Delivering on the promise of eLearning

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The use of eLearning is reemerging as a solution for delivering online, hybrid, and synchronous learning regardless of physical location, time of day, or digital reception or distribution device type. This white paper considers some of the reasons that institutions and enterprises are turning to eLearning to engage learners with ideas and information. It takes a look at a number of the "lessons eLearned" based on more than 20 years of empirical evidence exploring the use of learning technologies 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 an endless number 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 has passed the 1 billion subscriber mark, with 2 billion subscribers expected by 2011. Participative websites such as Wikipedia have increased from 2% in 2005 to more than 12% of all Internet traffic by mid–2007 (*www.computerworld.com/action/article.do?command=viewArticleBasic&articleId=9016938*). Within six months of operation, YouTube announced that its viewers were downloading 100 million videos a day. Airwide, a company that provides mobile messaging services, predicted that the United States would ring in 2008 by sending more than 730 million messages. Impressive, until one remembers that China currently has more than 1.6 billion text messages sent in an average day (*http://internetcommunications.tmcnet.com/topics/broadband-mobile/articles/17231-airwide-predicts-record number-sms-messages-be-sent.htm*). The number of e-mails, text messages, and instant messages exchanged on a daily basis continues to grow exponentially—and all this, as futurist Wayne Hodgins reminds us, with an estimated 15% of the world currently online. By all appearances, it seems that we are standing on the front wave of ubiquitous connectivity. And the more that we are connected, the more we want to find new avenues to engage with one another and share ideas and information in ways that were not possible even just a few years ago.

In this highly connected, always switched-on world, eLearning makes more sense than ever before. It offers anyone 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 their current employment. As eLearning extends the reach of the campus and corporate learning center, it provides learners with more ways in which to participate in education, training, and professional development, on terms increasingly defined by learners themselves.

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"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 postsecondary 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

Description of the eLearning market

The American Society for Training and Development (ASTD, *www.astd.org*) notes that technology-mediated training and education—eLearning—represents 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 (MacStravick, 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 saving and employee productivity. Government initiatives include looking to eLearning and training support for first responses and those involved in homeland security and emergency services. Two additional pressures affecting government employees include the growth of online self-service and centralized customer service centers, phenomena also being experienced in the telecommunications and pharmaceutical industries. The anticipated retirements of the "Boomer" generation across all sectors is forcing organizations to actively seek out ways to capture expertise before it 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.

The 2006 IDC report also suggested that the global learning market for higher education is set to grow with a healthy CAGR of 12%, to $1.89 billion by 2008. The Sloan Consortium annual online learning benchmarking report notes that more than 90% of all postsecondary institutions in the United States currently offer some form of eLearning. Online enrollments increased at a rate of more than 18% in 2005, compared with traditional enrollment 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, with the majority delivered as online courses. A recent Gartner report (2005) speculates that perhaps only one-third of the current eLearning market features online courses in today's emerging eLearning market. "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. Virtual classrooms are expected to grow in adoption across all vertical markets because of ease of use and increased awareness of the benefits of deploying learning management systems (LMS) and 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 create more demand for commercial and community produced learning content assets. Attractive offerings, such as simulation-based, game-based, and mobile learning, are also expected to drive the future demand for more and higher quality digital content.

The concept of eLearning in 2008 is not the same eLearning that first appeared on the education and training industry's horizons in the mid 1990s. 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 overpromise on what they believed eLearning offered to the education, training, and performance support industries. Not surprisingly, eLearning under-delivered on virtually all its many promises. Following the dot-com crash of 2001, eLearning practitioners—from instructional designers and content analysts to web designers and graphic artists—took a 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 tools such as Adobe® Captivate® and Adobe Presenter, where easier-to-use content creation tools gave subject matter experts a chance to contribute to the digital content dialogue.

Inspired by the ongoing quest for innovative, personalized, portable, and 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:

- Virtual classroom—Continues to be the most familiar analog 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. Virtual classrooms are for those who may be pursuing a distance education program made up entirely of online lessons, or it may include experiences where learners join in from a variety of distributed locations in a real-time class session via the Internet. The virtual classroom model includes places for posting papers for review and comment, completing tutorials, distributing class assignments, team review of more secure PDF files containing multimedia assets, and breaking away into study sections using web conferencing tools. In the Adobe world, common tools used for constructing virtual classrooms include Adobe Acrobat,® Acrobat Connect™ Pro (formerly known as Macromedia® Breeze® Meeting), Adobe Presenter (formerly Breeze Presenter), and Adobe Captivate software.

