

Distance Training

How Innovative Organizations are Using Technology to Maximize Learning and Meet Business Objectives

Deborah A. Schreiber and Zane L. Berge

Preface

It is a daunting task to maintain an educated, high-performance workforce in today's global economy. Increased competition, regulatory bodies, changing technology, and process re-engineering conspire to disrupt traditional employee practice and capability. The need for training, retraining, and lifelong learning by professionals demands that continuing education and staff development accommodate diverse learning environments, including the home, office or offsite conference room. To meet such demands, organizations and businesses are relying on communications technology and distance learning to deliver training.

Trainers and education specialists in business, nonprofit organizations, and government agencies traditionally looked to developments in communications technology to strengthen distance learning. Following a century of dramatic change and innovation, it appears that the integration of telecommunications and satellite technology are poised to support significant improvement in the interactivity, collaboration, and real-time delivery of distance education and training. There is an ever-increasing explosion of interest now in corporate videoconferencing, electronic performance support systems, and online web-based courses by business and industry.

Deciding what technology to use, however, and how to use it effectively are probably the two biggest questions faced by organizations as they attempt to design delivery of distance training. And once implementation begins, a company wrestles with how to institutionalize its efforts so that distance learning becomes part of the profile of the organization.

Purpose

The purpose of this book is to describe how corporations, non-profit organizations, and government may apply education and training at a distance to best meet business objectives. The goal is to illustrate, through case studies, how to maximize utilization of organizational technology to implement effective distance and distributed learning. Each case summarizes the organizational and technical barriers encountered as well as the pitfalls and limitations that were overcome in meeting business goals and objectives through distance training.

To help address these issues, a set of guiding principles has been identified that provide a framework for discussing distance learning in corporations, nonprofit organizations, and government agencies. These principles are derived from the theories of conceptual models of learning and instructional systems development. The guiding principles are not

"standards" of operation established to meet criteria of accreditation or funding. These principles represent systems engineering strategies for design, development, and implementation of distance training "processes."

Audience members should keep in mind this set of guiding principles when reading the book. These principles may be used to guide analysis and discussion of the case studies as the authors discuss such issues as the strengths and weaknesses of distance learning technology, relating distance training performance objectives to business needs, or developing an effective corporate distance learning implementation strategy. This book is unique for its richness in business-focused experiences and simultaneous consideration of learning issues.

Audience

The intended audiences for this book include organizational managers, performance consulting professionals, and practitioners charged with the training functions in corporations, non-profit organizations, and government agencies. Additionally, this book may be used as a primary textbook for students and professionals studying to enter the distance training field.

Readers would use this book mainly to analyze how others have successfully integrated distance training into their organizations and the pitfalls and limitations that were overcome in meeting business goals and objectives. As a text, this book is most suitable for courses in business management, government training, and college graduate classes. Students should use this book to analyze case studies in distance training and discuss various perspectives on alternative solutions.

Guiding Principles

A set of principles has been developed that guides planning and preparation of training tailored to meet business-driven distance and distributed learning. The goal is to follow these principles to identify the organization's business needs and objectives, determine performances that meet these needs, and deliver distance training events and programs that facilitate the desired performance outcomes.

The editors distinguish here between a distance learning "event" and a distance learning "program." A distance learning program is not a program of instruction, such as a curriculum of courses or modules. A distance learning program refers to an organizational process, consisting of policies and procedures specific to departments' or divisions' functions and responsibilities. In contrast, a distance learning event does represent an independent course or module. The distance learning event is often an isolated and separate delivery exercise.

The following guiding principles represent a model for developing distance training. This model employs a reiterative process of analysis and design and is derived from the theories of instructional systems development and conceptual frameworks of learning. The goal is to maximize utilization of technology and institutionalize an organization's distance training efforts:

1. Analyze business needs,
2. Identify strategic distance training events and programs,

3. Apply conceptual frameworks of learning to distance training,
 4. Identify and select delivery tools (develop organizational technology plan),
 5. Correlate distance learning instructional materials to technology delivery tools,
 6. Secure implementation support,
 7. Implement a balanced roll-out strategy, and
 8. Evaluate distance learning processes and measure transfer.
- (See Chapter Three for more information on the Instructional Design Model for Distance Training, which is an embellishment of these guiding principles.)

