

Is Online Learning Really Ready for Prime Time?



Introduction

A Cisco Systems commercial recently claimed that training for every job, everywhere, will someday be on the Internet. The promise of anytime/anyplace learning utilizing Internet technologies has many futurists pronouncing the death of traditional instructor-led training. Keep in mind, many of the same pundits have held annual conventions for the past ten years to pronounce the death of the mainframe, yet “Big Iron” still plays a vital role in corporate America. Whether it is because of the hype, or in spite of it, this hot new “Magic Bullet” has many companies reexamining their approach to the management of the training function. At the end of the day, the HR and Training managers are still asking themselves one tough question. What is the best strategy for providing effective, timely, and economical training for our employees? Three different strategies appear to be taking shape in the quest to create today’s learning organizations.

The first approach attempts to use online training as a “cost effective” alternative to instructor-led training. Many organizations who advocate this approach view training as a simply a cost and place it on the negative side of the balance sheet. The organizations attracted to this approach are usually faced with high employee turnover and a high-frequency training environment with very short Return On Investment (R.O.I.) periods due to low employee tenure.

The second approach views the online training tools as a way to address gaps in employee skill sets. Many HR managers find themselves on a nerve racking treadmill as they struggle to recruit, train, and retain the talent and skill sets necessary to succeed in a dynamic and savagely competitive business environment. The technical positions in most firms are those most hotly contested. The Department of Labor recently estimated that approximately 340,000 IT jobs are currently unfilled due to the lack of qualified applicants. That number is expected to explode over the next several years as training organizations cannot meet the market’s insatiable demand. The challenges of access, availability, and affordability are driving many organizations to investigate and invest in new tools and techniques which can alleviate some of the

incredible pressure upon the organizations’ skills inventory. Many of these organizations have invested heavily in software platforms like PeopleSoft and the hardware required to support them. The cost of training tools are often viewed as an infrastructure investment – rather than a raw cost and are evaluated over longer R.O.I. periods.

The third, and final, approach looks to online learning tools as a way to generate, capture, and harness the intellectual capital within the organization. This strategy is often referred to as “Knowledge Management.” Organizations in this camp often have successfully recruited and retained highly skilled, highly educated, and highly compensated professionals and Subject Matter Experts (SMEs) and look to the investment into online learning tools to maximize their productivity by minimizing downtime. Learning tends to be focused into collaborative venues, broadcast technologies, internet resources, and micro classes. In these organizations, any and every tool that maximizes the productivity of these high-yield revenue generators is viewed as an investment and R.O.I. numbers are usually not even calculated due to absurdity. These organizations also view the intellectual capital base that they possess as one of their greatest assets. Some progressive organizations have even begun to reduce these “Knowledge Bases” to software code and turn them into revenue generators. In the process these organizations have moved knowledge from the cost to the asset column on the balance sheet. While the profitability of these firms has proved astonishing, the grueling process of achieving these results is not for technically challenged organizations leery of change. The faint of heart need not apply.

Is Online Learning really ready for Prime Time? The purpose of this paper is to examine emerging concepts, technology, terminology and issues involved in online and distance learning, including the pros and cons of various approaches, and pointers on how to gauge the feasibility of online training for your organization.

Online Learning

The Online Learning phenomenon is fundamentally a fusion of three factors. The first, and most important factor, is obviously the learner. Second, you must account for the different tools and techniques for presenting the material. Finally, you cannot separate the learner or the tools from the organizational context in which they must both function. If an organization offers no incentive, or worse yet a disincentive, for learning, then success is about as likely as Bill Gates' attendance at a Department of Justice appreciation dinner. A great deal of attention will be given in this paper to the new tools and technology of learning, but a brief look at the changing face of the learner might prove fruitful.

According to Bob Mosher, Assistant Executive Director of the Information Technology Training Association (ITTA), we have seen a distinct evolution in the learner's approach to learning,

Learners: How they've grown... Or have they???

