

WisView Teleconferencing



How Well Do Students Learn Through Teleconferencing?

There have been literally thousands of evaluations and comparisons of on-campus versus off-campus learning. The general finding is that students in site-based educational programs usually do better than those on campus. Sometimes their performance is equal, very rarely is it worse. The reasons for this are often due to the increased course preparation and organization required by teleconference delivery and the stress on work-centered applications that lead to improved student motivation. The chart below shows the performance of on-campus and off-campus students enrolled in our technical Japanese courses.

Student Success in Site-Based Education

The paragraphs below explain why teleconferencing students do well and how they learn in this format.

1. We deliver short courses via teleconferencing in one- to two-hour lecture/discussion sessions that are scheduled once or twice a week over a period of several weeks. This format allows students time for reflection and allows us to require more rigorous student input and participation such as student projects, homework, quizzes or other assignments.
2. We organize our courses as seminars or workshops. In addition to lectures and discussion, each course includes: a notebook containing all lecture illustrations and outlines of key points, supplementary readings and homework problems and assignments, usually submitted by fax or e-mail. Courses may also include student presentations made over the teleconferencing system. In some courses we supply specific software to be used in solving problems.
3. Site-based education allows the students to develop applications of the subject matter that are directly related to their own work. The instructors stress this in the problems and homework assigned.
4. The courses that we select for teleconference delivery focus on concept or skill building. Teleconferencing can provide the interaction between students and instructors that is so important in skill and concept learning. Courses solely information-based can better be delivered as lectures through videocassette or satellite television.

ADVANTAGES OF TELECONFERENCING

STUDENT SUCCESS

OTHER ADVANTAGES

Other Advantages of Site-Based Delivery

1. Time and money saved on student travel and time away from work are key benefits for many participants.
2. The potential for training a team is also important. This could be a vertically integrated group that must work together to implement a new technology or change in the organization or a design team, involved in the creation of a new product. The team could also be a task force trying to solve a company problem. Since it is normally impossible to send the whole team off site for training, teleconference delivery is an ideal solution.
3. In addition to team instruction, we can deliver courses company-wide by connecting many geographically separate company sites to the same teleconference.
4. Teleconferencing courses are flexible and can be tailored to meet your organization's needs. It is relatively easy to add extra sessions to deal with special problems. It is also easy to bring in instructors from off campus or guest speakers from anywhere in the world.

MEETING NEEDS

Tailoring a Course to Meet Your Company's Needs

We realize the importance of the direct application of course principles to student learning and company satisfaction. For this reason, we assign application projects as described above. We can also tailor courses to your company's needs in the following ways:

1. Most courses include 1-2 sessions per week. We can add another session each week to deal with specific company problems. A typical public course would serve 4-8 sites. If there are several companies enrolled in the course, each company might have 1-2 sessions for its needs.
2. Courses may be team taught involving your instructors and our faculty. Often we are asked to provide background, theory and principles and general applications while the company wishes to generate its own specific applications. Team teaching can involve planning lessons together in advance or simply sharing instruction time. In the latter case, our faculty might teach on Tuesdays while your instructors would teach on Thursdays. We can usually provide some tailoring of course material without any increase in fees. Substantial course modification may require fee negotiations with the program director.

Technical Options for Site-Based Education

Engineering Professional Development courses are available live at your worksite via audiographic or video teleconferencing directly from the University of Wisconsin-Madison campus.

Audiographic Teleconferencing uses standard computer hardware and audiographics software along with a high-quality audioconferencing system to share information and visual images among many sites simultaneously. Voice and computer screen images, including pictures, text, data and high resolution graphics are transmitted live. At any time during a session, students can participate in discussions and ask questions through their microphones. They can also use an electronic pen and tablet to create or annotate visual materials on the computer screen. Several participants may speak and use their tablets at the same time, creating a high degree of interaction. The system operates on ordinary dial-up phone lines and is relatively easy to set up. A copy of the audiographics software and technical assistance in site setup are provided as part of the course.

The University of Wisconsin has used audiographics successfully for many years. Though the system transmits still-frame graphics as opposed to motion video, the advantages of low cost, ease of use and high-resolution display make it superior in many ways to traditional videoconferencing.

Video Teleconferencing uses compressed digital video teleconferencing systems to deliver interactive television to sites with that capability. In videoconferencing, participants will see a television image of the instructor and the students at the other sites as well as still graphics from an overhead camera. These videoconferencing systems also incorporate live audioconferencing. The University can interface with any equipment that meets CCITT H.320 standards and is available through an ISDN connection. We have experience in connecting with systems from V-Tel, PictureTel, Compression Labs and others and we support our own bridge.

Additional information on your teleconferencing options is provided in this response packet. You will also find phone numbers for course information and technical support and a checklist to help you organize your site and ensure the success of your WisView course.

Audiographics and video teleconferencing sites may be combined in one program. In this case, those sites with videoconferencing capability will receive a motion picture while the other sites will receive only the still graphics display. All sites participate equally in the audioconference.



TECHNICAL OPTIONS

ARRANGING YOUR CONNECTION

Arranging Your Connection to the WisView Videoconferencing Network

Video teleconferencing uses compressed digital video teleconferencing systems to deliver interactive television to sites with that capability. The University can interface with any equipment that meets CCITT H.320 standards and is available through an ISDN connection. We have experience in connecting with systems from V-Tel, PictureTel, Compression Labs and others and we support our own bridge.

Video teleconferencing is the state-of-the-art in interactive teleconferencing for business meetings and instruction. Its use is growing very rapidly. Your company may have a system already. If you are part of a large company and you do not know of any videoconferencing facilities at your site, ask around. Chances are that someone in your company is considering the installation of a videoconferencing system. You may be able to provide some additional incentive for this installation or help to tailor it for your educational needs.

If you know that you have a videoconferencing room at your site, you will have to arrange to use it for the course. If there are scheduling conflicts, we can arrange to ship videotapes of some sessions. Since the courses are designed to be interactive, you should not plan to attend more than one or two sessions by videotape delay.