Organization of the Book

This book begins with Chapter One's discussion of the history of distance training and explains how trainers and education specialists traditionally looked to developments in communications technology to strengthen distance learning. Chapter One also describes corporate and government cultures and how they influence policy and management issues regarding an organization's technology capability for distance learning. The various roles and personalities of information systems and human resource personnel are discussed as well as the impact such diversity has on the interdisciplinary efforts necessary for successful distance training.

Chapters Two and Three focus on the conceptual frameworks for distance learning and discuss some of the more salient instructional design principles as applied to distance training.

Regarding models of distance learning, Chapter Two explains that essentially there are two frameworks from which to view training and education. In the first, content and knowledge determined by someone else is transmitted to the learner (for example, lecture, textbook, videotape). In the second, a learner transforms information, generates hypotheses, and makes decisions about the knowledge he or she is constructing or socially constructing through interpersonal communication with others. Successful distance training occurs when instructional events are consistent with the characteristics of the selected learning model.

Chapter Three illustrates how the application of instructional design theory to distance learning enables a systems processing approach to be used to develop and implement training at a distance. The systematic application of the processes of analysis, design, and development to the implementation of distance learning ensures identification of each contributing factor and accounts for the associated impact of each component. Components of the distance learning process are interrelated and include the learner, instructor, primary instructional goal, performance objectives (driven by business needs of the organization), the learning environment, instructional delivery technology, and organizational culture. The focus of organizational culture includes discussion of corporate facilitators and institutional constraints affecting the design and development of distance learning.

Description of Case Studies

Chapters Four through Eighteen contain fifteen case studies that illustrate distance training in corporate, non-profit organizations, and government. Each case reviews the organizational and technical barriers encountered as well as the pitfalls and limitations that were overcome in meeting business goals and objectives through distance learning. The distance training applications range from dissemination of information and building

skills in critical thinking and problem solving to changing attitudes and affecting organizational culture. Content areas addressed include technical and electronic systems development, safety operation and maintenance, general healthcare and specific nursing tasks, managerial and policy issues, and organizational restructuring and new business development. While at one time some types of learning may have been considered inappropriate or "undoable" at a distance (such as mechanical or electronic skill development), the current corporate, non-profit, and government cases demonstrate this is no longer so.

The case studies help organizations answer such questions as how to maximize utilization of technology to deliver distance training and what organizational processes and procedures may aid in institutionalizing distance training efforts.

The case studies are organized into three sections, categorized by the primary type of learning that is facilitated by the distance training event or process: Part One (Distributing Information and Increasing Knowledge), Part Two (Building Skills [Technical and Critical Thinking]), and Part Three (Changing Attitudes and Enhancing Motivation). The editors utilized this categorization for two reasons: first, it dispels any lingering misconception that certain types of learning are undoable at a distance; and second, it illustrates that mastery of performance outcomes is dependent upon understanding what knowledge, skills, and attitudes facilitate the desired behavior. Each section describes case studies that fulfill business needs with specific types of learning delivered via a distance training event or process. The technologies selected for delivering distance training include a combination of computer-based training, electronic-performance support systems and online courses over the intranet/extranet, and live two-way video conferencing via satellite and fiber optics networks.

The authors of the case studies discuss the pitfalls and limitations that were overcome in meeting business goals and objectives with distance training and refer to the aforementioned guiding principles with varying degrees of detail. Employing this model for developing distance training, the contributing authors describe associated issues, including the following:

- Relating performance objectives to an identified business need
- The rationale for selecting specific distance training instructional strategies (events or processes) to facilitate mastery of the performance objectives
- The strengths and weaknesses of technologies selected to deliver distance training
- The development of an implementation plan (coordinating and maintaining support for delivery of distance training)
- Integrating formative and summative evaluation of the distance training event or process

Part One: Distributing Information and Increasing Knowledge

Disseminating information to increase knowledge is a most appropriate type of learning to facilitate at a distance when time and application are critical. This often occurs in content related to marketing information, operational processes, new business regulations, and life-saving techniques and other health issues. The body of information distributed includes facts, names, principles, and generalizations.

Part One contains five case studies that demonstrate distance training activities that disseminate information and increase knowledge. The chapter contributed by Dennis

Fukai and others, "Building Customer Relations: Web-Based Training for the Home Improvement Industry," illustrates how an in-store web-based application delivers information about construction materials that are purchased for home improvement projects. The application serves as a marketing tool for retail sales personnel, identifying and describing the hardware and manufactured materials available for sale as well as explaining the use of equipment and tools needed for successful completion of projects.

