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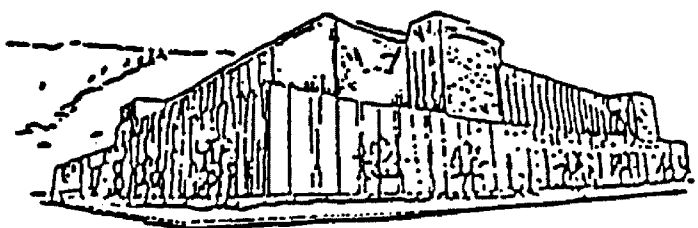
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DISTANCE EDUCATION

BY

BRENT BOOTH

B.A., WASHINGTON STATE UNIVERSITY, 1998

PRESENTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

MASTERS IN BUSINESS ADMINISTRATION

THE UNIVERSITY OF MONTANA

1999

Approved By:



Chairperson



Dean, Graduate School

6-25-99

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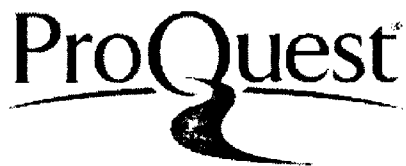


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ABSTRACT

Booth, Brent L., MBA, May 1999

Business Administration

Distance Education

Director: Dr. Maureen Fleming *M A F*

What is Distance Education? Is it new? Actually, various forms of distance education have been around for many years, but today's technology has added a new dimension. This paper begins by discussing the definition and history of distance education.

A review of the current technologies is detailed in a major section of this professional paper. What costs are involved? There are several components to be considered in designing a new distance education system. These include the hardware and software, transmission, infrastructure, and maintenance, along with personnel.

Technological options available to distance educators fall into four main categories: print, instructional audio, instructional video, and computer applications. There are also several ways universities can connect technology to distance education such as the Internet, the World Wide Web, computers, and television. All of these options are explained.

What tools does Distance Learning employ? There are four main tools: Interactive Instructional Audio, Instructional Television, Interactive Videoconferencing, and Web-based applications. Each of these tools as well as their advantages and limitations are reviewed in detail.

What concerns do students and instructors have about Web-based technology? The perspective of students and instructors, along with the issues of course evaluations and accreditation are summarized in the section on Web-based technology research.

How do the new innovations on Web-based technology affect businesses? Almost half of the respondents of a 1997 survey said they use web-based technology in their operations. Several advantages are cited. Has it changed the way some courses are taught at some high schools and universities? From "Virtual Frog Dissections" to "attending class" anytime of the day, high schools and universities are meeting the needs of their students in exciting new ways.

Tomorrow's universities will not only be built of brick and mortar; they will also be built of silicon chips. It will be both ways because we live in a society that wants it both ways to satisfy our diverse needs.

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INTRODUCTION

Many technological advances have taken place over the decades that have affected, and will continue to affect, the delivery of educational instruction. As professors increasingly employ technology in teaching courses, the difference between how a faculty member teaches a course on-campus versus teaching off-campus may be reduced. Post-secondary education will become increasingly distributed, thus making it much easier to reach students around the world. Through the use of technology, it may be possible for more student-faculty and student-student interaction to take place, irrespective of whether the student is enrolled on-campus or off-campus. The Cyber League, also known as electronic universities, will challenge the traditional brick and ivy universities in the 21st century. A recent survey conducted by the American Society for Training and Development predicts that instruction delivered via new technologies is expected to grow from 10% in 1996 to over 35% by the year 2000.¹ Students are increasingly utilizing distance education because of its improved flexibility and wider range of instructional offerings.

This paper will explore a broader vision of the learning environment. This vision includes the concept of the global classroom linked by a variety of technologies. Research of technologies including costs, technology options, connecting technology, and distance learning tools will be discussed. Exploring student, instructor, evaluation, and accreditation issues regarding research on web-based technology will be described. New innovations in the fields of business, high school, and university education will be explained.

History

Distance education is not necessarily new. Home-study programs were in existence a long time before the first personal computer was produced on the assembly line. Distance education enjoys a rich heritage. In 1840, Sir Isaac Pitman, the English inventor of shorthand, came up with the idea of delivering instruction through correspondence courses by mail.² When the printing press met the Pony Express, Pitman's concept of the limitless audience boomed. In 1891, the University of Wisconsin offered its first distance education program. They are one of the oldest and largest distance education programs in the United States.³

The printed book was the first virtual university. This technological marvel allowed for knowledge to be transferred worldwide. However, in the early days of academia, the mass distribution of printed books was denounced by many as a "technological high evil."⁴

New life was breathed into home study during the 1980s. Cable technology along with the rapid spread of home video cassette recorders allowed correspondence programs to enhance their courses. Instructors began recording lectures and mailing videotapes to remote students. Distance education is now delivered via mail, videotapes, cable television, satellite broadcasts, and most recently, via the Internet and video conferencing. Most of us use distance learning techniques in some form in our daily lives. We read books and newspapers, watch television programs, request information over the telephone or Internet. These are all learning experiences that educate us in the broadest sense.