If you find the videoconferencing facility not available or if the internal costs are prohibitive, audiographic teleconferencing, which is described elsewhere in this package, provides a flexible and educationally effective alternative.

Once you have located your videoconferencing room and talked to the room coordinator, you will need to learn how to use the room and will need to test your system with our bridge. To arrange this test, call Milly Kortenkamp at 608-262-3772. Milly will put you in touch with our technical support staff, who can answer any other questions you may have.

Engineering Courses Available at Your Worksite via Teleconferencing



Course Title	Director
Advanced AutoLISP Programming	Tom Smith
Advanced Ergonomics Application Workshop	Frank Rath
Air Distribution—HVAC	Harold Olsen
Basic Lighting Design	Don Schramm
Competing Through Speed in New Product Development and Manufacture	Frank Rath
Contaminant Transport: Identifying Processes and Applying Models	Jack Quigley
Creativity Refresher	Don Schramm
Design Through Manufacture	Frank Rath
Effective Engineering Design Analysis with PC Finite Element Methods	Tom Smith
Engineering Economics	Rolf Killingstad
Foundation Course in Reading German	Sandy Courter
Fundamentals of Hydrogeology	Jack Quigley
Introduction to AutoLISP Programming	Tom Smith
Japanese for Business and Industry	Jim Davis
NCARB Design Refresher/NCARB Spring Refresher	Don Schramm
Piping Systems for HVAC	Harold Olsen
Plumbing System Design	Harold Olsen
Remediation Processes for Contaminated Soil and Groundwater	Jack Quigley
Residential Energy Refresher	Don Schramm
Set-up Reduction	Frank Rath
Solid Modeling for 3-D Engineering Design	Tom Smith
Technical Writing	Steven Zwickel
Technical Japanese	Jim Davis
Understanding and Applying Artificial Neural Networks	Tom Smith
Using Ergonomic Fundamentals to Analyze and Design Jobs, Work Methods and Workstations	Frank Rath

ENGINEERING COURSES

Call toll free 800-462-0876 and ask for the program director listed next to the course in which you are interested. The program director can answer questions about course content and work with you to bring the course to your worksite. To request other courses and suggest new course ideas, call toll free and ask for Tom Smith.

FOR MORE INFORMATION

GETTING CONNECTED

How Audiographic Teleconferencing Works

The WisView audiographic teleconferencing system combines an audio teleconference with a computer-based display of high-color and high-resolution graphics, photographs, and sketches. Locations are linked using standard telephone lines and all sites participate equally.

EQUIPMENT NEEDS

The teleconferencing system used for audiographics is software-based, and will run on any standard 386 or better computer with 4 MB of memory, DOS 3.1 (or higher), and VGA (or higher-resolution) display. All systems also require our audiographics software, which is supplied with the course, a graphics tablet and a V.32 bis or V.42 bis modem (9600 baud or higher).

Equipment Checklist

Following is a checklist of the equipment needed. Information about room setup is also included. The base system is standard and can normally be found in-house, rented locally for \$100-200 per month. We can also rent audio systems, tablets and modems.

- 386 or better computer with 4MB of memory, 2 serial ports and DOS 3.1 or higher.
- VGA or higher-resolution display. One 16-inch monitor will serve two to three students. One 20-inch monitor will serve four to five students, depending on room layout. For larger groups you will need multiple monitors and a distribution amplifier or a projector.
- V.32 or V.42 bis modem (9600 baud or higher)
- Graphics tablet(s) that will emulate a Summa graphics tablet. One tablet will serve 4 to 8 students, depending on room layout. For larger groups, you can use multiple tablets and an ABC switch.
- Standard audio conferencing system (NOT a speakerphone). The system you use should have speakers sized for your intended audience and room configuration and include a minimum of one microphone for each four to six participants.
- For larger groups we recommend systems with separate microphones. A small group may get by with an integrated system.
- Two regular telephone lines (one for graphics, one for voice)



TECHNICAL SUPPORT

The WisView network is supported by Instructional Communications Systems (ICS), a unit of the University of Wisconsin-Extension. Technical support is available. If you are setting up your own site, and have questions about equipment needs, peripheral rental, setup and operation, please contact Milly Kortenkamp at ICS:

Phone (608)262-3772

Fax (608)263-4435

Room Setup

An important consideration in setting up a conferencing room is table space. Students need room for notebooks and textbooks, plus the teleconference equipment, including microphones, a graphics tablet, and a keyboard. In a typical classroom each chair is given two feet of table length. For audiographics we recommend three feet of working space per student.

The system also requires two phone lines: one serving the computer and one serving the system.

Checklist for Site Coordinators and Course Champions

This checklist covers both video and audiographic teleconferencing. Where differences in these two technologies affect your site arrangements, we have noted this in the copy below. The major purpose of the checklist is to describe the administrative arrangements you need to make, since these are often more complex than the technical arrangements.

Reserve a Room—If you are taking the course via videoconferencing, you will need to reserve your company's videoconference room. If you are taking it via audiographics, you will need to reserve a conference room that can be available for the length of the course. The room should have adequate table space for the teleconferencing equipment and for the student notebooks and textbooks. The room must also have two phone lines.

Recruit Participants at Your Worksite—WisView courses are most effective and economical when you have a group of participants from your organization. To help you recruit participants, we will provide a course description in the form of a poster that you can copy and distribute to others in your organization or post on a bulletin board. Attached to the poster is an enrollment form that you can customize and use for signing-up participants for the course. Putting an announcement in your in-house newsletter or other publication can also generate interest. If you would like, we can send the course information to you electronically, to make this task easier. Please

CHECKLIST FOR SITE COORDINATORS

contact Nancy Rebholz via Internet e-mail rebholz@engr.wisc.edu for a copy of your course information.

Obtain Management Support—Convincing management of the importance of the course content and the effectiveness of this distance education medium is critical to the success of your course. We've enclosed materials that document our experience with the system and provide relevant facts on student performance. The program director will be glad to answer questions about the content and benefits of the course.