The next two case studies, provided by Barry Howard ("Increasing Employee Knowledge and Understanding of Operational Systems: Integrating Multiple Technologies at NYNEX") and Lissa Klueter ("Disseminating Time-Sensitive Information: Using Interactive Distance Learning to Deliver Training and Education in the American Red Cross Biomedical Services"), also demonstrate distribution of information to increase knowledge. However, in these cases the performance outcomes are driven not by marketing but by business needs related to operational processes, including new rules and regulations. The NYNEX case integrates several technologies (including business television, live interactive videoconferencing, and computer-based tutorials) to provide information to staff to increase knowledge and understanding of the company's operational systems (for example, processes associated with the core business-telecommunications operations). Information is distributed on order-entry, maintenance scheduling, and accounts inquiry.

The case study by Lissa Klueter describes distance training employed by the American Red Cross Biomedical Services that includes dissemination of time-sensitive information about new FDA regulated procedures in the areas of collecting, manufacturing, and distributing blood components. The case describes in detail the roles and responsibilities of the members of the core distance learning team as well as the differences between two delivery tools: business television (BTV) and interactive distance learning (IDL) via satellite technology.

The last two case studies in Part One are provided by Therese Monahan ("Disseminating Time- and Regulation-Sensitive Information: Mortgage Bankers Association of America") and Michelle Warn and others, ("Graduate Programs at a Distance: A Partnership Between the California Department of Rehabilitation and San Diego State University"). In the case study described by Therese Monahan, the Mortgage Bankers Association conducts two distance training seminars to distribute time- and regulation-sensitive information regarding banking processes and procedures. The content is intended for loan originators and underwriters and includes information about loan origination, underwriting, and appraisal review.

The case study provided by Michelle Warn and others describes a partnership between the California Department of Rehabilitation and San Diego State University to provide training to fulfill state-mandated continuing education requirements. The goal of the training is the dissemination of information to increase knowledge and understanding in the field of rehabilitation, including issues surrounding people with disabilities, events that sway policy and social outcomes, and the overall community services and support systems available. The instructional technologies examined by this case study include online courses, teleconferencing, desktop conferencing, and compressed video conferencing.

Part Two: Building Skills (Technical and Critical Thinking)

Skills-based training at a distance is becoming increasingly successful due to the

application of improved distance learning instructional strategies. Well developed activities are being designed and employed to engage participants in group discussions, role-play, and online review of demonstrated techniques. Extended practice in the workplace is also employed to build and reinforce skill development with follow-up evaluation by online experts and/or clinical advisors.

Skill-building at a distance may include development of intellectual skills, motor skills, or interpersonal and communication skills. Distance training of intellectual skills includes the application of rules and solving problems, as well as the development of cognitive strategies for self-learning and independent critical thinking. Manual or psychomotor skills involve coordinated and accurate execution of muscle-controlled performances (such as production and maintenance of machines and technical or electronic systems). Interpersonal and communications skills (often considered intellectual skills) include the application and interpretation of verbal and nonverbal cues for social and political implication.

Part Two contains six case studies that demonstrate distance training activities designed to facilitate building technical skills and developing critical thinking. The first case listed, submitted by Mick Mortlock and Ed Dobrowolski, is titled "Reskilling Employees for Competitive Advantage: Reinventing at Unisys Corporation." This case study describes computer-based training and electronic performance support systems designed for distance learning in information management and re-engineering. The goal of the Unisys training is to develop critical thinking and problem-solving skills in employees so they may redirect current expertise to new and innovative areas of applications. The target audience for the distance training is interdisciplinary, cross-cultural, and multi-generational. The company's business need is to retain and sustain its human intellectual resource as the organization restructures and develops new business.

The next two case studies included in Part Two are "Delivering Technical Training to Advance Mechanical Skills: Interactive Video Teletraining in the Federal Aviation Administration" and "Delivering Clinical-Based Training in a Public Health Setting," contributed by Lynn W. Payne and Henry E. Payne, and Janet Place and others, respectively. Both cases describe distance training activities that facilitate physical or psychomotor skill development.

