



**STRATEGY
RESEARCH
PROJECT**

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DISTANCE LEARNING RECEIVES HIGH MARKS

BY

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USAWC STRATEGY RESEARCH PROJECT

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ABSTRACT

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Distance learning opportunities in training and education can prepare soldiers to meet the challenges of the future. This paper examines the quality and effectiveness of distance learning through the review of contemporary research and documentation. This paper also reviews the history and explores the future of distance learning. Since the 1866 enactment of the statute providing for the establishment of post schools in the Army, the objective of developing higher quality soldiers remains as significant today as it did almost a century and a half ago. The requirement for technical and advanced skills will only increase as the Army transforms to the Objective Force to respond more effectively to the National Military Strategy. In the 2000 Annual Report to the President and Congress, the Secretary of Defense indicated that increasing educational opportunities, such as distance learning, was the cornerstone of the Department's quality of life program.

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PREFACE

Distance learning is the future...and the future is now. Many commercial businesses and government agencies are examining the potential of this educational and training medium.

Research indicates that there are more expedient and interactive ways to provide distance learning than through traditional correspondence courses. The Department of Defense has developed the Advanced Distributed Learning program that includes many initiatives to integrate the efforts of academia, the business sector and government agencies. The Army developed and is implementing The Army Distance Learning Program, as well as implementing a test program of providing computers to soldiers at four installations to advance their postsecondary civilian education.

The proliferation of technological advancements and emerging guidelines for constructing a quality distance learning curriculum are creating a paradigm shift in training and education. Conversely, changing the mindset of those who feel that distance learning is not equivalent to traditional classroom instruction remains a challenge. Many employers may not perceive the same quality of education from a virtual university as compared to a traditional school. However, with the rising costs of resident education and changing employment trends in the job market, distance learning certainly meets the needs of a larger audience of students. This is even more significant for military personnel who have to be available to deploy anytime and anywhere, and therefore need to align training and educational opportunities that can be provided anytime and anywhere.

Distance learning is an adjunct to traditional educational delivery methods. It complements and expands educational opportunities. As such, distance learning has a viable role in assisting the military achieve its educational and training objectives regardless of the setting or situation.

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DISTANCE LEARNING RECEIVES HIGH MARKS

Distance learning is a viable educational resource in providing soldiers with requisite technical and advanced skills as the Army transforms to the Objective Force to meet the evolving requirements of the National Military Strategy. The Army has embraced the benefits that the information superhighway offers by capitalizing on existing technology. The systematic change has resulted in a proliferation of choices. Never before have there been so many alternatives available to train and educate soldiers. As a skill-based Army, soldiers are required to pass a myriad of training and education requirements to advance to the next higher career opportunity and grade level. The commercial sector has investigated educational equivalency concerns created by the overwhelming popularity of distance learning opportunities. This paper examines the quality and effectiveness of distance learning as an educational and training alternative for the military by reviewing contemporary research and documentation.

BACKGROUND

The Army identified and acted upon the need for higher quality soldiers almost a century and a half ago with the 1866 enactment of the statute providing for the establishment of post schools in the Army. One of the objectives was "to educate the soldier, so as to produce efficient noncommissioned officers, as well as trained and intelligent privates."¹

The United States Army continues to recognize the significance of this goal. Technological advancements bring warfighting doctrine into a new century to meet new challenges. Training is the foundation of the Army today, and it is training that will shape the Army of the future. The Army developed six imperatives to form the architecture that will shape the Army of the future. These imperatives include an effective warfighting doctrine; a mix of

armored, light and special operations forces; continuous modernization; the development of competent, confident leaders; a commitment to a quality force; and tough, demanding, realistic training, relentlessly executed to uncompromising standards.²

The January 14, 1999, final report of the congressionally established Commission on Servicemembers and Veterans Transition Assistance summarizes services and benefits within the Armed Forces. This Commission believed that education is the most valuable benefit the Nation can offer the men and women whose military service preserves liberty.³ The changing international and sociopolitical environment has resulted in a draw down of the Department of Defense. The number of uniformed military personnel was reduced from 2.174 million in fiscal year 1987 to 1.422 million in fiscal year 1998.⁴ The Commission found that, although reduced in size, the Armed Forces continued a high operating tempo. Unfortunately, low morale and a thriving economy are affecting the recruiting and retention requirements of the Services. "The propensity of youth to enlist in the Army has dropped 31 percent even after the success of Desert Storm."⁵ A Youth Attitude Tracking Study, an annual Department of Defense survey of 10,000 men and women aged 16-24, measured the propensity for military service in 1995 and found that young Americans place a high priority on attaining a college education and are inclined to move directly from high school to postsecondary education.⁶

The pace and complexity of deployments contributed to the changing force structure with greater demands placed on the military than ever before. "Since 1989, the average frequency of Army contingency deployments has increased from one every four years to one every fourteen weeks."⁷ Between 1960 and 1991, the Army conducted ten operations outside of normal training and alliance commitments, but between 1992 and 1998, there were twenty-six operations. Fortunately, technology may offer a solution to these challenges. In the *2000 Annual Report to the President and Congress*, the Secretary of Defense indicated that

increasing educational opportunities, such as distance learning, was the cornerstone of the Department's quality of life program.⁸

DEFINITIONS - A DISCUSSION OF EDUCATIONAL TECHNOLOGY

Technological advances have created a paradigm shift in how educational technology is defined and employed. There is no consensus about terminology, i.e., whether to call it distance education, distance learning, learning technology, educational technology, or technology-based learning; however, many definitions are common in that they incorporate the use of technology.

Most sources consider distance learning and distance education to be the same with the primary difference in emphasis. Distance education appears to place emphasis on the teacher while distance learning focuses more on the student. Moreover, the emphasis of distance education and learning is that the adult learner is self-directed and self-sufficient. Distance learning is the emerging term used more frequently today in place of distance education. The following definitions from several prominent organizations illustrate the differences and commonality in how distance learning is described.

The United States Congress Office of Technology Assessment defined distance learning as the linking of a teacher and students in several geographic locations via technology that allows for interaction.⁹

The American Council on Education (ACE) defines distance learning as "a system and a process that connects learners with distributed learning resources."¹⁰ The ACE characterizes distance learning as a "separation of place and/or time between instructor and learner, among learners, and/or between learners and learning resources" and "interaction between the learner and the instructor, among learners and/or between learners and learning resources conducted through one or more media; use of electronic media is not necessarily required."¹¹

The United States Distance Learning Association, a nonprofit association founded in 1988 to promote the development and application of distance learning in education and training, defines distance learning as the acquisition of knowledge and skills through mediated information and instruction, encompassing all technologies and supporting the pursuit of lifelong learning.¹²

The April 30, 1999, Department of Defense Strategic Plan for Advanced Distributed Learning states that distributed (also referred to as distance) learning takes place without the physical presence of an instructor and is enhanced with technology. "It may draw upon resources which are physically distant from the location where learning is taking place and may include the use of one or more of the following media – correspondence course materials, audio/videotapes, CD ROMs, audio/videoteletraining, interactive television, and video conferencing – to provide right-time, right-place learning."¹³ The strategic plan explains that advanced distributed learning "leverages the full power of computer, information, and communication technologies through the use of common standards in order to provide learning that can be tailored to individual needs and delivered anytime and anywhere. Advanced distributed learning also includes establishing an interoperable 'computer-managed instruction' environment that supports the needs of developers, learners, instructors, administrators, managers, and family."¹⁴

The Army defines distance learning as "the delivery of standardized individual, collective, and self-development training to soldiers, Department of the Army civilian employees, and units at the right place and time using training-effective designs and provided through the use of multiple means and technology."¹⁵

The ACE defines the term learner as an individual or group that seeks a learning experience and the provider as the organization that creates and facilitates the learning opportunity and monitors the quality of the learning experience.¹⁶

Distance education is not distance learning in the purist form of the definition, although the two phrases are applied interchangeably. Distance education and distance learning focus on the use of technology to support innovations in teaching and learning. Common elements of the definitions are that teachers and students are separated physically, either by time or by space, and some type of media is used for learning.

TYPES OF DISTANCE LEARNING MEDIA

Different types of media deliver information in distance learning and the medium is part of the distance education program. There are a significant number of technologies available for the delivery of distance learning courses and selecting the medium is an important part of the efficiency and effectiveness of the course. One-way and two-way communications are terms given to media used in distance learning. One-way communication mediums encourage passive viewing rather than active participation and may include broadcast and videotapes. Two-way communication may include teleconferencing and satellite broadcast. Synchronous communication is a type of two-way communication that occurs with virtually no time delay allowing participants to respond in real-time. Asynchronous refers to a type of two-way communication that occurs with a time delay, allowing participants to respond at their own convenience, such as a bulletin board.

Print was the first technology used in distance learning and is the most common and probably the least expensive to develop and distribute. Correspondence courses are an example of print materials since they include textbooks, manuals and study guides. Print media is asynchronous because it is a communication characterized by time-independence in that the sender and receiver do not communicate at the same time.

Several types of media encompass audio and visual-based distance learning. Audio and videocassettes are used in video-based instruction. College-by-cassette programs improve access to educational opportunities by removing the barriers of time and geographical location.

Radio and television broadcasting through cable and satellite are convenient and cost-effective and have credibility since they can present the views of experts.

Teleconferencing is the interaction of students and instructors via some form of telecommunications technology, such as audio, audiographics, video, and the computer. Audioconferencing employs the use of a telephone, whether it is a simple telephone call between a teacher and student or regularly scheduled multi-point sessions between a teacher and students at many locations. While there is potential for audioconferencing via the World Wide Web, bandwidth technology remains a limitation. Videoconferencing can be accomplished by satellite, television and telephone and allows students and instructors to interact face-to-face, whereas computer conferencing allows students and instructors to interact via a computer network.

Computer-based instruction refers to instructional programs that an individual student uses on a personal computer. Web-based conferencing is a new tool that replaces the long-distance telephone calls and charges of audioconferencing; however, the educational applications are limited by the current bandwidth of the World Wide Web. Web-based instruction is a promising medium for distance learning with an increasing number of resources available online and an increasing number of people who have access to the Internet. The World Wide Web is more than just a medium for delivering predetermined content, it is a tool for learning since the web can be used as a vehicle to search for and retrieve information.