Arrange for Equipment (Audiographics Only)— You will need to arrange for equipment that can be dedicated to the course. You may rent locally those components that you don't have. We can provide audio equipment, graphic tablets and modems. The use of our audiographics software is included with the course.

Consider Customization—An important benefit of WisView courses is the ability to customize the course materials and case studies to address the concerns of your organization. It is also possible to arrange for instructors from your organization to be involved in the course delivery.

Assign Course Administrative Responsibilities—Each course will have a site coordinator or lead student who will be in charge of receiving course notebooks and other materials and distributing them to those taking the course. The coordinator may also be involved in submitting to the instructors any homework, projects and exams assigned during the course.

Communicate Student Responsibilities—Once you have a number of interested students, it is important to communicate with them about the course schedule, possible assignments, team projects and distribution of course materials. Wisview courses are interactive and are most successful when participants attend regularly and are prepared for class discussion.

Test Your System—If the course is delivered via videoconferencing, you will need to test the videoconference hookup and work with the room coordinator to learn how to use the room. If the course is delivered via audiographics, we ask that the site coordinator or a lead student take a forty-five minute training session on using the audiographic software and connecting to our network.

Educational Environments in CyberSpace

by Ken Blystone
edited by J. Ashton

What I have developed over the past ten years is a “school” that exists inside a computer. Thousands of students and hundreds of teachers use the Digital Foundation BBS (DF-BBS) each year for instructional purposes. Our digital school is in its fourth generation, having seen four major revisions in software during ten years.

While most people think of school as a place, I see it as a learning environment that need not be located in a school building. Through the marvel of computer technology, a school can now be created inside an electronic communications network. Using modem-equipped computers, students, teachers, and parents can now dial into the educational environment of the DF-BBS from any place at any time. Students connect to our system in order to read and write both public and private e-mail, exchange information through a wide variety of public forums, search databases for information, engage in social interaction through interactive on-line “chats,” read lessons, take tests, ask questions and get answers virtually as they would do in a traditional physical school building.

The positive features of this technique are that: 1) students have to read and write in order to participate; 2) all e-mail responses are highly personalized and individualized; 3) the school never closes; 4) callers are identified only by their name, thereby minimizing the negative effects caused by differences in age, sex, race, and appearance; 5) the system is linked to a number of other systems that all share their resources, i.e., we have over 10,000 free software files available for download; 6) the system reaches directly into the homes of students, creating increased opportunities for parental involvement in education; and 7) the system can be used free of charge.

To promote the use of educational telecommunications I have conducted numerous inservice workshops for teachers, published articles about the technique in professional journals, given demonstrations of the

INTRODUCTION

DF-BBS system to civic organizations, and incorporated telecommunications into the curriculum of a computer science course for educators that I teach at U.T. El Paso. I have worked with other programs such as the International Student Space Simulation project, for which I provided the communications network that students from across the country used to share information during their simulated space missions. Gradually, teachers are discovering the power of modems to motivate students to excel in a new educational environment.

While some educators call what I'm doing "distance learning," I think the idea of creating a "school inside a computer" goes far beyond that limited description. In workshops, I remind teachers that all learning is "distance" learning; it's just that most teachers are used to a distance of about 20 feet (in the classroom).

With the DF-BBS system I can reach children who are 200 feet away from me in another classroom, children who are 20 miles away on the other side of town, or even students who live in other states or countries. To me, the single most important element in education is communication between the teacher and the student. What I have done is to facilitate the interaction that can take place between teachers, students and parents by creating a new type of learning environment that is open and available to anyone, young or old, 24 hours a day.

Over the past ten years, the educational BBS I originally set up in El Paso in 1985 has received over 1.5 million calls and served over 20,000 students.

Teachers need to understand that in the new cyberspace scheme of things, students won't need the textbook itself, they'll need access to the content of the textbook through cyberspace. I know this sounds radical, even threatening to some, but I believe I am describing what is inevitably going to happen. As educators, we need to prepare for the inevitable technological advancements that will superimpose themselves on the educative process. What better way to introduce teachers to this change than to involve them in it. I challenge you to explore cyberspace and I invite you to do so with a benevolent guide who is willing to help you. I want to use the opportunity TCET has given me through this publication

to let teachers experience first hand what cyberspace is all about and how this process works.

During the next decade, the educational process will go through a revolution in how things are done. We have seen the beginning of that revolution with the adoption of several textbooks that are computer based. In the future, however, schools will abandon a strict reliance on use of physical textbooks, and instead they'll buy access to instructional content through computer networks. We are rapidly moving away from static forms of technology (printed materials and even CD-ROMs) to dynamic environments in which improvements, corrections, and additions can be made to "digital textbooks" on a daily basis. In the future, a district may have only one textbook for all students enrolled in a particular course. The book will be stored in digital format on the district's network and if students need to study they'll access the textbook through the district's BBS. The Digital Foundation BBS already has hundreds of books available on-line that students can obtain via modem. These are books that students can check out, but they don't have to check them back in.

Opportunities for students to work collaboratively while learning about Texas history and culture reached new heights last school year through a program called "Lone Star Modem Amigos." The project linked students from around the state via computer modem on the K12 Network. This innovative program will enable students to establish a personal e-mail account on an educational computer network they could use from either home or school to make friends with other Texas students.

Kathie Christensen, 4th grade teacher at Glen Cove Elementary School in El Paso, received a grant from the Ysleta Independent School District to direct the Modem Amigo project. Each 4th grade classroom at Glen Cove has been equipped with a computer, modem, and telephone line. Glen Cove students are able to use their new classroom computer to call into the K12 Network and exchange electronic mail, scanned pictures, digital music, and hypermedia projects with other students in Texas. The content of electronic exchanges is centered around social studies essential elements, information gathering techniques, and problem solving activities within a computer-mediated learning environment.

