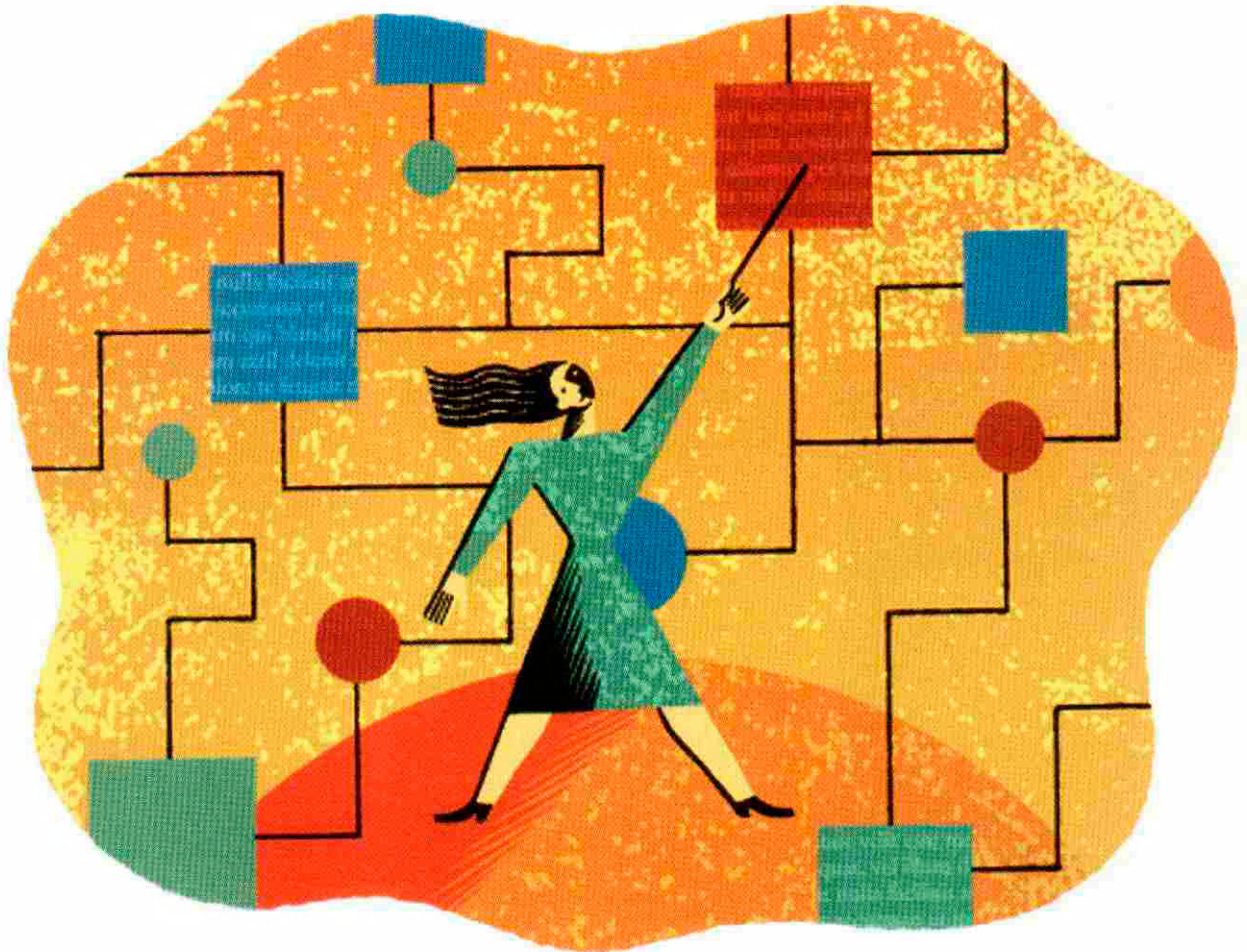


IN THIS ARTICLE

Training Industry News

TRAINING INDUSTRY TRENDS 1997

*An annual look at trends, by the research department of the
American Society for Training & Development.*



For centuries, the “technology” for transferring skills and knowledge has changed little: one human being teaching another. Generations of classroom trainers have deployed the time-honored “chalk and talk” approach. Only the overhead projector loomed on the horizon of a training landscape devoid of technology. Now, that landscape is awash with a torrent of new technologies,

BY LAURIE J. BASSI, SCOTT CHENEY,
AND MARK VAN BUREN

creating almost limitless possibilities for heightened learning.

These days, a variety of electronic media can facilitate the transfer of knowledge and skills. That represents both a challenge and an opportunity for professionals who specialize in workplace learning and performance. Technological innovation is constantly and pervasively altering the way in which work is done. That, in turn, has immediate consequences for the demands on specialists in workplace learning and performance improvement. The rapid pace of change requires that workplace learning occur on a just-in-time, just-what's-needed, and just-where-it's-needed basis. The same technological forces behind the restructuring of work are also enabling (and requiring) the workplace learning community to create more flexible and responsive learning and performance solutions.

At the same time, the increasing openness, democratization, and globalization of the world economy have made it clear that to compete effectively, businesses must be the best in the world at what they do. That has caused corporations to hone their core competencies to be world-class.

At firms operating in developed economies, core competencies are being defined in the context of knowledge-based work. In a world where technology and financial capital move across national boundaries with speed and ease, employees are the main, if not only, source of competitive advantage. In high-wage, developed countries, employees must be able to produce value-added, knowledge-based products and services. The often-heard CEO's mantra that "people are our most important asset" has been drowned out many times by the roar of downsizing and other policies that belie the importance of human capital. But there are signs that is changing. Emerging interest in knowledge management and intellectual capital suggests that firms are, in fact, attempting to manage and leverage knowledge (and the human beings who possess it) more effectively.

The importance of learning, and learning quickly, to a company's long-run viability means that workplace learning is becoming a signifi-

cant strategy. The bar is set high in terms of the skills required of professionals in workplace learning and the standards of accountability to which they are held.

"The Top 10 Trends" in the November 1996 issue of *Training & Development* identified these trends:

1. Skill requirements will continue to increase in response to rapid technological change. More than half of the new jobs created between 1984 and 2005 will require some education beyond high school (*Workforce 2000: Work and Workers for the 21st Century*, 1987). Since 1984, the percentage of workers who use a computer in their jobs has risen from 25 to 46 percent (*Level of Access and Use of Computers: 1984, 1989, and 1993*, U.S. Bureau of the Census, 1993).

2. The American workforce will be significantly more educated and diverse. Despite the challenge of hiring skilled workers, Americans are staying in school longer. The percentage of women, older workers, and Asian and Hispanic workers will continue to increase through 2005 (*Employment Outlook: 1994-2005 Job Quality and Other Aspects of Projected Employment Growth*, U.S. Department of Labor, 1995).

3. Corporate restructuring will continue to reshape the business environment. Downsizings, more small businesses, a lack of job security, and low employee morale will continue to affect the type of training and how it's delivered.

4. The size and composition of training departments will change dramatically; 58 percent of large U.S. corporations have downsized their HRD departments (*Rethinking Human Resources: A Research Report*, the Conference Board, New York, 1995).

5. Advances in technology will revolutionize training delivery. Developments in hardware, computer networking, multimedia software, and videoconferencing have tremendous potential for multiple-site delivery and bringing training closer to people's work sites.