Currently, the most popular distance learning media is computer-based communication including electronic mail, bulletin board systems and the Internet followed by telephone-based audioconferencing and videoconferencing.¹⁷

The following chart summarizes the generations of distance education technologies.¹⁸

Table 1. Generations of Distance Education Technologies

	Primary Feature	Timeframe	Media	Communication Features
First Generation	Predominantly one technology	1850s to 1960	<ul style="list-style-type: none"> • Print (1890+) • Radio (1930s) • Television (1950s and 1960s) 	<ul style="list-style-type: none"> • Primarily one-way communication • Interaction between student and faculty by phone and mail • Occasional onsite facilitators
Second Generation	Multiple technologies without computers	1960 to 1985	<ul style="list-style-type: none"> • Audiocassettes • Videocassettes • Television • Fax • Print 	<ul style="list-style-type: none"> • Primarily one-way communication • Interaction between faculty and student by phone, fax and mail • Occasional face-to-face meetings
Third Generation	Multiple technologies including computers and computer networking	1985 to 1995	<ul style="list-style-type: none"> • Electronic mail, chat sessions and bulletin boards using computers • Computer programs on disks, CDs and Internet • Audioconferencing • Seminar/large room videoconferencing via satellite, cable and phone • Fax • Print 	<ul style="list-style-type: none"> • Broadband communications from faculty to student via print, computer and videoconferencing • Two-way interactive capabilities for asynchronous and synchronous communication • Internet for text, graphics and video snippets
Fourth Generation	Multiple technologies including the beginning of high bandwidth computer technologies	1995 to 2005 (est)	<ul style="list-style-type: none"> • Electronic mail, chat sessions and bulletin boards using computers plus high bandwidth transmissions • Computer programs on disk, CDs and Internet • Audioconferencing • Desktop audioconferencing via satellite, cable and phone technologies • Fax • Print 	<ul style="list-style-type: none"> • Two-way interactive real-time audio and video • Asynchronous and synchronous communications • Full 30-frame-per-second digital video transmission with databases available via the Internet and World Wide Web • Lengthy digital video programming

The key differentiating characteristics in the generations of technology is the number of individuals that can be simultaneously supported in communication (i.e., one-way, two-way, or multiple-way communication), the amount and types of information (i.e., voice, video, data) that can be communicated (i.e., broadband or narrow band), and the speed at which that information is communicated.¹⁹

Print media is easily administered; however, there can be a lag time in mailing materials and material can become outdated since it is usually created and warehoused in large volumes. Audio-video and technology-based media also have inherent advantages and disadvantages. For example, the telephone system may be easy to use, but can have signal problems and be costly for long-distance calls. The major drawback of radio and television is the lack of two-way communication between the teacher and student. Web-based learning allows material to be packaged and distributed more efficiently to a larger audience using asynchronous communication; however, bandwidth limitations, computer malfunctions and server access can impose constraints. Regardless of which media is selected in distance learning, technology should not be a limitation of successful delivery of content.

HISTORY

Distance learning initially was delivered in the form of correspondence study. There is an excerpt from the March 20, 1728, Boston Gazette that advertises for lessons in shorthand.²⁰ European countries also offered courses in shorthand and languages as early as the 1840s.²¹

The University of Chicago offered extension courses by mail in 1892 and Baltimore's Calvert School was the first elementary school to offer correspondence study in the early 1900s. By 1920, the United States Marine Corps began enrolling marines in correspondence courses through the Marine Corps Institute, known as the Vocational School Detachment. The Marine Corps Institute continues to thrive with approximately 150 courses at both vocational and baccalaureate levels.²²

The development of media technology in radio and television during the next forty years provided new opportunities for educators to deliver educational programming. By 1969, Britain's Open University was established as a degree-granting distance learning institution with 19,581 students starting in the program in 1971.²³

In 1981, Public Broadcasting Station Adult Learning Service coordinated with 190 public television stations and some 2,000 colleges to deliver telecourses for college credit.²⁴

Just as technology advances, so does the means to provide education and training at a distance. A December 1999 report from the National Center for Education Statistics stated that the Internet was the predominant medium delivering distance education using an asynchronous style of instruction.²⁵

Distance learning is not a new training method in the Army. For example, in 1907, the Command and General Staff College began mailing course material to Active and Reserve Component soldiers who could not attend the resident course. The mail-order curriculum evolved into a full-fledged correspondence course by the 1920s. Another outreach program includes publications, such as *Military Review* founded in 1922, which provide professional development articles.²⁶

A PARADIGM SHIFT

Technological advances have created a paradigm shift in education. Libraries would have replaced schools if education were as simple as reading; however, the learning process involves mediated information and instruction. Higher education is delivered through three means. The first way is to have students travel to the source or origin of the courses, such as the university or resident institution to attend full-time. The second way is for students to commute from local areas to a satellite campus or institution to participate in coursework on a part-time basis. Distance learning has become the third way of delivering higher education.

Distance learning is becoming commonplace as exemplified by the growing number of universities and organizations responding to students who want and need nontraditional and flexible academic curriculums. Distance learning and virtual education are better vehicles for transmitting information with the computer screen delivering a prepackaged syllabus to thousands at a time.²⁷ This proliferation of technology has resulted in new opportunities for distributing knowledge between a teacher and students in a variety of geographic locations, thus eliminating walls and boundaries. As this growth pattern continues, there must be an examination of the issues evolving from this paradigm shift.

Approximately 52 million homes, half of all United States households, have at least one personal computer. Households with annual incomes of less than \$30,000 make up a quarter of the personal computer-equipped households, yet they account for a third of all new personal computer purchases in 1998.²⁸

In 1997-1998, approximately 44 percent of all higher education institutions offered some distance-based courses, an increase of one third since 1994-1995.²⁹ One in three colleges in the United States now offers some sort of accredited degree online.³⁰ A United States Department of Education National Center for Education Statistics study found that 1.6 million students were enrolled in distance education courses in 1997-1998.³¹ Most of the growth between 1994-1995 and 1997-1998 in higher education institutions can be attributed to the use of asynchronous computer-based technology, whereas the use of video-based technology did not grow.³²

A series of studies by the National Telecommunications and Information Administration reported that American's access to information tools, such as the Internet and computers has generally increased with disparities in access greater between white and Hispanic or black households. The Clinton Administration established DigitalDivide.gov as a clearinghouse for

information about efforts to provide all Americans with access to the Internet and other information technologies.³³

Studies indicate that the use of distance learning technology-based instruction reduces the cost of instruction by 30-60 percent, reduces time of instruction by 20-40 percent, increases effectiveness of instruction by 30 percent, increases student knowledge and performance by 10-30 percent, and improves organization efficiency and productivity. It also improves costs and efficiencies by distributing instructional media inexpensively to geographically remote locations.³⁴

Rick Armbruster, director of product development for Eduventures.com, a Boston-based company that conducts research and tracks investment in the education industry, does not feel that web-based learning is going to replace the traditional campus and classroom environment. "Instead, Web-based learning will enhance it and provide access to courses for a greater audience of students."³⁵ Course content can be packaged and distributed more efficiently to a wider audience using the Internet. Furthermore, education can be tailored to meet the needs of individual learners.³⁶

THERE IS NO TURNING BACK

PRESIDENTIAL AND CONGRESSIONAL EMPHASIS

On January 30, 1998, the President issued a memorandum to the heads of executive departments and agencies directing the investigation of emerging technologies to improve the cost-effectiveness and the quality of Federal training.³⁷

On October 7, 1998, Public Law 105-244 extended the programs offered under the Higher Education Act of 1965. The Administration sought to broaden opportunities for distance learners by expanding eligibility for student aid and encouraging innovative uses of technology by institutions, while ensuring the integrity of these courses and programs. It contained three

provisions related to distance education: the Distance Education Demonstration Program, Learning Anytime Anywhere Partnerships, and the Web-Based Education Commission.

The Distance Education Demonstration Program allowed for pilot projects that are strictly monitored by the United States Department of Education to test the quality and viability of expanded distance education programs currently restricted under Title IV. The program was designed to increase access to higher education, determine the most effective methods in delivering quality distance education, identify statutory and regulatory requirements to enable greater access, and to define the appropriate level of Federal assistance for students enrolled in distance education.

The Learning Anytime Anywhere Partnerships enhanced the delivery, quality and accountability of postsecondary education and career-oriented lifelong learning through technology. It authorized the Secretary of Education to make grants to or enter into contracts or cooperative agreements with eligible partnerships to fund the development and assessment of model distance learning programs and innovative software, the development of methodologies for identification and measurement of skill competencies, and the development of other support activities.

The third legislative provision provided for the creation of a Web-Based Education Commission, which President Clinton appointed in November 1999. This Commission was established to develop a policy roadmap that will help education and policy officials at the local, state, and national levels address the digital age challenges of the Internet and other emerging technologies.³⁸ The Commission's mission was to address measures for all learners to have full and equal access to the capabilities of the World Wide Web, and to ensure that online content and learning strategies are affordable and meet the highest standards of educational quality.³⁹

During the first Commission hearing on February 2, 2000, Secretary of Education Richard W. Riley stressed that technology is not a substitute for solid teaching, but rather a tool for helping teachers teach and for helping students learn at the highest levels. He suggested that one of the thorniest problems of the Web is ensuring quality content.⁴⁰ Secretary Riley addressed quality concerns stating, "The issue of quality also involves preparation of a quality teaching force that understands and can teach these issues; the quality of the curriculum that matches the high standards of learning that so many states are developing; and the quality of delivery of services in the world of higher education."⁴¹

Secretary of the Army Louis Caldera provided testimony at the Commission's fourth hearing on July 20, 2000. Secretary Caldera discussed the Army University Access Online distance learning initiative, which he introduced on July 10, 2000. This distance learning initiative will prepare Information Age-savvy soldiers for the digital challenges of the twenty-first century. The Commission commended the Army on this initiative, which would give student-soldiers an opportunity to participate in web-based learning.⁴²

In the December 2000 final report to the President and Congress, the Web-Based Education Commission asked the Congress and Administration to embrace an "e-learning" agenda as a centerpiece of the Nation's education policy and seek out opportunities to modify or change public law to support technology.⁴³ Among the areas suggested for consideration:⁴⁴

- Federal and state governments should adopt a policy framework that will accelerate the broadband deployment in education.
- Policymakers should partner with educational institutions and the private sector to support continuous growth through the use of technology.
- Public and private sectors should join forces in developing high quality content and applications for online learning. Congress should articulate development priorities

and Federal agencies should adopt technical standards for design of online courses and frameworks for developing good online courses and courseware.

Public Law 105-261, the Strom Thurmond National Defense Authorization Act for Fiscal Year 1999, passed on October 17, 1998, required the Secretary of Defense to develop a strategic plan for guiding and expanding distance learning initiatives within the Department of Defense and provide it to Congress by March 1, 1999. Public Law 105-262, the Department of Defense Appropriations Act for Fiscal Year 1999 directed the development of a corresponding implementation plan by July 30, 1999.