**WAYS TEACHERS
HAVE USED THE
K12 NETWORK-
THE POSSIBILITIES**

One of the goals of the project is to encourage Texas schools to provide students direct access to telecommunications technology. Over 5,000 students in the El Paso region are participating in educational networks designed specifically for use by children. Jack Crawford, founder of the K12 Network, says “this is a network with training wheels.” The K12 Network is easy to use and it teaches students the fundamentals of using a computer as a communications device.

The K12 Network operates as a part of FidoNet, a 35,000 member computer network, which started 11 years ago. The K12 Net was formed by an international group of teachers in 1990, and during the last five years it has grown to over 600 sites in fifteen countries. Rapid expansion is expected in the coming months now that the FidoNet feed is available via satellite at very low cost.

In Texas, there are over 1,000 FidoNet sites participating in over 100 Texas cities. Teachers wanting to join the Lone Star Modem Amigo project simply need to connect with a local FidoNet site and request a link to the K12 Network. There are no fees to join the K12 Network and use of the network for special projects linking children is free of charge.

Christensen’s Modem Amigo project is one of several modem projects being conducted by YISD teachers. Last school year, Carol Hooper, 8th grade mathematics teacher at Indian Ridge Middle School, linked her students with kids from 8 countries to discuss math problem solving strategies in the “MathMagic Project.” More than 50 schools from all over the world participated in MathMagic by calling into the K12 Network to exchange ideas on solving a variety of math problems. Hooper’s students’ TAAS scores were among the highest in the district which prompted the school’s principal to install 30 telephone lines during the summer so more students can participate in this year’s MathMagic program.

The French language teacher at Desert View Middle School, Toy Wong, received a grant from the district to direct a telecommunications project between students in El Paso and students in Canada and France. Local students are able to practice their French language skills with native speakers through modem exchanges. During the summer months, Ms.

Wong attended district-sponsored HyperCard programming training and developed HyperCard stacks using French audio sequences. These “stack programs” have been made available on the K12 Network and the DF-BBS for download to any teacher requesting them.

Other telecommunication projects are taking place between schools within the Ysleta I.S.D. High school honors students are serving as peer tutors to younger students on the local DF-BBS. Additionally, high school programmers are writing TAAS-based math and science software, uploading it to the DF-BBS and making it available to all teachers within the district. Teachers are even starting to place requests with our corps of high school programmers for custom software to support instructional units. Much of what is being produced by our own students is just as good as commercial software.

The Modem Amigo project is the latest extension of educational uses for cyberspace. Students are learning how to use computers, how to access international networks, how to create digital portfolios, and how to make new friends. Schools interested in joining the K12 Network and making the Lone Star Modem Amigo project available to their students should contact us through the numbers in the “Cyber-Appendix.”

The future relationship between education and technology is uncertain. In some ways teachers have clearly embraced the use of computers in schools. Walk into most schools these days and you are likely to see computer generated banners encouraging “the team” on to victory. Or, you might see examples of student reports up in hallways that were obviously created on a classroom computer using some type of word processing software.

But what you are less likely to see are students, in any significant numbers, participating on local, regional, national, or international computer networks. Few teachers have ever participated in a digital learning environment. And it follows, students are not likely to experience something that their teachers have never experienced. Teachers are not likely to push for instructional devices that they are unfamiliar with themselves.

**HOW FAR HAVE WE
COME? -**

**HOW FAR DO WE
HAVE TO GO?**

**THE IMPORTANCE
OF PARTICIPATING
IN CYBERSPACE**

Some teachers think of a computer as a “thing.” To some, it is a mysterious and often intimidating piece of equipment that can run software programs to keep students occupied on computer lab day. To others it is a machine that lets you print out banners, greeting cards, and an occasional letter home to parents. Increasingly, teachers are using computers to keep track of their grades and to perform other classroom management activities. In the vast majority of instances, however, teachers are stuck in the “task mode” of conceptuality with computers. In other words, a computer is a device that lets you run software to serve the existing educational structure.

Computers are more than task tools. In recent years, computers have been linked together to create a massive, resource-rich, interactive environment in which people can work, play and learn. It is time for teachers to recognize that computers have evolved into something much more than just tools for tasks: they have become an “environment.” Today, a computer literate student with a machine and modem at home has many more resources available through the environment of the computer information highway than they do in the traditional campus environment.

The Information Super Highway is not a single place. Rather, it is a conglomerate of different networks that can be linked together. The linking of networks can get somewhat technical, and it is best to learn about linking on the networks themselves. Why? Because the network landscape is ever-changing. By the time a “how to do book” for computer networking is published, there is a good chance that some of its content is already out-of-date. In fact, this is true of FidoNet.

The original “book of instructions” on how to set up and run a Fidonet system using Tom Jennings’ original Fido software was published in the late 1980’s. The content of the book was current for a short period of time. Within months of its release it was out-of-date before it reached most people. If the book advised readers to use a certain piece of software to accomplish a certain task, it was likely there was already another piece of software, better and improved, to take its place by the time the book came out.

When I paid the registration fee for Fido software, I received a copy of what is known as “The Book.” After receiving the instruction manual (The Book) for Fido software, the software went through four version changes in about as many months. Each time a new version was released, I immediately downloaded it and installed it on my BBS.

I wanted to offer callers to our system the new features contained in the new versions. With each of these changes there were other pieces of software that came out as enhancements to the new versions. The software became more and more flexible, more powerful, and more feature-filled. Before long, however, the Fido software had features that were not documented in its instruction manual. To be aware of the newest features and to learn how to use them, a sysop has to read the “README” files that come out with each new release.

In the new age of computer environments, schools often have a hard time adjusting to rapid change. School districts often plan in terms of yearly budgets. They decide what they are going to be able to do based on annual budgets and operate using an annual “mind-set.” At the state level the mind-set is even longer—school textbooks are adopted for multiple years and planning is done for longer periods of time.