Distance Education

Distance education occurs when instructors and students are geographically remote, and technology is used to bridge the instructional gap.⁵ Distance education may employ correspondence study, audio, video, computers, or any combination of the mentioned technologies.⁶

Distance education has progressed through three generations. The first-generation was characterized by the predominant use of a single technology. It lacked direct interaction between the student and the instructor. Correspondence study is its typical form. Therefore, it is called the correspondence model.⁷

The second generation of distance education used integrated multi-media. This permitted two-way communication between students and tutors, but still did not allow direct communication with the instructor.⁸ An example of this asynchronous technology would be instructional television.

Technological advances have taken us into the third generation. The third-generation is characterized by synchronous two-way communications between students and instructors and, in many cases, synchronous communication among students. Interactive video conferencing would be a good example of third generation distance education. The three generations of distance education demonstrates that as technology has progressed, so has distance education.⁹

REVIEW OF TECHNOLOGIES

Cost

One of the first things that must be considered when establishing a distance education program is the cost of the system. An analysis of costs is essential in making sensible decisions. The cost structure of each technology and the cost per-student should be considered. For example, one must distinguish between capital costs such as video equipment versus operating costs needed for people to operate the equipment, buy the supplies, and pay the electric bill. When deciding which media and technologies to use, the distance education program should also consider the following issues: each technology's accessibility for learners and the flexibility for the target group; the best technology for supporting the types of learning and instructional approach; and organizational requirements.¹⁰

When designing a distance education system, several cost components must be considered:

1. Technology – hardware (e.g., computers, video & audio equipment, televisions) and software (e.g., computer programs).
2. Transmission – leasing transmission access is an on-going expense (e.g., high-speed digital data channels, fiber optics, microwave, and satellite).
3. Infrastructure – the network and telecommunications infrastructure located at the originating and receiving campuses.
4. Support – miscellaneous expenses including administrative costs, registration, facilities, advising, and overhead costs needed to ensure that the system functions effectively.
5. Maintenance – updating and repairing equipment.

6. Personnel – to staff all functions previously mentioned.¹¹

Many students have access to the equipment that is required for distance education through libraries and computer laboratories. However, the cost of introducing student owned computing into distance education should also be considered. The following list of items can be identified as possible costs for students: the personal computer, modem, multi-application software package, graphical/sound user interface, printer, and an Internet service provider. The recurrent costs associated with student owned computing include consumable products such as floppy disks, ribbons or cartridges, Internet fees, and paper. In addition to tuition, many distance education students pay the same fees that traditional students pay. However, an assortment of these fees are not applicable. For example, shuttle bus fees, building use fees, recycling fees, etc., should not be charged to a distance education student. In most cases, distance education students will not visit the main campus.¹²

Technological Options

There are a wide variety of technological options available to distance educators. They fall into four main categories:

1. Print is the foundation from which all other delivery systems have evolved. Various print formats are available including textbooks, workbooks, study guides, and case studies. Print is still the most user friendly among the media considered; it is portable and requires no other piece of equipment to access it.

2. Instructional audio tools include the interactive technologies of telephone, radio, and audio-conferencing. One-way audio tools include tapes and radio.

3. Instructional video tools include film and videotape, still images such as slides, and real-time moving images combined with audio technology.

4. Computer applications are used to send and receive information electronically. Computers have been a dynamic force in providing a means of overcoming time and distance to reach students using both one-way and two-way communications.¹³

Connecting Technology

There are several ways for universities to connect technology with regard to distance education. Four of the main categories are listed below:

1. The Internet was first conceived in the early 1960s by the United States government. It is an international network used to connect personal computers, mainframes, and supercomputers around the globe. The Internet has revolutionized the computer and communications world like nothing before.¹⁴ The Internet allows anyone with a computer, or access to a computer, to send or receive information globally in a matter of seconds. The Internet is a very powerful and useful tool in this age of technology. Many products and services have been developed for the Internet since its inception.