On January 12, 1999, the President issued Executive Order 13111 entitled *Using Technology to Improve Training Opportunities for Federal Government Employees*. It tasked the Department of Defense to work with businesses and universities to develop standards for training software and associated services, and to provide guidance to Defense agencies on how to use these standards for large-scale development and implementation of efficient and effective distributed learning technologies.

DEPARTMENT OF DEFENSE DISTRIBUTED LEARNING

In November 1997, the Department of Defense and the White House Office of Science and Technology Policy launched the Advanced Distributed Learning initiative. The purpose was to ensure access to high-quality education and training materials that can be tailored to individual learner needs and made available whenever and wherever required. This initiative was designed to accelerate large-scale development of dynamic and cost-effective learning software in order to meet the education and training needs of the military and the Nation's work force in the twenty-first century.⁴⁵

A collaborative partner in this initiative is the Instructional Management Systems Project, a consortium of Government organizations, over 1,600 colleges and universities and 150 corporations. This initiative is a means for formulating voluntary guidelines that will meet

common needs of making learning software accessible, interoperable, durable, reusable, adaptable, and affordable.⁴⁶

Joint Vision 2010 defines how the force will need to leverage technological opportunities to achieve new levels of effectiveness in joint warfighting.⁴⁷ While yesterday's right-time, right-place learning paradigm met yesterday's military requirements; it cannot meet future requirements based on more demanding deployment criteria. "Providing anytime-anywhere instruction is a key to maintaining military readiness in the information age and one of our foremost priorities."⁴⁸

To meet the training and readiness requirements of the future, the Secretary of Defense provided the following vision, "to ensure that DoD personnel have access to the highest quality education and training that can be tailored to their needs and delivered cost effectively, anytime, and anywhere."⁴⁹ The purpose is not to replace the entire classroom model of training and education, but rather to provide for the distribution of as much learning as possible while maintaining the Service-directed standards for quantity and quality of instruction.

In response to the Strom Thurmond National Defense Authorization Act for Fiscal Year 1999 and the Department of Defense Appropriations Act for Fiscal Year 1999, the Secretary of Defense provided a strategic plan to Congress on April 30, 1999, and the implementation plan on May 19, 2000.

The strategy is to pursue emerging network-based technologies, create common standards that will enable reuse and interoperability of learning content and lower development costs, promote widespread collaboration that can satisfy common needs, enhance the commercial-off-the-shelf product development cycle, and establish a coordinated implementation process. "It is designed to deliver efficient and effective high-quality learning continuously to Department of Defense personnel anytime-anywhere."⁵⁰ The end state products will be characterized by accessibility from any location; interoperability between all

advanced distributed learning instructional platforms, media and tools; durability to withstand technology changes; reusability between applications, platforms, and tools; and cost-effectiveness.⁵¹

The strategic plan identified five elements from a policy perspective needed to develop an advanced distributed learning system. They include: common industry standards; interoperable tools and content; a robust and dynamic network infrastructure for distribution; supporting resources; and cultural change at all levels of command, recognizing that learning is an official requirement of the duty day.⁵²

The implementation plan documents a variety of actions and initiatives to include.⁵³

- Establishing the Education and Training Steering Committee.
- Conducting a comprehensive review of distance learning programs.
- Chartering a Reserve Component Distributed Learning Program Integrated Process Team to assess legal and departmental policy impediments to implementing distance learning practices within the Reserve Components.
- Releasing the Sharable Courseware Object Reference Model (SCORM) for public testing, evaluation and comment. This specification for instructional software will promote interoperability and reuse across the Department, the Federal Government, academia, and the private sector.
- Establishing an advanced distributed learning co-laboratory to foster partnerships, optimize resource sharing and for large-scale collaboration.
- Adding two more advanced distributed learning co-laboratories. The lab in Orlando, Florida was established to promote collaboration and rapid development of prototypes and system acquisitions. The second lab was established in partnership with the University of Wisconsin and the Wisconsin Technical College System to

promote collaborative development, demonstration and evaluation of next generation learning technologies.

- Issuing Defense Planning Guidance to develop and maintain strategic training plans that guide Department of Defense training programs.
- Defining an advanced distributed science and technology program. The Deputy Under Secretary of Defense for Science and Technology examined key research areas to accelerate the advanced distributed learning capability and to develop a research agenda to produce that capability by the year 2012. The analysis identified four important research areas: intelligent computer-aided instruction, authoring tools, distributed simulations, and dynamic learning management.

The implementation plan addressed operational requirements and resources. The implementation plan also discussed how the Services are addressing the advanced distributed learning requirements.

ARMY DISTANCE LEARNING

Significant force and resource reductions following the Cold War and Persian Gulf conflict precipitated a reevaluation of the Army's training management systems. Concurrently, the Army was supporting deployments world wide with an increasing reliance on the Reserve Components. Resulting observations identified shortcomings in unit and soldier readiness. This combination of events highlighted the need for the Army to adjust its training system.

There are three components of the Army's training system: training in schools, training in units, and training support. These components address unit and individual training strategies. There is a third strategy of self-development. Self-development is the soldier's responsibility for personal performance improvement or to prepare for promotion.

To meet the training challenges, the Army is implementing a distance learning system consisting of a network of information architectures and linkages to support all audiences-

individuals, schools and units. The architecture of this network will serve as the conduit through which soldiers, leaders and units receive information and courseware to meet specific training needs. Distance learning will not fundamentally change performance standards, but instead enhance the way the Army trains by using current and emerging technologies for delivery of training to the soldier. Technology takes the classroom to the unit, and the unit to the classroom, providing training in a world wide virtual environment.⁵⁴

The Army has four primary initiatives: the Distance Learning Program, Classroom XXI, the Army Doctrine and Training Digital Library, and Army University Access Online.

In April 1996, the Army published the Army Distance Learning Plan. The objective of the plan was to increase and sustain force and unit readiness. It supported standardized training provided through the Total Army School System within the Active and Reserve Components and was accomplished through a broad range of training options for unit operational needs and for individual soldiers.⁵⁵ In 1999, the Army examined its Distance Learning Program for ways to improve training, enhance readiness, and support Army transformation by exploiting current and emerging distance learning technologies for the development and delivery of training and education materials. The Army Distance Learning Program, in collaboration with the National Guard Bureau's Distributive Training Technology Project and the United States Army Reserve's Reserve Education and Learning Program, delivers standardized individual, collective, and self-development training and educational opportunities to soldiers and civilians anytime and anywhere using multiple means and technologies.⁵⁶

The second initiative, Classroom XXI focuses on leveraging technology to use information in a variety of ways to increase the Army's warfighting capability. The Army Doctrine and Training Digital Library, the information foundation for Classroom XXI, provides an interactive library for trainers, training and combat developers, resource managers, and Active and Reserve Component soldiers world wide.

On July 10, 2000, Secretary of the Army Louis Caldera introduced a distance learning initiative called Army University Access Online. One reason for the initiative was to prepare Information Age-savvy soldiers for the digital challenges of the twenty-first century. Another reason was to offer a recruiting incentive since the propensity is for young adults to go to college directly after completing high school. Online education provides soldiers with an opportunity to serve the Nation without compromising their personal educational goals.⁵⁷ On December 14, 2000, Secretary Caldera announced the award of the \$453 million contract to PricewaterhouseCoopers to provide distance education for an estimated 80,000 soldiers over the next five years.⁵⁸

DISTANCE LEARNING VERSUS CLASSROOM LEARNING

The paradigm debate also focuses on the qualitative versus quantitative issue. Skeptics of distance learning were concerned about the potential of inferior quality education offered at a distance. In assessing quality, distance learning must still be concerned with legitimacy and accountability, hence it is important to distinguish between quality assessment and quality assurance. Quality assessment systems refer to those tools or mechanisms that assess the program outcomes of good teaching. Quality assurance systems are concerned with creating and maintaining conditions by which the student can achieve the desired outcome.⁵⁹ The quality of a distance learning program should be evaluated in terms of its ability to affect knowledge, skills and dispositions.⁶⁰ Dispositions refer to a commitment to providing the best possible instruction to students, a sense of caring, and a sense of responsibility or stewardship towards the school.

QUALITY ASSESSMENT

Is technology-assisted distance learning as effective as traditional face-to-face classroom instruction? Thomas L. Russell, author of the *no significant difference phenomenon*,

concluded that there is no difference in the effectiveness of the two mediums. Mr. Russell, director emeritus of instructional telecommunications at North Carolina State University, hoped to find scientific backing indicating that technology improved instruction. "A startling finding was that there were/are an enormous number of studies—by far the vast majority of comparative ones—that showed no significant differences."⁶¹ He compiled a summary of 355 research reports, summaries and papers written between the years 1928 to 1998. These no significant difference studies provide evidence that technology does not denigrate instruction. Some educators complain that not enough work is completed to assess the quality of distance learning. Although Mr. Russell disagrees, he suggests that more research is needed in areas such as determining what kinds of students are best suited for virtual education.⁶²

A similar review of distance education studies released by The Institute for Higher Education Policy, commissioned on behalf of the American Federation of Teachers and the National Education Association, suggests that existing research leaves too many questions unanswered or inconclusive. The 1999 report entitled *What's the Difference?* examined the written material published during the 1990s. The report identified important shortcomings of the original research and other literature on the effectiveness of distance learning. For example, the research studies used in the *no significant difference phenomenon* revealed methodological flaws in the research design thus questioning its results.⁶³ The report suggested a more cautious view in determining the effectiveness of distance learning.

The report provided three broad implications on the proliferation of distance learning. The first is access to college as it relates to the efficacy of computer-mediated learning, such as exploring the quality of the access, the skills of the student using the technology, and participation in asynchronous communication. The second concern is that technology cannot replace the human factor in higher education. Third, although much of the research conducted has been to assess how technology affects student learning, many of the results seem to

indicate that technology is not nearly as important as learner characteristics, student motivation and the instructor.⁶⁴ "The key question that needs to be asked is: What is the best way to teach students?"⁶⁵ The report suggests research should focus on the design of instruction itself since that is the critical factor in determining student achievement.

While the report entitled *What's the Difference?* questions the validity of the research in the *no significant difference phenomenon*, it is important to note that other research sources have criticized *What's the Difference?* for sloppy and contradictory analysis.⁶⁶

QUALITY ASSURANCE

What are the characteristics of an effective distance teaching-distance learning program? Good distance teaching practices are fundamentally the same as good traditional teaching practices. Instructional models are based on the way in which information is communicated to a student, and the manner in which the student learns the material and constructs new knowledge from the information presented.