Yet in the computer network environment, change takes place monthly, weekly, and in some cases, almost daily. By the time a school attempts to design and implement a network access schema, they may be linking up with something that is new to them but out-of-date to the consistent network user. Software upgrades are constantly coming out, as well as new software that allows you to link to a particular network. To find out about what is available, schools should start “surfing the networks.” New and old methods for providing network access to students are available to schools. The variety of software, techniques, and number of revisions to publicly available shareware is growing exponentially. When looking for direction on what to choose, teachers and administrators need to get on-line and start looking around for solutions that fit their needs and their budgets. Sometimes “new” means more expensive, and sometimes “new” means totally free.

My son is a college music major. He composes music on his computer and he is quite good at it. Almost everything he has learned about digital music has come from a music conference in which he participates through FidoNet.

I came to a realization not long ago when our family was watching the movie *Amadeus*. The movie portrays a time when musicians, such as Mozart, went to Vienna to associate with and learn from each other. Other periods have seen artists congregate in a particular place to practice their craft—impressionistic art came from Paris, and even contemporary music is associated with a places like Nashville or MoTown. But today’s artists are starting to congregate in cyberspace. My son often asks me, “Has the mail come in yet?”, meaning the e-mail packets that carry messages from his music friends from around the country. My son is part of an international group of new-age artists that are not bound by traditional distance constraints. He can interact with like-minded individuals, learn from them, and socialize with them in a dynamic environment.

Computer networks are dynamic, fluid environments. Schools, on the other hand, are generally much less flexible. With rigid bell schedules, semester schedules, and curriculums, the environment of the school and the environment of cyberspace are so different that they can conflict with each other. There is a well-known cartoon phrase that is very appropriate to the inability of schools to adapt to technological change. “We have met the enemy and he is us.”

A personal case in point: About five years ago I had an exceptionally bright student named Michelle. In her history class she was studying the Indians of Texas and she came to me for help with a research paper she was doing. She said she could only find 3 books in the middle school library about Indians and she wanted to know if I would help her use the classroom modem to do the kind of library research I had talked to my computer literacy classes about. During lunch, I let Michelle use my university account to logon to the UTEP library network. Within minutes she was “surfing.” With a little help she soon learned that the university had hundreds of books on Indians and that some of those books appeared to be exactly what she needed for her research paper. The following school year, as an eighth grader, Michelle continued to visit my room at

the lunch hour to use the “university connection” as she and her friends started calling it.

Several years passed and the next time I heard about Michelle she was at the high school doing a research paper for her senior English teacher. Her mother contacted me to find out what was going on in my school district. When I quizzed her a little, I learned that Michelle had asked her teacher if she could format and printout the computer searches she had done for her research paper instead of turning in hand written reference cards on 3 X 5 index cards. The teacher said that using a computer was cheating and that she would have to hand write the cards. When I heard this I was disappointed in my colleague at the high school. This teacher totally undermined the work I had done to prepare this student to use powerful computerized methods to do research. Because the teacher didn't use technology, she wouldn't allow her students to use it either. They were forced to use “horse and buggy” methods because that's the mind-set of the teacher. This incident has caused me to think a lot about educational malpractice and the need to set technology standards that will weed out teachers who don't keep up with modern instructional methodology.

As an educational technologist, I am frequently asked by teachers such questions as which computer should I buy, or what software should we get for our children? Additionally, as a technology trainer of teachers it is my job to prepare district personnel to do a better job in the classroom—technologically speaking—by answering the question, “What should my lesson plan look like with technology integrated into classroom activities?”

Given the fact that the level of technology can vary greatly between schools, I believe the best training is that which can be used by anyone, regardless of which computers they have (old or new), and how many computers they may have (one or many). One of the reasons modems connected to BBS's are so effective in the educational arena is that they connect with virtually any type of computer.

Our local system, the DF-BBS, links Apple IIe's, Macintosh, IBM,

**MAPS VS THE
COMPASS -
TOWARDS A
CYBERSPACE
PHILOSOPHY**

and even a few Commodore computers to a common educational resource. In the past few months we have even found software that makes the graphical interface for our callers using Macintosh and IBM computers identical. Using “RIP-Script” software, we can train teachers at school to access our network on Macintosh computers, then give the teacher a free copy of RIP-Term software to use at home on their IBM. In this way, which platform they use is not an issue—the network looks and operates the same way on either computer.

While telecommunications technology is improving, becoming more seamless between platforms, we still have a long way to go in implementing its use in our schools. Implementing any new instructional technique within a school implies the need for training. But training to effectively put digital resources in the hands of students must move beyond simply dealing with how to do it. We must start dealing with the issue of why we are doing it. We must begin to ask how computer use relates to what is going on in thousands of classrooms. Moreover, if we seek to improve our schools and reform what we are doing, does current computer use serve to change things or keep things the same? What is the purpose of doing technology training and what form should it take?

When trying to show someone how to get from point A to point B, we generally have a couple of options. We can give teachers a map or we can give them a compass. Both methods serve the purpose of “getting there,” but they do so in significantly different ways. Maps imply that “the way” has already been found, whereas the compass is indicative of “finding the way.”

Telecommunications networks are natural environments for “finding the way” and promoting the compass methodology of education. This is what is meant by “surfing the nets.” Using a modem, students can link into a variety of networks and begin the process of digital exploration. They can do on-line research for reports, they can find digital music, they can download pictures, and they can enter into social environments in which they can “chat” with other people via their keyboard. Yet, even though the technical ability to do all these activities has existed for years, many of our schools still do not provide access to educational networks via modem. Most classrooms still do not have telephone lines.

In education, there are district mission statements in almost every school district that read something like this, “It is our purpose to provide a quality education to our students to prepare them for the future.” It’s the words “for the future” that hold the key for defining how we should conduct education. Since the future is unknown, it makes much more sense to spend our time using the compass method rather than the map method to teach. While both methods are valuable and useful, ultimately, each student is going to have to “find their way” through life. To me, doing it with a compass and the implied exploration is more likely to be useful to a student than to follow the preconceived notion (the map) of following a road that “in the future” may lead to ghost towns.