2. The World-Wide Web (WWW) is an innovative front-end to the Internet. The WWW provides Internet users with a uniform and convenient way to access the resources available on the Internet. Software interfaces, such as Internet Explorer and Netscape Navigator, facilitate navigation and use of the WWW.¹⁵ The WWW and Web browsers have made the Internet more user-friendly, as well as lessening the learning curve. Web browsers link to remote computers and retrieve the information to be sent to your

computer to be viewed. These documents are formatted using Hypertext Markup Language (HTML). HTML solves computer incompatibility problems by using standardized tags.¹⁶

3. Rapid development in computer technology has provided drastic improvements in magnetic storage, processing power, and computer networks. Computer applications for distance education in this broad category can be classified into four sub-categories:

- A. Computer-assisted instruction (CAI): The computer is used as a self-contained teaching machine to present individual lessons.
- B. Computer-managed instruction (CMI): The instruction is not necessarily delivered via a computer. However, CAI and CMI are often combined. Here the computer is used to organize and track student records and progress.
- C. Computer-mediated communication (CMC): The computer applications are used to facilitate the delivery of instruction by using electronic mail, fax, World-Wide Web applications, and real-time computer conferencing.
- D. Computer-based multimedia: The goal of computer-based multimedia is to integrate various voice, video, and computer technologies into a single and easily accessible delivery system.¹⁷

4. The availability and power of television give it unique teaching characteristics. Television can enhance learning by providing a wide variety of audiovisual learning materials. Methods of delivery include broadcasting, videocassettes, cable, and satellite.¹⁸

Distance Learning Tools

There are four main tools which distance learning employs: Interactive Instructional Audio, Instructional Television, Interactive Videoconferencing, and Web-based applications. Following is a discussion of these learning tools.

1. Interactive Instructional Audio refers to the tools used in distance education and includes the telephone, audio-conferencing and radio. Audiotapes and radio are passive, one-way, audio tools. Instructionally, these tools are similar to print. Audio-conferencing can be audio-only or audio-graphic. Audio-only conferencing uses the public telephone system to connect people at two or more locations. The technical components of an audio-conference typically include speakerphones or microphones, an audio bridge, and a device to facilitate multiple interactions.¹⁹ Audio-graphic conferencing combines image and voice technology. Audio-graphic peripherals, such as electronic blackboards, still video, and computers provide a visual component, but voice remains the principal communication method.²⁰

Advantages

- ❑ It is relatively inexpensive to install, operate, and maintain.
- ❑ It uses available telephone technology, which enables it to reach many students.
- ❑ The technology is generally familiar to instructors and students.
- ❑ It allows for student and instructor participation.

Limitations

- ❑ It can be impersonal because it eliminates non-verbal cues.
- ❑ It places restrictions on the type of content that can be delivered in oral form.
- ❑ Initial resistance may be encountered until users become familiar with the equipment.

2. Instructional Television offers courses so students can take college classes at times and in locations that are convenient. Classes can be viewed in the convenience of the home or on college campuses. Passive instructional television generally involves pre-produced programs, which can be distributed by videocassettes, or broadcast using cable or satellite technology.²¹ Instructional television can be integrated into the curriculum at three basic levels: 1) Single lesson programs provide a lesson introduction, overview, or summary on one specific topic. 2) Select unit programs provide the content foundation in a series of programs. 3) Full course programs are a series of programs that are integrated into a full semester of course work. Typically, these courses incorporate instructional printed materials.²²

Advantages

- ❑ The medium of television is familiar to many people.
- ❑ Complex or abstract concepts can be easily illustrated through the visual medium.
- ❑ It is an effective way to show students new environments.
- ❑ Classes can be viewed at the student's convenience.
- ❑ It is an effective way to introduce, summarize, and review concepts.

Limitations

- ❑ Broadcast quality programs can be expensive to create.
- ❑ If the programs are not professionally produced they often are not as effective.
- ❑ Producing videos is time consuming and may require sophisticated production equipment.
- ❑ Instructional effectiveness can be limited without interaction between instructors and students.
- ❑ Once the programs are complete, they are difficult to update and revise.²³

3. Interactive Videoconferencing is an alternative teaching tool that allows faculty to instruct students in a classroom setting at more than one campus concurrently. This system can be integrated into a distance education program with minimal adaptation to the curriculum. A videoconferencing system must include audio-visual equipment such as monitors, cameras, microphones, speakers, as well as a means of transmitting information between locations. Transmitting the instruction can be accomplished via microwave/broadcast television, fiber optics, telephone lines, and limited satellite systems. Most interactive videoconferencing systems use high capacity Integrated Services Digital Networks (ISDN) to compress digital video for the transmission of data. The video compression process actually decreases the amount of data transmitted over the lines simply by transmitting only the changes in the picture.²⁴

Interactive videoconferencing has two main types: 1) Point-to-point is simply used to connect two locations and 2) Multi-point is capable of simultaneously connecting more than two sites through the use of a multi-point control unit.²⁵ The core of interactive videoconferencing is the codec (coder/decoder). This is an electronic device that transmits and receives the video signals that the students will see on their monitors. The codec takes the signals, compresses and digitizes them, and transmits the signals over digital phone lines.²⁶

There are three sub-categories of Videoconferencing systems: A) Small room videoconferencing. This system is designed primarily for small groups seated around a conference table. B) Desktop Videoconferencing systems operate using a personal computer and videoconferencing software. These systems are generally less expensive,

however, the resolution is limited. C) Classroom Videoconferencing systems usually use high quality audio-visual components, codecs, and an interface that allows all participants to be seen on the monitors.²⁷