COGNITIVE CONSIDERATIONS OF THE LEARNER

People exhibit significant individual differences in the cognitive processing that they adopt in problem solving and other similar decision making activities. Cognitive learning styles of an individual include the predispositions of perceiving, remembering, organizing, processing, thinking, and problem solving.⁶⁷

There are six characteristics to consider in applying the cognitive learning styles to educational technology: the mode of delivery and presentation rate; the order of presentation, pace of instruction, and selection of learning activities; monitoring of learning performance, storing responses, and conducting assessments; provision for simulations, which supply learning experiences; formation of a collaborative learning group by linking the learner to the instructor and to other students for support; and access to learning resources. As such, responsive teaching styles are imperative by designers and educators of distance learning

courses.⁶⁸ The instructional development process for distance learning should consist of the customary stages of design, development, evaluation, and revision.⁶⁹ Design and delivery considerations include:⁷⁰

- Analyzing the cognitive characteristics of students through assessing the audience and terminal objectives and matching the cognitive styles to the instructional content.
- Maintaining supportive online assistance.
- Adapting instruction to the various cognitive styles of students by matching the instructional materials to the teaching style.
- Assessing what the students learned in the distance learning class in the areas of knowledge, comprehension, application, analysis, synthesis, and evaluation that includes timely feedback from the instructor.

Revision of the distance learning program should be based on feedback from instructors, content specialists, and learners; and provisions should be made to update courses to keep the subject matter current and relevant.⁷¹

Understanding cognitive abilities or the style of the learner is critical in the development of a quality distance learning program. Most distance learning students in postsecondary education are adults and tend to be more intrinsically motivated than younger students. However, some distance learners do not achieve success because of the individual's preferred learning style or due to the lack of an effective learning strategy.⁷²

PSYCHOLOGICAL CONSIDERATIONS OF THE LEARNER

One key psychological factor is the organization of learning. In a traditional classroom environment, learning occurs at a scheduled time, in a group of a certain size, for a set number of hours, in a certain building, with certain subjects or material—all which provide a degree of rigidity in teaching and learning activities. In a distance learning environment, many of these aspects are individualized, providing greater flexibility. Students engage in learning activities at

their convenience, for the most part, and they can go over materials repeatedly until they understand the subject matter rather than going at the pace of the face-to-face teacher and classmates. These processes of activation create a psychodynamic of distance learning.⁷³

Motivation is another key psychological element that refers to factors regulating an individual's readiness or commitment to expending energy on a particular task at a particular time. In the traditional classroom setting, it is natural to engage in learning activities. Conversely, distance learning is usually in a different physical environment such as home, where television or children playing may be a distraction, and where there is a lower degree of social motivation. However, the isolated environment can have a positive result since the student can learn without fear of being embarrassed in a classroom. Hence, intrinsic motivation is imperative for distance learners to achieve successful results.⁷⁴

Another consideration is the learning process. The stimulus-response learning of the classroom environment in which a teacher solicits class feedback has less impact in distance learning where there is a delay in responses and immediate class participation is absent. Distance learning occurs by indirect contact rather than direct contact in the classroom; hence, communication processes are dependent on impersonal and structured communication.⁷⁵ An important variable in learning effectiveness is the preference of the student for a particular mode of learning, such as cooperative, competitive or individualized, which may be why many instructors incorporate cooperative learning and interactivity within groups of students between sites.⁷⁶

The materials used in distance education can provide the program's greatest strengths and weaknesses. The materials should be thought-out carefully to ensure the content is presented in ways that make it learnable for students of widely differing ability, background and knowledge, and previous experience.⁷⁷

Students value timely feedback on course work and are more motivated if they are in frequent or more structured contact with their instructor.⁷⁸ The effectiveness of the learning process and the decision to continue to engage in distance learning is determined by the information students receive about their efforts. This can be in the form of feedback or evaluations (i.e., grades). The feedback loop integrates the whole process of motivation, communication, attitudes, and self-image. In the face-to-face classroom, verbal and nonverbal feedback can convey that information. In the distance learning environment, feedback is largely impersonal, formal and usually task-oriented. This would suggest that the value of the feedback is most dependent on the distance learner's maturity and intrinsic motivation. However, the remoteness of the distance learner provides an opportunity for greater self-evaluation.

BENCHMARKS FOR SUCCESS

The rapid growth of technology-based distance learning in higher education has prompted many organizations and institutions to develop principles or guidelines to ensure the integrity and quality of distance learning across the broadest spectrum to include course development, learning resources, infrastructure, and rights on intellectual property. As educators look forward, new models of delivery must be accompanied by enhanced assessments that look beyond the traditional classroom methods. "If distance learning is to continue to expand into the mainstream of higher education, criteria must be established for the innovative learning methodologies appearing on the horizon."⁷⁹

United States Secretary of Education Richard W. Riley addressed quality concerns in remarks provided to the February 2, 2000, Web-Based Education Commission hearing suggesting that the issue of quality also involves preparation of a quality teaching force that understands distance learning, a curriculum that matches the high standards of learning, and the quality of delivery of services.⁸⁰ "In designing effective distance instruction, one must

consider not only the goals, needs, and characteristics of teachers and students, but also content requirements and technical constraints.”⁸¹

The Institute for Higher Education Policy, a nonprofit, nonpartisan organization whose mission is to foster access to and quality in postsecondary education, published a report in April 2000 entitled *Quality on the Line: Benchmarks for Success in Internet-Based Distance Education*. The report examined the public debate on the merits of Internet-based learning and provided tangible measures of quality in distance learning. The study identified twenty-four benchmarks divided into seven categories considered essential to ensuring excellence in Internet-based distance learning. These benchmarks addressed the concerns of how quality will be maintained and who will be the guardians of quality and the innovators to present material in new and engaging ways.⁸² They included:

- Institutional support benchmarks provide for building and maintaining the distance education infrastructure and developing a technology plan that includes electronic security measures.
- Course development benchmarks provide standards for course development and design and for determining the appropriate technology to deliver course content.
- Teaching and learning benchmarks address student interaction with faculty and other students, the feedback process for student assignments, and instruction regarding the proper methods of effective research.
- Course structure benchmarks suggest students be advised about the program to determine if they possess the motivation and commitment to learn at a distance and if they have access to the minimal technology required by course design.
- Student support benchmarks provide for students to have access to technical assistance; access to program information, such as admission requirements, tuition,

and student support services; and access to information through electronic databases, interlibrary loans and other sources.

- Faculty support benchmarks provide for technical assistance in course development for faculty, and for faculty members to receive instruction on transitioning from classroom teaching to online teaching.
- Evaluation and assessment benchmarks provide for educational effectiveness to be assessed through an evaluation process and through data on enrollment, costs and successful innovative uses of technology.

The Regional Accrediting Commissions drafted guidelines for the evaluation of electronically offered degree and certificate programs. The eight regional accrediting commissions assure the quality of the majority of degree-granting institutions of higher learning in the United States. The Commission's guidelines are divided into five components: institutional context and commitment, curriculum and instruction, faculty support, student support, and evaluation and assessment.⁸³ These guidelines are consistent with the benchmarks provided by the Institute for Higher Education Policy.

There is no single best way to deliver online learning because learning is an individual process. Likewise, there may be no single best way to use technology in online learning because some content may not be suitable for online delivery and faculty may have a difficult time exploiting the use of the technology. Despite these limitations, effective distance learning can take place through applying five important criteria:⁸⁴

- The courses are interactive. There should be opportunities for learners and faculty to build upon the information conveyed through the use of threaded discussions, chat areas and exercises that invite the student's involvement. This interactivity represents connectivity between the student and instructor. The quality and integrity of the process depends on sustained, two-way communication.⁸⁵

- The courses allow for reflection and practice. The content should be practical and understandable to the user, such as models that present information on case studies and simulations.
- The courses provide for variety in presentation. Students will more readily grasp the concepts or information by using illustrations with the concept.
- The course material is relevant. Students do better when the objectives of the course are directly linked to issues, theories, case studies, research, and knowledge that are practical. Students require some amount of integration of the information being provided so that it makes sense.
- The course information is accurate and appropriate. Faculty members should ensure the content is appropriate to learning needs and that the material is reviewed periodically to ensure it is current and accurate.

Students benefit from a well-designed syllabus. Structured note taking and interactive tools (i.e., study guides and visuals) contribute to a student's understanding of the course material; however, visuals must be tailored to the characteristics of the medium.

No medium in and of itself will improve learning in a significant way when it is used to deliver instruction. The key to improving learning is determined by how effectively a medium is exploited in the teaching-learning situation. For example, unlike the live classroom, face-to-face conversations disappear on the web. However, the medium allows every thought to be captured for future examination and elaboration. The result is richer more thoughtful discussions because of the inherent potential to stimulate the learning environment created by the medium. Thus, from this perspective, the web offers three distinct advantages that can be leveraged by the instructor: the web appeals to students' learning mode, the web provides for flexible learning, and the web enables new kinds of learning.⁸⁶

TECHNOLOGY INTEGRATION

What factors determine the most effective mix of technology in distance learning? There are two distinctive philosophies. One is based on structured, preprogrammed learning materials and the other is based on computer communication functions. The former views the computer as a black box substitute for the face-to-face teacher instruction, such as computer-assisted learning software. The latter view is called the networks approach because the computer creates a channel of communication between learners and teachers, such as computer-mediated communication. These two approaches can be integrated for optimal effects in distance education.⁸⁷

Research indicates that the delivery technology should be appropriate to the content offered and all participants should have access to the same technology. Increasing evidence suggests that the quality of learning is higher with interactive computer-based training and other self-directed technology-based training than with traditional instruction. Case studies indicate that self-paced multimedia training can take 20-80 percent less time than instructor-led training, which is attributed to better instructional design and the students' option to bypass content already mastered.⁸⁸

The United States Congress Office of Technology Assessment found that there is no single best use of technology and there is no single best way of teaching with technology. Flexibility should be encouraged allowing teachers to develop their personal teaching approach using the variety of options offered by technology.⁸⁹ There are challenges in preparing instructors and staff in using the newer technologies; however, the following measures will ensure a successful transition. Involve instructors in applying the use of the technologies so they become comfortable with the media and so they develop a personal stake in the quality of learning.⁹⁰ Support the student with learner-centered systems applying sound cognitive and psychological principles about human information processing, learning and performance.