- **Truth (Standard ILT)**
 - "How do I do it??"
 - 1980's
- **Value (ILT, Custom)**
 - "Why do I do it??"
 - Early 1990's
- **Indexing (ILT, Custom, Self-Directed)**
 - "Where do I apply it in my life??"
 - 2000's

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as depicted in the graphic. Just as organizations have varied attitudes and approaches to the value of learning, individuals can have very different motivations and perceptions regarding how and why they learn. The savvy training manager is constantly looking for new ways to match the needs of the learner with the needs of the company's bottom line. If the company fails to provide a positive learning environment for the *indexing*, or value-based, learner then the firm will probably lose some of their most progressive and visionary employees. In today's dynamic business environment, few companies can sustain the persistent loss of *value and indexing* learners. The challenge is to provide learning tools that meet these learners' needs. For some learners and for some types of learning, traditional hands-on instructor-led training (ILT) is still the best choice, providing the human guidance and interaction that these learners require. In today's business environment, it is crucial to provide alternative means of learning as well.

The balance of this paper will look at online learning tools, which run the gamut from CD-ROM based CBT's to web-based

interactive distance learning. Some of these technologies focus on content, while others are concerned with delivery mechanisms. The challenge every training manager faces is the blending of organizational, individual, and technological issues into a cost effective training strategy. The technologies outlined in the pages to come must be placed within your organizational context and must account for the varied learning styles that you will inevitably encounter. The technologies listed can be read as a catalog of functionality and capacity, or can be evaluated as the tools on a pegboard to be used in the building of a learning organization. How you read the pages that follow could minimize or greatly expand the benefit of your time spent reading it.

In recent years, a multitude of terms have been used to describe online learning, including the following:

Computer-based training (CBT) - Generally refers to self contained courses, self paced, presented on a computer, that do not provide links to learning resources outside of the course. The course materials are typically provided on CD-ROM, but could also be available through the network, Intranet, or Internet.

Web-based training (WBT) - Generally refers to computer-based courses available via intranet, extranet, or Internet that are also linked to learning resources outside of the course, such as references, internal and/or external knowledge bases, electronic mail, online discussions, and video conferencing. For example, Microsoft has done an excellent job of this with their TechEd product, which heavily references their TechNet knowledge base.

Content Options

Online training can work well if it is aligned with the specific needs of the learner, done in small pieces, and the material is straightforward and well produced to motivate the learner and prevent boredom. The material should be designed to be modular so that the learner can quickly access the desired content, and in small enough sections to provide just-in-time learning. The design must be so compelling that the learner doesn't want to walk away, much like the reluctance to put down a good book. According to a study done by Braehler and Johnson for the University of Washington, *Pedagogy: A Primer on Education Theory for Technical Professionals*, "Many computer-assisted instructional materials (CAI) are developed by technical professionals who have the critical technical skills necessary for successful implementation, but lack knowledge of educational principles. The resulting CAI are technology-driven rather than pedagogy-driven. Educators have the content and pedagogy expertise to design effective CAI, but owing to the fact that they generally lack the technical expertise to complete the computer work, they must rely upon technical experts to develop CAI... To date, there almost seems to be a belief that learning will take place because technology is present, even in the absence of sound instructional design."

Custom Developed

Custom developed CD-ROM based training enables the content to be customized to industry and business processes, but quality materials are extremely expensive to produce. A half day of instructor-led training typically translates into *one* hour of interactive media, with a production cost of \$40,000-\$80,000. Stable content is also required, in that it is not easy to make changes. Custom developed materials can be effective for training large numbers of people (over 1,000 to justify cost), geographically dispersed employees, shift employees, and high turnover positions.

Off-the-Shelf

There is a wide range of content available for popular application products and technical tools. However, due to a limited audience, there is much less content available for industry-specific training. Educational and delivery design vary greatly, consequently these products need to be carefully evaluated.

Examples of Online Content Providers

- ZDU (www.zdu.com/www.smartplanet.com)
- Course Technology (www.course.com)
- DigitalThink (www.digitalthink.com)
- NETg (www.netg.com)
- SmartForce (www.smartforce.com)
(formerly CBT Systems)
- Educational Multimedia Corp.
(www.educationalmultimedia.com)
- Computer Prep (www.computerprep.com)
- CyberStateU (www.cyberstateu.com)
- The Answer Center (www.theanswercenter.com)
- Computer Training Network (www.comptrain.net)
- Digital Quest (www.digitalquest.com)
- PTS Learning Systems (www.ptsls.com)

Distance Based Delivery

Distance learning includes any type of educational situation in which the instructor and students are separated by time, location, or both. There are two main categories of distance learning: asynchronous and synchronous.