Since 1991, the University of Montana has offered their Off-Campus Master's in Business Administration (MBA) program through interactive video-conferencing. Currently, they link six major classroom sites across Montana with two distance education classrooms in Missoula on the Montana Educational Television Network (METNET).²⁸ This program has graduated 123 students; 114 others are presently enrolled, and approximately 42 are expected to graduate in 1999.²⁹

Advantages

- ❑ It allows for “real time” audio-visual contact between instructor and student at all connected sites.
- ❑ It supports the use of a diverse range of media.
- ❑ It enables connection with external resources.
- ❑ It appeals to a wide variety of learning styles.
- ❑ It provides access to students at remote sites and special needs students.³⁰

Limitations

- ❑ The initial cost of the equipment and infrastructure may be prohibitive.
- ❑ Configuring the system properly is critical to avoid audio echoing and visual ghosting.
- ❑ Some students may remain uninvolved in the course.
- ❑ It requires a “team” of people to operate.
- ❑ Some compression methods are not compatible with one another.³¹

4. Web-based distance education is an innovative asynchronous/synchronous approach where computer-based training is transformed by the technologies of the World Wide Web, Internets, and Intranets. Web-based education is structured in a way that allows for self-paced instruction on virtually any topic. Advances in computer and network technology make web-based education an ideal vehicle for delivering training anywhere in the world. Web-based education expands upon computer-based training with group activities like discussion forums, mail lists, and chat sessions.³² The Internet and WWW, perhaps more than any other distance media, have helped to overcome the barriers of time and space in distance education.³³

Advantages

- ❑ The technology is readily available.
- ❑ The cost is relatively inexpensive.
- ❑ The information can be updated rapidly.
- ❑ Training is flexible and self-paced.
- ❑ It offers a wide variety of multi-media access.³⁴
- ❑ It has the potential to reach a global audience.³⁵

Limitations

- ❑ The capacity of the communications link is limited (bandwidth).³⁶
- ❑ The instructional effectiveness can be curbed with limited interaction between instructors and students.
- ❑ It places restrictions on the type of content that can be delivered in oral form.
- ❑ It is not well suited for some discussion issues.³⁷

RESEARCH ON WEB-BASED TECHNOLOGY

Web-based training is delivered using Transmission Control Protocol (TCP) and Hypertext Transfer Protocol (HTTP), the protocols that are used to define the WWW. TCP ensures that the data is shipped and received in the proper order, while HTTP is used to signify that an Internet site is a WWW site.³⁸ Web-based distance education usually takes on one of the six following forms: 1) Electronic mail, 2) Bulletin boards/newsgroups, 3) Interactive tutorials, 4) Interactive conferencing, 5) Intranets, and 6) Informatics, the use of online databases or library catalogs.³⁹

The WWW and web browsers have turned the Internet into a user-friendly environment. It gave novice users the ability to integrate text, graphics, and sound into a single tool while easing the learning curve. Another novel feature is the ability to create independent home pages.⁴⁰ Web-based courses allow students to develop skills in collaborating with distant colleagues and working with diverse individuals. These skills are increasingly needed in the global workplace.⁴¹

For instructors, web-based distance education provides many opportunities for distance teaching and learning. The home page can contain information regarding the class such as the syllabus, class notes, solutions, assignments, the instructor's biography, and other important links that pertain to the class.⁴²

Although the MBA interactive video-conferencing program has been successful at the University of Montana, approximately 85% of those who inquired about this form of distance education did not enroll. In 1996, two market surveys were sent out and the survey's indicated that the major impediment to enrolling was the foundation program (prerequisite courses for the MBA). As a result of this survey, the Business School

approved the concept of developing new courses to be delivered via the WWW in May 1997. Currently, Off-Campus MBA students are able to complete all of their foundation program requirements through flexible, asynchronous delivery on the WWW; these courses are well suited for this instruction mode.

Some critics suggest that web-based education is not well suited for some discussion issues. However, thoughtfully designed web-based courses can actually enhance interaction between students and the instructor. The anonymity of computer communications has the potential to allow someone who is reluctant to speak in a face-to-face situation the opportunity to voice their opinion through the use of technology.⁴³

Student Issues

Effective distance education programs begin with careful planning and a focused understanding of the course requirements and the student needs. Regardless of the educational context, the primary role of every student is simply to learn. Distance education brings additional challenges because of the span that separates them from the instructor and other students. This allows for fewer opportunities to interact and technological links must be relied on to bridge the gap.⁴⁴

Distance education students, like traditional students, must be responsible for the many issues that face them in their collegiate years. Some believe that distance learners must be even more focused, better time managers, self-disciplined, self-motivated, and they must be able to work independently.⁴⁵