The case study provided by Payne and Payne illustrates that technical training can be delivered and mechanical skills successfully developed via interactive videoteletraining (IVT). One of the first courses at the Federal Aviation Administration to be converted from resident-based training to IVT was the Cockpit En Route Inspection course. Safety operators and maintenance staff successfully developed skills for using the new equipment. The case study illustrates that there was no statistically significant difference in learning between the resident-based and distance training courses. The FAA case study also describes evaluation of several components that contribute to the success of IVT events, including effective instructional strategies that enhance participant-instructor interactivity during teletraining.

The case study by Janet Place, Tim Stephens, and Patricia O'Leary Cunningham also describes technical or, more specifically, clinical-based training via distance learning. The instructional strategy combines interactive video at six remote sites to guide clinical training in physical assessment for patient screening and referral. A proficiency-based model is followed that requires learners to perform a series of actual client exams for exercise and practice. Physical assessments may include breast exams, PAP tests, and prostate exams. Follow-up evaluation is provided by clinical advisors.

The fourth case study in Part Two describes development of interpersonal and communication skills via distance training. The case, titled "Skills-Based Distance Training for a Global Environment: Malaysia's Virtual University," was submitted by Patrice Sonberg and Manon Ress and describes a cross-cultural partnership between the Malaysian government and an educational technology firm in the United States. The objective of the described case was to develop and implement a web-based distance training program that is skills-based and designed to meet the corporate and political needs of an evolving world economy. Although one of the training objectives was to build intellectual skills in content areas of "high technology" (computer and information systems capabilities and international business practices), the primary goal was to build student interpersonal skills for participation in a global environment. This includes building skills in language, communication, and cultural procedures and protocol.

The last two cases described in Part Two are "The Value of Building Skills with Online Technology: Online Training Costs and Evaluation at the Texas Natural Resource Conservation Commission" by Scott Walker and "Building Intranet Courseware Using Multidisciplinary Teams: The Story of Quantum Solutions, Inc. and Columbia/HCA Healthcare Corporation" by Ann D. Yakimovicz. These case studies describe distance training activities intended to build critical thinking and problem-solving skills in using online technology and in managing multi-disciplinary teams for development of web-based courseware, respectively.

The case by Scott Walker describes the application of distance learning by the training academy of the Texas Natural Resource Conservation Commission, a state environmental regulatory agency. The agency utilized multiple distance learning technologies to deliver training, including videoconferencing and internet-based online courses (with email and web-based delivery of instructional materials). After briefly describing the strengths and weaknesses of the various attempts at distance training, including the coordination of nine remote sites throughout a heavily-used videoconferencing network, Walker focuses on building skills in using online technology. The strategy employed includes piloting and evaluating the internet-based course "Online Training: Net Tools for Work." The intended audience for the distance training was highly technical in their areas of expertise (environmental management and legislation) but very novice with this delivery medium.

Finally, the case study by Ann D. Yakimovicz describes the design of intranet-based courses that build skills in healthcare management and policy issues. Course topics target senior healthcare executives of the Columbia/HCA Healthcare Corporation and cover content areas related to shifts in managed care, for-profit hospitals, and patients covered by HMOs and other insurance contracts that provide a fixed monthly payment for services. The training was designed to facilitate problem-based learning. The author provides significant information on the development of multi-disciplinary teams, the roles and responsibilities of each member, and the team's affect on design, development, and delivery of distance training.

Part Three: Changing Attitudes and Enhancing Motivation

The final section of case studies includes four chapters, each describing distance training activities that are designed to change attitudes or enhance motivation for desired behaviors.

Attitude may be considered a personal or emotional perspective, preference, or value. Attitudes guide social and organizational interactions and affect performance. Enhancing

motivation of staff is appropriately facilitated through distance training when personnel and business perspectives are adversely affecting overall productivity and return.

The first case study presented in Part Three, "Eliciting Community Beliefs and Changing Attitudes Through Education: Interaction Distance Training at the Columbus Center," was submitted by Regina Bento and others. This case study in distance training represents a just-in-time application developed to serve the information and emotional needs of high school students and teachers, as well as a broader public, regarding the pfiesteria microorganism associated with a critical problem of fish lesions in Chesapeake Bay. The study describes distance training activities that elicit the beliefs and feelings of the participants about pfiesteria, the fish lesion problem, and the broader societal impacts and allows them to examine these feelings in a supportive environment. The latest scientific evidence is available during the distance event to provide information and answer questions. The goal is to quiet "pfiesteria hysteria" and facilitate the immediate and extended audience to make informed decisions about the use of Chesapeake Bay seafood and waters, as well as to motivate these participants to later seek, on their own, further information about the subject.

