning content assets such as learning objects and podcasts, and a final third focused on services associated with eLearning, including content creation and platform integration services. "Virtual classrooms" are generally developed as distributed learning environments that can take advantage of synchronous experiences such as classes, seminars, and e-mentoring, as well as digital online courses and flexible learning content creation and deployment opportunities. They are expected to grow in adoption across all vertical markets due to their ease of use and increase in awareness about the benefits of deploying learning management systems (LMS) and/or learning content management systems (LCMS) for managing many of the artifacts associated with virtual teaching and training activities. Today's more flexible virtual classroom systems for eLearning create more demand for commercial and community-produced learning content assets. Attractive offerings such as simulation-based learning, games-based learning, and mobile learning are also expected to drive the future demand for more and higher quality digital content.

eLearning as we know it in 2006 is not the same eLearning that first appeared on the education and training industry's horizon. Back then, great excitement came from realizing that the Internet—and more specifically, the World Wide Web—had the power to completely transform teaching, training, learning, and performance support practices. Excitement about the possibilities caused eLearning's proponents to over-promise on what they believed eLearning offered to the education, training, and performance support industries. Not surprisingly, eLearning under-delivered on virtually all of its many promises. Following the dot-com crash of 2001, eLearning practitioners—from instructional designers and content analysts to web designers and graphic artists, experience designers, and system integrators—took a good, hard look at the things that worked in successful eLearning programs. What emerged was an appreciation for programs that delivered scalable, standardized courses that achieved reliable, repeatable results. The caution exercised in the shadow of the crash resulted in a period of eLearning more notable for its standardization than for its innovation. But it also helped spark the emergence of rapid

eLearning, with tools such as Adobe® Captivate™ 2 and Adobe Presenter 6, as well as new content forms such as blogging and podcasting where subject matter experts now had a chance to contribute to the digital content dialogue without concern for technical abilities.

Inspired by the ongoing quest for innovative, personalized, portable, engaging "just-the-right-stuff" experiences, today's eLearning designers are turning to the disciplines of web and software design, advertising, architecture, instructional design, and learning science for methodological guidance. Today's eLearning takes advantage of a broad and rich foundation of multidisciplinary media and methodologies.

Varieties of eLearning

Some of the most typical ways in which eLearning programs are implemented include:

- **The virtual classroom—**The virtual classroom model of eLearning continues to be the most familiar analogue for building eLearning programs. The intention of virtual classrooms is to extend the structure and services that accompany formal education programs from the campus or learning center to learners, wherever they are located. The virtual classroom is for learners who may be pursuing a distance education degree made up entirely of online lessons, and it may include campus-based courses, where students join in from a variety of on- and off-campus locations—in a real-time class session via the Internet. The virtual classroom model includes places for posting papers for review and comment, and for completing tutorials and distributing class assignments for team review before posting the secure PDF file containing multimedia assets and for breaking away into study sections dealing with shared interest using web conferencing tools. In the Adobe world, common tools used for constructing virtual classrooms include such applications as Adobe Acrobat® 8, Adobe Acrobat Connect™ Professional (formerly known as Macromedia® Breeze® Meeting), Adobe Presenter 6 (formerly Breeze Presenter), and Adobe Captivate 2.

- **Online learning—**This model of eLearning revolves around its dependence on courseware, delivered over the Internet to learners at a variety of locations where the primary interaction between the learner and the experiences of their learning occur via networked computer technology. Increasingly, learning management systems are serving as the basis for building online programs where the education experience is entirely meditated through a digital interface. Adobe tools, which have long been the de facto standard for creating interactive digital learning content, include such familiar products as Flash® Professional, Dreamweaver,® Photoshop® CS, Illustrator® CS, Adobe Premiere® Pro, Adobe Contribute™ and Adobe Captivate 2, to name a few. The rising trend of integrating dynamic, modular learning content—learning objects—in face-to-face and elearning programs alike is expected to drive greater demand for solutions built on Adobe Flex® and Adobe LiveCycle® platforms. Greater interoperability with industry leading LMS platforms extends integration of Acrobat Connect Professional.