When incorporating technology into distance education, students must be properly trained on the equipment. Information about the technology and how to use it should be

part of the course. This will ease some of the anxiety that distance education students might experience in these types of courses.⁴⁶

Other issues such as advising and registration are extremely important to any student, but can be more troublesome for the distant student. Whether the student is on the campus or not, students need quality advising. Personal contacts for remote sites and the main campus should also be distributed. This could all be included in a “telesyllabus,” an expanded course syllabus for distance learners.⁴⁷

Instructor Issues

The success of any distance education course is, appropriately, in the hands of the instructor. One of the major differences between learning in the traditional method of education compared to distance education is the variety and extent of interaction. Special challenges confront instructors teaching distance education courses. For example, instructors must develop an understanding of the needs of distance learners with little, if any, face-to-face contact. Also, traditional courses cannot be directly transported into distance education; certain changes must be made for a quality presentation. Instructors need to develop a working understanding of the technology, while remaining focused on their role as an instructor. This allows for instructors to be skilled facilitators, as well as content providers.⁴⁸

Some key issues that instructors must address before teaching a distance education course include: receiving adequate training in regard to the technology that they will be using, adapting instructional materials for a particular technology, developing the most effective method to present the material, discovering the most appropriate method to

interact with students, and allotting an adequate amount of time to prepare and teach a quality course.⁴⁹

Distance education offers new opportunities to instructors and students, but it also presents some areas of concern. The main area of concern for instructors is the possibility of downsizing. More part-time instructors and technical staff may replace the number of full-time instructors. Some suggest that universities may offer on-line courses to several hundred distance learners using part-time instructors or teacher assistants to facilitate the course.⁵⁰ If this happens, many universities may lose their accreditation.

Higher education has seen decreases in state funding, and many predict that this trend will continue into the next decade. Oftentimes when money is tight, administrators turn to part-time instructors and look to advances in technology to cut costs. However, technology is not always inexpensive. There is a need for equipment, support networks & services, marketing, and possibly a communication infrastructure. In addition, costs associated with registration, advising, testing, etc., still exist.⁵¹

On the other hand, there is no substitute for a live instructor in the classroom, whether it is virtual or traditional. Instructors and administrators must remember that students do not learn from the technology. They learn from competent instructors who teach via technology.⁵² It doesn't matter how impressive the technology becomes, instructors will always be central in deciding how that technology is used, and in guiding, shaping and evaluating new developments. Empowered by technology, the roles and responsibilities of distance education instructors will expand significantly.⁵³ Distance education will not replace the need for instructors. The technology used in distance education should simply be seen as an add-on to existing universities.⁵⁴

Course Evaluations

Research indicates that, as long as the delivery technology is appropriate to the content of the material being taught, the instructional format itself has little effect on student achievement.⁵⁵

An independent study administered at Brigham Young University measured the course effectiveness and student attitudes towards distance education. Over 500 students completed the evaluation forms. The questions were written using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). One question stated, "This course met my needs." It had a mean score of 4.34 with a standard deviation of .75. Another attitude question stated, "I would recommend this course to a friend." The mean score was 4.21 with a standard deviation of .83. One of the questions that asked the participants to compare educational methods stated, "The educational value of this course was equivalent to a successful classroom experience." It had a mean score of 4.03 with a standard deviation of .95. Another comparison question stated, "I learned as much or more in this course than I would have in a similar classroom course." The mean score was 3.94 with the standard deviation of 1.13.⁵⁶

Stanford University conducted a three-year study comparing the performance of students studying via distance technology with students taking the traditional on campus instruction. The study showed that the 16,652 students that attended classes on campus had an average GPA of 3.40, while the 1,771 distance education students had an average GPA of 3.39.⁵⁷

S.L. Hodge-Hardin, a doctoral student at East Tennessee State University, completed a dissertation on math achievement among students taking developmental algebra at a

distance or in the traditional classroom. This study concluded that there was no significant difference between the two groups.⁵⁸

These studies suggest that there is not a large variance in the performance of students who received their instruction at a distance or in the traditional classroom.⁵⁹

Accreditation

Accreditation is a voluntary process through which an independent, nationally recognized association evaluates the quality and effectiveness of an educational institution. Accreditation of a university that offers distance education is important to ensure that records are widely accepted by other universities, employers, and professional associations.⁶⁰

In the United States, regional accreditation boards are the most widely recognized forms of accreditation. The United States is divided into six geographic regions and the accreditation boards are: Middle States Association (MSA), Northwest Association of Schools & Colleges (NASC), North Central Association of Colleges & Schools (NCA), New England Association of Schools & Colleges (NEASC), Southern Association of Colleges & Schools (SACS), and Western Association of Schools & Colleges (WASC). These six boards are considered equal in the eyes of academia for the purpose of degree status and transferring credits from one college to another.⁶¹ The American Assembly of Collegiate Schools of Business (AACSB) also accredits all undergraduate and graduate programs at the University of Montana's School of Business Administration.

