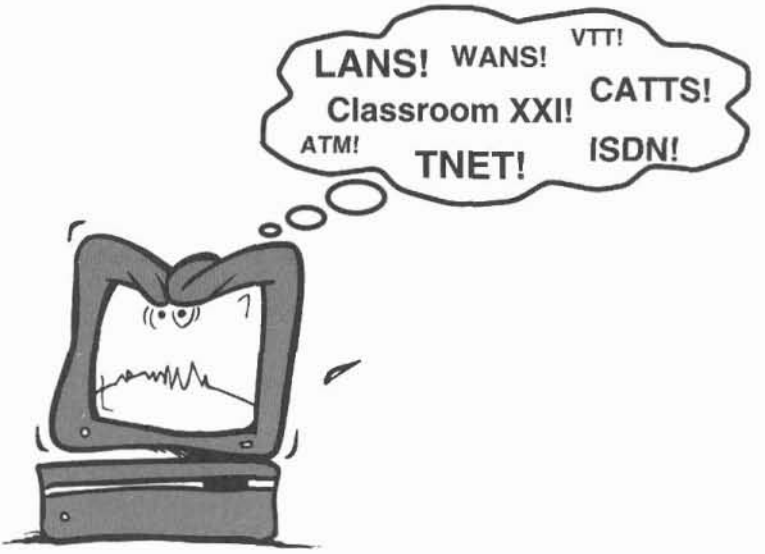


Training Technology for the Technology Impaired

By Al Waltman

LANS, CANS, ATM, WANS, CATS, CATTS, Classroom XXI, CBT, CAI, CD-ROM, Internet, Distance Learning, Intranet, ISDN, Digital Doctrine, TNET, VTT, VTC...AHHHGGG!!!!!

If you are in data overload because of all the wirehead kinds of things above, join the crowd. Digital technology is outpacing most of our abilities to understand the acronyms, much less what they mean and how they will impact our jobs, our units, and us. By the time you read this article, some of the information in it will no longer be current. Moore's Law states that computer microprocessor speed doubles every 18 months and the price remains constant. That rule has remained valid through eight or nine generations of microprocessors, and based on current press releases, it will continue to hold true. Improvements and changes in other computer hardware and software occur at about the same pace. So how does one keep up? That's our challenge.

It is not possible in a short article such as this to explain all the activities you can expect to see in the next few years in training technology development. We hope to forecast the most significant changes we expect and describe some of the technologies we will use to improve soldier and civilian training across the Engineer Regiment. Distance learning, multimedia training, and training modernization activities will be the focus.

Distance Learning

Distance learning can be defined as delivering the required training to the right student, where and when it is needed. Sounds easy, doesn't it? Let's take this apart and see what's involved.

Current guidance from TRADOC directs that every soldier be trained using a standardized program of instruction that teaches the same tasks to the same standard, no matter where the training is given. Soldiers who graduate from a resident course at Fort Leonard Wood will be trained on the same aspects of their job and to the same standard as soldiers who attend an equivalent course at a Total Army School System (TASS) Battalion. The challenge is to provide quality training to the TASS student while he or she continues to hold a full-time job.

The challenge is not new. For years large corporations have spent millions of dollars on employee education and in-house "corporate universities." Xerox, IBM, and even McDonalds have world-renowned corporate training facilities. Opportunities for normal academic studies are big business. The University of Maryland, Webster University, and Central Texas College are on many military installations worldwide, offering degree programs up to the master's level and vocational training in areas such as auto mechanics and small-engine repair.