Apply the notion of “map teaching” or “compass teaching” to technology training of public school teachers and there is quite a dilemma to be faced. Should training consist of showing teachers which buttons to push on a computer, or should it be something more conceptual in approach. The need for both methods is evident to me. But again, in the long run, the conceptual approach (compass method) will probably have the greatest impact and far-reaching effect.

A comparison I often use to hammer home this idea in workshops is to liken typical technology training to driver education. If driver ed was taught like a lot of technology training is done, we’d have students get in a car and buckle and unbuckle their seatbelts, turn the windshield wipers on and off, roll the windows up and down, adjust the rear view mirror, and honk the horn. But after doing all these things, the student driver still hasn’t gone anywhere!

Technology training that takes the form of showing teachers which mouse button to push, which menu to pull down, how to change the desktop pattern, and how to do all the little “things” you can do with a computer, doesn’t address how the machines are going to be used in the classroom. We need technology training in which teachers join computer-mediated conferences and begin the process of exploring how to work with each other inside a digital environment. Once they are comfortable working with each other to design curriculum inside such an environment, they will be ready to start meeting their students in the same digital place.

**THE INFORMATION
SUPER HIGHWAY**

**PROBLEMS IN
CYBERSPACE**

Setting up a school or district BBS network creates new opportunities for students and teachers to meet. BBS technology is an inexpensive method for expanding the schoolday, increasing materials availability, and inspiring students to read and write. An educational system that doesn't offer computer networking for its staff and students is an incomplete system.

The Internet has only begun to be discovered by the general populace. For several decades, the military, university, and scientific and research communities have used it to facilitate their work. In the past couple of years, however, people not connected with universities have discovered communication on the Internet through newsgroups and listservs. This expansion is not necessarily beneficial.

For some time I have participated in the National Council of Teachers of Mathematics forum (the NCTM-List) that is hosted by Swarthmore College. As an instructional supervisor for my school district, I have found this conference to be enlightening, rich with useful ideas, and supportive of our district's efforts to implement the NCTM standards. The conference participants tend to be teachers, university professors, and other professional educators. While the participants may not agree with each other on all aspects of mathematics education, as scholars they understand that their on-line comments are meant to add to a true dialogue—a social conversation in which contributors “agree to disagree” as they attempt to persuade with anecdotal information, empirical data, and good rhetoric.

Over the past several months, however, I have noticed more and more comments coming into the conference from “America On-Line” participants. Many of the messages from this source have progressively weakened the conference due to their uneducated nature. Whereas scholars usually are given access to the Internet through their university or college connection, anyone who pays a monthly fee to a commercial service can jump into a conference conversation. Recently, some of the conversation has not only been NOT scholastic in nature, it has fallen below acceptable levels of plain good manners. Participants who lack “net-tiquette” (understanding how “flaming” can diminish a conversation)

and who only have “lay-person” superficial knowledge of educational methods are entering messages that water down the conference with meaningless opinions and prejudices that clutter up the conference landscape.

In the last few months, increasing numbers of participants have entered “I’m out of here” messages as they discontinue receiving the conference. The quality of a conference is important to its success. Teachers are not going to be willing to wade through dozens of messages that are trivial, opinionated, rude, sexist, racist, or just plain silly. I know I don’t have time to waste on such messages. Therefore, it is important to understand that forums need to be monitored and/or moderated to eliminate “extraneous” messages from entering into on-line conversations. Some might complain that this is a form of censorship, and they are right. Policies may need to be developed to deal with the problem of keeping digital dialogue on topic and focused on the purpose of the forum. If you set up a BBS, you’ll need to assign moderators to forums—people responsible for keeping the conversation on topic and purposeful.

There is something new on the horizon for American education. It promises to help both the teacher and the pupil in acquiring those basic goals of education, namely literacy, knowledge of self and society, problem solving ability, creativity, independent critical and analytical thought, and career guidance. Some call it “the information super-highway.” I prefer to call it simply, “the environment.” Just like school hallways lead to classrooms, computer networks lead to cyberspace where students can engage in educational activities.

The cyberspace environment is a digital school with no walls, no halls, no bells, no janitors, and no security guards. This school is open to anyone, without regard to age, sex, race, or handicap as long as they have the technical means to show up. The environment is an electronic school that is made possible by the use of personal computer communications.

One of the benefits of working in the environment of cyberspace is that all participants can receive direct, individualized instruction and attention while still able to interact with thousands of others. Students use

**MY CYBERSPACE
HOPE FOR THE
FUTURE**

our access to cyberspace, the Digital Foundation Network, to get on-line help with their homework, exchange electronic mail, search databases for information, and get counseling if necessary. The students interact more often in cyberspace; many exchange over fifty pieces of e-mail each week. How many traditional teachers would consider fifty written assignments each week to be excessive?

The major advantage to the environment of cyberspace is two-fold. Students have to read and write to participate, and they like to be there. Much of the current education-bashing concerns the lack of literacy—or the basic ability to read and write on a functional level—in our high school graduates. Using the environment of cyberspace, students spend every minute while on-line reading, writing, and thinking. The technology strengthens these skills, because the technology requires it.

Students on the DF-Network are excited about their ability to cultivate friendships with other students from around the world. El Paso school librarians are reporting lines forming before the doors open with students anxious to get to a computer and check their e-mail, and students are getting modems installed in their parents' home computers, redefining the concept of homework. One parent recently wrote to me saying, "You have cultivated our 14 year old couch potato. She doesn't sit staring at the TV. Now she uses the keyboard to interact with other kids. Through your network we're actually getting some good use out of our home computer. Thank you!"

The students, parents, and teachers in El Paso area schools are now linked to each other and the world through the Digital Foundation Network. Students are encouraged to use modem-equipped computers at school and/or at home to communicate with a staff of peer tutors in order to get help with school work. All students in the community are invited to call and participate in our learning environment, our little part of cyberspace, which is available 24 hours a day, 365 days a year.