Another nationally recognized accreditation agency for distance education universities is the Distance Education & Training Council (DETC). Although the DETC is a

recognized agency, credits and degrees from on-line colleges that hold only the DETC accreditation are not widely accepted by regionally accredited colleges.

To further complicate the issue, there are several Web-sites that claim that they are legitimate universities. However, the .edu domain extension on the WWW currently is not regulated. Therefore, it is easy to be misled into believing that just because the site has a .edu domain, it must be a real educational institution. Consequently, it is extremely important to check and see if the on-line university that you are considering has legitimate accreditation.⁶²

NEW INNOVATIONS IN WEB-BASED TECHNOLOGY

Business

Traditional network management systems are being replaced by web-based technology. Information system professionals who survived the shift from mainframes to client/servers may have to adapt again to web-based systems.⁶³ The key advantages of web-based computing over client/server are the speed of development, simplicity, and rapid pay back. For example, the Federal Express package-tracking application took less than two months to develop from conception to completion. Citicorp developed a web-based application to support operations in 100 countries for less than \$50,000. The original cost estimate using client/server technology was close to \$1 million.⁶⁴

In 1997, Management Accounting magazine completed a survey of 466 companies that employed more than nine million people. Almost half (47%) of the respondents said they use web-based technology in their operations. This is up 27% from the 1996 survey. Approximately three-fourths (73%) of the respondents said they plan to use web-based technology within the next two years. The top reasons for implementing web-based technology was to enhance employee communication and employee training. Only 9% said that cost reduction was their number one goal.⁶⁵

Technology has allowed workers to have flexible hours created by telecommuting to virtual offices. The term “boundaryless” work force has been used to define this new direction. James O’Connell, vice president of government relations and human resource policy for Ceridan Corporation, an information services firm, calls boundaryless workers an employment “megatrend.” Boundaryless doesn’t mean workers are invisible; they generally spend part of the work week at the office. Ceridan conducted a survey of 401

companies in 1998. According to their survey, 91% said they use some type of boundaryless work arrangement; 60% said that the arrangement attracts qualified workers, and more than half said that it increased productivity.⁶⁶

Mortgage companies are experiencing a large growth in the web-based market. Forrester Research Inc., estimates online mortgages will capture nearly 10% of the \$1.3 trillion mortgage market. Harold Otto, web-master for New York Mortgage, states that they conduct over 35% of their business electronically. Sky Tsan, mortgage loan seeker, recently refinanced his home mortgage. He simply searched the Internet for the best rates, downloaded a loan application, filled it out on his home computer and e-mailed the completed application. He states the contrast in the process from 10 years earlier. "I spent days calling around, I made an appointment with a banker just to receive an application, completed the paperwork, met again with the banker, just to get the long approval process in motion." He believes the process has been shortened by several weeks. There are obvious benefits to searching for a mortgage online. It offers the convenience of being able to shop 24 hours a day, and it also saves time. However, Keith Gumbinger, vice president of HSH Associates, suggests borrowers must exercise some caution before divulging personal financial information. Borrowers should research the lender and how their privacy will be protected before sending confidential information, states Gumbinger.⁶⁷

Another corporate web-based training concept is the Web-Based Performance Support System (WBPSS). It is a web-based system that provides on-demand access to information, job aids, knowledge assets, training, and support for many tasks that are

performed in the workplace. It uses web technology to deliver support in an enterprise environment.⁶⁸

One of the most valuable resources within an organization is its information assets, the collective knowledge of its employees. A WPSS can be used to organize, manage, and retrieve these assets for the benefit of the users within an organization. It can be designed by using existing or by creating customized performance enhancing components. A WPSS often consists of the following components:

- ❑ Productivity software
- ❑ Job-aids, templates, wizards, and cue cards
- ❑ Task-related information
- ❑ Knowledge-assets management system
- ❑ Web-based training
- ❑ Agents (software applications that perform tasks behind the scene)
- ❑ Artificial intelligence system

Since most WPSS's have to be exclusively created to meet an organization's needs, most WPSS's do not come in shrink-wrapped packages.⁶⁹ It has been predicted that WPSS's will encounter tremendous growth in corporate information systems departments in the coming years.⁷⁰

Web-based High School Courses

Cyberschool, a project of the Public School District in Eugene, Oregon, offers high school courses using web-based technology. Students can enroll to earn a letter-grade or pass/fail credit in subjects such as English, Mathematics, Technology, and Social Sciences, without setting a foot in a classroom. Kingswood Oxford High School in West Hartford, Connecticut, offers on-line resources that are organized by content areas such

as Art, Music, Economics, Government, Mathematics, etc., to assist students with their studies.⁷¹ The “Virtual Frog Dissection Kit” demonstrates that high school students are on the cutting-edge in regard to web-based technology. This site takes students through the dissection process. It allows students to view the frog from a variety of angles, with clear instructions and support.⁷²