6. Training departments will find new ways to deliver services. To cope with the demand for quality instruction, they are creating structures to support networks of internal and ex-

ternal providers, such as consultants and community colleges.

7. There will be more focus on performance improvement. In a survey of training professionals at ASTD's 1996 International Conference, 89 percent "strongly agreed" or "agreed" that a shift from training to performance improvement is a top trend. Training professionals now borrow from such areas as organizational development, industrial and organizational psychology, and strategic human resources to provide performance improvement interventions.

8. Integrated high-performance work systems will proliferate. Training departments—like all business units—are being forced to re-examine their role and focus more on measurable results. The new emphasis will be on creating systems that align the separate efforts of functions, departments, and people.

9. Companies will transform into learning organizations. In a 1995 ASTD National HRD Executive Survey, 94 percent of respondents said they thought it was important to build a learning organization; only 9 percent said their companies weren't moving in that direction. In a learning organization, training is integral to work—a by-product of work rather than something done in isolation. The role of training professionals in learning organizations is to find ways to capture and share knowledge systematically as work occurs and changes.

10. Organizational emphasis on human performance management will accelerate. More organizations are using multilevel performance-management elements, such as gainsharing and team rewards. Many are tying performance management to business goals, such as expressing goals in terms of cycle time, quality metrics, or customer satisfaction. They're also reviewing employees' performance in the context of meeting such goals. And they're taking an interest in job analysis, evaluation, competency modeling, skill standards, and testing.

ASTD believes that trends 4, 5, 6, and 7 will be especially influential in shaping the landscape of workplace learning and performance improvement. This article provides more detail



DISTINCTIONS AND DEFINITIONS OF LEARNING TECHNOLOGIES

The term *learning technologies* creates some confusion. It combines two separate and distinct phenomena—a presentation method (such as interactive multimedia, videoconferencing, and EPSS) with a distribution or delivery method (such as CD-ROMs, the Web, and audiotapes). For example, interactive multimedia is a presentation method that can be delivered through such delivery methods as CD-ROM, LAN (local area network), and WAN (wide area network). In addition, various instructional methods (separate and distinct from presentation methods and delivery methods) are available for any particular learning technology. Instructional methods include lectures, games, group discussion, and role play—delivered electronically or through such traditional means as classroom training. Electronic learning technologies are a subset of all learning technologies.

Though the following list of learning technologies isn't exhaustive, we offer the following distinctions and definitions:

Learning Technologies. The use of electronic technologies to deliver information and facilitate the development of skills and knowledge.

Distinctions

- ▶ **instructional methods.** How information is taught to learners. Such approaches include lectures, literature, games, demonstrations, expert panels, case studies, exercises, group discussion, simulations, and role play.
- ▶ **presentation methods.** How information is presented to learners. Such methods include electronic text, computer-based training, interactive TV, multimedia, teleconferencing, online help, groupware, virtual reality, audio, video, and electronic performance support systems.
- ▶ **distribution methods.** How information is delivered to learners. Such methods include satellite and cable TV; LAN/WAN networks; computer disks; the Web (the Internet, intranets, and extranets); CD-ROMs; email and voicemail; simulators; audiotapes and videotapes; and telephone.

Definitions

Presentation methods.

- ▶ **electronic text.** The dissemination of text via electronic means.
- ▶ **CBT.** A general term used to describe any learning event that uses computers as the primary distribution method; typically used to refer primarily to text-based, computer-delivered training.
- ▶ **multimedia.** A computer application that uses any combination of text, graphics, audio, animation and/or full-motion video. Interactive multimedia enables the user to control various aspects of the training, such as content sequence.
- ▶ **interactive TV.** One-way video combined with two-way audio or other electronic response system.

- ▶ **teleconferencing.** The instantaneous exchange of audio, video, or text between two or more individuals or groups at two or more locations.
- ▶ **online help.** A computer application that provides online assistance to employees.
- ▶ **groupware.** An integrated computer application that supports collaborative group efforts through the sharing of calendars for project management and scheduling, collective document preparation, email handling, shared database access, electronic meetings, and other activities.
- ▶ **virtual reality.** A computer application that provides an interactive, immersive, and three-dimensional learning experience through fully functional, realistic models.
- ▶ **audio.** One-way delivery of live or recorded sound.
- ▶ **video.** One-way delivery of live or recorded full-motion pictures.
- ▶ **electronic performance support system (EPSS).** An integrated computer application that uses any combination of expert systems, hypertext, embedded animation, and/or hypermedia to help a user perform a task in real time quickly and with a minimum of support by other people.

Distribution methods.

- ▶ **cable TV.** The transmission of television signals via cable technology.
 - ▶ **CD-ROM.** A format and system for recording, storing, and retrieving electronic information on a compact disc that is read using an optical drive.
 - ▶ **electronic mail (email).** The exchange of messages through computers.
 - ▶ **extranet.** A collaborative network that uses Internet technology to link organizations with their suppliers, customers, or other organizations that share common goals or information.
 - ▶ **Internet.** A loose confederation of computer networks around the world that are connected through several primary networks.
 - ▶ **intranet.** A general term describing any network contained within an organization; used to refer primarily to networks that use Internet technology.
 - ▶ **local area network (LAN).** A network of computers sharing the resources of a single processor or server within a relatively small geographic area.
 - ▶ **satellite TV.** The transmission of television signals via satellites.
 - ▶ **simulator.** A device or system that replicates or imitates a real device or system.
 - ▶ **voicemail.** An automated, electronic telephone answering system.
 - ▶ **wide area network (WAN).** A network of computers sharing the resources of one or more processors or servers over a relatively large geographic area.
 - ▶ **World Wide Web.** All of the resources and users on the Internet using the Hypertext Transport Protocol (HTTP), a set of rules for exchanging files.
- We'd like your input on these definitions and distinctions. Send comments to panderson@astd.org.**

FIGURE 1: TRAINING DELIVERY AS A FUNCTION OF TIME AND SPACE

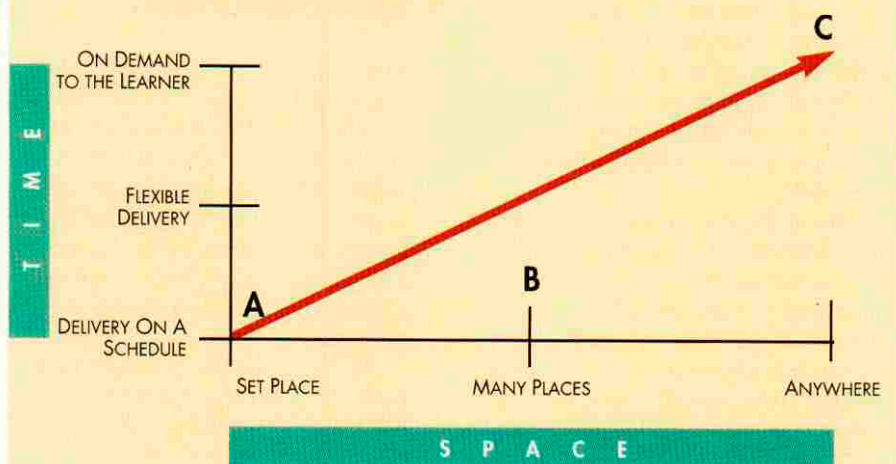


TABLE 1: USE OF ELECTRONIC LEARNING TECHNOLOGIES

LEARNING TECHNOLOGY	PERCENTAGE USING TECHNOLOGY IN 1996	PERCENTAGE EXPECTING TO USE TECHNOLOGY IN 1997	RANK IN THE YEAR 2000
CBT: disc/hard drive	55.2	63.5	9
Video-teleconferencing	53.1	56.3	5
CBT: CD-ROM/CD-i	42.7	54.2	10
Interactive television/video (including satellite)	37.5	42.7	6
Multimedia: CD-ROM/CD-i	29.2	37.5	7
Internet/Web	27.1	47.9	3
CBT: LAN/WAN	21.9	41.7	4
Computer teleconferencing	14.6	22.9	8
Intranet	13.5	44.8	1
Multimedia: LAN/WAN	12.5	24.0	2
EPSS	4.2	13.5	11
Virtual reality/electronic simulation	1.0	2.1	12

[SOURCE: ASTD'S NATIONAL HRD EXECUTIVE SURVEY, 1997]

on the key aspects of these trends: learning technologies (trend 5), outsourcing (a component of trends 4 and 6), and performance measurements (a component of trend 7).