Asynchronous

The asynchronous model provides self-paced learning in which learners and instructors are not logged on at the same time. The learner can choose from a variety of media, communicate with the instructor and other students via message boards, complete the coursework according to the class syllabus or outline, then submit the completed material to the instructor for evaluation. Signup is either by subscription (flat rate for given period of time), or by course title. The main advantage of asynchronous training is convenience for the learner, with training occurring anytime, anyplace. The disadvantages include low accountability and a high dropout rate. For example, in a recent ZDU survey, the dropout rate for students was 50%. The industry considers a 60% completion rate to be successful.

Synchronous

In the synchronous model, students and instructors interact in real time via virtual classrooms, using a combination of delivery methods.

Low End Synchronous

Low end synchronous delivery is primarily presentation based (“one-to-many”) – at a stated time, learners logon to hear the instructor lecture, view slides, white board, and/or application demos. Learners may have chat and polling capabilities, but interaction is limited. This method does not include streaming video or audio. Audio is provided via telephone, utilizing a teleconferencing bridge.

Case Study

Northwest Airlines – Prior to the development of the current Education Strategy at Northwest Airlines, surveys showed that only 10% of requested training was being satisfied by their instructor-led program, their skills inventory was unreliable, and training was not matched to skill gaps, competencies or strategies. They needed to improve their education to provide tools for competitive edge, to provide training based on skill gaps, identify and link training to strategies, implement multi-platform solutions, provide just-in-time training, and provide training for personal advancement. The training needed to be available to 52,000 employees in 22 countries. Their first step was to determine what training was needed. They created an extensive Skills Management System to define skills needed by employees and to enable identification of skill gaps by employee. They identified multiple means of providing learning opportunities, including books, periodicals, audio tapes, videos, CBT, web-based training, and instructor led training, that employees could identify directly through the Skills Management System. They set up a check-out library for employees to access materials for use at their desk or for personal career development off-hours. They set up a CBT/Mentor classroom with an on-staff facilitator and matched mentors with learners. They provided self-paced training venues for fundamentals learning (80%), which freed additional funds for instructor-led training on advanced topics (20%). Through extensive, high quality marketing, they were able to gain acceptance of the new methods. They now have a comprehensive training program that meets organization and learner objectives.

Low end synchronous training provides a richer experience for learners than asynchronous, with the ability to ask questions in real time. It can be effectively used for pre-training, Q&A sessions during a migration, or periodic updates. The bandwidth requirements are lower than high-end synchronous training, and the client requirements are low – phone, computer, browser, Internet connection. The prime disadvantage is the high cost of teleconferencing, which means that this method is not cost effective over time. For example, connecting 25 locations at a rate of \$1.15 per minute equates to \$1,725 per hour.

High End Synchronous

High end synchronous delivery is the distance-based emulation of a classroom environment, providing a higher degree of interaction between the instructor and learners (optimum class size of 8-10 learners). It is instructor-centric, including “over the shoulder” capabilities. It includes all of the capabilities of the lower end synchronous, but also provides streaming audio, streaming video, and application sharing. It provides the capability for participants to chat online and ask questions via microphones in real time. It enables the instructor to “take control” of learner’s computers, to demo or assist, and can provide “breakout rooms” for learners to work independently with assistance from the instructor.

High end synchronous training requires, in many cases, prohibitively high bandwidth, and may not work with the organization’s firewall configuration. Client requirements are also higher, including sound card, microphone, and fast Internet connection (minimum of 56K), and firewall/security reconfigurations. Costs vary widely, from a low cost, externally hosted session for 4-5 people, to \$50,000+ internally hosted solutions. High end synchronous provides the best online learning environment, but is the most problematic due to high infrastructure requirements and Internet bandwidth limitations.

Examples of Distance-Based Delivery Providers:

- MSHOW (www.mshow.com)
- PlaceWare (www.placeware.com)
- Microsoft’s Net Show & Net Meeting (www.microsoft.com)
- Centra (www.centra.com)
- Lotus LearningSpace (www.lotus.com/learningspace)
- InterWise (www.interwise.com)
- LearnLinc (www.ilinc.com)
- Net Podium (www.netpodium.com)
- PrepVision (www.computerprep.com)
- Webex (www.webex.com)
- BitRoom Collaboration System (www.lucent.com)
- Rotor System (www.rotorcom.com)
- Communicast (www.communicast.net)
- KRM (www.krm.com)
- Netcall (www.vstream.com)
- InSync (www.insynctraining.com)
- TalkPoint (www.talkpoint.com)
- Horizon Live Distance Training (www.horizonlive.com)