Web-based Universities

The World Wide Web Course Tool (WebCT) is an easy-to-use tool that facilitates the creation of WWW-based courses that might otherwise be beyond the ability of the non-computer programmer. WebCT was developed for academic use. It allows instructors to design their web-based course, provides a set of educational tools that can easily be incorporated into any course, and provides a set of administrative tools that assist instructors in the task of course administration. WebCT can be used to create entire on-line courses, or to simply publish materials that supplement existing courses.⁷³

WebCT consists of three main aspects:

1. It contains presentation tools. These tools allow the designer to customize their course by determining the layout, text, colors, graphics, etc.
2. It contains a set of student tools. These tools include communication tools (e-mail & chat), student-evaluation and self-evaluation tools (automatically marked quizzes and content-related questions), a course calendar, glossary, search engine, student presentation area, and a student home page generation site.
3. It also contains a set of administrative tools. These tools aid in the delivery of the course material. A list of tools includes an on-line textbook, student progress

tracking, question & on-line quiz creation, questionnaire delivery, student access control & tracking, and grade maintenance & reporting.⁷⁴

Ongoing work is proceeding on several fronts with regard to WebCT. They are exploring the possibility of implementing new tools that would include real-time audio & video conferencing for student collaboration. They hope to accomplish this task by integrating existing packages into WebCT rather than designing the tools themselves.⁷⁵

Columbia Business School has signed on as the first academic institution to provide educational material to a start-up company called UNEXT.com, according to Dean Meyer Feldberg. UNEXT.com plans to deliver postgraduate-level training electronically to corporations around the world. The content will include courses that are typically offered in an MBA program, plus some additional courses in which working people around the world might be interested. UNEXT.com sees this joint venture not only as an intellectual opportunity, but also as a business opportunity. Eventually, they hope to offer course material from other top-ranked universities. However, UNEXT.com is not alone in seeing the vast opportunities in delivering education materials. As an example, the University of Southern California Business School and Wharton School at the University of Pennsylvania, recently signed a contract with Caliber Learning Network Inc., a company affiliated with Sylvan Learning Systems Inc. Many universities are attempting to expand their reach beyond their campuses, while enterprises are seeking to tap the demand for university-caliber education at home or in the workplace.⁷⁶

The UC Irvine's Graduate School of Management provides a state-of-the-art learning environment where students carry their laptop computers into "wired" classrooms. Web-based technology allows the students to pursue their studies on or off campus. Instructors

can give electronic tests/quizzes and get instant feedback on the student's performance. Less than a second after finishing each test the students can see all the wrong answers on their screens and an explanation of what the correct answer should have been. During "office hours" students log into a chat room to ask question or seek advice. The university believes that virtual classrooms help students prepare for the business world that increasingly requires an understanding of technology.⁷⁷

Selena Castro, full-time Washington State University (WSU) student, wife, and mother of two is thrilled with the virtual class options. The web-based, Econ 102-V, class allows her to "attend" anytime, day or night, from anywhere, even work. Logging on to the on-line discussion group, and checking for new messages from other students and the instructor ensures that she doesn't miss a thing. Being able to call up lectures, self-tests, and interactive diagrams any time allows her to have more control of her valuable time. Especially appealing were the hands-on, interactive diagrams, said Castro. When students worked with supply and demand graphs, they plugged in variables along the X and Y-axis and then watched the graphs change. This is something a textbook could never do. "This class fit my life; I love it!" states Castro. The instructor, WSU Ph.D. candidate Jayne Brahler, stresses that the materials for the web-based instruction are pedagogy, not technology, driven.⁷⁸

Universities not only serve the traditional student on campus, but the local community as well. A current example is the national live teleconference in Missoula, Montana, on April 21, 1999. Continuing Education at the University of Montana is joining forces with the Public Broadcasting Service's business channel to provide support staff with a professional growth opportunity in conjunction with Professional Secretaries Day. The

participants will travel to the University of Montana for a live, interactive video teleconference featuring keynote speaker Joan Lunden, former co-host of ABC-TV's "Good Morning America."⁷⁹

Dow Jones University offers a completely new way to build powerful investing skills. They offer six-week courses that include a combination of interactive features, multimedia lessons, and on-line quizzes to teach the important principles of investing. The web-based site allows students to improve their investing skills at their own pace, anywhere they have Internet access. The web-site also offers links to current global news. The courses are only \$49 each and range from basic to advanced on the topics, which include:

- ❑ Introduction to Investing
- ❑ International Investing
- ❑ Economic Essentials for Investors
- ❑ Planning and Investing for Retirement
- ❑ Fundamental Analysis of Common Stocks
- ❑ Tools and Techniques of Technical Analysis⁸⁰