- **Rapid eLearning—**This is a direct response to eLearning products that made it hard for non-technical subject matter experts and learners to contribute and make use of multimedia learning content to the knowledge base. Rapid eLearning uses tools such as Adobe Captivate 2 and Adobe Presenter 6 to reduce the time it takes to produce rich, engaging Flash learning content, while allowing more non-technical contributors, including subject matter experts (SMEs) and students, to share their SCORM and AICC conformant Adobe Captivate learning objects as a stand-alone Flash movie or as an element of a multimedia portfolio that can be securely shared within an Adobe PDF document.

- **Mobile learning—**Mobile learning builds on the availability of ubiquitous networks and portable digital devices, including laptop computers, PDAs, game consoles, MP3 players, and mobile phones, and it takes advantage of place-independent flexibility that comes from working away from the desktop. Mobile learning provides the opportunity to connect informal learning experiences that occur naturally throughout the day with formal learning experiences,

such as those encountered in the virtual classroom model, using games or in online learning implementations. Common tools for producing mobile learning content include Flash Professional, Flash Media Server, and Flash Lite.™

- Performance support systems include decision support tools, checklists, and other kinds of performance aids that are designed to bring workflow support to the point of need. Performance support tools can be simple and straightforward or can be richly immersive, depending upon need and criticality of performance.

From specialized content creation tools such as FrameMaker® to Acrobat 8 and all of the Adobe Creative Suite® and Studio 8 tools, to server products such as ColdFusion® and those for creating rich Internet applications with Flex and LiveCycle, Adobe tools are a fundamental ingredient for building eLearning solutions that respond to any and all eLearning deployment models.

Kinds of eLearning content

As reported in the eLearning Guild Content Authoring Report (2005), five of the top seven tools used for producing eLearning content already come from Adobe Systems. Generally speaking, the products associated with Adobe Systems before its acquisition of Macromedia in December of 2005 had not typically been identified among the tools used for producing eLearning content. And yet when one looks at the number of file types being published to the web, the clear leader among the most commonly web-published file type was PDF.

Frequency of File Types Published to the Web

Source: google.com
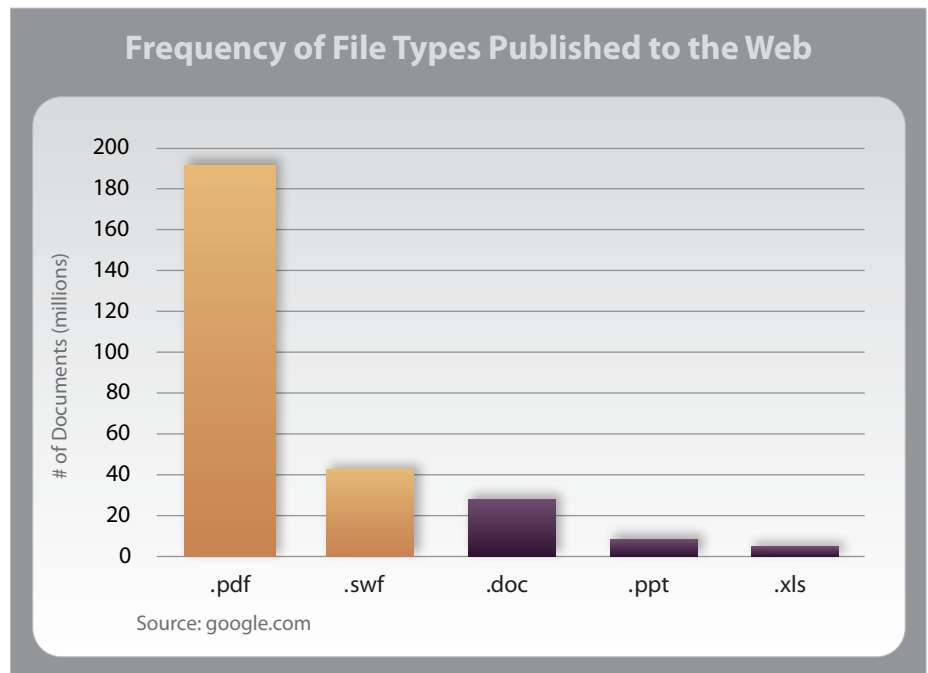
Adobe Acrobat 8 and Adobe Presenter 6 can take content produced using Microsoft PowerPoint and Word and convert them to either web-friendly Flash output or into secure PDF files, making it possible to create and share ideas and information regardless of technical ability.