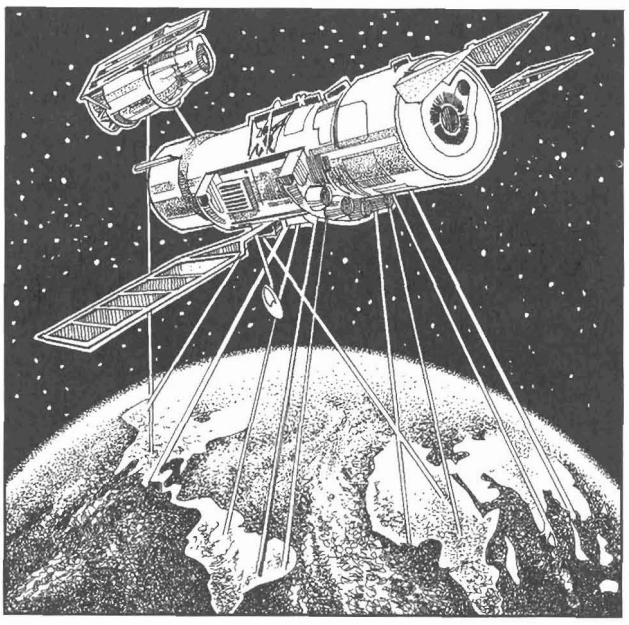
So long-distance learning isn't a new idea. It has just gone high tech. Until recently, the correspondence course was the popular, nonresident training model for the Army, and many soldiers benefited from that program. The Army correspondence course program is still viable as a paper-based system. But correspondence has become a slightly dirty word in the education and training arena, and distance learning with new technologies is gaining credibility.

The challenge that we face is to identify courses that should be trained using distance learning. The amount and kind of training appropriate for this method are determined by the specific tasks to be trained. Distance learning represents a powerful capability when applied with the proper balance of course content and delivery technologies. The Army is spending large amounts of money to convert correspondence course training support material to digital multimedia. This conversion will help ensure that the training is compatible with the needs of our more mobile and technologically aware forces.

As training materials change to digital formats, the delivery medium must change as well. The technology infrastructure the Army is putting in place is reaching a point where many soldiers and civilians can learn wherever they can plug in their computer. Currently 108 military-owned or-operated video-teletraining facilities are located across the United States and Europe. These facilities, linked together in the training network (TNET), provide two-way video and audio capability in either single-location-to-location communication or multiple-location modes. Based on a combination of terrestrial communication lines and satellites, live training can be delivered virtually anywhere a soldier or civilian is located.

The use of electronic networks will become a key element in the delivery of training. Connecting individual students to others gathered in high-technology classrooms, networks will be the means for sharing ideas among students under the tutelage of an instructor located anywhere on the network. Without an electronic backbone, accessing and sharing information will not be possible. Local area networks (LAN) provide connectivity among computers within classrooms and within buildings. Campus area networks (CAN) provide electronic connections between buildings on schools or installations. The wide area network (WAN) provides worldwide connectivity.

In each of these networks, a new technology in data communications called *asynchronous transfer mode (ATM)* allows high-speed, high-volume, two-way data, audio, and video communication connectivity. The goal is to have high-technology classrooms in place that can integrate these networks and provide students with an excellent learning environment. Called Classrooms XXI, they are designed to create a training environment that supports individual soldier learning throughout the total Army. The idea is to move instruction away from the traditional instructor-focused method to one that is student-focused. By involving students in their own training, their understanding of the subject matter is more in-depth and is retained longer.



Classrooms XXI are being built to leverage information-age technologies to gain training efficiencies while maximizing training effectiveness. Between now and 2005, about 30 high-technology Classrooms XXI will be built on Fort Leonard Wood, and several hundred will be built Armywide. Planning and construction have started, and we expect to have more than 15 of these classrooms on Fort Leonard Wood by mid-1999.

Multimedia Training

The evolving technologies of computers, communications, and digital hypermedia have provided new vistas for the design of learning environments. Multimedia presentations can be used with video, high-resolution graphics, and animation to allow students to better visualize physical and logical events, as well as relationships and parts of a system, equipment, or problem. Computer-based training (CBT) and computer-aided instruction (CAI) can be used to enhance or replace instruction with equal effectiveness when proper design considerations are included in the training-development process.

Limited multimedia development capability is in place in the Engineer School, and several products have been developed. All of the Engineer School's programs of instruction are being reviewed for potential conversion to a multimedia format. While contractors will accomplish much of the conversion, the school will maintain the capability to develop lessons or multimedia products to support contingency operations or other rapid-development needs. These products can be designed for delivery via CD-ROM or the Internet.