Provide for interactivity in the instructional delivery system. Finally, use systems thinking in determining the need for training and technologies to be employed by identifying the long-term goals.⁹¹

Education should employ less expensive technology when the outcome of using media devices is the same or no better than using other teaching techniques. In the Forward section of the *no significant difference phenomenon*, Richard Clark of the University of Southern California, Los Angeles, asked, "Why spend more for instruction if there is a significantly less expensive way to achieve the same result?"⁹²

The best technology selections may be a combined or integrated approach including basic multimedia and customizing a media selection model to help achieve a balance between cost and quality.⁹³ Continually review what training organizations in the Government and industry are doing with technology since advanced technologies may be obsolete in three to five years and will need to be upgraded or replaced. Looking beyond current needs allows for growth.⁹⁴

LESSONS LEARNED

The computer can break down physical barriers to accessing education; however, it can create new barriers. These may include computer malfunctions, difficulty with software or problems accessing the Internet server.⁹⁵ To overcome these issues, the providers of online educational programs should ensure ample technical support is available.

In a study by the Institute for Defense Analysis, computer-based instruction may be a preferred media for the following types of training:⁹⁶

- Computer-based instruction may be the most feasible and cost-effective way to master a subject matter if large amounts of practice are required since this training media has the noted qualities of patience, privacy and economy.

- Computer-based instruction simulations used partially or wholly in place of actual equipment will lower costs and increase training accessibility. This type of training offers reproducible simulations where soldiers can observe the results of sets of actions and then repeat the exercise.
- Computer-based training can also provide simulations in training objectives that may otherwise be too dangerous for the soldier to conduct in a real-life training scenario.
- Computer-based instruction can be provided to physically dispersed learners at arbitrary times and places, such as the barracks or at home.
- Computer-based instruction allows for closely monitored progress and privacy.
- Assessment can be built into computer-based instruction so that outcomes can be standardized and even certified.

Computer-based instruction can accomplish a variety of instructional objectives in a variety of instructional settings. It is more effective than other commonly used approaches to military training, and it is projected to be more cost-effective than other commonly used approaches to training.⁹⁷

It is through experience and application that the Army is refining its use of distance learning. One example is the Battle Staff Course taught at Fort Hood, Texas. The course was fielded approximately three years ago consisting of two phases. The first phase was an independent correspondence course that required soldiers to be prepared for examination upon arrival at the installation for the second phase. Instructors observed that the soldiers were not adequately prepared to pass the exam. As a result, instructors incorporated a review session at the beginning of the second phase allowing soldiers to ask requisite questions about the material they did not understand, thus accommodating their individual learning styles.

Dr. Jim McClellan, a professor of history at the Alexandria Campus of Northern Virginia Community College, initially viewed distance learning with skepticism. With his teaching

schedule divided between traditional classroom instruction and distance teaching, he has reached several conclusions about distance learning. "A college-level course is a college-level course, regardless of the medium through which it is presented."⁹⁸ He suggested that distance learning should not sacrifice its inherent strengths in an effort to imitate traditional styles of instruction and distance learning should be more than televised classroom lectures. Virtual learning can take students to higher levels of education. Dr. McClellan used a combination of media, such as viewing videotaped lectures, participating in computer conferencing, proctored exams, submission of written projects, and field trips. He concluded, "Not only will distance learning teach students effectively, its techniques will help reshape the traditional classroom-based instruction."⁹⁹

ISSUES

Computer/web-based learning content still has challenges to overcome. Some of these challenges include the inability to move a course from one web-based learning management system to another, inability to use or move content pieces across different learning management systems, and the inability to create searchable content or media repositories across different learning management systems. The Department of Defense is working with users, developers and industry to develop distributed learning technologies that forge alliances in strategic technical areas and that accelerate the pace of technology to meet the goal of providing distributed learning anytime, anywhere. The Department of Defense developed the SCORM and released the first version in January 2001. It is a reference model designed to integrate the set of specifications to meet Defense requirements, and to bridge the gap from general emerging technologies to implementation.

In addition to the SCORM, the distributed learning initiative also includes co-labs that will provide an open, collegial environment for sharing learning technology research, development,

and assessments, as well as assimilate and disseminate lessons learned. The co-labs will also perform technical evaluations of distributed learning tools and perform content training and effectiveness evaluations of tools and prototypes.

Examining the drop out rate of postsecondary students remains an issue. Instructors tend to blame student's poor time management and procrastination; however, there may be other factors to consider, such as a lack of a university or institution support network, inadequate telecommunications facilities, miscommunications between the instructor and students, and a lack of course relevance.¹⁰⁰ However, teacher mediation and learner support increase the completion rate for distance learners.

CONCLUSION

This paper has reviewed the history of distance learning and examined contemporary research on the quality and effectiveness of distance learning. Education has been transformed in such a way that there is no turning back. Distance learning provides for a focus on the student instead of the classroom. It focuses on the abilities and needs of the individual learner and allows for lifelong learning to become a reality.

Many research sources indicate there is no significant difference in the quality of distance learning versus traditional classroom learning, although some sources view the effectiveness more cautiously. The differences in the two learning environments exist with the learners or students. A student's success in a distance learning environment is largely predicated on individual cognitive and psychological characteristics. There are numerous guidelines and models emerging that integrate these considerations in developing and implementing a quality distance learning curriculum.

There is no single best way to deliver online learning because learning is an individual process. No medium in and of itself will improve learning in a significant way. Each medium or

technology has its own advantages and disadvantages. The key to improving learning is determined by how effectively a medium is exploited in the teaching-learning situation. Media is the vehicle that delivers instruction, but it is the content of the vehicle that influences achievement.

Distance learning overcomes traditional campus-based or installation-based program constraints in funding and access. Courses can be taken anytime and anywhere. Courses that would otherwise be difficult to offer at some campuses or military installations because of limited resources or other professional and personal impediments are now a possibility. Distance learning is not only a qualitative method to providing education, but also a cost-effective way to deliver instruction to soldiers and civilians.

RECOMMENDATIONS

The real point of education is about content and people, and bringing the two together for greater understanding. Distance learning is not the panacea for every challenge in education; however, it is part of the solution. In meeting the educational challenge of providing training anytime, anywhere, it is recommended that the following areas be examined in further detail.

- The Army should aggressively pursue developing and implementing distance learning commensurate with the emerging guidelines and standards developed through the Department of Defense Advanced Distributed Learning initiatives.
- The Army should consider the components of quality assurance in designing courseware and preparing distance learning curriculums. As discussed in this paper, there are benchmarks, such as those provided by the Institute for Higher Education Policy report entitled *Quality on the Line: Benchmarks for Success in Internet-Based Distance Education*, the Regional Accrediting Commissions' Guidelines for the

Evaluation of Electronically Offered Degree and Certificate Programs, and the interrelated specifications provided in the SCORM that can help achieve quality goals.

- In an effort to expedite courseware development, the Army should explore prepackaged courses available within the Department of Defense, other Services, and on the commercial market that can be modified or exploited to meet its needs.
- The Army should develop a faculty-training course that teaches instructors the basics of teaching online, as well as developing course material using the appropriate media. Instructors must understand the nuances of the distance learning experience and the cognitive and psychological characteristics of students learning at a distance. Additionally, distance learning instructors must understand the impact of packaging different types of teaching media for the optimal learning experience.
- Army leadership should examine the United States Army Training and Doctrine Command's progress in developing and fielding courseware and then expeditiously resolve any resulting impediments.

WORD COUNT = 9,393

ENDNOTES

¹Lieut. John L. Sehon, 20th U.S. Infantry, "Post Schools in the Army," Journal of the Military Service Institution 14 (May 1892): 523.

²Carl E. Vuono, "Training and the Army of the 1990s," Available from <<http://www-cgsc.army.mil/milrev/english/janfeb97/vuono.htm>>; Internet; accessed 11 September 2000.

³Anthony Principi, "Congressional Commission on Servicemembers and Veterans Transition Assistance Final Report," (January 14, 1999), 3.

⁴Ibid., 21.

⁵Ibid., 22.

⁶Ibid., 23.

⁷Louis Caldera and Eric Shinseki, United States Army Posture Statement FY01, Posture Statement Presented to the 106th Cong., 2d sess. (Washington, D.C.: U.S. Department of the Army, 2000), xi.

⁸William S. Cohen, Annual Report to the President and the Congress, (Washington, D.C.: U.S. Department of Defense, 2000), 111.

⁹"Distance Learning Resource Handbook," available from <<http://stinet.dtic.mil/special/dlresorce.htm>>; Internet; accessed 28 August 2000.

¹⁰Defense Technical Information Center, "Distance Education," available from <<http://stinet.dtic.mil/special/distance1.html>>; Internet; accessed 24 August 2000.

¹¹Ibid.

¹²"United States Distance Learning Association," available from <http://www.usdla.org/04_research_info.htm>; Internet; accessed 23 January 2001.

¹³U.S. Department of Defense, "Department of Defense Strategic Plan for Advanced Distributed Learning," Report to the 106th Congress, (Washington, D.C.: U.S. Department of Defense, April 30, 1999), 5; available from <<http://adlnet.org>>; Internet; accessed 25 September 2000.

¹⁴Ibid.

¹⁵"Operational Requirements Document," The Army Distance Learning Program, available from <<http://www.tadlp.monroe.army.mil/ord1.htm>>; Internet; accessed 25 June 2000.

¹⁶Defense Technical Information Center, "Distance Education," available from <<http://stinet.dtic.mil/special/distance1.html>>; Internet; accessed 24 August 2000.

¹⁷L. Sherry, "Issues in Distance Learning", International Journal of Educational Telecommunications 1, no. 4 (1996): 337-365; available from <<http://www.cudenver.edu/~lsherry/pubs/issues.html>>; Internet; accessed 7 November 2000.

¹⁸U.S. Department of Education. "Distance Education at Postsecondary Education Institutions: 1997-98." (Washington, D.C.: National Center for Education Statistics, December 1999), 4.

¹⁹*Ibid.*, 3.

²⁰"Timeline: Highlights in Distance Education (DE) and Library Services," available from <<http://www.lib.usf.edu/~ifrank/lis5937/distuse/history.html>>; Internet; accessed 28 August 2000.

²¹"Distance Learning Week: Past Present, Future," available from <<http://www.pbs.org/als/dlweek/past.htm>>; Internet; accessed 28 August 2000.

²²*Ibid.*

²³"Timeline: Highlights in Distance Education (DE) and Library Services," available from <<http://www.lib.usf.edu/~ifrank/lis5937/distuse/history.html>>; Internet; accessed 28 August 2000.

²⁴"Distance Learning Week: Past Present, Future," available from <<http://www.pbs.org/als/dlweek/past.htm>>; Internet; accessed 28 August 2000.

²⁵*Ibid.*

²⁶Christopher R. Gabel, "The Leavenworth Staff College: A Historical Overview," available from <<http://www-cgsc.army.mil/milrev/english/septoct97/almanac.htm>>; Internet; accessed 11 September 2000.