Adobe knows eLearning content development

Top eLearning Products

Rank	Product		
1	Adobe Flash®		
2	Microsoft PowerPoint®	**+ Adobe® Presenter =** rich, effective eLearning	
	Microsoft Word®	**+ Adobe Acrobat® =** Intelligent documents	
3	Adobe Dreamweaver®		
4	Adobe Captivate®		
5	Adobe Authorware®		
6	Camtasia®		
7	Adobe Acrobat Connect™	Source: Joe Pulichino, eLearning Guild Content Authoring Research Report, October 2005	

From the teaching-and-learning perspective, the file type is most significant in its ability to distribute specific kinds of learning content in reliable, secure ways. From this perspective, the Adobe "universal clients" of Adobe Reader® (on 89% of all computers connected to the Internet) and Flash Player (on 97% of all computers connected to the Internet) give learning organizations the assurance of knowing that learning content produced using Adobe tools will not require any additional client downloads for distributing digital content assets. Some of the ways that this learning content is used includes but is not limited to:

- Course resources, including syllabi, reading lists, assignments, reading assignments

- Multimedia: applications, animations, pictures, videos, blogs, wikis, podcasts

- Flexible content, including SCORM and AICC conforming learning objects

- Web conferences

- Virtual work spaces

- Community: social media, social networks

Why eLearning matters to individuals and enterprises

Growing sophistication in organizational analytics methods are beginning to correlate investments in human capital and enterprise IT systems with enterprise success metrics such as revenue, profitability, knowledge measurement, retention, and talent attraction. eLearning provides a foundation for performance monitoring that makes those correlations between people and learning technologies possible. For example, ASTD Benchmarking Forum enterprises have been reported to outperform Standard and Poor's Index companies by a ratio of 7:1. Enterprise eLearning benefits appear to be realized on two distinct fronts:

- One focused on the needs and interests of individuals who are linked to competency and accomplishment.

- The other more closely aligned with the needs of the enterprise, tied to true business results.

Learning management systems are an increasingly important part of this conversation. When used in conjunction with reliable, valid, and predictive assessments, and when correlated with an individual's learning profile, a learning management system can generate data for diagnosing skill gaps and prescribing activities and experiences that link learning events with on-the-job experience. Individuals can monitor their own progress and determine what the next step in their professional development should be. A range of learning resources—individual objects, online communities of practitioners, professional advisors and mentors, and so on—become available when and where those resources are needed by the learner. Learning management systems also give business managers ways to begin tracking returns on learning investments, time on learning tasks, and learning content use patterns. They make it relatively easy to track course completion, task completion, resource use, and historical use data, as well as the results of assessments and various qualitative evaluations.

Learning management system adoption in higher education is close to 90% of all US post-secondary institutions, with the LMS adoption rate growing around the world. Campus leaders fully admit that in some cases faculty use of LMS platforms continues to revolve around posting course syllabi online, collecting student assignments, and reporting student grades (Kvavik and Caruso, 2005).

As learning stakeholders gain greater comfort stepping outside the structure of the online class and start making better use of hybrid and blended learning resources and methods, the dependence upon learning management systems as we know them today is likely to shift. While certainly important, a learning management system is one of many ingredients needed to craft a successful recipe for eLearning success.