Low End Synchronous

- Presentation based
 - “One to many”
 - Lecture
 - Slides / White Board
 - Application demos
- Audio via teleconferencing bridge
- Lower bandwidth requirements
- Low client requirements
 - Phone
 - Computer
 - Browser
 - Internet connection
- Limited learner interaction
 - Chat/messaging
 - Polling
- High cost of teleconferencing

High End Synchronous

- Instructor-centric classroom environment
 - 8-10 learners optimal
 - Lecture
 - Slides / White board
 - Application sharing
- High interaction between instructor & learners
 - Chat
 - Microphone
 - Instructor “over the shoulder” capabilities
- Streaming audio & video
- High bandwidth requirements
- Challenging firewall requirements
- Higher client requirements
 - Sound card
 - Microphone
 - Fast Internet connection
 - Special client software
- Assumes heavy infrastructure investment in high capacity Internet, messaging, and LAN/WAN technologies

Learning Management Tools

An online learning program often involves more complex planning than a classroom-based program. It is critical with any online training that there be a measurement tool or methodology to gauge the effectiveness of the program and to monitor the student's progress and completion.

Learning management software should interface with the organization's enterprise software, as well. Following are examples of current learning management systems:

- Docent Enterprise 4.0 (www.docent.com)
- Ingenium 4.5 (www.click2learn.com)
- WBT Manager 1.0 (www.integritytraining.com)
- Pathware 4/LearningSpace (www.lotus.com)
- KnowledgeSoft 3.3 (www.knowledgesoft.com)
- IntraLearn (www.intralearn.com)
- Phoenix (www.pathlore.com)
- Learning Portal 2.5 (www.teamscape.com)
- WorldTrak (www.infotec.com)
- SmartForce eLearning (www.smartforce.com)
- Web University Learning Solutions (www.imginc.com)
- SkillSpace (www.recor.com)

The costs and capabilities of these systems vary widely. Server software can cost up to \$40,000 per server, per user costs range from \$20 - \$90, plus an annual maintenance fee of 20% of the purchase price.

Online Learning Pros and Cons

Online training has the potential to provide flexible training options for employees. These options include access to job-specific training content, available when convenient, in multimodal methods, giving immediate feedback to the learner. In some cases, training time is decreased and retention is increased. Employees can be empowered to pursue an individualized training plan that meets their specific needs – IF the appropriate content is available to them.

Learner Issues

An important issue relates to learners' individual learning styles. Some learners may prefer a self-study program. Others simply don't learn well without direct human interaction in a classroom setting. Perhaps the most significant difficulty in online learning is sustaining the momentum to complete the course. It is difficult for employees to limit distractions and interruptions and to schedule the time to actually complete the course, despite the best of intentions. Consequently, online learning often has a high dropout rate. The best completion rates occur with online training that has a high-level of interactivity between the instructor, the learner, and other learners, with predefined course times and deadlines.

Content Challenges

While a number of generic courses are readily available for popular application software packages, job specific and industry specific training typically must be custom developed, requiring significant time and expense.

Technology Challenges

Some technology challenges are involved in online learning. The first technology hurdle in a networked environment is to assure adequate bandwidth to support multimedia training internally. Online learning can consume scarce bandwidth, putting a strain on the network. If content is accessed from outside of the organization, firewall and security issues can be significant factors in addition to bandwidth. Network firewalls may not support access to distance learning technologies. While "voice over IP" (audio over the Internet) is relatively inexpensive, currently the quality of service is often poor, with frequent loss of audio, or distracting slowness of audio not keeping up with the video. The student's connection to the internet may be too slow, some programs require cumbersome client software for audio and video capabilities, and additional hardware such as sound cards, speakers, and video cameras may be necessary. Videoconferencing and teleconferencing are typically expensive. Satellite technology is a good alternative

Pros

- Doesn't require travel
- Less time away from the job
- Convenience and flexibility
- Immediate feedback provides better retention
- "Just-in-time" training vehicle
- Access to up-to-date real time knowledge
- Empowered learners
- Low "Per-Event" Cost

Cons

- Requires heavy management and administration
- Learners are often confused & lost due to lack of structure
- Technology driven design, which lacks educational framework
- Learner reluctance and frustration leads to high drop-out rates
- Dearth of job-related content
- Potentially serious security and delivery issues
- Expensive infrastructure is assumed to be in place.

for distance learning (less “jerky”), provides some learner interactivity via telephone, and a TV quality image, but requires expensive infrastructure.