The use of electronic learning technologies to deliver information and

facilitate the development of skills and knowledge will revolutionize learning. But despite increasing use of the term *learning technologies*, it doesn't have a universally accepted definition. To some people, it means any technology used to facilitate learning, including

paper and pencil. To others, it means only technologies presented or delivered electronically. (See the box, Distinctions and Definitions of Learning Technologies.) A unifying attribute of learning technologies is that they seek to enhance the flexibility of learning options via electronic means.

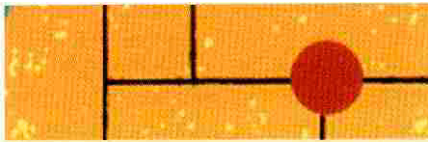
In Figure 1, traditional classroom training is represented by point A. Most electronic learning technologies inhabit the spaces to the north and east of point A. Teleconferencing, for example, lets training take place at multiple locations but requires a designated training time (point B). Because of their flexibility, learning technologies enable learners to escape from the fixed, inflexible time-space demands of a classroom. C represents the point at which a technology can enable learning to occur anytime, anyplace. For people with the appropriate hardware, that technology includes intranets and the Internet.

Until recently, companies have been exploring the use of the Internet and intranets cautiously. But as technology continues to improve their efficiency, the Internet and intranets will increasingly be used to deliver training. Many businesses already have internal webs.

The Information Technology Association of America estimates that HRD and training departments are heavy users of intranets (*HR Magazine*, January 1997). Industries that deliver training via the Internet or intranets doubled their activity between 1996 and the first quarter of 1997 (*Business Wire*, February 1997). External sources that develop company training systems via electronic learning technologies have grown in conjunction with the recent corporate interest in outsourcing multiple aspects of training.

For example, CBT Systems in Menlo Park, California, markets to large companies training courses delivered over their intranets. Other suppliers, such as Logical Operations Interactive and Microsoft Online Learning Institute, have also established niches in the intranet market (*Computer Shopper*, February 1997).

Another new Internet option is the Business Channel, offered jointly by The Williams Companies and Public Broadcasting Service. The Business



BENEFITS AT A GLANCE

Here are some potential benefits of electronic learning technologies for training delivery.

- ▶ **greater cost-effectiveness.** More people trained more often, reduced cost, flexibility to add participants without additional cost.
- ▶ **increased quality of instruction.** Access to remote experts, more program choices; multiple opportunities for instructor and participant interaction.
- ▶ **self-paced, individualized.** Participants learn at levels comfortable for them, at times convenient to them.
- ▶ **fewer resource requirements.** Classrooms, trainers, and other classroom-related resources aren't needed.
- ▶ **decentralized training.** Learning can occur anytime, anywhere, anyplace.
- ▶ **tireless delivery.** Trainers can get tired, but technology is always available for consistent delivery.

(Source: *Selecting and Implementing Computer-Based Training*, National Workforce Collaborative, 1997)

Channel provides interactive training over the Internet, with on-demand training to subscribing organizations ("PBS Heads to the Desktop," by S. Bradley, *Meetings and Conventions*, January 30, 1997).

Although use of the Internet and intranets to deliver training is not yet widespread, it's expected to jump dramatically in the next three years. (See Table 1 on page 49.) Eighty-one percent of the companies that are members of ASTD's Benchmarking Forum anticipate an increase in using the Internet for internal training.

A major benefit of training delivery via the Internet or an intranet is that different computers and different operating systems can be used simultaneously to share information and

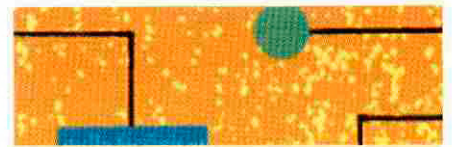
communicate worldwide. That makes delivery more consistent on an as-needed basis. The greatest drawback is the lack of reliable interactive, multimedia capabilities (*Knowledge Inc.*, February 1997). But as advances in technology conquer that problem, intranet and Internet use will increase. New developments will remove some of the technical roadblocks, such as bandwidth limitations, and create opportunities for more dynamic intranet training systems, including video and animation.

Ultimately, the Internet and corporate intranets will be the major mechanisms for interactive, multimedia training delivered anywhere and on-demand. Until then, when highly interactive training is needed, other learning technologies such as videoconferencing and traditional training are more effective (*Technical & Skills Training*, January 1997).

A clear distinction between the Internet and intranets is the speed with which training applications can be delivered. Many delivered via the Internet are relatively slow. Intranets can be much faster because they have an open standard for delivery instead of being tied to one supplier's system. Because of an intranet's capability to streamline communication and enhance performance, the intranet market will exceed the Internet market in 1999 by a ratio of two to one, according to Zona Research.

After the initial investment in the required technological resources, intranets are usually cheaper than other distance learning tools because they can be maintained and updated easily and quickly. They don't require printed materials or CD-ROMs. And users can access training as needed in real time. But as technology improves the Internet's speed and security, the distinction between it and intranets will blur, according to Ovum, a consulting firm in Burlington, Massachusetts.

Many companies are already taking advantage of training via the Internet and intranets. Ernst & Young uses its intranet to distribute training materials to employees. Strategic Interactive, a software firm, is developing a training system to give employees of auto companies access to



CHOOSING FROM THE ALTERNATIVES

The wide variety of electronic learning technologies makes it hard to know which is the most cost-effective and beneficial for conveying information, knowledge, and skills. The critical factors to consider are the content, audience, expected learning gains, and costs—fixed and marginal.

More research is needed on how to determine a particular learning technology's potential benefits, but the total cost can be calculated, albeit with some difficulty. The fixed expenses of development can be high, but the marginal expenses (per additional learner) tend to be low. Consequently, the total cost varies with the size of the audience. And even though the cost of a particular learning technology may be prohibitive, a technological breakthrough (which might be right around the corner) could make it more feasible financially.

Generally, the smaller and more geographically concentrated a particular audience, the more likely traditional classroom training will be the most cost-effective. Conversely, the larger and more geographically dispersed the audience, the more likely some form of electronic learning technology will be most cost-effective. In some cases, a combination (such as classroom training with an electronic technology) may be best.