Current landscape of eLearning adoption
eLearning has found a particularly loyal and growing audience among working adult learners. Increasingly eLearning is being selected by campus-based students as part of campus-based, face-to-face classes, as well as in online and blended eLearning programs. eLearning continues to offer flexible alternatives for meeting the ongoing organization requirements of a diverse work force. As workers become increasingly mobile—and today, a worker is considered to be a mobile worker if he or she is out of the office more than 20% of the time—the need to support performance at the point of need is accelerating interest in mobile learning and decision support tools, interactive checklists, podcasts, and VOD (video on-demand) casts. Gaming has also emerged as one of the most compelling new trends in the learning industries, and it is increasingly being numbered among the most successful strategies for supporting the learning and performance support needs of NetGens, Millennials, and Boomers alike—an important challenge facing today's learning professionals working across all sectors.

Of course, we've learned that "always accessible" information access literally bursts open the walls of the classroom and rocks the locus of classroom control. It can be a disruptive influence in academic settings. Being able to check on facts and figures in the middle of a professor-led discussion democratizes classroom dynamics in previously unimaginable ways. It means richer and more productive online workflow tools. It means that the emerging Web 2.0 collaborative and contributive technologies such as blogs, wikis, and vlogs need to be as much a part of the digital learning dialogue as are ebooks and curriculum modules available from commercial publishers.

eLearning designers must be prepared to balance desires for effective experience with the demands of effective instruction. Learners and teachers alike need to be mindful that by combining the best of design from disciples such as interface design, experience design, architecture, cognition, and instruction, the next wave of eLearning will hopefully enable more engagement with ideas and information in revolutionary ways than ever before.

Creating engaging experiences for learning

Extending better experiences—particularly richly immersive online experience—is the driving obsession of the software and web services industries. The demand for applications of increasing complexity has continued to outpace the ability of traditional web applications to represent that complexity in online settings. The result that comes from pushing most flat-file websites beyond their ability is often a frustrating, confusing, or disengaging user experience resulting in dropped users, low click-through rates, lost connections, and increased costs. This phenomenon is not limited to the act of completing e-commercial transactions. The high percentage of eLearning course completion failures have been attributed to poorly designed online experiences that demotivate learners with repetitive, boring functionality and other various frustrations. The experience of completing an instructionally sound eLearning course shouldn't have to be painful.

Web applications have come a long way from the first hard-coded unchanging web pages and CGI Web server scripts (Duhl, 2003). As each successive wave of client and web server technology ups the ante on the previous generation, improvements regarding capability, integration, and responsiveness continue to come forward. Taking a technological view of what is required to enable a high-quality, interactive online experience, some of the attributes include the following:

- It must utilize a ubiquitous client, to maximize the audience reach.

- It must run unchanged across the internet on multiple platforms.

- It must execute well across low- or high-bandwidth connections.

- It needs to restore processing power (not just rendering capabilities) to the client.

- It must deliver engaging user interfaces with high degrees of interactivity.

- It needs to represent processes, data configuration, and sale and feedback complexity.

- Utilize audio, video images, and text in a seamless manner.

- Support the mobile workflow by allowing users to work online and offline.

- Allow the client to determine for itself what content or data to access and when.

- Access multiple middle-tier services (both .NET or Java) and backend data stores.

- Provide a dynamic and powerful front end for the evolving web services-based network— use emerging standards such as XML and SOAP.

- Integrate with legacy applications and systems.

- Allow for the incremental addition of new functions to existing web applications and environments to get the most out of existing web application investments. (Duhl, 2003, p. 6).

In support of more engaging eLearning

Each model of eLearning described earlier in this white paper provides different approaches to engaging learners with their experiences. Each model shares a number of similarities:

- Each perspective is shaped by some degree of technology mediation, and is looking for a way to transcend distance.

- Each perspective assumes some degree of self-regulation/independence on the part of the learner.

- Each perspective acknowledges the value of facilitation by an instructor, agent, or guide.

When each individual model for eLearning creation is influenced by the heuristics for creating rich digital experiences offered by Duhl and his colleagues, the likelihood of improving the experience of extending cognitive performance is greatly improved.