“Despite the abundance of products and services in the distance learning market, controversy continues over the value of this approach compared to conventional training methods”, according to Elizabeth Clark in her article on Distance Learning in Network Magazine (9/99).

Summary

Online learning can be extremely beneficial to organizations who have invested the time required to plan a solid knowledge management strategy. The savvy training manager must still take into account the learning philosophy of the organization and the outlook, ability, and appetite of the learner, then choose the most appropriate delivery mechanisms. Many of the tools outlined in this paper must be carefully targeted in order to garner the maximum benefits.

In some cases, online training has proven to be a viable alternative to classroom training when used for highly motivated employees, geographically dispersed staff, or new hires. While they make up a small percentage of employees, many *indexing* learners prefer online learning to the traditional classroom environment. According to Sheila McGovern, research analyst with International Data Corp, technology-based training represented only 2 percent of the overall IT training market in 1998. By 2003, she predicts it will comprise 14 percent of that market. Early demand for technology-based training is coming from IT firms, systems-integration organizations, sales organizations, the financial and banking industries, and academia. These organizations are moving toward online training not because it’s better than traditional methods, but because they have the technical infrastructure and the economic capacity to provide an alternative option.

In most organizations, however, online training is viewed as a new tool targeted towards the “pre-learning” and “post-learning” audience. Industry studies have shown that learners who have been exposed to a topic prior to classroom training derive greater benefits from the classroom training and have much higher long-term retention rates. Most people readily accept the adage, “If you don’t use it, you will lose it” as a fact of life.

As shown in the Northwest Airlines example, online training may provide the best alternative when targeted at very specific training objectives. Northwest used online assessment and training as a very effective pre-classroom training requirement. Online training was also used to bring employees up to the pre-requisite level needed for classroom training and augment classroom learning, by providing a variety of access techniques for the learner. It can also be used for post-training and support. Online learning has shown the highest returns when deployed in concert with other tools within a well-architected knowledge management system, that is supported by a strong internal change management effort.

In closing, Online Learning is almost ready for “Prime Time” and is providing many knowledge managers with a powerful tool! However, it is not a “Magic Bullet” that will single-handedly replace all of the traditional training techniques. Even the most aggressive projections place online learning at only 20% to 30% of the training market. Most organizations are currently struggling with not only how to provide quality online training on a timely basis, but also with how to motivate employees to actually follow through with doing online learning. Not unlike the corporate mainframes, the instructor-led classroom environment isn’t ready for early retirement quite yet!

Case Studies

Fortune 100 Insurance Company – a large midwest based insurance company replaced their mainframe based email system with Lotus Notes. They needed to train 10,000+ employees in multiple locations prior to the migration. To automate the training and enable many people to be trained in a short period of time, they hired an outside multimedia developer to develop custom CD-ROM based training. The training for headquarters personnel was then conducted in the classroom with the CD-ROM material and a facilitator to help learners as needed. This solution allowed learners to progress at their own speed, with the benefit of assistance as needed.

NCR Corp. is yet another company that agrees Web-based training is valuable. Up until two years ago, 95 percent of NCR’s training was delivered through the classroom in buildings located worldwide. Today, 10 percent of the \$6.5 billion company’s in-house training is web-based, and 40 percent is delivered outside the traditional classroom setting, chiefly through interactive television, CD-ROM and the Web.

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Questions to Consider

- Is training limited by the ability of learners to attend traditional, multiple day classes?
- Does your organization have the necessary hardware, Internet connectivity, and network bandwidth to support online training?
- Does your firewall allow access to distance-based learning technologies?
- Is online training content currently available for the application software that you use that is consistent with the way this software is used in your industry? If not, is it feasible cost and time-wise to have custom materials developed?
- Are your employees expected to participate in online learning during regular office hours? If so, will time be allocated for them to do so? Will their progress be monitored? Will they be incented and given recognition for completion of the training?
- Do you want your employees to use technology in a more competitive way?

Terminology

Application demos versus application sharing – application demo capability means that the instructor/presenter can demonstrate software (show and tell only). Application sharing enables participants to interactively use the application software.

Bandwidth – the physical capacity of the network to transmit information, usually in bits per second.

Chat – a discussion that occurs online when all of the participants are simultaneously signed on (a form of synchronous online communication).

Collaborative – technologies that link people together so that they can interact with one another.