A decision-making tool, *Advisor*, will be available in the Winter ASTD Books catalogue, December 15.

job training on the Internet from any location at any time of day (*APA Monitor*, March 1997). The Gartner Group



USING LEARNING TECHNOLOGIES

In the April 1997 National HRD Executive Survey, the 275 panel members discussed trends regarding learning technologies. The survey sheds light on the extent to which organizations are using or expect to use electronic learning technologies as delivery systems. It also identifies the roles of HRD professionals in using learning technologies and the challenges they can expect to face.

A primary finding was confirmation of the significance of learning technologies. The results reveal that investing in learning technologies is of widespread importance to both HRD executives (92 percent) and top executives (82 percent). But respondents attach different degrees of importance to such investments. Seventy percent of the HRD executives said that learning technology investments are "very important," compared with slightly less than 18 percent of the top executives.

Another finding was a greater use of learning technologies. Respondents reported that, on average, 10 percent of their organizations' training time in 1996 was delivered by new learning technologies. They expected that figure to rise by 67 percent in 1997 and triple by 2000. They predicted that by then, 35 percent of all training will be delivered by learning technologies. They expect instructor-led training to decrease from 80 to 55 percent.

A close look at the use of individual learning technologies shows that the top three choices for delivering training in 1996—CBT on disk or hard drive, video-teleconferencing, and CBT on CD-ROM—are likely to remain the top choices in 1997. But by 2000, the most common learning technologies are expected to change dramatically. Respondents predicted that many organizations will use distributive technologies capable of combining text, video, and audio digitally—such as intranets, multimedia on local or wide-area networks, and the Internet or Web.

A comparison of the 1996 and 1997 figures reveals that this trend is already in gear. The use of intranets is expected to more than triple (from 14 to 45 percent); the use of the Internet and Web is expected to soar from 27 to 48 percent. Substantially more respondents

expect to use LANs and WANs (either with CBT or multimedia) this year than last.

The survey also indicates that HRD professionals are already taking primary responsibility for certain aspects of introducing and managing learning technologies. Their tasks include identifying potential applications, designing and maintaining training content, and implementing and maintaining the learning technologies. The last two require HRD practitioners to be technologically informed and conversant. Developing and designing the hardware are still the province of information systems.

Identifying potential HRD-related applications for technology can be a daunting task, without knowing what criteria to use. HRD executives say that the most important criteria center around the type of skills to be learned—how complex they are, how frequently they change, and whether they are hard or soft skills. Next in importance are the costs, short- and long-term, of a learning technology application. Next in importance are the characteristics of the learners—how many, their geographic dispersion, their current skill levels, and so forth.

Nearly 55 percent of the HRD execs said that keeping pace with the rate of change looms as their biggest challenge. Considering the time it takes to develop and implement new learning technologies and the rapid rate at which they're introduced, they're no longer state-of-the-art by the time they're fully operational. That targets a trend towards the use of flexible learning technologies that can be customized easily and deployed quickly, without a major change in the technology infrastructure.

Two additional challenges are how to assess the effectiveness of learning technologies and how to determine their useful applications. The costly initial outlay of such technologies requires HRD people to be able to justify the expense and demonstrate the potential value.

Overall, the surveyed HRD executives think that the potential of learning technologies to serve as a delivery method is tremendous. However, there are some critical hurdles to overcome: the need to keep pace with the rapid rate of change and the need to assess when and where learning technologies will be most effective.

of Stamford, Connecticut, created the Internet Learning Center to provide interactive courses on information technology.

A critical question concerning learning technologies is their cost-effectiveness compared with traditional training approaches. In an era of budget cuts and downsizings, the evidence that electronic learning

technologies can reduce training time and costs (and train more people more often) is causing great interest. Unfortunately, there's little solid research comparing the cost-effectiveness of traditional versus electronic approaches. Nevertheless, here is some evidence that electronic learning technologies can be highly cost-effective.

- ▶ A consortium, GATE (Government Alliance for Training and Education), reports that training time and costs have been reduced significantly by distance learning at the U.S. Department of Energy and Federal Aviation Administration.
- ▶ The U.S. Coast Guard has used multimedia for several training initiatives, resulting in significant annual

savings due to less need for instructors (*Training*, February 1997).

► At the AT&T Center for Excellence in Distance Learning, videoconferencing and other distance learning resulted in significant cost savings (“It’s Time To Change the Way We Train!” by A. Chute, H. Starin, and D. Thompson, 1996, <http://www.lucent.com/cedl/dlnews1.html>).

► A 1992 study by Pennsylvania State University suggests that employee retention during training via distance learning is equal or superior to classroom instruction. Another study shows that interactive video-based instruction achieved a 25 to 50 percent higher retention rate than classroom instruction (*Multimedia and Videodisc Monitor*, March 1992). More evidence shows that the quality of learning is higher with either interactive CBT training (*Interactive Video-Based Training-On-Demand Over Multimedia Networks*, August 1995) or other self-directed, computer-based training (*Wall Street Journal*, January 3, 1996) than traditional instruction.

► The speedy rate of training delivery is a clear advantage of most electronic learning technologies. Case studies show that self-paced, multimedia training can take 20 to 80 percent less time than instructor-led training, due to a tighter instructional design and learners’ option to bypass content already mastered (*Training & Development*, February 1996). A survey of more than 100 companies shows that multimedia training can reduce learning time by 50 percent, compared with classroom training.

► Companies such as Apple Computer, Andersen Worldwide, and Storage Technology report less training time with multimedia. Storage Technology technicians who were once required to travel to a central location for four to 10 days of training now receive training through a localized multimedia system, saving \$1.5 million over a three-year period (*Journal of Interactive Instruction Development*, Winter 1996).

► Some studies suggest no significant difference between new and traditional training approaches in terms of learning and employee satisfaction (<http://www.usdla.org/dl.html>, 1997).

The box, Benefits at a Glance, on



TABLE 2: COMMONLY OUTSOURCED HRD FUNCTIONS

HRD FUNCTION	COMPLETELY OUTSOURCED	SOME ASPECTS OUTSOURCED	COMPLETELY IN-HOUSE
Outplacement	71%	21%	8%
Benefits Administration	1%	86%	13%
Training Delivery	3%	83%	13%
Payroll	9%	36%	56%
HR Information Systems	2%	35%	63%

(SOURCE: “NONPERMANENT WORK ARRANGEMENTS AND OUTSOURCING,” *ECONOMIC REPORT*, MANUFACTURERS’ ALLIANCE, DECEMBER 1996)

page 50 shows the potential advantages of electronic learning technologies.

Although there is a dearth of systematic, high-quality information on cost, employers generally think that electronic learning technologies are more expensive than classroom training. A 1996 survey by the Seybold Group found that 78 percent of respondents considered cost to be an obstacle to using multimedia CBT courseware (*The ASTD Training Data Book*, by Laurie Bassi, Anne Gallagher, and Ed Schroer, ASTD, 1996). A 1996 survey found that the median number of person-hours required to develop one hour of CBT is about 200 (*Computer-Based Training Report*, by Floyd Kemske, SB Communications, Hingham, Massachusetts). At a rate of \$50 per hour, the average cost of developing an hour of CBT would be \$10,000.

It’s unclear, however, to what extent the high fixed costs of electronic learning technologies are offset by their greater cost-effectiveness in the long-run. A study by the AMR Training and Consulting Group estimates a high return-on-investment from electronic learning technologies (particularly for multimedia-based training) ranging from 100 to 400 percent. But some estimates on ROI for traditional training are even higher. Unfortunately, no available sources directly compare the return-on-investment of

electronic learning technologies with the ROI of traditional training.