Lessons eLearned

The first eLearning implementations represented one of the first viable opportunities for bringing together learning stakeholders—from academia, from government, from the nonprofit sector, and from business—to work toward what many believed to be a "new world order" of personalized learning. Unfortunately, the earliest days of eLearning were a remarkable object lesson in naïveté, hubris, and missed opportunity (Wagner 2002).

With eLearning emerging from the shadow of its post-dot.com readjustments, an entire generation of new practitioners is being drawn to eLearning for the first time. The following observations are offered as a brief but pointed summary of some of the important "lessons eLearned" from more than 20 years of program evaluation data and research exploring the impact of technology on learning and cognitive performance.

- Learning is a deeply personal act that is facilitated when learning experiences are relevant, reliable, and engaging. During those early days of eLearning, we learned the hard way that simply building a learning system that could be accessed over the Internet did not guarantee that people would have much need for, or interest in, the courses and programs, regardless of the provider. We learned that shoveling courseware online did not provide anyone—faculty, students, or administrators—with an online experience that was much more than tedious electronic page-turning. Sometimes we learned the hard way that "doing learning unto others" could quickly demotivate and disengage the very people we had hoped to serve.

- Different kinds of learning demand appropriate strategies, tools, and resources. Concrete operational learning can be facilitated using representational media, whereas teaching complex problem-solving—such as performing surgery or landing an airplane—may be far better served by allowing learners to practice developing those skills in a safe, risk-free virtual environment. Having just-in-time access to information, even in a flat-file, text-based form, may be far preferable to having no access to any information at all. Questions about media-appropriateness from a pure cognitive perspective are likely to be mitigated by aesthetic and experience quality metrics. More than 20 years of empirical evidence underscores that there is no such thing as a "one-size-fits-all" technology solution for learning. (e.g. Clark, 1983; Jonassen, 2004).

- Technology in and of itself may not guarantee better learning. But when effectively deployed, technology can help focus attention while attracting and maintaining a learner's interest. Technology engages learners by structuring and organizing information, by displaying and demonstrating procedures and operations. It can help make a learning experience more memorable and can help relate new information to that which is already known. Technology can simulate a range of conditions, immerse people in virtual environments, and provide safe practice opportunities as mastery is developed—all of which are necessary conditions for maximizing the probability that learning will occur. Perhaps even more important, technology allows us to have relationships with information in our own, unique ways. This phenomenon effectively shifts the question from "Will technology improve learning?" to "How much further will technology let us push the envelope of human cognitive, affective, and kinesthetic experience?"

- The more engaging the experience and the more intentional the results, the greater is the likelihood that learning will occur. In reflecting on the importance of experience design in software development, Kevin Mullet (2003) has noted that early software users were themselves programmers and consequently were highly tolerant of complex interactive models and primitive visual displays. Today's users are very different. Interactive software is now considered useful only to the extent that ordinary users can understand and take advantage of the functionality it provides. Looking at it from a learning-oriented perspective, when

technology can help strengthen learner motivation, focus attention, make a learning moment more memorable, or demonstrate the relevancy of learning to performance, the greater is the likelihood that technology will have a direct positive effect on learning (Wagner, 2005).

Summary and conclusions

Adobe's solutions for eLearning are all based upon creating and extending rich, engaging learning experiences that connect learners with instructors, other learners, and rich learning content assets regardless of physical location. Engagement is the conceptual glue that holds distributed, distant, and eLearning experiences together. Being able to determine the kinds of outcomes that a learning engagement should enable guides the developments of instructional designs, concept specifications, functional specifications, and technical specifications. They will also provide metrics for evaluation. Interactions that promote and enable a strong sense of social presence help keep learners engaged and motivated. The significant role played by technology mediation, and the value that rich, engaging content creation, distribution, and management tools contribute to the experience of rich, effective eLearning programs enables new levels of engagement and participation among all learning stakeholders.

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