Extranet – an Internet-like network that is only available to people chosen by the organization, including people external to it.

Groupware – software that provides synchronous and asynchronous online collaboration, including e-mail, shared work files, and online chats.

ILT -- Instructor-Led Training

Intranet – an Internet-like network that is only available to people working internally to an organization.

Knowledge management - refers to the process of gathering, organizing, and presenting information that has been collected over time, and leveraging that information for purposes such as training and problem solving.

Learning management systems – software that tracks individual student progress, records scores of quizzes and tests within an online learning program, and tracks course completions. This information may also be transferred to other record management software, so permanent educational records reflect completion of online learning.

Message boards – bulletin-board type communication where you can leave messages and expect to see responses to messages you have left (also referred to as threaded discussions).

Polling – in online learning, the capability of receiving responses from online learners during a session (for example, yes/no responses).

Streaming video and streaming media – streaming video is a sequence of “moving images” that are sent in compressed form over the Internet and displayed by the viewer as they arrive. Streaming media is streaming video with sound. With streaming video/media, the Web user does not have to wait to download a large file before seeing the video or hearing the sound. Instead, the media is sent in a continuous stream and is played as it arrives. The user needs a “player”, a special program that uncompresses and sends video data to the display and audio data to speakers. A player can be either an integral part of a browser or separate software. Streaming video is usually sent from prerecorded video files, but can be distributed as part of a live broadcast “feed”. In a live broadcast, the video signal is converted into a compressed digital signal and transmitted from a special Web server that is able to do “multicasting”, sending the same file to multiple users at the same time.

Voice over IP – voice delivered using the Internet Protocol, sending voice information in digital form in discrete packets rather than in the traditional circuit-committed protocols of the public switched telephone network (PSTN). The major advantage of VoIP and Internet telephony is that it avoids the tolls charged by ordinary telephone service.



The Occam Group, LTD is a consulting firm dedicated to the art of Knowledge Management. We specialize in helping firms maximize the power of their people by bringing technology in line with strategic business objectives. In far too many companies today, technology has taken over the budgetary resources of the firm by promising almost mythical return on investment. As industry analysts and active technologists, we offer our partners a refreshing alternative. We don't sell hardware, we don't place people, and we don't want to take over half of your office space with an army of consultants. Our mission is to offer our clients a strategically focused, business driven analysis of their IT environment that will bring technology in line with the organization's objectives. Simply stated, we help organizations rethink their technology, strategically.

"It is folly do with more, what could be achieved with less."
-Sir William of Occam

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Ken Barnhart spent 10 years with United Parcel Service in various operational and IT management positions where he focused on the re-engineering of people, process, and technology platforms to create greater levels of performance and profitability. His strong people skills and keen eye for systems can be seen in his redesign of the data capture process for the Total Track System, which was a finalist for the USA Today/RIT quality achievement award. Since leaving UPS two years ago, he has authored an enterprise analysis methodology and has served as an infrastructure and technology consultant to Fortune 500 firms, West Publishing, IT training companies, system integrators, and state government agencies. Ken is a Microsoft Certified Trainer, a Gartner Institute Master Instructor, a Gartner Institute Subject Matter Expert (SME) for Enterprise Resource Planning (ERP), a contributor to the Microsoft Knowledge Management Technical Readiness Group, an annual presenter at the Influent Computer Training World and Frontlines Conferences, and a frequent presenter at the HDI Conference, Executive Perspectives Sessions. Ken's approach to business is distinguished by a passion for excellence and his approach to technology is governed by an unrelenting drive to simplicity, clarity, and relevance.

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Tina Rankin is recognized throughout the U.S. as an expert in technical training and is a popular speaker at national and local training and support conferences. Tina is a Microsoft Certified Trainer and Gartner Institute Master Instructor with over fifteen years of experience as a technical trainer. Ten years ago Tina founded Valley Micro Associates, Inc., a partner level Microsoft Certified Technical Education Center, on a revolutionary model that used veteran independent IT consultants as technical trainers. Due to her innovative style and commitment to quality, she was recognized by Microsoft as visionary and asked to participate in several national education and training task forces. Tina also served on the Executive Board of the Association of Microsoft Solution Providers during its formative years. Two years ago, Tina sold Valley Micro to return to her passion of helping companies leverage their technology in order to create learning organizations. Tina's strong technical skills, expansive business experience, and outstanding track-record of courseware development give her a rare vantage point on the role of technology in the learning process.