Outsourcing

More focus on core competencies and cost containment has led many companies to rely on outsourcing—called the “growth industry of the nineties.” Outsourcing is becoming an essential management tool. In 1996, more than 90 percent of organizations outsourced at least one activity (Michael F. Corbett & Associates, Poughkeepsie, New York, <http://www.corbettassociates.com>).

According to a recent survey conducted by the Outsourcing Institute, more than half of all organizations increased their use of outsourcing in 1996. U.S. companies spent about \$100 billion outsourcing various business functions. By 2001, that figure is expected to surge to \$318 billion, according to Corbett & Associates. In an April 1996 issue of *Business Week*, Tom Peters called outsourcing “the most sweeping trend to hit management since reengineering.”

Though many companies consider employees’ knowledge, skills, and abilities critical to success, few view training as a core competency. Consequently, the training function has become a prime candidate for outsourcing. A recent survey by the Manufacturers’ Alliance shows that HRD functions, including training,

are most often cited as areas in which outsourcing will increase. Table 2 shows that though outsourcing all training delivery is rare (3 percent of firms), most companies (83 percent) outsource at least some training. Data from the Outsourcing Institute is consistent with that finding. In 1996, more HRD activities (84 percent) were outsourced than any other functions. Logistics and information technology were outsourced at 52 and 51 percent. The average outsourcing of other functions was 30 percent.

Countervailing forces alert us to consider the outsourcing trend carefully. The need for greater corporate agility demands just-what's-needed solutions, which require a closer link between training and performance. In a 1995 ASTD National HRD Executive Survey on performance support, 84 percent of the respondents said there would be a closer link between training and performance by 2000. In the July 1997 National HRD Executive Survey, respondents said the most significant HRD trend in the next three years will be a shift from providing training to improving performance. Interestingly, respondents did not identify outsourcing as a significant trend.

Integrating training with performance improvement has implications for outsourcing. By keeping performance-related training in-house and outsourcing such training as computer skills, employers can use resources more effectively. For example, Corning outsources individual learning courses while maintaining courses focused on institutional learning and performance in-house. Rethinking training as part of performance management helps tie training effectiveness more directly to specific business goals. That can make outsourcing ineffective beyond a certain point.

Dow Chemical's outsourcing approach appears to have struck a balance between countervailing forces. It is based on a distinction between strategic and tactical training. Though Dow recently outsourced all tactical aspects of training (scheduling, materials control, and delivery), in its U.S. locations, it kept the strategic aspects (design, development, integration,

and evaluation) in-house. That enables employees to focus on managing goals and the impact of training and performance improvement on the company.

Defining the term. *Outsourcing* is an umbrella term. In its broadest sense, it's synonymous with external and clearly distinguished from in-house. In the context of training, outsourcing can describe an array of training services or a few. At the extreme, outsourcing involves using external consultants to manage all aspects of training—from design and development to delivery and evaluation.

DuPont is perhaps the most widely cited example of that form of outsourcing, sometimes referred to as *insourcing*. Insourcing requires the merging of resources both inside and outside of an organization for unique training solutions. Specifically, external providers collaborate with employees to create a new entity responsible for everything from daily training operations to long-term planning. DuPont claims the approach has been successful because of internal expertise and external objectivity (*Boston Globe*, January 7, 1997).

Frequently, employers enlist the services of external providers for specific aspects of training, including bringing consultants in-house to conduct training or to train internal trainers so that training is an internal function. For example, Digital Equipment Corporation doesn't consider training to be a core competency, so 80 percent of its training, including most design and delivery, is outsourced. Only strategic planning and technical training (considered vital to Digital's business goals) are internal activities. Digital's outsourcing exists primarily through partnerships with local training consultants, specific suppliers such as Microsoft, and global training houses.

Among the members of ASTD's Benchmarking Forum, three companies outsource at least 40 percent of design, development, instruction, administration, and technical support; three others maintain almost all of those functions in-house. In contrast, forum member Aetna has undergone a dramatic reorganization in which it eliminated its training group and let go hundreds of trainers. Some out-



TOP 10 TRENDS

Here are the top 10 HRD trends, according to respondents to the July 1997 National HRD Executive Survey.

Currently

1. Computer skills training
2. Teamwork training
3. Shift from training to performance
4. Decision-making and problem-solving training
5. Rapid development and deployment of training
6. Systems-thinking training
7. Demonstrating training outcomes
8. Measuring performance outcomes
9. Shift from training to learning
10. Making a business case for training interventions

Next three years

1. Shift from training to performance
2. Computer skills training
3. Shift from training to learning
4. Virtual organizations
5. Demonstrating training outcomes
6. Measuring performance outcomes
7. Delivering training to meet specific needs
8. Emphasis on knowledge management
9. Rapid development and deployment of training
10. Teamwork training

sourcing replaced internal staff, and more outsourcing is anticipated.

Most companies fall in the middle of the outsourcing continuum. They rely neither on internal staff or external providers completely. Still, most have done more outsourcing in the past year and will continue. A 1995 survey by Dataquest Worldwide Services

shows that almost two-thirds of the respondents used outside suppliers to develop customized courseware; more than 40 percent used external sources for needs assessment. Many of those companies anticipate more need for outside training services over the next two years.

A recent survey by the U.S. Bureau of Labor Statistics indicates that small firms (fewer than 500 employees) spend more than 50 percent of their training budgets on outside suppliers (*Expenditures on Employer-Provided Training*, by Laurie Bassi, ASTD, July 1996). The National Association of Manufacturers says that small employers, who tend to use community colleges and other low-priced training providers, will use such services more often (*Training*, December 1995).

An expanding market. Data from a sample of U.S. firms (1994 EQW National Employer Survey) indicates that employers are using a wide variety of external training providers. As outsourcing grows, an increase in the size, number, and type of providers is likely. Such independent providers as community and technical colleges, universities, profit-oriented learning and development centers, and private industry associations are discovering new business opportunities in outsourcing.

Though most of the external training market began with a focus on specific products, such as training for a new piece of machinery, it has recently and quickly expanded to include training services. According to Dataquest, external suppliers increasingly provide customized training geared to employers' needs.

The short life cycles of technology products, compounded by the greater complexity of many job roles, are expected to heighten the demand for external information-technology education providers and other training providers. For example, New Horizons Computer Learning Centers, one of the largest computer training businesses in the world, plans to open 170 new training facilities worldwide within the next three years (*Adult Assessment Forum*, Winter 1996).

Also on the rise is classroom training at community and technical colleges and in the corporate education

departments of four-year colleges and universities. Although community colleges have offered training programs to local businesses for decades, more are jumping at the opportunity to form partnerships with companies. The American Association of Community Colleges estimates that the number of community colleges actively seeking to provide training to companies has jumped from about 50 percent in 1990 to 90 percent (*Training*, December 1995).

■ *Partnerships
between two-year
schools and
corporations
point to
contract training
arrangements
becoming a
significant presence
in the training
supplier market* ■

Technical institutes, such as those in Wisconsin's technical college system, continue to provide training for employers. In a recent survey by Wisconsin Manufacturers and Commerce, a statewide business association, the technical college system was listed as the most important external training resource for in-state employers; 58 percent report using them to meet specialized training needs. Fifty-three percent report using other outside providers such as consultants; 24 percent rely on four-year colleges or graduate schools. Several four-year colleges and universities have established separate corporate education divisions that provide training on a contract basis.