Continuing projects in our CyberSpace on the DF-Network include:

1. Creation and transmission of digital student artwork via modem.

2. Continuation of the “Global Village News” created by Chris Rowan, a 4th grade teacher in Brownsville, Texas.
3. Creation of a library of music files so students can share music scores via modem.
4. Expansion of a Quick-Time (TM) movie library where students can share their creations of animated video sequences.
5. Introduction of the Special Projects Echoes through which students work collaboratively on major programming efforts to include ShowPrep Scripts and HyperStudio Stacks.
6. Carol Hooper’s MathMagic project through which students are engaged in problem solving activities that require logical discussion and verbalized answers.
7. The Camlu Modem Bridge Project that links senior citizens with children so the seniors can share a “living history” with youth.
8. Kathie Christenson’s “Lone Star Modem Amigo” project through which all 4th grade classrooms at Glen Cove Elementary explore Texas history and culture via modem.
9. The “Stacking Up Science” project in which senior high school honors science students prepare TAAS science software for use by middle school and elementary school students.

In addition to on-line projects that take place in the environment of cyberspace, there are also sizable collections of instructional materials that are growing in both quantity and quality inside cyberspace libraries. For example, the DF-BBS library has become a repository for both traditional educational shareware/software and our own locally produced custom-made software. It is quite possible that in our collection is a piece of software that would be highly useful to other schools around the state. Educational software is becoming easier to produce through hypermedia authoring programs like HyperStudio. This summer the Ysleta I.S.D. sent 20 educators to be trained by Roger Wagner Publishing in the use of HyperStudio. We have made a strong commitment to using this software product because we believe it has the potential to revolutionize how our schools use computers.

In the Ysleta I.S.D., we are moving away from “drill and kill” software toward software that promotes critical thinking and creative

**USING COMPUTERS
TO CREATE
PRODUCTS-**

**MOVING TOWARDS
SELF-RELIANCE**

production. Our simple test for software quality is to ask, “Does the student walk away from the computer with a product?” If a student sits at a computer pressing “A B C D” as answers to workbook-like questions, we consider this to be a “red flag” warning us that the computer is being used at a low level. On the other hand, if we see students inviting us to their machines to show us what they have made, we feel students are in a creative production mode, which is what we are looking for.

An example of what we have been able to produce locally is Mouse-N-Math. Mouse-N-Math is a teacher-designed software program for grades K-2. Using this program helps children learn how to use a mouse by moving color bar math manipulatives into positions on the computer screen as directed by their teacher. The color bars come in two versions, those with numbers “etched” on them and plain color bars without numbers. The program is designed to be “open-ended” and it encourages teachers to participate with the children as they use the computer.

Mouse-N-Math avoids the pitfall of using “drill & kill” tactics by creating “workspace” in which students create their own number combinations. The emphasis is on using a student-centered discovery approach for learning math combined with a computer environment in which children feel they are in control of what’s going on. There are no clocks to beat, no monsters chasing you around the screen, and nothing to shoot at or destroy. With Mouse-N-Math children explore how things fit together numerically in a colorful, non-stressful computer environment where they work at their own pace.

At the time this is being written, August 1995, I am running three BBS systems: 1) The Digital Foundation BBS; 2) The Academy K12-Network BBS; and, 3) The Ysleta Educational Telecommunication BBS. Each system runs on different BBS software, and each has a different focus. The best way to understand these systems is to call and explore them. All three systems operate as free public access BBS networks. Your only cost for access will be whatever long distance charges you incur. Generally, long distance costs about 10 cents per minute. Therefore, you could access these systems and explore for 10 minutes for about one dollar.

**THE
“CYBER-APPENDIX” -
HOW TO ACCESS OUR
CYBERSPACE**

If you need help setting up a BBS for your school, please feel free to contact me through any of the following systems:

The Digital Foundation BBS (915-590-6336)

This multi-line system is used by thousands of students and teachers for cyberspace projects. It is the largest, most sophisticated system of the three that I am running. The DF-BBS runs on a commercial BBS package called Major-BBS. If you want to set up a BBS like this one, your minimum cost to do so would be approximately \$2,500.00. If you want to add more lines and functions to the BBS, as we have done, the cost can easily approach \$15,000.00. Additionally, you will have to budget for telephone lines. We budget \$360.00 per line per year. For a ten line system, you would need to budget close to \$4000.00 for telephone line installation and maintenance for one year. The DF-BBS is also an Internet compatible system. Our domain name is “df-net.org.” If you wish to contact us for additional up-to-date information you can send e-mail to “helpdesk@df-net.org.”

The Academy K12-Network (915-598-1987)

This Fidonet/K12-Net system provides students and teachers a low-cost alternative to the Internet for providing world-wide communications. The K12-Network consists of 38 content-specific echomail conferences covering virtually all academic topics. The Academy K12-Network BBS runs on the freely available, original, Fido software written by Tom Jennings (creator of Fidonet). The cost to establish a K12-Network system is the cost of a computer (doesn't have to be fancy) and the cost of a single telephone line. If you have an older IBM compatible you are not using anymore, you might consider using it to start your own Fidonet node. If you would like to access our K12-Network BBS, you can logon using the name “Guest Teacher” with a password of TAAS.

The YET-BBS (915-595-6806)

This system is for use by Ysleta I.S.D. employees only. It runs on a freeware package called DLX. It has easy-to-use e-mail and on-line chat

functions. We also use the system to maintain several databases of lesson plans for teachers. Recently, we used the YET system to transmit TAAS scores and results directly to campuses. This system allows administrators from multiple campuses to logon simultaneously and conduct teleconference sessions. If you would like to try this system, please call my voice line (915-595-5676) for access information.