Training Modernization

Army training is on the edge of its most significant change since World War II. The digital age is providing trainers at all levels with tools never imagined a few years ago. Full-motion simulators of ground combat vehicles are a reality. These high-fidelity simulators are interconnected with other simulators so that soldiers and commanders can fight in a virtual environment.

Sharing instructors between service schools results in a virtual schoolhouse in TRADOC. Multimedia CBT is replacing paper-based correspondence courses. Automation tools such as the Automated Standard Army Training (ASAT) System and Computer-Assisted Training System (CATS) will provide the commander and trainer with detailed training strategies that are event-based and sequentially scheduled to build mission success. These and many other modernization actions will occur in the next few years.

The Engineer School's Director of Training has developed a Regimental Training Modernization Strategy that identifies the most significant needs of the Regiment in individual, unit, and institutional training modernization. The strategy will provide the vehicle for long-term improvements in training both at Fort Leonard Wood and in field units.

One of the first actions was to form an Integrated Concept Team (ICT) with the mission to identify the top training aids, devices, simulations, and simulators (TADSS) needed to train the regiment in maneuver support, force support, and topographic engineering. The team is responsible for developing a prioritized list of training system needs and developing the requirements documents. Only through this type of action can training be truly modernized and brought into the 21st century.

None of us can predict what type of training will be used in the future, but all indicators point toward more training at home stations and using digitized products. Individual training such as the Basic and Advanced Noncommissioned Officer Courses (BNCOC and ANCOC) will continue to have a resident component, but more of the training will be through self-study or video teletraining. Unit and crew training will also be supported by digitized training products. Large-scale, networked, simulation/simulator products will aid in home-station training. TADSS will provide the opportunity for enhanced training through the use of new digital training technology—either as a part of a Combined Arms Tactical Trainer (CATT) or something as extreme as a virtual-construction mission with networked construction equipment.

Glossary of Technospeak

ATM - *Asynchronous transfer mode.* A system of long-distance communication that features high speeds and the ability to simultaneously handle multiple data streams.

Bandwidth - The range of frequencies a circuit will carry. Often used informally to mean the amount of information a network will carry at any time.

CBT - *Computer-based training.* Computer applications that cause learning through the use of graphics, audio, video, and text-based material.

FDDI - *Fiber-distributed data interface.* A standard for a 100-Mbps (mega bites per second) optical fiber ring local area network.

HTML - *Hypertext markup language.* A programming language used by specialized software applications called browsers to create a graphical interface between the user and the World Wide Web.

ISDN - *Integrated services digital network.* A system for combining voice and data transmissions over long-distance lines.

Internet - A worldwide internetwork that interconnects thousands of public and private networks and millions of users.

Intranet - A corporate internetwork that provides the key Internet applications, especially the World Wide Web. An intranet operates within the organization for internal purposes. It can exist as an isolated, self-contained internetwork or may have links to the Internet.

LAN - *Local area network.* A small network, usually of personal computers, that serves a single department or workgroup.

Optical Fiber - A thin filament of glass or other transparent material through which a signal-encoded light beam may be transmitted by means of total internal reflection.

SONET - *Synchronous optical network.* A network transmission system devised for fiber optics.

Teleconference - A conference between persons remote from one another but linked by a telecommunications system. This system may be video, audio, data, or a combination of the three.

TCP/IP - *Transmission-control protocol/Internet protocol.* A widely used pair of protocols used to link networks.

TNET - *Training network.* A two-way audio, two-way video teleconferencing system used by the Army to conduct distance learning.

Twisted Pair - A type of network wiring that uses pairs of twisted wire, similar to telephone wire.

WAN - *Wide area network.* A network that uses long-distance communications methods to operate over large areas, usually connecting parts of a single organization or interest group.

WWW - *World Wide Web.* A networked, graphically oriented hypermedia system. Information is stored on servers, exchanged between servers and browsers, and displayed on browsers in the form of pages of text and images.

The future in training is exciting. At the current rate of growth and technology improvements, can the holodeck be far behind? On the other hand, the leadership role of the chain of command will never be supplanted by a machine. In every case, a human must judge when performance is good enough and when remedial training is appropriate. Only through the judicious use of technology as an aid to training can unit readiness be sustained and improved.

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