- Rapid eLearning—A direct response to eLearning designs that had excluded nontechnical subject matter experts (SMEs) and learners alike from contributing multimedia learning content to the knowledgebase. Rapid eLearning uses tools such as Adobe Captivate and Adobe Presenter to reduce the time it takes to produce rich, engaging FLV learning content, while allowing more nontechnical contributors, including SMEs and students, to share their SCORM and AICC conformant Adobe Captivate learning objects as a standalone FLV movie or as an element of a multimedia portfolio that can be more securely shared within a PDF document.

- Online learning—Refers to courseware that is delivered over the Internet to learners at a variety of locations, where the primary interaction between the learner and the experiences of their learning occurs via networked computer technology. Increasingly, learning management systems are serving as the basis for building online programs where the learning experience is entirely mediated through a digital interface. Adobe tools have long been the de facto standard for creating interactive digital learning content and include such familiar products as Adobe Flash® Professional, Dreamweaver,® Photoshop,® Adobe Premiere,® Contribute,® Adobe Captivate, and Adobe Presenter to name a few. The rising trend of integrating dynamic, modular learning content—learning objects—in face-to face and eLearning programs alike is expecting to drive greater demand for solutions built on Adobe Flex® and Live Cycle® platforms. Greater interoperability with industry-leading LMS platforms extends integration of Adobe Acrobat Connect Pro.

- Mobile learning—Builds on the availability of ubiquitous networks and portable digital devices, including laptop computers, PDAs, game consoles, MP3 players, and mobile phones. Mobile learning 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 online learning implementations. Common tools for producing content include Flash Professional, Flash Media Server, and Flash Lite.™

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

From specialized content creation tools, such as Adobe Framemaker® to Adobe Acrobat and all of the Adobe Creative Suite® tools, to server products such as ColdFusion,® to applications for creating rich Internet applications (RIAs), such as Flex and Live Cycle, Adobe tools are a fundamental ingredient for building eLearning solutions that respond to any and all eLearning deployment models.

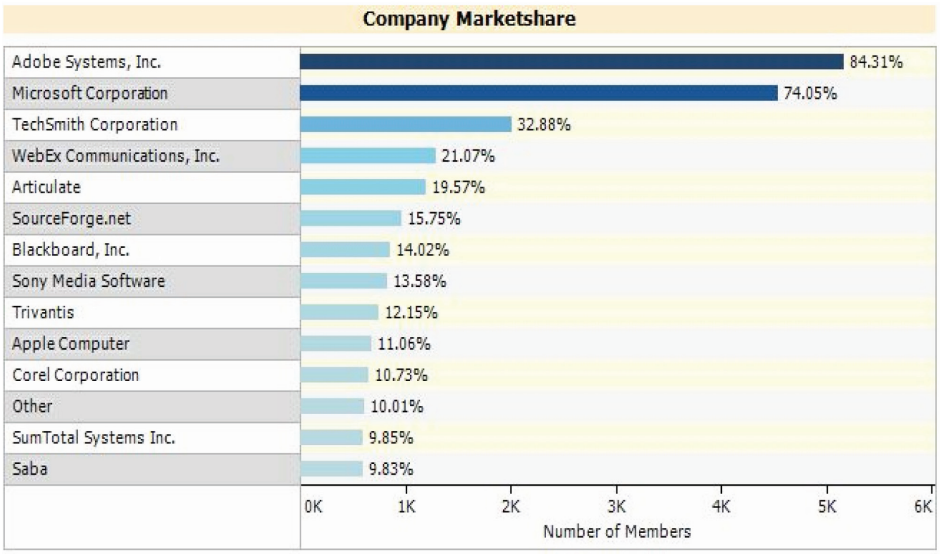
Kinds of eLearning content

As reported by the eLearning Guild (2008), 84.31% of the Guild's membership reports using at least one Adobe tool as part of their regular eLearning practice. Guild members report that they use two to three Adobe products on any given project, and that they keep four to six Adobe products on hand. In a spring, 2007 research study conducted by Bersin Associates, eLearning professionals were asked to identify the tools they typically used as part of their work. While not usually viewed as an eLearning tool, Acrobat was the surprising top choice mentioned by more than 73% of the respondents, with nine other Adobe products, including Flash, Dreamweaver, Photoshop, and Adobe Captivate, appearing among the products mentioned in the Bersin study (see Figure 1).