Such programs are being developed and adapted to target corporations by addressing their specific needs, ranging from basic computer training to strategic solutions. Such institutions as Gateway Community College in Phoenix have found a niche in the supplier market on training and workforce development for

small businesses. Most of the programs have a common focus on the particular needs of employers, including needs assessment, design, development, and instruction. Maricopa Community College, also in Phoenix, developed a specialized training curriculum to support Motorola's semiconductor-manufacturing process (*Training*, December 1995). Mesa Community College, one of the 10 colleges that make up the Maricopa system, established a joint curriculum committee with Motorola to design courses (*Technical & Skills Training*, August/September 1992). Terra Community College in Ohio and Chippewa Valley Technical College in Wisconsin offer general training support services, such as course registration and employee testing. To meet employers' needs, many local colleges have expanded their educational offerings to new areas—such as quality, ISO 9000, and sales training. Rio Salado Community College created two new associate degrees—in airline operations and customer service—for America West Airlines and American Express (*Human Resource Executive*, February 1996).

The training offered by community colleges, technical institutes, and corporate education departments differs from the academic and career development tracks of four-year colleges and universities, primarily because of its emphasis on developing workplace skills. Some community colleges reinforce the commitment to providing workplace-relevant training by guaranteeing the skills of their graduates to employers and by offering additional training at no charge for dissatisfied employers. A focus on workplace-relevant training is also reflected in the schools' common practice of hiring local professionals to help design and teach many of the contract courses. Although full-time faculty are generally involved in developing and delivering the courses, the schools think it's important to draw on the experience of seasoned professionals to ensure that material is up-to-date, practical, and useful. Such experts are often chosen from the businesses seeking the training.

Unlike four-year colleges and universities, community and technical

colleges and corporate education departments usually establish a location separate from their campuses. At Delta Community College in Saginaw, Michigan, corporate contract training is a distinct entity from its other two-year education programs. Delta began providing auto-maintenance training programs for General Motors more than 10 years ago. Since then, the college has established Delta Corporate Services, a separate function offering both local and global training services to organizations. Its use varies from the implementation of one-time, specific programs to comprehensive services. At one firm's Michigan facilities, DCS is responsible for training management, support, and delivery. Although training is conducted at the firm's worksite, DCS delivers all of it. Boston University's Center for Corporate Education is also a separate entity, with its own 200-acre campus and administration. Teachers at the center are called trainers instead of professors, and each has practical experience in the corporate world.

Local colleges and corporate education departments have tended to establish formal partnerships or alliances with businesses. Norton Manufacturing, an Ohio-based crankshaft maker, developed an alliance with Terra Community College and several state agencies to provide employee training and testing. Similarly, Union Pacific Railroad partnered with Salt Lake City Community College to provide training to its 35,000 employees (*Human Resource Executive*, February 1996). Employees spend two weeks on campus and then participate in six months of self-study, with support from the college's instructors. By entering into such partnerships with businesses, the community colleges, technical colleges, and continuing education departments forge a unique and participative role as education providers interested not only in developing the private sector workforce, but also in tackling employer-specific challenges. Companies still tend to turn to four-year colleges and universities for management and executive training, while local colleges tend to gear their programs to technical and rank-and-file employees.

Although the services provided by some of the schools mentioned may be more expansive than the services offered by most local colleges, partnerships between two-year schools and corporations point to contract training arrangements becoming a significant presence in the training supplier market.

Another important outside source of training are trade and professional associations. There's little research on the role of such associations as suppliers. Yet, employers consistently cite them as an important resource. A scan of the literature on national trade associations in a few large industries (retail, hotel, health care, and pharmaceuticals) suggests that trade associations play a role in the delivery of industry-specific training, although often through field offices at the local level. For example, the American Pharmaceutical Association delivers APhA-developed education programs in conjunction with various state-level pharmaceutical associations.

■ The trend towards greater outsourcing of training is not only apparent by the behavior of employers and colleges but also by the interest of investors ■

Trade and professional associations also serve as facilitators or clearinghouses of information on training providers. In addition to providing its own seminars, the American Dental Association maintains a list of more than 300 dental education providers. Some associations act as standard-setters by helping establish skill standards or by designing and developing courseware marketed to employers. The American Hotel and Motel Association's Educational Institute provides a variety of materi-

als for home study and hotel-based classrooms. The institute also offers certification programs in hotel administration, food and beverage services, sales, and operations, as well as distance learning courses and on-site consulting services in training management. The National Retail Federation is developing employee certification programs, using skill standards set by retailers in the industry.

Labor unions are also involved in providing training, though usually as an advisor or a partner in curriculum development rather than delivery. Since 1986, the Communications Workers of America, International Brotherhood of Electrical Workers, and AT&T have managed worker training at AT&T through the AT&T Alliance, an independent not-for-profit organization run jointly by the unions and management (*Labor's Key Role in Workplace Training*, by M. Roberts and R. Wozniak, AFL-CIO, 1994). The Alliance offers such services as career planning and assessment, basic skills training, occupational training, personal finance planning, exam preparation, and stress management.

The trend towards greater outsourcing of training is not only apparent by the behavior of employers and colleges but also by the interest of investors. Specialized training firms, such as Computer Learning Centers, have become publicly traded firms in an effort to capitalize on and fuel their rapid expansion. Taking advantage of opportunities in the corporate world, CLC recently spun off a new division, Advantec Institute, that offers customized computer classes geared towards employers' needs. Based on the positive response so far (and the realization that the demand for such services is greater than the supply), CLC anticipates continuing its expansion into the domain of corporate training, particularly in providing customized packages.

Other training and development companies are emerging in corporate markets and capturing the interest of Wall Street. CBT Systems, Learning Tree International, National Education Corporation, and Westcott Communications, among others, have received



In collaboration with ASTD staff, a group of representatives from ASTD's Benchmarking Forum is developing an outsourcing decision-making tool that will be described in an upcoming issue of *Training & Development*. First, the group defined *outsourcing* as "using noncompany resources to provide some or all of the training, learning, and performance-improvement products and services needed to support a company's strategic direction."

Here are some questions to ask when deciding whether to outsource an initiative.

- ▶ What's the business case?
- ▶ Are internal support systems required for the initiative?
- ▶ Can we provide a wide-enough variety of products and services?
- ▶ What capabilities do we have in-house? What is our skill mix?
- ▶ How often will we have to update?
- ▶ Is a stable supplier available?

Regarding the audience and time constraints,

- ▶ Who are our target participants?
- ▶ What is their geographic dispersion?
- ▶ Do we have peaks and valleys in our needs?
- ▶ When is the training required?
- ▶ What is the time period for preparation?
- ▶ Is there time to reskill?

Regarding cost and value,

- ▶ What are the actual systems costs of maintaining the initiative internally, compared with outsourcing it?
- ▶ What are the cost constraints?
- ▶ What is the payback period?
- ▶ What is the global value-added aspect? Can it be achieved with outsourcing?

Regarding strategic focus,

- ▶ How does our culture affect this decision?

- ▶ Does it make sense from a systems perspective?
- ▶ Can outsourcing decisions be integrated into a systemic solution?
- ▶ How would outsourcing affect the ability to maintain control of strategic issues?
- ▶ What is the role of changing technology?