²⁷Michele Tolela Myers, "CyberU: What's Missing," Washington Post, March 21, 2000, A25.

²⁸Institute of Higher Education Policy for the Council for Higher Education Accreditation, "Distance Learning in Higher Education," (Washington, D.C.: Institute of Higher Education Policy for the Council for Higher Education Accreditation, "Distance Learning in Higher Education, February 1999), 1.

²⁹Council for Higher Education Accreditation, "Distance Learning in Higher Learning," Update Number 3; available from <<http://www.chea.org/Commentary/distance-learning-3.cfm>>; Internet; accessed 24 August 2000.

³⁰Alessandra Bianchi, "E is for E-school," Inc., (July 2000): 29.

³¹The Institute for Higher Education Policy, Quality on the Line: Benchmarks for Success in Internet-Based Distance Education, (Washington, D.C.: The Institute for Higher Education Policy, April 2000), 1.

³²Council for Higher Education Accreditation, "Distance Learning in Higher Learning," Update Number 3; available from <<http://www.chea.org/Commentary/distance-learning-3.cfm>>; Internet; accessed 24 August 2000.

³³"Distance Education and the Digital Divide," available from <<http://distancelearn.about.com/education/distancelearn/library/blpages/blpages/bldigitaldiv.htm>>; Internet; accessed 23 August 2000.

³⁴U.S. Department of Defense, "About ADL," available from <http://www.adlnet.org/about_adl/index.htm>; Internet; accessed 25 September 2000.

³⁵Alessandra Bianchi, "E is for E-school," *Inc.*, (July 2000): 30.

³⁶*Ibid.*

³⁷"Enhancing Learning and Education Through Technology." White House Press Release, January 30, 1998; available from <<http://www.adlnet.org/documents/pres-exec.htm>>; Internet; accessed 5 September 2000.

³⁸Homepage of the Web-Based Education Commission, available from <http://www.hpcnet.org/cgi-bin/global/a_bus_card.cgi?SiteID=154797>; Internet; accessed 23 August 2000.

³⁹ Web-Based Education Commission February Hearing Summary, available from <http://www.hpcnet.org/cgi-bin/global/a_bus_card.cgi?siteID155282>; Internet, accessed 24 August 2000.

⁴⁰Remarks As Prepared for Delivery by United States Secretary of Education Richard W. Riley to the Web-based Education Commission, available from <<http://www.ed.gov/Speeches/02-2000/20000202.html>>; Internet; accessed 12 October 2000.

⁴¹*Ibid.*

⁴²Web-Based Education Commission July Commission Hearing Summary, available from <http://www.hpcnet.org/cgi-bin/global/a_bus_card.cgi?store_SiteID=176797>; Internet; accessed 21 September 2000.

⁴³Web-Based Education Commission Report, "The Power of the Internet for Learning: Moving From Promise to Practice," December 2000, iv; available from <http://www.hpcnet.org/cgi-bin/global/a_bus_card.cgi?SiteID=154977>; Internet, accessed 16 January 2001.

⁴⁴*Ibid.*, v-vi.

⁴⁵U.S. Department of Defense, "About ADL," available from <http://www.adlnet.org/about_adl/index.htm>; Internet; accessed 25 September 2000.

⁴⁶*Ibid.*

⁴⁷U.S. Department of Defense, "Department of Defense Strategic Plan for Advanced Distributed Learning," Report to the 106th Congress, (Washington, D.C.: U.S. Department of Defense, April 30, 1999), 7; available from <<http://adlnet.org>>; Internet; accessed 25 September 2000.

⁴⁸*Ibid.*, 8.

⁴⁹*Ibid.*

⁵⁰Ibid.,10.

⁵¹Ibid., 11.

⁵²Ibid.

⁵³U.S. Department of Defense, "Department of Defense Implementation Plan for Advanced Distributed Learning," (Washington, D.C.: U.S. Department of Defense, May 19, 2000), ES2-ES-5; available from <<http://adlnet.org>>; Internet; accessed 25 September 2000.

⁵⁴United States Army War College, "How the Army Runs: A Senior Leader Reference Handbook", (1999), 15-3 to 15-4.

⁵⁵"Operational Requirements Document," The Army Distance Learning Program, available from <<http://www.tadlp.monroe.army.mil>>; Internet; accessed 25 June 2000.

⁵⁶U.S. Department of Defense, "Department of Defense Implementation Plan for Advanced Distributed Learning," (Washington, D.C.: U.S. Department of Defense, May 19, 2000), 5; available from <<http://adlnet.org>>; Internet; accessed 25 September 2000.

⁵⁷Richard T.Cooper, "Soldier by Day, Online Student by Night," Los Angeles Times, July 10, 2000.

⁵⁸"Army Awards Distance Education Contract to PricewaterhouseCoopers," available from <<http://www.dtic.mil/armylink/news/Dec2000/r20001214auaol.html>>; Internet; accessed 15 December 2000.

⁵⁹H. Dean Nielsen, "Quality Assessment and Quality Assurance in Distance Education Teaching," Distance Education 18, no. 2 (1997): 287.

⁶⁰Ibid.

⁶¹Thomas L. Russell, comp., the no significant difference phenomenon (Raleigh, N.C: North Carolina State University, 1999), xii.

⁶²Jeffrey R. Young, "Scholar Concludes That Distance Ed is as Effective as Traditional Instruction," available from <<http://chronicle.com/free/2000/02/200002100lu.htm>>; Internet; accessed 23 August 2000.

⁶³The Institute for Higher Education, "What's the Difference?" (Washington, D.C.: The Institute for Higher Education, April 1999), 18.

⁶⁴Ibid., 7-8.

⁶⁵Ibid.

⁶⁶"Distance Education: No Significant Difference," available from <<http://distancelearn.aboutcom/education/distancelearn/library/library/blpages/blnsd.htm>>; Internet; accessed 23 August 2000.

⁶⁷Yuliang Liu and Dean Ginther, "Cognitive Styles and Distance Education," available from <<http://www.westga.edu/~distance/liu23.html>>; Internet; accessed 7 November 2000.

⁶⁸Ibid.

⁶⁹L. Sherry, "Issues in Distance Learning," International Journal of Educational Telecommunications 1, no. 4 (1996): 337-365; available from <<http://www.cudenver.edu/~lsherry/pubs/issues.html>>; Internet; accessed 7 November 2000.

⁷⁰Yuliang Liu and Dean Ginther, "Cognitive Styles and Distance Education," available from <<http://www.westga.edu/~distance/liu23.html>>; Internet; accessed 7 November 2000.

⁷¹L. Sherry, "Issues in Distance Learning," International Journal of Educational Telecommunications 1, no. 4 (1996): 337-365; available from <<http://www.cudenver.edu/~lsherry/pubs/issues.html>>; Internet; accessed 7 November 2000.

⁷²Ibid.

⁷³Arthur J. Cropley and Thomas N. Kahl, "Distance Education and Distance Learning: Some Psychological Considerations," Distance Education 4, no. 1 (1983): 30-31.

⁷⁴Ibid., 31-32.

⁷⁵Ibid., 32.

⁷⁶L. Sherry, "Issues in Distance Learning," International Journal of Educational Telecommunications 1, no. 4 (1996): 337-365; available from <<http://www.cudenver.edu/~lsherry/pubs/issues.html>>; Internet; accessed 7 November 2000.

⁷⁷Arthur J. Cropley and Thomas N. Kahl, "Distance Education and Distance Learning: Some Psychological Considerations," Distance Education 4, no. 1 (1983): 34.

⁷⁸"Is Distance Education Effective?" available from <<http://otan.dni.us/edlp/distance/reseffective.html>>; Internet; accessed 7 November 2000.

⁷⁹"Quality in Distance Learning," available from <<http://spectrum.troyst.edu/~rtbothel/ideas/dlquality.htm>>; Internet; accessed 19 September 2000.

⁸⁰Remarks As Prepared for Delivery by United States Secretary of Education Richard W. Riley to the Web-Based Education Commission, available from <<http://www.ed.gov/Speeches/02-2000/20000202.html>>; Internet; accessed 12 October 2000.

⁸¹L. Sherry, "Issues in Distance Learning," International Journal of Educational Telecommunications 1, no. 4 (1996): 337-365; available from <<http://www.cudenver.edu/~lsherry/pubs/issues.html>>; Internet; accessed 7 November 2000.

⁸²The Institute for Higher Education Policy, "Quality on the Line: Benchmarks for Success in Internet-Based Distance Education," (Washington, D.C.: The Institute for Higher Education Policy, April 2000), vii.

⁸³Regional Accrediting Commissions, "Draft Guidelines for the Evaluation of Electronically Offered Degree and Certificate Programs," September 2000: 1.

⁸⁴Judy Smith, "The Five Keys to Effective Distance Learning," available from <<http://www.sitetriner.com/printhread.cfm?catid=5&threadid=7>>; Internet; accessed 15 October 2000.

⁸⁵L. Sherry, "Issues in Distance Learning," International Journal of Educational Telecommunications 1, no. 4 (1996): 337-365; available from <<http://www.cudenver.edu/~lsherry/pubs/issues.html>>; Internet; accessed 7 November 2000.

⁸⁶Ronald D. Owston, "The World Wide Web: A Technology to Enhance Teaching and Learning," Educational Researcher 26, no. 2 (March 1997); available from <<http://www.edu.york.ca/~rowston/article.html>>; Internet, accessed 7 November 2000.

⁸⁷Yuliang Liu and Dean Ginther, "Cognitive Styles and Distance Education," available from <<http://www.westga.edu/~distance/liu23.html>>; Internet; accessed 7 November 2000.

⁸⁸"Quality in Distance Learning," available from <<http://spectrum.troyst.edu/~rtbothel/ideas/dlquality.htm>>; Internet; accessed 19 September 2000.

⁸⁹United States Congress Office of Technology Assessment, "Power On! New Tools for Teaching and Learning," (Washington, DC: U.S. Government Printing Office, OTA-SET-379,1988): 17.

⁹⁰"Topic 2. Actual ATT Use and Lessons Learned," available from <<http://cted.inel.gov/cted/dl/att/att-2.html>>; Internet; accessed 7 November 2000

⁹¹Ibid.

⁹²Thomas L. Russell, comp., the no significant difference phenomenon (Raleigh, N.C: North Carolina State University, 1999), x.

⁹³"Topic 2. Actual ATT Use and Lessons Learned," available from <<http://cted.inel.gov/cted/dl/att/att-2.html>>; Internet; accessed 7 November 2000.

⁹⁴Ibid.