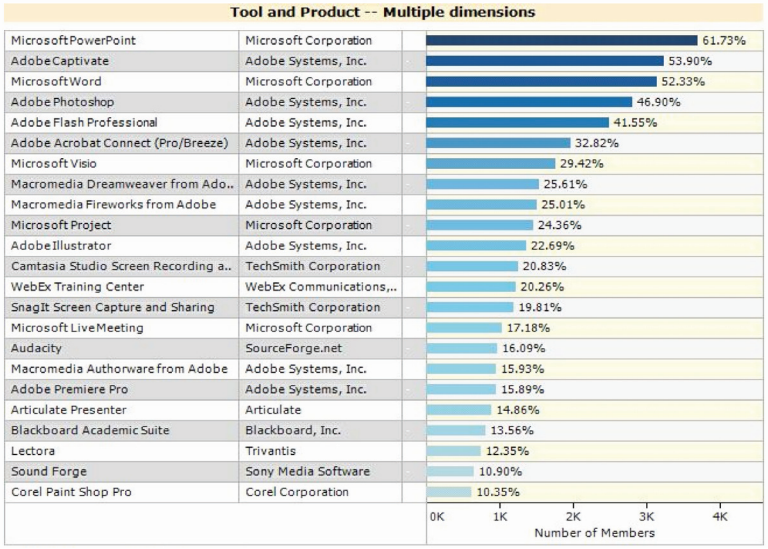
Adobe Acrobat and Adobe Presenter can take content produced with Microsoft PowerPoint and Word and convert it to either web-friendly FLV output or into PDF files, making it possible to create and share ideas and information regardless of technical ability.

% Usage	Product
73.60%	Acrobat
72.40%	PowerPoint
59.30%	Word
56.10%	Photoshop
43.50%	Flash
36.60%	Dreamweaver
27.20%	Other
24.80%	Illustrator
18.70%	Frontpage
16.30%	Adobe Captivate
15.90%	Camtasia
10.60%	RoboHelp®
8.10%	Sound Forge
6.50%	Breeze (Adobe Connect)
6.50%	Adobe Premiere
4.50%	Contribute
4.50%	FreeHand®
4.50%	GoLive®
4.50%	Authorware®
3.70%	Director®
3.30%	Framemaker
2.80%	Articulate
2.80%	Firefly
2.00%	Producer
2.00%	Toolbook

Figure 1. Adobe products are an important part of the eLearning professional's toolkit.



Company market share of eLearning products from the eLearning Guild, December 2007.



Top eLearning products, eLearning Guild, December 2007.

From the a 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," Adobe Reader® (on 89% of all computers connected to the Internet) and Flash Player (on 98% of all computers connected to the Internet), give learning organizations the assurance of knowing that learning content produced using Adobe tools do 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 workspaces
- 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. The use of 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:

- Need and interests of individuals who are linked to competency and accomplishment
- 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, an LMS 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 spent on learning tasks, and content use patterns. An LMS makes it relatively easy to track course completion, task completion, resource use, and historical use data as well as assessment results and various qualitative evaluations.

LMS adoption in higher education is close to 90% of all U.S. postsecondary 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 are likely to shift. While certainly important, an LMS is still just one of many ingredients needed to craft a successful recipe for eLearning success.

Current landscape of eLearning adoption

Among working adult learners, eLearning has found a particularly loyal and growing audience. 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. And eLearning continues to offer flexible alternatives for meeting the ongoing organization requirements of a diverse work force. As workers become increasingly mobile—and today, workers are considered mobile if they are 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 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 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.

Designers of eLearning must be prepared to balance desires for effective experience with the demands of effective instruction. Both learners and teachers need to be mindful that by combining the best of design from disciplines 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. Pushing flat-file websites beyond their ability is often a frustrating, confusing, or disengaging user experience that results 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:

- Utilize a ubiquitous client to maximize the audience reach.
- Run unchanged across the Internet on multiple platforms.
- It must execute well across low- or high-bandwidth connections.
- Restore processing power (not just rendering capabilities) to the client.
- Deliver engaging user interfaces with a high degree of interactivity.
- Represent processes, data configuration, 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 what content or data to access and when.
- Access multiple middle-tier services (both .NET and Java™) and back-end data stores.
- Provide a dynamic and powerful front end for the evolving web services-based network, using 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:

- Shaped by some degree of technology mediation, and is looking for a way to transcend distance.
- Assumes some degree of self-regulation or independence on the part of the learner.
- 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 adoptions of the late 1990s represented one of the first viable opportunities for bringing together learning stakeholders—from the academy, government, nonprofit sector, and business—to work toward what many believed to be a "new world order" of personalized learning. Unfortunately, the earliest days of eLearning turned out to be a 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 are 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 (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, and 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) 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

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 development of instructional designs, concept specifications, functional specifications, and technical specifications. These experiences 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 eLearning experience, enables new levels of engagement and participation among all learning stakeholders.

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