Here are some reasons to outsource and their relevant questions.

To gain access to world-class capabilities.

- ▶ Do state-of-the-art skills exist internally or externally?
- ▶ What would it take to get them? (the time, staff, facilities, skills, values, and so forth)
- ▶ How reliable is the outside expertise?
- ▶ Can it be done faster? More effectively?

To increase the operational efficiency of the training and learning function.

- ▶ Are other organizations performing the same operations at a better value or cost than we are?

To improve training's contribution to core initiatives and strategies.

- ▶ Where can the training department and its staff add value?
- ▶ Do we lack internal expertise and staff?
- ▶ Do we have enough staff to perform the initiative in time?
- ▶ Is the audience so small or large that it warrants outsourcing? Or do the benefits warrant internal expertise?
- ▶ How often is the desired expertise needed?

To specialize training, add flexibility, improve timeliness, and reduce costs.

- ▶ Can we build flexibility with existing resources?
- ▶ Do we have to provide training globally?
- ▶ Is the purpose to move from fixed to variable costs or to reduce costs?
- ▶ How long will payback take?
- ▶ How long do we have to achieve the desired results?
- ▶ What are the costs and benefits?

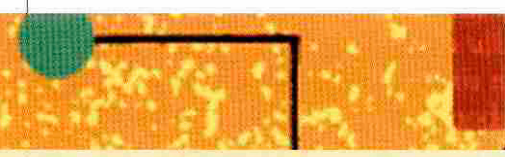
The questions of why and what to outsource can be difficult to untangle. The group determined that each of the general questions can be applied function-by-function in determining what to outsource. Such functions include administration and analysis (determining where you want to be, where you are, and what performance is needed to achieve business goals); identifying performance gaps; and projecting the benefits. Other functions include design (identifying the appropriate actions and specifications) and development (creating the performance initiative).

Additional functions are implementation; application support (transferring learning on-the-job); evaluation (measuring performance improvement); and managing the outsourcing.

The group created this goal: To design and implement cross-functional processes to facilitate successful outsourcing. The management activities of outsourcing fall into these categories: planning, communications, supplier management, and feedback and reporting. To accomplish the identified goal, it's necessary to address internal and external factors.

Internal

- ▶ Identify stakeholders; map their degree of support and interest. Get



them on board early—philosophically and functionally.

- ▶ Ensure that there's a process for aligning the proposed initiative with overall goals.
- ▶ Continue to evaluate internal resources.
- ▶ Report to management the potential business results.
- ▶ Orient internal staff to the need for, and benefits from, outsourcing.
- ▶ Teach training staff about supplier management.
- ▶ Understand the costs and the implications on the company's culture.
- ▶ Determine whether there are global implications.
- ▶ Identify legal issues, such as dual employment.
- ▶ Identify and involve key support functions, such as purchasing and communications.
- ▶ Conduct ongoing evaluation of outsourcing as a business strategy.

External

- ▶ Develop and use supplier selection and certification tools.
- ▶ Define suppliers' scope and their expectations.
- ▶ Determine whether the relationship will be teaming or contracting. If teaming, communicate the big picture to suppliers: we sink or swim together.
- ▶ Write and manage performance contracts with suppliers.
- ▶ Conduct ongoing evaluation of the suppliers.
- ▶ Determine whether your company is best-served by one, a few, or many suppliers.
- ▶ Know their corporate cultures.
- ▶ Provide ongoing feedback to suppliers regarding their performance.

heightened attention from business investors after recently making public stock offerings.

Smith Barney advises its clients that a well-balanced portfolio should include investments in education and training providers. It segments its coverage of that sector into these groups: education management organizations, training and development providers, and instructional media companies.

With regard to the last two, Smith Barney bases its advice on these big drivers:

- ▶ the trend towards outsourcing
- ▶ the evolution from a manufacturing-based to a knowledge-based economy
- ▶ the ubiquitous nature of technology
- ▶ changes in the workplace
- ▶ advances in communications technology
- ▶ the global economy.

In a presentation at ISA's annual conference in March 1997, Charles Hall, director of Smith Barney's Education Group, cited evidence that during the past two years, training and development stocks had appreciated at more than twice the rate of Standard & Poor's Industrials.

Smith Barney is not alone in being drawn to the education and training sector, made up of 5,300 for-profit firms. Montgomery Securities and Piper Jaffray have also developed education and training investment lines; others are poised to enter the market. The legendary investor Warren Buffett has taken an active interest in the for-profit training and education industry, particularly by buying Flight-Safety International, considered the largest U.S. training firm. Former junk bond king Michael Milken, with a partner, invested \$125 million in Knowledge Universe, a training and consulting company expected to reach \$1 billion in sales by year end (*Business Week*, August 4, 1997). The actions of those savvy investors signify the growth of the training and development industry. Training stocks are selling for 30 to 50 times expected earnings, a phenomenon that also characterized the behavior of technology stocks in their boom. As training firms continue to expand and offer new tools to meet specific company demands, Wall Street's interest will surely grow.

Performance measurement

Efforts to cut costs, focus on core competencies (and outsource the rest), and use learning as a strategic source of competitive advantage all point to the need for ongoing, accurate evaluation. In a survey of more than 1,000 training professionals at ASTD's 1996 International Conference, 93 percent said they are under increased pressure to demonstrate return-on-investment. In the July 1997 National HRD Executive Survey, the need to measure performance outcomes is high on senior practitioners' list of current and future HRD trends.

It has never been easy to isolate (credibly) training's effect from other performance improvement interventions. The reliance on electronic learning technologies (such as EPSS) will almost certainly complicate that already difficult task. Yet, in an era when learning is central to competitive advantage and all corporate functions are held to new standards of accountability, the challenge must be met head-on.

An important point often missed is the debate regarding the value of measuring training's effect, including ROI. On one side, the thinking is that what gets measured gets managed. If workplace learning initiatives aren't measured sufficiently, it's highly unlikely that they'll be well-managed. That will be particularly true as more electronic learning technologies become available and choosing among them becomes more complex. It has too-often been ignored that measurement is a component of good management and essential to continuous improvement.

With those considerations in mind, several Benchmarking Forum companies began working together in September 1996 to improve evaluation approaches. At the first meeting of the Performance Metrics Working Group, it constructed this guiding principle: "Our purpose is to use measurement as a means to promote continuous improvement in the cost and performance effectiveness of learning."

Substantial efforts are underway at many Benchmarking Forum companies to tie training more closely to business outcomes. That appears to be one fad that won't go away. Here are some buzzwords that top management

continues to use and take seriously:

- ▶ shareholder value
- ▶ profitability
- ▶ efficiency
- ▶ customer satisfaction
- ▶ return-on-investment (at the corporate level)
- ▶ return-on-assets
- ▶ cycle time
- ▶ performance.

Training professionals must understand and speak that language, and be able to translate the results of their work into those concepts. Inherent in the language are metrics for linking the results of training and learning to business outcomes and strategies.

In its efforts to improve measurement and evaluation on behalf of the entire profession, the PMWG recognizes the need to provide meaningful benchmarks of training outcomes in the language spoken by senior managers and CEOs. The group also realizes that it will take time and effort to achieve that objective. Though the group's goal is to benchmark training and education outcomes at Level 4 and beyond, it knows that it's necessary to walk before running. So, it chose to concentrate its initial efforts on Levels 1 and 3. Group members agreed that Level 2 evaluation, though important for the purpose of continuous improvement, would be too difficult to implement uniformly across firms and interventions.