⁹⁵Ronald D. Owston, "The World Wide Web: A Technology to Enhance Teaching and Learning," Educational Researcher 26, no. 2 (March 1997): 28; available from <<http://www.edu.york.ca/~rowston/article.html>>; Internet, accessed 7 November 2000.

⁹⁶J.D. Fletcher, "What Have We Learned About Computer Based Instruction in Military Training?" In Virtual Reality, Training's Future? ed. Robert J. Seidel and Paul R. Chatelier. (New York: Plenum Press. 1997), 175.

⁹⁷Ibid., 176.

⁹⁸Jim McClellan, "Distance Education: Lessons Learned", Inquiry 3, no., 1 (Fall 1998): 58.

⁹⁹Ibid., 62.

¹⁰⁰L. Sherry, "Issues in Distance Learning," International Journal of Educational Telecommunications 1, no. 4 (1996): 337-365; available from <<http://www.cudenver.edu/~lsherry/pubs/issues.html>>; Internet; accessed 7 November 2000.

BIBLIOGRAPHY

- "Army Awards Distance Education Contract to PricewaterhouseCoopers." Available from <<http://www.dtic.mil/armylink/news/Dec2000/r20001214auaol.html>>. Internet. Accessed 15 December 2000.
- Army Science Board. "Use of Technologies in Education and Training" Ad Hoc Study Final Report. Washington, D.C.: Army Science Board, December 1995.
- Bianchi, Alessandra. "E is for E-school." Inc. 22, no. 10, (July 2000): 29-32.
- Bingham, John, Teresa Davis and Cathy Moore. "Emerging Technologies in Distance Learning." Available from <http://horizon.unc.edu/projects/issues/papers/Distance_Learning.asp>. Internet. Accessed 19 September 2000.
- Brigham, David E. "Factors Affecting the Development of Distance Education Courses." Distance Education 13, no. 2 (1992): 169-192.
- Brown, John Seely and Paul Duguid. The Social Life of Information. Boston Massachusetts: Harvard Business School Press, 2000.
- Chapman, Don. "The Death of Distance Education; Long Live Distributive Learning." Available from <<http://www.unesco.org/education/educprog/lwf/doc/portfolio/opinion18.htm>>. Internet. Accessed 31 October 2000.
- Christinaz, Daniel U., William J. Walsh, Gary Filipiski, and Susan Escobar. "Interactive Multimedia Distance Learning (IMDL)," Prepared by MEI Technology Corporation for the United States Air Force Research Laboratory, January 1999.
- Committee on Quality Assurance and Distance Education- Findings and Recommendations (February 1998). Available from <<http://www.unet.maine.edu/steer/qualityassure.htm>>. Internet. Accessed 19 September 2000.
- Cooper, Richard T. "Soldier by Day, Online Student by Night." Los Angeles Times, July 10, 2000, p. A1 and A7.
- Council for Higher Education Accreditation. "Distance Learning in Higher Education." CHEA Update Number 3. Available from <<http://www.chea.org/Commentary/distance-learning-3.cfm>>. Internet. Accessed 24 August 2000.
- Cropley, Arthur J. and Thomas N. Kahl. "Distance Education and Distance Learning: Some Psychological Considerations." Distance Education 4, no. 1, (1983): 27-39.
- Dede, Chris. "Distance Learning to Distributed Learning: Making the Transition." NLII Viewpoint (Fall/Winter 1997). Available from <<http://www.educause.edu/nlii/articles/dede.html>>. Internet. Accessed 19 September 2000.

- Defense Technical Information Center, "Distance Education." Available from <<http://stinet.dtic.mil/special/distance1.html>>. Internet. Accessed 24 August 2000.
- Defense Technical Information Center. "Distance Learning Best Practices Summary." Available from <<http://stinet.dtic.mil/special/disabest.html>>. Internet. Accessed 19 August 2000.
- Defense Technical Information Center. "Distance Learning Resource Handbook." Available from <<http://stinet.dtic.mil/special/dlresorc.htm>>. Internet. Accessed 19 August 2000.
- Defense Technical Information Center. "The DTIC Review: Distance Learning." Fort Belvoir, VA: Defense Technical Information Center, June 1997.
- "Definitions of Key Terms." Available from <<http://ir.bcc.ctc.edu/Definitions.htm>>. Internet. Accessed 19 September 2000.
- Dingle, Jesse, Lisa Napp, Wendy Gooch, and Alicia Kelly. "Internet Education: Today's Fad or Tomorrow's Future?" Available from <<http://horizon.unc.edu/projects/issues/papers/Dingle.asp>>. Internet. Accessed 19 September 2000.
- "Distance Education and the Digital Divide." Available from <<http://distancelearn.about.com/education/distancelearn/library/blpages/bldigitaldiv.htm>>. Internet. Accessed 23 August 2000.
- "Distance Education: Glossary." Available from <<http://www.utexas.edu/cc/cit/de/deprimer.html>>. Internet. Accessed 9 September 2000.
- "Distance Education: No Significant Difference." Available from <<http://distancelearn.about.com/education/distancelearn/library/blpages/blnsd.htm>>. Internet. Accessed 23 August 2000.
- "Distance Learning Week: Past, Present, Future." February 28-March 3, 2000. Available from <<http://www.pbs.org/als/dlweek/past.htm>>. Internet. Accessed 28 August 2000.
- Durica, Rosemary A. "The Effects of Change in the Transition From Traditional Training Methods to Training Delivered by Technological Methods on Military and Civilian Education and Training Specialists in Selected Military Training Organizations." Ph.D diss. Texas A&M University, 1999.
- "Enhancing Learning and Education Through Technology." White House Press Release, January 30, 1998. Available from <<http://www.adlnet.org/documents/pres-exec.htm>>. Internet. Accessed 5 September 2000.
- Executive Order 13111. "Using Technology to Improve Training Opportunities for Federal Government Employers." January 12, 1999. Available from <<http://www.pub.whitehouse.gov/uri-res/12...:pdi://oma.eop.gov.us/1999/1/12/5.text.2>>. Internet. Accessed 28 September 2000.

- "Experiment Shows Student Do Better Online." Chronicle of Higher Education (February 21, 1997). Available from <<http://www.krwebdesign.com/data/studobtr.htm>>. Internet. Accessed 19 September 2000.
- Fletcher, J.D. "What Have We Learned About Computer Based Instruction in Military Training? Virtual Reality, Training's Future? ed. Robert J. Seidel and Paul R. Chatelier. New York: Plenum Press. 1997.
- Freed, Ken. "A History of Distance Learning." Available from <<http://www.media-visions.com/ed-distlrn3.html>>. Internet. Accessed 28 August 2000.
- Gabel, Christopher R. "The Leavenworth Staff College: A Historical Overview." Available from <<http://www-cgsc.army.mil/milrev/english/sepoct97/almanac.htm>>. Internet. Accessed 11 September 2000.
- "Glossary of Distance Education Terminology." Available from <<http://www.uidaho.edu/evo/dist14.html>>. Internet. Accessed 7 November 2000.
- "Glossary of Selected Distance Learning Terms and Phrases." Available from <<http://www.cdc.gov/phntn/lingo.htm>>. Internet. Accessed 19 September 2000.
- Gross, Marilyn. "Training via E-mail and Internet: Lessons Learned Since An Experiment in Distance Learning." Available from <<http://www.charityvillage.com/charityvillage/research/rdl2.html>>. Internet. Accessed 7 November 2000.
- Habash, Mohammed Ali. "Technologies and Media for Distance Education." Available from <<http://seamonkey.ed.asu.edu/~mcisaac/disted/final98/finalmh.html>>. Internet. Accessed 19 September 2000.
- The Institute for Higher Education Policy. Distance Learning in Higher Education. Washington, D.C.: The Institute for Higher Education Policy, February 1999.
- The Institute for Higher Education Policy. Quality on the Line: Benchmarks for Success in Internet-Based Distance Education. Washington, D.C.: The Institute for Higher Education Policy, April 2000.
- The Institute for Higher Education Policy. What's the Difference? Washington, D.C.: The Institute for Higher Education Policy, April 1999.
- "Is Distance Education Effective?" Available from <<http://www.otan.dni.us/cdlp/distance/reseffective.html>>. Internet. Accessed 7 November 2000.
- Jacques, Michele M. "How to Find World Wide Web Distance Education Resources." Available from <<http://www.uwex.edu/disted/resources.html>>. Internet. Accessed 7 November 2000.
- Jones, Maryhelen. "Future Fast Forward." Available from <<http://www.oclc.org/oclc/man/10256dis/jones.htm>>. Internet. Accessed 19 September 2000.

- Kerlin, Bobbi A. "Cognitive Engagement Style, Self-Regulated Learning and Cooperative Learning." Available from <http://www.irn.pdx.edu/~kerlinb/myresearch/srl/self_reg_learn.html>. Internet. Accessed 19 September 2000.
- Kraver, Ted. "Emerging Learning Technology Report." December 1997. Available from <<http://www.altp.org/SSP/EmergingLearningTechnologyReport.htm>>. Internet. Accessed 3 November 2000.
- Layton, James R. "No Significant Difference Phenomenon." Educational Technology & Society 2, no. 3 (1999). Available from <http://ifets.massey.ac.nz/periodical/vol_3_99/book_review.russell.html>. Internet. Accessed 19 September 2000.
- Lieberman, David. "America's Digital Divide." USA Today, October 11, 1999. Available from <<http://www.usatoday.com/life/cyber/tech/ctg382.htm>>. Internet. Accessed 24 August 2000.
- Liu, Yuliang and Dean Ginther. "Cognitive Styles and Distance Education." Journal of Distance Learning Administration (Fall 1999). Available from <<http://www.westga.edu/~distance/liu23.html>>. Internet. Accessed 7 November 2000.
- Lynch, Claudia. "What Does it All Mean?" Available from <<http://www.unt.edu/UNT/departments/CC/Benchmarks/jafbmr98/defined.htm>>. Internet. Accessed 19 September 2000.
- Marland, P.W. and R.E. Store. "Some Instructional Strategies for Improved Learning From Distance Teaching Materials." Distance Education 3, no. 1 (1982): 72-106.
- McCarthy, Michael. "Big Budget Recruiting Shifts to Cyberspace." Army Times, May 22, 2000, 16.
- McClellan, Jim. "Distance Education: Lessons Learned." Inquiry 3, no. 1, (Fall 1998). Available from <<http://www.br.cc.va.us/vcca/i3mcclellan.html>>. Internet. Accessed 7 November 2000.
- Meadows, George and Aimee Howley. "The Internet and the Truth About Science: We Gave a Science War But Nobody Came." Education Policy Analysis Archives 6, no. 19 (October 13, 1998). Available from <<http://epaa.asu.edu/epaa/v6n19.html>>. Internet. Accessed 31 October 2000.
- Metzko, J., G.A. Redding, and J.D. Fletcher. "Distance Learning and the Reserve Components," Institute for Defense Analyses, December 1996.
- Moore, Michael G. and Greg Kearsley. Distance Education: A Systems View. California: Wadsworth Publishing Company, 1996.
- Myers, Michele Tolela. "CyberU: What's Missing." Washington Post, March 21, 2000, p. A 25.