The second case study presented in Part Three, "Measuring Existing Attitudes to Assess Training Transfer: The Interactive Distance Learning Group Looks at Learning and Transfer from Satellite Training," was submitted by Joan Conway Dessinger and others. This case study is different from the one submitted by Bento and others in that Dessinger and others describe distance training that does not change attitudes but rather "measures existing attitudes" of participants toward a particular distance training event as an indicator of transfer of learning. This case evaluates self-efficacy, perception of utility, and course satisfaction to determine the effectiveness of a distance training event to facilitate learning transfer back on the job. Although this case study also measures increased understanding from newly distributed content information, as well as improved skill development, it is the measure of affective characteristics by the Interactive Distance Learning (IDL) Group that is unique to this chapter. (Note: The IDL Group, Inc. is a subsidiary of the nonprofit organization National Center for Manufacturing Sciences. Companies and agencies participating in this case study include Eastman Kodak, Ford Motor Company, General Motors, EDS, Texas Instruments, and the United States Airforce.)

The third case study presented in Part Three is "Unanticipated Attitudinal Change: The Progression Toward Self-Directed Distance Training at H.B. Zachry," submitted by Larry M. Dooley, Kim E. Dooley, and Keith Byrom. This case study is similar to the first chapter in this section by Regina Bento and others except that the significant change in attitude of Zachry company staff was unplanned. The improved attitude toward distance training was an unexpected (but welcomed) outcome of the distance training activities themselves.

The H.B. Zachry corporation originally identified its business goal to standardize training on the customs and procedures of supervisors by designing and institutionalizing a distance learning program. The intent was to provide information on company and industry regulations and guidelines, including corporate history and culture, procedures for hiring, discipline, and termination, labor law compliance and human relations, and employee benefits. And although the intended outcomes for increased knowledge and skill development occurred, the most significant, albeit unexpected, outcome was a major shift in attitude of the traditional, conservative, family-owned company toward self-directed distance learning. Classroom-based, instructor-led training appears no longer to manifest the only effective training approach for this company!

The final case study of the book was submitted by Jim Suchan and Alice Crawford and is titled "Utilizing Telelearning as a Strategic Media Choice to Enhance Executive Development and Affect Organizational Perspective: The U.S. Navy's Bureau of Medicine and Surgery." This chapter describes a distance training model that focuses on telelearning as strategic media choice, not merely a conduit that passes information from instructor to student. This distance training model is designed to guide the Navy Bureau of Medicine and Surgery Executive Management Education administrators' thinking about distance learning applications to executive development modules and to change the organizational discussion about learning, interactivity, and the capabilities of new telelearning media. The case study by Suchan and Crawford is similar to the H.B. Zachry chapter in that the authors hope to see a change in attitude about distance training as a result of participation in distance training activities themselves. Also, Suchan and Crawford identify the strategic contributions of the distance training events and discuss how this information may be used to enhance motivation of executive management toward support and institutionalization of telelearning.

Conclusion

The final chapter of the book provides a summary of best practices of distance training as represented by the case studies. A discussion of the lessons learned includes the strengths and weaknesses of distance training efforts as related to the guiding principles outlined in Chapter One.

Following the final chapter, a Glossary is included to standardize usage of distance learning terms and vocabulary relative to the case studies presented. The editors' intent is to avoid ambiguity which may result due to use of organization-specific references, as well as to clarify potential misconceptions about technologies. Online resources for additional terms and phrases in distance learning are also provided in the Glossary.

A key to implementing successful distance training events is the integration of instructional methodology, instructional materials, and the technology utilized to deliver the instruction. A consistency or complementation must exist among these components for successful distance learning to occur. The discussions of the conceptual frameworks of learning and instructional design model for developing distance training facilitate the process. Following this strategy, organizations begin to answer such questions as how to maximize utilization of technology to deliver distance training and what organizational processes and procedures may aid in institutionalizing distance training efforts.

Acknowledgments

We would like to acknowledge the reviewers of this book: Diane Gayeski, Barry Howard, Ellen D. Wagner, and Tom Clark. We greatly appreciate their time and contribution on this book.

Deborah A. Schreiber, Ed.D. Zane L. Berge, Ph.D.

Washington DC

September 1998