From work being done at several companies, it appears that Level 1 data—when thoughtfully structured, gathered, and analyzed—has a greater benefit than previously recognized. In particular, early evidence suggests that Level 1 data may have some predictive validity for the types of information desired from Level 3 and 4 evaluations. In fact, Level 1 data may have the potential to be a useful, timely, and cost-effective short-run predictor of the long-term effects of training. As a result, Level 1 data can possibly be harnessed for the purpose of the continuous improvement of training and its outcomes.

To realize the full potential of reaction data, Level 1 questions must extend beyond smile sheets. To maximize its usefulness, a Level 1 evaluation should include questions on such issues as a course's relevance re-

garding job requirements, timeliness, accuracy of content, and ease of registration—in other words, utility-oriented questions.

One of PMWG's intentions is to investigate fully whether and to what extent Level 1 data can indicate Level 3 measures. If such a predictive capacity exists, Level 1 data can be used to improve the likelihood that new skills and behaviors will be transferred on the job.

In early 1998, the initial work of the Performance Metrics Working Group will be published in *Training & Development*, including a core set of Level 1 and Level 3 survey questions designed to apply across firms. The core questions, which can be supplemented with questions tailored to a firm's specific needs, cover training outcomes, as well as the barriers and enablers to effective training. Though the PMWG still has much to do, its initial work will, for the first time, enable the systematic benchmarking of training outcomes. Perhaps more importantly, it will result in valuable information for generating continuous improvement.

Emerging trends

Several potentially significant emerging issues have least two factors in common: One, they result from the ongoing evolutionary needs and opportunities of doing business in the information age. Two, they're likely to have profound implications for people working in the arena of workplace learning and performance improvement.

Routine work that can be automated or exported to low-wage countries has all but disappeared in high-wage, developed nations—making it clear that the only basis for sustainable competitive advantage is through value-added, knowledge-based work. Seen in that light, it's not surprising that there is a growing interest in knowledge management in the corporate and academic communities.

At some level, knowledge management—which can be defined as the process of creating, capturing, and using knowledge to enhance organizational performance—is nothing new. All firms must manage knowledge in some way or quickly go out of business. What is new is that it's active,

purposeful, and often an explicit responsibility of a senior manager—for example, the chief knowledge officer.

Although knowledge management can encompass a broad array of activities, it is associated mainly with activities that try to document and appropriate people's knowledge (codified knowledge) and disseminate that knowledge throughout an organization. Typically, such activities are conducted through a company-wide database. Knowledge management also includes activities that facilitate human exchanges through such venues as interactive software, email, and the Internet.

Examples of knowledge-appropriating activities include

- ▶ creating knowledge bases or databases in which proven solutions are shared
- ▶ compiling corporate “yellow pages”—directories of employees with specialized knowledge
- ▶ creating lists of experts to whom employees or customers can ask questions.

Examples of human exchange activities include

- ▶ establishing employee Web sites, chat rooms, and email functions to facilitate personal communication and share knowledge among employees
- ▶ using interactive software such as Groupware or online forums so that more than one person can work on a problem at the same time
- ▶ arranging and financing face-to-face meetings between people working at different locations.

From the perspective of workplace learning, there are two striking aspects of knowledge management. One, such efforts try to capture and capitalize on the informal approaches through which people learn as a by-product of doing their work. Two, such efforts appear only rarely to be tied to a company's formal mechanisms (such as training) for creating knowledge among workers.

That suggests there is an important, but unrealized, opportunity for ensuring that knowledge management initiatives are well-integrated with formal education and training. It also suggests that firms are recognizing the strategic importance of informal learning and that people responsible for

workplace learning should take heed of this development.

Intellectual capital

One evidence of the intensified interest in intellectual capital is three recent books with that term in the titles. Each book defines intellectual capital somewhat differently, but all agree on the hidden value:

- ▶ intellectual property
- ▶ know-how
- ▶ customer loyalty
- ▶ information about customers and suppliers
- ▶ processes and technology systems
- ▶ patents and trademarks
- ▶ corporate culture
- ▶ employees' competencies, skills, knowledge, and morale.

All three books say that intellectual capital has been swept under the rug of goodwill and that it's time to create, manage, measure, and leverage intellectual capital. They say that in the next millennium, "the value is not in the tangible assets but in the intangible ones." They also say that knowledge is more valuable and more powerful than natural resources, big factories, or fat bankrolls.

The books warn that double-entry bookkeeping systems (in which expenditures on education and training are recorded as costs) are the enemy of intellectual capital and that to realize fully its value, corporations need better systems for measuring intangibles. Companies need to develop better measures of the investments (such as training) they make in human capital and the value such investments produce.

According to the books' authors, such measures are important because they're needed for effective management and because they can predict future performance. Academics and other experts say that standard accounting measures fail to quantify performance. If nonfinancial measures can predict future performance, such measures can also attract financial capital to companies managing their intellectual capital wisely.

There is no "there"

The discovery of the steam engine resulted in the Industrial Revolution, which resulted in a fundamental reorganization of human economic and social activity—work and life adapted to the needs and opportunities of an industrial era rather than an agricultural era. Semiconductor-integrated circuits are the steam engines of information processing and a catalyst for another fundamental reorganization of human activity—from what was compatible with the industrial age to what is consistent with the information age.

The dawn of the information age has given rise to virtual corporations—which, according to Davidow and Malone, "to the outside observer will appear almost edgeless, with permeable and continuously changing interfaces between company, supplier, and customers. From inside, the view will be no less amorphous, with traditional offices, departments, and operating divisions constantly reforming according to need. Job responsibilities

■ *People work at home, in their cars, at airports, and even on beaches* ■

will regularly shift, as will lines of authority—even the very definition of employee will change." Since that was written in 1992, other aspects of the inside view of a virtual organization have become apparent. In many cases, there is no "there." Instead, people work at home, in their cars, at airports, and even on beaches.

The emergence of virtual corporations prompts mostly unanswered questions. How will employees acquire the knowledge and skills for rapidly changing responsibilities? How will we instill and maintain important aspects of corporate culture when people work in geographic isolation? How do we promote teamwork when people rarely, if ever, see each other face-to-face?

How do we deal with *disintermediation*?—a term coined by Don Tapscott in his book, *The Digital Economy*. According to Tapscott, "Middleman functions between producers and consumers are being eliminated through digital networks.

Middle businesses, functions, and people need to move up the food chain to create new value or they face being disintermediated." Tapscott warns that if a company has in its midst agents, wholesalers, distributors, retailers, brokers, or middle managers, it's time to do some serious strategizing (or career planning, if you're one of them).

That advice speaks to many profitable businesses and their functions. At some level, professionals responsible for workplace learning and training have always been brokers—brokers of information. As electronic learning technologies replace traditional training, the brokerage function becomes more apparent. The task essentially becomes matching learning needs with available technologies. But as the information for making a good match becomes more readily available, the need for the brokerage function diminishes. Logically, in a digital economy, workers will have the capacity to locate and obtain exactly the training they need, thus bypassing the middleman.

Tapscott's advice to people who serve as brokers is to find ways to *re-intermediate*—a terrible term, he admits, meaning to add value. The shift from training to performance improvement represents one way to do that. ■

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