Ken Blystone, Educational Technologist Ysleta I.S.D. Staff Development
Division 9600 Sims El Paso, Texas 79925

YISD Main Number: 915-595-5500
Office Voice Mail: 915-595-5676
Office Fax: 915-595-5930
DF-BBS Data 1: 915-590-6336 K12
Network: 915-598-1987
YET-BBS: 915-595-6806

Internet Address: kenbly@df-net.org
support@df-net.org
Fidonet Address : ken.blystone@f64.n381.z1.fidonet.org

The following is a listing of On-Line Teaching and Learning sites available on the World Wide Web as of July 7, 1995, listed in the Yahoo directory using Netscape:



(numbers within parentheses indicate the number of additional links to that particular topic)

Academic Instruction using WWW

Alliance for Computers and Writing (3)

AskERIC Virtual Library - AskERIC is an Internet service dedicated to providing education information to the networked K-12 audience.

CATS PROGRAM Home Page - offers a graduate diploma course in the area of development and application of advanced software technologies.

Center for Visual Creation Catalogue of Classes

City University - offers information about the university and is a vehicle for students to complete select courses via the Internet.

CNU Online - provides dialup and internet connections to a growing distance education project. Courses may be taken for enjoyment, credit, or towards a 4 year degree.

Computational Science Education Project - CSEP produces electronic teaching materials for advanced undergraduates and beginning graduate students in computational sciences and engineering.

Computing Maths Lecture Notes

Conferences (2)

Department of Instructional Technologies

Earth System Science Community Curriculum - a holistic approach to the study of the Earth that stresses investigations of the interactions among the Earth's components in order to explain Earth dynamics, Earth evolution and global change.

Education Sharing Service

Educational Archive - Large Education Archive available via ftp & html HTML portion is still under construction.

Educational Online Sources Home Page - Welcome to the world wide web of educational online sources. We want to make this a space where everyone can contribute, where everyone together can build a clearinghouse for educational information.

eText - Electronic Textbook project at Caltech

General, Organic and Biochemistry - Two semester series of lecture slides, practice exams and chapter summaries.

Globewide Network Academy (5)

Hewlett Packard Email Mentor Program - mentor program developed by HP to encourage local K-12 students to take full responsibility for their education by providing an environment which nurtures their interests, dreams and goals.

ILTweb - Institute for Learning Technologies (ILT) Columbia University - a working prototype for the ILTnet Educational Resources Network, a high-speed multimedia network linking many diverse local and global resources related to education and educational technology.

Institutes (7)

Interact Project - aim of the INTERACT project is to provide students with an understanding and appreciation of the interactions and relationships which occur in engineering phenomena. This is being done by use of interactive computer simulations of engineering systems.

International University College [new] - The mission of the IUC is to serve as a university to develop and provide affordable courses, certificates and degrees to individuals world-wide, using electronic technologies.

James, Leon - Visit a unique educational experiment in which students put their reports on Home Pages and interlink them generationally every semester creating a generational virtual superdocument.

KIDLINK: Global Networking for Youth 10-15 - KIDS-96 (sm) is a grassroots project aiming at getting as many children in the age group 10-15 as possible involved in a GLOBAL dialog. KIDLINK (sm) is the name of the organization that runs the yearly KIDS-*nn* projects.

Learning Connection - Worldwide tutoring exchange. Find a tutor for your specific needs or be a tutor by filling out our easy on-line form

Learning Through Collaborative Visualization - Through the use of advanced technologies, the CoVis Project is attempting to transform science learning to better resemble the authentic practice of science.

Live From Antarctica - a Passport to Knowledge project designed to allow students and teachers the opportunity to experience what life is like in the coldest place on the planet, Antarctica.

Math and Science Education@ (44)

Middle of Nowhere - an experiment in using hypertext web documents to distribute hoarded information to students of all ages around the globe.

NASA Educational Resources

NovaNET - system for computer-aided instruction - a system for computer-aided instruction. The system provides instruction, communications, courseware authoring, and curriculum and student management tools.

NYU Hippocrates Interactive Learning Experiment

OnLine Education

Open University (UK) - Course on Lisp & Prolog - offering courses for credit in Common Lisp and Prolog to anyone on the Internet. Course materials and software can be obtained either on-line or via conventional mailings. Formal registration is required (details provided), and tuition takes place using a combination of email, listserv, synchronous & asynchronous conferencing, and other methods as appropriate.

People Advancing Knowledge for Humanity

Products and Services (2)

SyllabusWeb - Covers technologies of interest to educators in high schools, colleges, and universities.

Synthesis Coalition (2)

Teaching with WWW

The 'Ed'-files

The CHANCE Database Welcome Page - a case study course based upon current chance events as reported in the daily newspapers such as the New York Times and the Washington Post and current journals such as Science, Nature, and the New England Journal of Medicine.

The ECSEL Coalition - a coalition of seven diverse schools and colleges of engineering engaged in a five-year effort to renew undergraduate engineering education and its infrastructure.

The Ictinus Network - a model for the delivery and management of academic material via a heterogeneous computing network. Students are able to connect their own personal computers in their studio to the core computing resources of the Department and of the University.

The Long Island Educator

THE ON-LINE VISUAL LITERACY PROJECT

The Text Project - generate hypertext textbooks to teach various subjects over the network.

Tutorial Documentation - a filter for a CGI-compliant HTTP server that makes it slightly easier to develop tutorial style questions and have them presented by most Web browsers.

University of Florida's IBM Writing Project - involves the teaching of undergraduate and graduate writing and literature classes in an X-windows based networked writing environment.

University of Missouri at Columbia - Online Writery - online tutoring service for undergraduates, which makes use of the web, e-mail, MOO, and other resources.

Using WWW to Augment University Courses

Villa Park (1)

Virtual Academy (Wirtualna Akademia) - promote the Internet among Polish speaking people and education through the Net.

Virtual Online University - Virtual Online University is a liberal arts university located online, in the form of a virtual environment called a VEE, or Virtual Education Environment.

Virtual Summer School at UK's Open University - Students of Cognitive Psychology used Internet

Videoconferencing and a range of other communications technologies to participate in tutorials and practical lab activities.

Web Educational Support Tools (WEST) - a project of the UCD Computer Science department designed to deliver course materials and support to students over the WWW.

WWW '94 WS: Teaching & Learning with the Web

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