- Nasseh, Bizhan. "A Brief History of Distance Education." Available from <http://www.seniornet.org/edu/art/history.html>. Internet. Accessed 5 September 2000.
- Nielsen, H. Dean. "Quality Assessment and Quality Assurance in Distance Teacher Education." Distance Education 18, no. 2 (1997): 284-317.
- Oliver, Martin. "An Introduction to the Evaluation of Learning Technology." Educational Technology & Society 3, no. 4 (2000). Available from http://ifets.ieee.org/periodical/vol_4_2000/intro.html. Internet. Accessed 31 October 2000.
- "Operational Requirements Documents." The Army Distance Learning Program. Available from <http://www.tadlp.monroe.army.mil/ord1.htm>. Internet. Accessed 25 June 2000.
- Owston, Ronald D. "The World Wide Web: A Technology to Enhance Teaching and Learning?" Educational Researcher 26, no. 2 (March 1997): 28-30. Available from <http://www.edu.yorku.ca/~rowston/article.html>. Internet. Accessed 7 November 2000.
- Pagney, Bernard. "The Role of Learning at a Distance in National Educational System." Distance Education 3, no. 2 (1982): 107-115.
- Patton-Bennington, Elaine. "IPSE-Glossary of Terms." Available from <http://www.ihets.org/consortium/ipse/fdhndbook/glossary.html>. Internet. Accessed 7 November 2000.
- Pettenati, Maria Chiara, Omar Abou Khaled, Christine Vanoirbeek, and Dino Giuli. "The Learning Tutor: A Web-based Authoring System to Support Distance Tutoring." Educational Technology & Society 3, no. 4 (2000). Available from http://ifets.ieee.org/periodical/vol_4_2000/pettenati.html. Internet. Accessed 31 October 2000.
- Peraya, Daniel. "Distance Education and the WWW." Available from <http://tecfa.unige.ch/edu-comp/edu-ws94/contrib/peraya.fm.html>. Internet. Accessed 7 November 2000.
- Principi, Anthony. "Final Report of the Congressional Commission on Servicemembers and Veterans Transition Assistance." January 14, 1999.
- Public Law 105-244. Higher Education Amendments of 1998- A Bill to Extend Authorizations Under the Higher Education Act of 1965.
- Public Law 105-261. Strom Thurmond National Defense Authorization Act for Fiscal Year 1999, Section 378.
- Public Law 105-262. National Defense Appropriations Act for Fiscal Year 1999, Section 8104.
- Pugh, H. Lauren, Stephen W. Parchman and Henry Simpson. "Video Telecommunications for Distance Education: A Field Survey of Systems in US Public Education, Industry and the Military." Distance Education 13, no. 1 (1992): 46-64.

- "Quality in Distance Learning" Available from
<<http://spectrum.troyst.edu/~rtbothel/ideas/dlquality.htm>>. Internet. Accessed
19 September 2000.
- Regional Accrediting Commissions, "Draft Guidelines for the Evaluation of Electronically Offered
Degree and Certificate Programs," (September 2000).
- Remarks as prepared for delivery by U.S. Secretary of Education Richard W. Riley at the Web-
Based Education Commission (February 2, 2000). Available from
<<http://www.ed.gov/Speeches/02-2000/20000202.html>>. Internet. Accessed 12 October
2000.
- "Report: Digital Divide Not So Deep." Bloomberg News, April 12, 1999. Available from
<<http://news.cnet.com/news/0-1005-200-341054.html>>. Internet. Accessed 12 October
2000.
- Riley, Peter C. and Louis C. Gallo. "Electronic Learning Environments: Design
Considerations." T.H.E. Journal (January 2000). Available from
<<http://www.thejournal.com/magazine/vault/A2595.cfm>>. Internet. Accessed 3 November
2000.
- Russell, Thomas L., comp., the no significant difference phenomenon. Raleigh, N.C.: North
Carolina State University, 1999.
- Russell, Thomas L. "Television's Indelible Impact on Distance Education: What We Should
Have Learned from Comparative Research." NLII Viewpoint (Fall/Winter 1997). Available
from <<http://www.educause.edu/nlil/articles/russell.html>>. Internet. Accessed 7 November
2000.
- Schreiber, Deborah A. and Zane L. Berge. Distance Training. San Francisco: Jossey-Bass,
Inc., 1998.
- Schmidt, Steffen, Mack C. Shelley, and Monty Van Wart. "The Challenges to Distance
Education in an Academic Social Science Discipline: The Case of Political Science."
Education Policy Analysis Archives 8, no. 27 (June 16, 2000). Available from
<<http://epaa.asu.edu/epaa/v8n27>>. Internet. Accessed 31 October 2000.
- Sedlak, Robert A. and G. Phillip Cartwright. "Two Approaches to Distance Learning: Lessons
Learned." Available from <<http://contract.kent.edu/change/articles/janfeb97.html>>.
Internet. Accessed 7 November 2000.
- Sehon, John L. "Post Schools in the Army." Journal of the Military Service Institution 14 (May
1892).
- Sherry, L. "Issues in Distance Learning." International Journal of Educational
Telecommunications, (1995): 337-365. Available from
<<http://www.cudenver.edu/~lsherry/pubs/issues.html>>. Internet. Accessed 7 November
2000.

- Smith, Judy. "The Five Keys to Effective Distance Learning." Available from <<http://www.sitetrainer.com/printthread.cfm?catid=5&threadid=7>>. Internet. Accessed 15 October 2000.
- "Some Definitions of Distance Education." Available from <<http://www.uwex.edu/disted/definition.html>>. Internet. Accessed 19 August 2000.
- Spencer, Ken. "Educational Technology – An Unstoppable Force: A Selective Review of Research Into the Effectiveness of Educational Media," Educational Technology & Society 2, no. 4 (1999). Available from <http://ifets.ieee.org/periodical/vol_4_99/spencer.html>. Internet. Accessed 31 October 2000.
- "Teaching on the Net: What's the Difference?" T.H.E. Journal (April 1997). Available from <<http://www.thejournal.com/magazine/vault/A1365.cfm>>. Internet. Accessed 22 September 2000.
- "Technology and Distance Education." Available from <<http://staffweb.library.vanderbilt.edu/class/techde.htm>>. Internet. Accessed 19 September 2000.
- "Tele-learning Technologies: Glossary of Selected Terms." Available from <<http://www.to.utwente.nl/ism/online96/project/kiosk/glossary.htm>>. Internet. Accessed 19 September 2000.
- Thorpe, Mary. Evaluating Open & Distance Learning. Essex, England: Longman Group UK Limited, 1988.
- "Timeline: Highlights in Distance Education (DE) and Library Services." Available from <<http://www.lib.usf.edu/~ifrank/lis5937/distuse/history.html>>. Internet. Accessed 28 August 2000.
- "Topic 2. Actual ATT Use and Lessons Learned." Available from <<http://cted.inel.gov/cted/dl/att/att-2.html>>. Internet. Accessed 7 November 2000.
- U.S. Congress Office of Technology Assessment, "Power On! New Tools for Teaching and Learning," Washington, DC: U.S. Government Printing Office, OTA-SET-379, 1988.
- U.S. Department of Defense. "About ADL." Available from <http://adlnet.org/about_adl/index.htm>. Internet. Accessed 25 September 2000.
- U.S. Department of Defense. "Implementation Plan for Advanced Distributed Learning." Washington, D.C.: Department of Defense May 19, 2000. Available from <<http://adlnet.org>>. Internet. Accessed 25 September 2000.
- U.S. Department of Defense. "Strategic Plan for Advanced Distributed Learning." Washington, D.C.: Department of Defense, April 30, 1999. Available from <<http://adlnet.org>>. Internet. Accessed 25 September 2000.
- U.S. Department of Education. "Distance Education at Postsecondary Education Institutions: 1997-98." Washington, D.C.: National Center for Education Statistics, December 1999.

- United States Distance Learning Association. "Research Information and Statistics." Available from <http://www.usdla.org/04_research_info.htm>. Internet. Accessed 23 January 2001.
- Vuono, Carl E. "Training and the Army of the 1990s." Available from <<http://www-cgsc.army.mil/milrev/english/janfeb97/vuono.htm>>. Internet. Accessed 11 September 2000.
- Walker, Jack. "Leveraging Technology for Joint Training." JFQ (Summer 1997): 104-108.
- Web-Based Education Commission. "The Power of the Internet for Learning: Moving from Promise to Practice." December 2000. Available from <http://www.hpcnet.org/cgi-bin/global/a_bus_card.cgi?SiteID=154797>. Internet. Accessed 16 January 2001.
- Web-Based Education Commission. "Welcome to the Home Page of the Web-based Education Commission." Available from <http://www.hpcnet.org/cgi-bin/global/a_bus_card.cgi?SiteID=154797>. Internet. Accessed 23 August 2000.
- Web-based Education Commission. "February Commission Hearing Summary." Available from <http://www.hpcnet.org/cgi-bin/global/a_bus_card.cgi?SiteID=155282>. Internet. Accessed 24 August 2000.
- Web-based Education Commission. "April Commission Hearing Summary." Available from <http://www.hpcnet.org/cgi-bin/global/a_bus_card.cgi?SiteID=155278>. Internet. Accessed 24 August 2000.
- Web-based Education Commission. "June Commission Hearing Summary." Available from <http://www.hpcnet.org/cgi-bin/global/a_bus_card.cgi?SiteID=163097>. Internet. Accessed 24 August 2000.
- Web-based Education Commission. "July Commission Hearing Summary." Available from <http://www.hpcnet.org/cgi-bin/global/a_bus_card.cgi?SiteID=176797>. Internet. Accessed 21 September 2000.
- Wolfe, Thomas E. "Faculty Preparation for Distance Learning." Available from <<http://www.au.af.mil/au/afiad/plans&policy/papers/revpaper.htm>>. Internet. Accessed 6 September 2000.
- Young, Jeffrey R. "Scholar Concludes That Distance Ed Is as Effective as Traditional Instruction," The Chronicle of Higher Education (February 10, 2000). Available from <<http://chronicle.com/free/2000/02/2000021001u.htm>>. Internet. Accessed 23 August 2000.