Yogesh Gupta, senior vice president of Product Strategy for Computer Associates, suggests that the most important web-based function their company has to offer is its Advanced Help Desk. Users can forward questions or problems to a support department simply by completing a form on a web page. The form is then processed according to company support procedures.⁸¹

Not everyone sees web-based technology as a practical tool. Jill Huntington-Lee, vice president of marketing communications at Micromuse Inc., takes a critical view of web-based technology. She states, "Web technology is pretty. It's colorful. But the data is not

always in a standard format.” The director of Spectrum Platform Development, Joe Massey, is skeptical about web-based security. He indicates, “Our customers are squeamish about putting the capability to control devices on a web site.”⁸² Other critics bring up the much-debated “Y2K” (year 2000) uncertainty. To represent years, computers generally use the last two digits, for example ’97, ’98, and ’99. When 1999, ’99 in computer language, rolls over at midnight New Year’s Eve to 00, many computers will conclude it is 1900, not 2000. No one knows for sure what will happen, but both sides of the issue have staunch opinions. The Y2K problem has definitely provided a healthy dose of humility for our modern society, which tends to worship progress and technology.

CONCLUSION

It has been written by many that combining technology with education is a unique danger for the next millennium. This is simply not true. As the printing press made written texts popular, many warned that this form of education would ruin academia because people would read, write, and memorize rather than speak and debate as it was done for all of human prehistory. Every time a new tool has made in-roads into academia the nature of education has changed, from the introduction of the fountain pen, printed text, computers, Internet, and now videoconferencing.

Today's universities will not only be built of brick-and-mortar; they will also be built of silicon chips. It will be both ways because we live in a technological society that wants it both ways to satisfy our diverse needs. Distance education is no longer distant due to the continuing advances in technology. Technology has altered the relationship between students and instructors, and even what is considered a classroom situation.

Ten years ago, few people would have understood the term "distance education" as we know it today; now it has become part of our educational vocabulary. Distance education has changed from being the last choice for people who were unable to attend college to being their first choice due to the advances in technology.

The future is one where learning boundaries will soon disappear as distance education opportunities continue to expand. One of the most prolific areas for growth is for courses leading to a Master's in Business Administration. With the flexibility and quality of distance education, students would be able to complete their course of study without suffering the loss of salary. Another trend is the increasing interest in providing on-the-job training through distance education. Classroom-based seminars can save a company

hundreds of dollars a day. On-the-job training removes expenses such as travel, lodging, and transit time. If institutions don't adapt and make distance education available, the consumer will find it elsewhere.

The quality of education in tomorrow's universities will not depend on the physical structure, but on the quality of thought and heart that goes into designing and delivering the overall educational experience. If you haven't been in a classroom in five or more years, be assured that much more than content has been updated.

Dr. Thomas A. Clark, co-author of Distance Education: The Foundations of Effective Practice, once wrote: "Educational media are mere vehicles that deliver instruction but they do not influence student achievement any more than the truck that delivers our groceries causes changes in nutrition."⁸³

Distance education offers many options as previously discussed. Distance education should not be viewed as an objective, but as a strategy that can potentially serve many objectives. The primary benefit to educational institutions through distance education may be the increased number of non-traditional students they are able to attract and serve.

Making choices with respect to distance education technology can be difficult. Institutions must carefully prepare today for what is anticipated as a widespread integration of information into teaching, learning, and research. Five recommendations for integrated distance education include: 1) assign a committee to analyze all major distance education issues and purchases, 2) establish high standards for certificate and degree programs, 3) avoid confrontations between traditionalists and technology enthusiasts, 4) encourage collaboration and cooperation between distance education faculty, and 5) maintain a strong commitment to staffing, funding, and support structures.

Computer based technology is exciting and it is just getting started. This medium is just one of many mediums. It will not completely replace the other mediums. For example, radio didn't replace newspaper and television didn't replace radio. Some mediums are simply better suited for different situations and applications.

No one knows where technology will be five years from now, including Bill Gates. The only thing that is known is that technology will be much different in five years compared to today's technology. Having said that, I believe that the WWW and on-line instruction will continue to grow. However, it will grow exponentially when there is enough bandwidth to make it readily accessible. The WWW is becoming an effective delivery device, but not as quickly as people believed it would. Interactive videoconferencing will continue to play a significant role in terms of both teacher-student and student-student interaction. I also believe that face to face instruction will continue to play a crucial role in many of the finest distance education courses.

Computers, the WWW, and the Internet are shaping the current generation of distance education. Distance education is currently receiving widespread acceptance. Graphical multimedia applications using three-dimensional on-line movies, audio communications and video conferencing will also become more prevalent. It is likely that artificial intelligence, knowledge systems, and virtual reality may shape the next generation of information technology.

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